

VR in Live Music: New Perspectives on the Application of VR to Improve Concert Accessibility for Disabled Attendees

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ABSTRACT

Live music and concert experiences have cemented themselves as a staple sector of the music industry. Festivals and events welcome millions of fans annually yet concerns over accessibility greatly limits who's able to enjoy a large-scale show. The suggestion to incorporate virtual reality and 360 degree filming on-site as a supplemental experience for disabled attendees shifts traditional concert viewing into a widely welcoming and inclusive one. By introducing such technology as well as reevaluating existing practices, the wide gaps that debilitate accessibility can soon close. This paper outlines the changes that must be made and results they'd have on live music and the industry as a whole.

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INTRODUCTION

The objective of this research is to fill accessibility gaps in the live music industry by incorporating an emerging technology in a way that enhances disabled consumers' experience of large scale live events. The recommendations presented in this research will clarify the importance of adopting technology, specifically VR/360 degree live-streaming, into live music events to increase accessibility, elevate the experience, and engage with a large and overlooked market of disabled consumers. Verticals from the primary recommendation illuminate how implementation can lead to other areas of improvement and potential for monetization.

In order to facilitate complimentary research, a range of questions are asked for investigation. This began by questioning who is subject to an inaccessible concert experience and what could be done to create a more inclusive and elevated experience for such an audience? From here, questions arose in how VR currently exists in application to music and who/how are key players influencing the interweaving industries of music and virtual reality? Why is it important to incorporate emerging technology into live music and how can it be done in a way that reshapes all prior live music experiences. After gathering a greater understanding of VR's position in a modern digital era and accessibility in regards to large scale events, novel insights for organizers, promoters and advocacy organizations can mend the disjointed experience.. Therefore exactly how can VR best be implemented to encourage a more inclusive and accessible live music experience that maximizes attendance, consumer satisfaction and revenues?

The primary proposition of this research suggests for large scale event operations to incorporate real-time 360 degree streamed VR experiences within disabled sections for attendees

to opt in and out of an enhanced experience. The research will also propose other theories of how this service could be monetized and the resulting positive impact across industries. Current concert accessibility will be very closely analyzed and considered when developing theories that maximize value for all stakeholders involved in an event operation. The current state of concert accessibility will be fully dissected along with ways technology, advocacy and laws are actively improving the experience for disabled attendees. The recommendations of this research will be most relevant to large scale event organizers, owners and promoters along with a final relevance to charitable organizations, big brands and marketing agencies.

The recent toll the music industry, along with many others, have taken from COVID-19 leaves the future a very uncertain one. In relation to this study and live music, the only prediction one can make is that organized events will not return to normalcy in the United States until there is a vaccine. Although so far it can be seen that audiences can adapt in ways, not necessarily legal and socially safe, to create, share and enjoy live music. On a first hand account creativity has stretched to curate the most unique and adaptive live music experiences. For instance, a stationary box truck near McCarren Park in North Brooklyn played music from the confines of the truck bed for all who passed by. City rooftops have turned into DIY venues being outfitted with full sound-systems, lighting and a sizable outdoor crowd. Pop-up events are becoming more common to be heard promoted in outdoor locations like under bridges and outside in large industrial lots along with drive-in concerts. With all that being said, these initiatives are very restrictive in avoiding too large crowds and don't represent how festivals and arena tours will respond. The research questions in this study regarding large-scale operations might be greatly skewed when the live music industry reopens. However, how the music industry responds and

adapts due to COVID-19 will be in a far different manner than how it ever operated before.

Could it be possible that in a post coronavirus festival and event setting that due to extreme capacity restrictions, accessibility significantly improves? These are only speculations as the reopenings will be handled on a country-by-country (and even state-by-state) basis as many other decisions were handled throughout the pandemic. It's important to mention that the research and recommendations were conducted under a pre-pandemic lens and represent the industry as such.

RESEARCH METHODS

There's currently a gap of research that directly relates virtual reality and its application to accessibility therefore each individual industry and topic were researched separately but later analyzed together to target trends and areas for improvement. Secondary research came in the form of academic journals, online articles, industry reports, books, experimental studies, case studies and guidelines/best practices. Research topics included virtual reality, 360 degree filming, live-streaming, large scale event accessibility, disability and protection. A systematic search using the previous research topics as keyword combinations generated potential resources for review. Search results were also restricted to those that included the key words to ensure their relevance to this research. Studies with an emphasis on AR and CGI based VR were excluded.

An emphasis was placed on the research study involving *Rapid Passage through Various Ambiences*, an experimental 360 degree immersive film about the Chungking Mansions in Hong Kong. The study introduced olfactory and somatosensory stimulus while subjects were in a virtual reality experience in the form of smells, breezes and heat. The goal was to measure the response and increase the ability to create and maintain a presence in VR that maximizes engagement. Pimentel and Texeira's quote from the early years of VR exploration in the 1990s

perfectly sums up the purpose of this study

The question isn't whether the created world is as real as the physical world, but whether the created world is real enough for you to suspend your disbelief for a period of time (1993).

The study was completed by the School of Media and Performing Arts at Coventry University.

A research paper published in the International Journal of Event and Festival Management served as a thought provoking resource on ways technology and media are shifting how music festivals are conceived and delivered. The paper also considers technological advancements as a tool for improving accessibility among other notable points.

All research and data was gathered via the NYU library, online databases (i.e. Google Scholar, Statista, JSTOR, Scholar One) and company websites. In order to create a clean and cohesive data set made up of many non-related resources, each resource was individually annotated and dissected. Then a data set was created from noted trends and topics and organized to be analyzed as a whole. Additionally a comparative analysis was conducted with both the medical and education industries to better understand how VR is merging to alleviate struggles faced by disabled members of these communities. The combination of research creates a solid ground to generate meaningful recommendations.

DELIMITATIONS

For the purpose of this research, all forms of mobile augmented reality used by either the general public or disabled in a concert setting, have been overlooked. The only reference to augmented reality will be in relation to a HMD (head-mounted display) virtual reality devices

and a 360 degree VR experience. Here, AR will be defined as animations and text overlaid on the true-to-life live broadcast.

When discussing the background and analysis of virtual reality and its industry, the general public along with disabled will be considered to evaluate market size, growth and potential along with consumer acceptance, adoption and general sentiment.

A large factor of event accessibility goes into architectural design and the construction phase of new venues or festival sites. Additionally, design and construction are relevant when remodeling existing venues and buildings to improve accessibility. However, when analyzing accessibility and applying recommendations, a deep analysis of these pertinent and preliminary stages are beyond the scope of this study.

The following research neglects to address the accessibility concerns and issues associated with performers and industry professionals as solutions in that realm are beyond the scope of this study. The research will specifically apply to disabled concert attendees accessibility.

The implementation of these recommendations are not for events and venues with a capacity below 7,500. Mid and small sized venues are beyond the scope of this study as production costs, funding and streams of revenue differ immensely compared to large scale operations. Mid/small scale operations likely won't have the resources or support necessary to execute most recommendations.

When considering live music accessibility in terms of this research elderly and other groups of individuals that have difficulty finding a festival or event accessible are beyond the scope of this study.

Although many forms of both government and non-profit organizations advocate on behalf of disabled individuals all that may be referenced will not be deeply discussed. Only the ADA in terms of the United States will be closely analyzed to recognize significant gaps for the purpose of this study.

OUTLINE

The research first evaluates current trends and activations happening where music and virtual reality meet. Beyond virtual reality, a deep dive into the background of accessibility and disability awareness brings more understanding to the current state. Disability and accessibility both are defined prior to a reference of US government initiated protection (ADA) and global support organizations that are raising awareness for the disabled community. An analysis of the VR industry is conducted projecting market size and consumer adoption, problems to overcome but also highlights and what the future may look like where music and VR industries merge. Then the range of concert accessibility issues including ticket purchase, communication, physical design and technology are reviewed before addressing ‘the invisible audience’. Pain points within the ADA and its enforcement are also reviewed and considered in how it’s valuable to better understand the audience. A look into the medical and education sectors provides insight on if and how VR technology is already being used to improve experiences for a disabled audience in other industries. A review of the *Rapid Passage through Various Ambiences* experiment breaks down the study and applies the findings/participant testimonials to the live music industry. Finally a reflection on the importance of engagement and interactivity in the current world and what it means to the music industry helps tie together all supporting research in forming final recommendations. A brief conclusion wraps up the research before presenting

recommendations for promoters or venue organizers and advocacy organizations or legislation.

Finally areas of further research are outlined to complete the research.

BACKGROUND

VIRTUAL REALITY / 360 DEGREE MEDIA

The rise in music centered VR technology is demonstrating a pattern to be noted. A new segment is developing which combines immersive technology and elevates consumer's ways of experiencing music. Examples include The WaveVR, NextVR, GearVR, MelodyVR and WithinVR. They all highlight different ways of experiencing music in a virtual reality and show the possibility of what's to come. The style of experience each company creates typically falls into two categories; (1) real concerts filmed with multiple 360 degree fixed points to jump between (2) an animated, interactive and online virtual space with live performances from avatars representing artists. Regardless the type of experience, both forms represent how currently virtual reality and live music are combining for at home consumption. All the above companies have potential to set the guidelines and common practice of how VR media in live music is created and distributed.

Live Nation is another important player to note in the virtual reality meets music realm. The company reached an international VR market through partnerships with a range of the previously stated VR companies, the most impactful was with NextVR (with additional support from CitiBank). This campaign involved live streamed VR concerts in real time and available on demand to at home concert goers. The lineup boasted chart topping talent and extended over multiple months. The content was created using the previously described 360 degree method providing rare vantage points for viewers in VR. The 360 cameras that captured the concerts

were placed in a few locations but typically either the thick of the crowd, a mezzanine, front row or on stage. This allowed viewers to freely move between the available camera points but interactivity was limited to this and the experience flattens very quickly as consumers grow fatigued.

CONCERT ACCESSIBILITY

Finkel, Sharp & Sweeney define accessibility as the “measures put in place to address participation by those with impairments”, impairments may be physical or mental and also temporary or permanent (2019). The ability for a disabled person to attend a concert or festival proves to be a challenging task given the current status of venue and festival accessibility. Current venues and productions do not adequately accommodate the disabled as reviewed in Attitude is Everything’s State of Access Report 2018. The State of Access Report includes a survey that concluded the bottomline needs for disabled concertgoers to be able to attend an event are extra seats for assistants (or additional assistants), a wheelchair accessible space, step-free seating and a viewpoint of sign language interpreters (when necessary). Additional needs of disabled attendees can also include needs for meditation, animal assistance, specific foods and fluids, gaining early entry to venues, guides to seating areas and most importantly the ability to remain mobile during the performances. Further survey data revealed that the majority of disabled attendees suffer from mobility impairments. This is closely followed by chronic physical health conditions with a steep drop to mental conditions. Attendees also mentioned their needs from most important to least important thorough surveys which ranked in accessible seating, need for personal assistant, followed by access to restrooms.

Attitude Is Everything's State of Access Report 2018 accounts the sheer magnitude of disabled fans that want to experience live music events reaching 3.3 million British citizens. Across the Atlantic in the United States, the Hastings Communication and Entertainment Law Journal reports 43 million disabled Americans. Although actions have been made to improve this category's ability to attend concerts and festivals, a portion continues to miss out. Logistically a limit to venues accessible seating options exists resulting in an inevitable problem of sold out seats.

In 1990 the United States took measures to protect disabled Americans through the American's with Disabilities Act (ADA). The act "protects the civil rights of individuals who (1) have a physical or mental impairment that substantially limits one or more major life activities, (2) have a record of such an impairment, or (3) are regarded as having such an impairment. Major life activities include walking, seeing, hearing, speaking, breathing, learning, working, caring for oneself, and performing manual tasks" (Pacer; 2019). In 2008, amendments reinforced that the definition of disability and the term 'substantially limits' should be interpreted broadly. The protection extends into the sectors of employment, government programs and access to public and private places (including concert venues, arenas and festivals). The ADA is enforced by the Attorney General who's to investigate alleged violations and complete compliance checks on existing entities. The ADA also contains a 'private right of action' provision which allows for discriminated individuals to enforce other provisions of the ADA (Carlson, Katherine; 1998). When allegations develop and civil action is necessary the court protects the disabled and punishes inaccessible entities as follows...

The court (A) may grant any equitable relief that such court considers to be appropriate ... ; (B) may award such other relief as the court considers to be appropriate, including monetary damages; (C) may, to vindicate the public interest, assess a civil penalty against the entity in an amount (i) not exceeding \$50,000 for a first violation; and (ii) not exceeding \$100,000 for any subsequent violation (Carlson, Katherine; 1998).

The result of a suit filed by the Justice Department versus Ellerbe Becket facilitated two important rulings that defined new terms in regards to ADA compliance. The first being that wheelchair sectioned seating must have lines of sight comparable to general admission. The second requirement revolves around integration and dispersal meaning that disabled seats not be segregated from GA and these seats be evenly dispersed throughout the venue or space (Carlson, Katherine; 1998). Important to note in ADA compliance relation to the live music industry is that both entertainers and venue owners are liable for ADA violations.

Apart from government action on addressing disabled accessibility, non-profit and charity organizations amplify the voice and advocate on behalf of the disabled population. These organizations campaign to raise awareness, reduce discrimination and facilitate greater accessibility across society. For instance, Attitude is Everything (AiE) has created The Charter of Best Practice for Festivals and Events to follow as a guide to improve accessibility. The Toronto Rehabilitation Institute has also released a thorough checklist for improving accessibility in large conferences and conventions. The ADA also released the Standards for Accessible Design in 2010 with a supporting document. Unfortunately, needs are still not being met and disabled groups continue to experience discrimination. The research paper published in the International

Journal of Event and Festival Management introduced the theory of the ‘invisible audience’ representing the discriminated and neglected market that is unable to access live music in the current environment.

Of course another primary problem and proliferating issue within disabled venues and events is the lack of budget. Some festivals and venues simply do not have the capabilities to reconstruct existing venues or build out accommodating sections, seating, bathrooms and hire additional staff for disabled assistance and sign language interpretation. However the Journal of Event and Festival Management points out a promising slew of investments into developing more accessible venues (2020).

FINDINGS (DATA ANALYSIS)

VIRTUAL REALITY

Statistics reinforce the promising growth of the VR market. Statista reports the global market to reach 18.8 billion US dollars in 2020. Also interestingly Statista projects that in 2023 VR technology will be used at three times the rate in industrial settings compared to by consumers. This gives you a better idea of where and how the technology will be specifically used. Instantly the medical and education fields are environments where VR seems to have vast possibilities of application. More on what can be learned from these parallel industries to come later.

At the moment limitations exist in creating a seamless, widely adopted virtual music experience. Anthony Mattana outlined these at the 2016 NAMM Show. He pointed out the fact that there is no common practice or industry wide standard for all these VR software and hardware companies. This theme of a lacking best practice or standard can be found repeated

across other research. This deters integration and delays progress compared to a cohesive and complimentary ecosystem. Another issue in the current environment is consumer adoption. Users are becoming less interested in VR software that utilizes 360 degree cameras to create their virtual environments because it restricts them to fixed points (Wired). The experiment on the Chungking Mansions simulation also nodded to this issue in creating a feeling of presence in the user. Additional issues arise in current low quality CGI virtual worlds but this is rapidly developing as technology and graphics improve. However for the purpose of this research, ways in which a 360 degree live streamed experience can be enhanced and offered as an alternative to disabled concert attendees is the focus. Consumer insight also reveals how important it is to create a presence for users in a VR world so they feel engaged enough to stay, as either an observer (in a 360 degree simulation) or participant (in a CGI virtual world) in the environment.

Regardless of the issues above, there is a lot of promise to shine a light on as well. Amy Lameyer who experienced and reported on a Live Nation and NextVR stream of Thievery Corporation admitted that she “got up and danced. [she] may have even clapped and whistled. This is the future and [she’s] eagerly awaiting more”. Supporting data from Greenlight Insights found that 65% of consumers were interested in live VR events and the number one suggestion for future VR content was concerts (Wired). Based on the past examples in work from NextVR, there’s a clear interest and potential for consumers to engage with live-streamed VR concerts. Although it must be noted that due to COVID-19, NextVR’s efforts in shaping the market have been put on hold and in May of 2020 the company was acquired by Apple. Even though the company failed to sustain independently, Apple’s acquisition points to heightened interest in the VR and AR industries from the tech giant and fuels the strong possibilities to come.

CONCERT ACCESSIBILITY

The State of Access Report by Attitude is Everything surveyed disabled concertgoers, family and caretakers calculating that 95% of attendees experienced issues when attempting to attend live music events (2018). Alarming 88% felt discriminated against in the process. The 2017 UK Live Music Census also investigated accessibility and suggested there was a need for significant improvement to the state of accessibility at both venues and festivals as revealed in the survey response. Lack of satisfaction and evident discrimination experienced by this audience calls for immediate action. The census also revealed that many promoters and venue owners have never completed any form of disability awareness training. By continuing to overlook information and ignore critical insight, the environment only delays correcting accessibility issues. A positive conclusion of the census reveals that 90% of promoters claim to only book shows at accessible, step-free venues. Even if this result is skewed on the bias of self-reporting, it shows the willingness of the industry to accommodate disabled consumers more actively in future productions.

Before accommodating disabled attendees needs, it's good to understand exactly what disabilities the audience experiences to better and more appropriately structure efforts. AiE has outlined these through their 2018 survey, the leading disability as mentioned, comes in the form of mobility impairments at 68%. Of the disabled audience 38% are wheelchair users. Furthermore, 35% of the audience suffers a chronic physical health condition, 17% from mental health conditions, 14% from hearing impairments, 9% from vision impairments and 16% make up the combined portion of learning disabled / autistic. It would therefore be most beneficial to

alleviate tensions faced by the majority surrounding mobility limitations. As this would yield the highest return on efforts per segment of the disabled audience.

To continue to better understand the disabled audience, their sentiment and feelings of who's responsible for injustices were also surveyed by AiE. Interestingly, unsatisfied disabled attendees found ticketing companies (if involved) to be more at fault than entirely blaming the venue (AiE; 2018). Additionally, a large enough audience portion would blame the artist or band for the poor experience to warrant concern (AiE; 2020). The consequences from a bad concert experience on the audience's future actions is what is alarming as the surveyed claimed 81% would be less likely to attend the venue again, 76% would be less likely to purchase a ticket from the same source, 21% would refuse to see the artist or band again and 15% percent would never buy a future record or merch (AiE; 2018). The results not only give a greater understanding to how the audience feels but also show the overall impact to the entire music industry following a poor and inaccessible experience.

Research indicates that accessibility stems far before disabled concert goers arrive at an event. To fully understand concert accessibility a first look at ticket purchase and the barriers associated is needed. Research also illuminates the importance of a viable form of two-way communication between organizers and ticket purchasers during the initial customer interaction and throughout the time leading up to an event as well as during. Come concert time, apparent physical barriers breed more inaccessibility. However, it's promising to look at how technologic improvements are being used unconventionally to aid disabled attendees' experiences at events.

Online Ticket Purchase

Along the consumer interaction timeline of attending a concert, disabled individuals struggle right from the start when they begin to think about attending an event. An overwhelming majority of tickets are sold and purchased online. Therefore, the primary source for event entry is inaccessible and restricts a group of disabled consumers from being able to operate the technology and navigate web browsers to purchase a ticket as noted in the *Journal of Event and Festival Management* (2020). Katherine Carlson also brought this primary hurdle to attention in her 1998 review of the ADA when ticketing circumstances were vastly different. The lack of improvements over the past 22 years are in part caused by ever changing means of ticket distribution and digitalization. Whatever ways ticketing continues to adjust in the coming decades, a proactive approach to ensure disabled access must always be considered. Services provided by the UK charity Vocaleyes try to alleviate some of the struggles faced at ticket purchase by using audio event descriptions for vision impaired.

AiE also highlights the importance of reliable communication at ticket purchase and throughout the timeline to alleviate any uncertainties faced by disabled attendees who are trying to attend an event. AiE's 2018 survey also suggested including information specific to the purchased disabled seat/section (such as the amount of steps to the seat and its proximity to a nearby bathroom) as this is valuable for attendees to prepare and reduce any associated stress with attending. If organizers consider accessibility from the start of event planning and communicate all information to disabled attendees in advance to those that can purchase tickets online, barriers for them are immensely reduced and a sense of inclusivity is achieved.

Ticketing lines also exist for those with disabilities that need to call in to make a purchase. However a call in service lacks in the immediacy and efficiency that online customers

receive. Time is spent waiting in phone cues and being placed on hold that only diminishes a smooth and stress free ticket purchase. It's apparent how a lot of anxiety can surround the ticketing process of a disabled fan's journey to a concert and discriminate many from even making the initial attempt.

Apart from typical ticket transactions occurring online and blocking a segment of the disabled audience, the nature of how tickets are sold also create blockades that are more difficult to pass. This being that large scale festivals and concert tours quickly sell out to mass buyers and bots and then are resold at outrageous rates creating an elitist marketplace. Although disabled section seats may not be the ones bought out in mass ticket purchase schemes, they certainly perpetuate the issue in there not being enough disabled seats offered. Venues and promoters goals of maximizing revenues with high attendance means they're more likely to sell a GA seat than convert a section for disabled attendees that they don't believe will come (i.e. the invisible audience). In Attitude is Everything's 2018 State of Access Report, they acknowledge the ticket capacity and selling-out problem as well as point out that priority is given to GA attendees. With false sell-outs due to bots, the true interest and predicted attendance is heavily skewed for a show that might not have sold out as quickly if left to a fair ticket purchase environment.

Christine Swain from Colston Hall, an UK concert venue, noted the importance of Attitude is Everything's Charter of Best Practices for Festivals and Events and how "it's a great base for any venue to use to improve its services" (The International Journal of Events and Festival Management, 2020). Attitude is Everything also launched a campaign in 2006 called Access Starts Online that involved 50 major UK music festivals to include a detailed webpage with all things in regards to accessibility on their websites to improve communication. The

campaign also encouraged festivals and venues to pledge to abide by the Charter of Best Practices for Festivals and Events. Keeping up the momentum from efforts like these will create a more accessible ticketing system for disabled attendees.

Communication

Across all research a trending emphasis on communication between promoters and disabled consumers was noted and Access Starts Online aims to combat this directly. By implementing an improved system of communication and customer service, AiE found that initiatives made here are an inexpensive way to successfully combat accessibility compared to structural or logistic changes with a near equivalent impact. Hawkins confirmed that even if an event perfectly executes all forms of structural accessibility yet lacks in customer service and communication “people will be much angrier than if physical access wasn't there and be much less-likely to revisit” (The International Journal of Events and Festival Management, 2020). By providing a concrete and transparent home for event organizers to communicate the current state of accessibility at an event or festival, communication barriers are immensely improved for disabled concert goers. Whether the state of the event is inaccessible or completely disabled friendly, attendees will know prior if they logistically are able to attend the event and what preparations might be needed made prior to improve their access.

Another tool Swain used that proved successful in creating a more accessible venue was tapping into mystery shoppers; Clare Griffiths of Roundhouse, another UK venue, reinforced the value in mystery shoppers and the ability for them to provide an alternative perspective and a first person experience of a disabled concert goer. Griffiths mentioned that “working with people that have access needs knowing what works for them really is key” (The International Journal of

Events and Festival Management, 2020). AiE mystery shoppers also reinforced previously noted points regarding communication and that “events with limited access but good customer service, generally receive positive reports from customers who want to return” (The International Journal of Events and Festival Management, 2020).

The too obvious, which took some time figuring out, simply has to do with The Golden Rule; treat others as you’d like to be treated. The Journal of Event and Festival Management outlined how important a supportive style of copy written in first person language establishes a strong and personal connection from the start. The journal states how this encourages attendance by addressing accessibility positively. Other recommendations mentioned proposed including how-to or FAQ videos, generally the takeaway here is to offer multiple ways for those with different disabilities to interpret and engage with important information as easily as possible per situation. Communication and interaction can be extended into social media fronts as well where events and organizers have capabilities to build a sense of community for all welcomed concert-goers. Becoming more human throughout the customer interaction will yield a far more accessible environment.

Improved communication also recognizes a greater level of awareness on behalf of organizers and promoters. Higher awareness can lead to a higher level of consumer experience as stated by narratives outlined in the Journal of Event and Festival Management (2020). This is where advocacy programs and global support organizations have the potential to play a role in creating a more accessible and inclusive live music environment.

Physical Barriers

As previously mentioned, the logistics and physical barriers of designing, constructing and renovating festival grounds and existing event spaces are largely responsible for the lack of accessibility once disabled participants finally obtain a ticket and embark on their concert experience. Physical issues all relate back to the key struggle which is a clear line of sight from disabled sections, including those seated in wheelchairs. The scope of issues and concerns in regards to the physical venue space also encompass the topography of the venue (stairs, ramps, elevators and inclines) as well as enough square feet of space (for personal aides, administering medication, accommodating transport throughout venue, etc.) and finally ease of access to other needs (vendors and restrooms).

The State of Access Report of 2018 by AiE outlines disabled concert attendees prime needs as surveyed...

1. To bring medical equipment or medication
2. To bring a guide dog or human aid
3. To bring specific foods or fluids
4. To gain early entry to familiarize with venue and avoid crowds
5. To be ushered or guided to their seat or section
6. To be able to come and go freely during the event or performance

It's clear that to meet these needs the more space available puts each point in closer reach.

Furthermore, needs can be alleviated with a relaxation on rules applied to disabled attendees and a better understanding of the easily achievable needs that made a big impact on their experience.

When addressing the issue of how venues are designed and space is allocated, promoters run into the issue of detracting from GA seating/standing to enlarge walkways, exits, disabled

sections and create back of house areas for administering medicines or other needs. This fear of revenue loss not only cripples the amount of tickets made available for disabled attendees but also when the space permits to create a fluidly accessible venue, it's then sacrificed to increase GA ticket sales. Also venues and promoters may fear another financial pressure in new staffing roles like ushers or disabled concierge/venue representatives that provide a slew of important information to disabled attendees. Embracing the surrounding technology available can decrease the staffing needs here by creating in-pocket venue and festival apps that answer all disabled attendees' concerns and offer real-time assistance with a rep. For those disabled that may not be able to use this technology, it will be expected that an aid would be assisting them at the event. Access regarding an aides admittance to assist a disabled attendee at an event removes the need to staff venue ushers and aides. As discussed, a primary concern of disabled attendees during the event is communication with a reliable source of information to answer all their questions and concerns. Once an accessible design for a festival or venue with ample square footage is created and financial concerns regarding revenue loss or staffing are assuaged, the other attendee points of concern are easily resolved.

Most of the concerns above persist due to lack of awareness of disabled needs. Simple exemptions from typical venue rules of no food/drink from outside vendors, early access or re-entry would facilitate a better and more executable experience for disabled attendees. There's room for abuse regarding these exemptions which requires a degree of documentation when attendees try to take advantage of such privileges. As long as festival build-outs and new venue construction teams are educated, aware and accessible conscience, then all these needs are within reasonable reach.

Specific to festivals, Carol Humphries of Greener Gathering Festival nodes these challenges and reinforces how electricity is precious in spreading a more technologically advanced and equivalently more accessible space (The International Journal of Events and Festival Management, 2020). Unless the event site of a festival is in an extremely remote location or unforgiving environment there's little to no explanations for why ample electricity sources cannot be constructed, distributed and generated either renewably or with gas.

When it comes to altering already existing venues an entirely different lens presents new problems to address. Issues begin in finding the budget to make such renovations that would improve a space's accessibility. There's an option to source renovation cost assistance from organizations and governments to help alleviate the financial burden faced by non-accessible venues but that extends beyond the analyses of this research. If budget is not an issue, then one may arise in that the venue simply cannot be altered in a way that would improve accessibility and has a flawed design from conception. In the instance where no budget is available and zero funds can be raised, more out-of-the-box thinking is required to lower the inaccessible barriers. A transferable seating arrangement could call for disabled seating creation on a per show basis and just enough area zoned off for the disabled attendees needs. This practice would be best implemented using raised, removable staging dispersed throughout the venues floor section. Of course this is considering elevator access to the floor or step free via a wheelchair friendly decline.

Technology

Advancements in technology are improving accessibility and shining a light on the future potential and engaging ways companies are shifting experiences. The audio giant Sennheiser has

rolled out an app called MobileConnect that delivers clear and customizable audio content in realtime at concerts. Those with hearing disabilities can use this technology to craft the ideal listening experience for their situation and this provides thought provoking models for other ways customizable and personalized technology can improve experiences.

It's also becoming more common for festivals and events to have charging stations across the grounds or venue that can be used by both general and disabled attendees for a myriad of technological luxuries and aids. Large events can also be noted for providing on-site visual aides in the form of large LED screens both left and right of center stage. As well as induction loop systems available for those with hearing aids. The wider share of electric supply sources and improvements in infrastructure on festival sites leads to quicker improvements in accessibility. Wells of electricity make it easy to incorporate technologically advanced systems and electric powered amenities for disabled attendees.

The widely talked about Google Glass was used by the National Theatre to provide personal real-time captioned lyrics to deaf and disabled concert goers (The International Journal of Events and Festival Management, 2020). Claire, from the National Theatre cited the glasses for "suddenly removing a lot of barriers for venues ... you can do something that is personal and it's not just one show where you can see the captioning performance" (2020). However, Google Glasses use in a live music setting should not be limited to just live captioning as there are many other realms of augmented reality where it could be of use. These will be overlooked for the purpose of this study. The advancements in technology show no boundaries in ways they can be applied and both an augmented reality provided by Google Glass and ther personalized experiences seen here shape the study's recommendations to come.

The adaptability and ease of integrating new tech into a concert setting creates a better experience and it will be just as simple to integrate virtual reality systems on site. Even with the highlight on the sub issues above, there's promise online ticket distribution can be equally accessible and that technologic integration can improve experiences. The ethos regarding accessibility from both festival organizations and large concert tours has shifted in recent and will naturally yield a more accessible environment as information sources, examples and trial-and-error continue to shift best practices.

THE INVISIBLE AUDIENCE

Disabled London based artist and AiE advocate, Paul Hawkins coined the theory regarding the invisible audience and defined this audience as “people who aren’t going at the moment, but would be if they felt it was accessible for them” (The International Journal of Events and Festival Management, 2020). The term perfectly sums up the neglect and discrimination of this market. The theory of the invisible audience implies that by their defined nature it’s a challenge to identify and reach them to better understand ways to encourage their engagement. However, most organizers and promoters would simply assume that this audience has no interest in attending anyways. Of course these potential attendees account for a relevant portion of both the live and recorded music industry’s revenues and should not be overlooked. In the circumstances of this research, the invisible audience’s impact on the live end of the industry is in focus.

As previously demonstrated in survey analysis, a look at audience reports offer a better understanding of the disabled market from their point of view. This illuminates key tension points to aggressively improve along with insight to simple and achievable solutions. Hawkins

also acknowledges that listening to your audience's feedback is vital for development and success however if the invisible audience is not engaging then there is a lack of feedback from this segment's experience. If organizations don't listen to their disabled audience because they are unintentionally discriminating against them and they're not attending, the level of unawareness will persist. Discrimination in live music towards the invisible audience comes in the form of marketing that never reaches them and as discussed difficulty at ticket purchase and on-site during the event. If the invisible audience is ever to be heard, discrimination must be spearheaded to create a more inclusive concert and festival experience. In doing so the first hand experiences and reviews from the invisible audience will be collected and the data reviewed to improve areas as called for.

In reference to the Ellerbe Becket case, which deemed disabled seating to be equally distributed throughout a venue with comparable lines of sight as GA, achieving distribution and visibility continually tops the list of pain points for promoters and organizers. Goals of maximizing revenues again take precedent in needing to be met prior to the needs of disabled. Therefore in a system where the more stakeholders fear a loss in revenues, the higher the barriers of entry for disabled attendees will be - perpetuating the thought process of the invisible audience that it is not feasible for them to attend a large scale event. When promoters and venues accept that the invisible audience has the potential and will fill any fear of lost revenues will the gap be closer to closing.

Attitude is Everything's goals also bring discrimination to attention and "hopes to communicate a sense of the massive and often untapped consumer group that is out there, asking the industry to embrace their custom and recognize what they need in order to be granted an

equal service” (2018). The importance of educating event organizers that disabled needs are achievable and how to tap into an overlooked market will reduce this theory’s impact. Disabled persons advocacy organizations, like AiE, along with reinforcement from ordinances, like the ADA, must shift thinking about how to market, target and organize events to reach the invisible audience.

The final findings on the invisible audience draw correlations here to the current ‘Black Lives Matter’ movement which sparked a wildfire of support in the United States and subsequently around the world. Of course the BLM movement represents a far more systemic, systematic, highly sensitive and deeply rooted social injustice but the broader theme of discrimination is similar to that experienced by the invisible audience and disabled attendees. The success of the movement and global impact is apparent in nightly news coverage that continues reporting on a wide network of organized protests and the progress made from demanding justice over nearly two months. The coverage and attention the topic has received and the results it has incited shows the impact that advocacy and education surrounding a problem can achieve. The social-digital way the world interacts immensely accelerates the reach and result of movements like BLM and could be used in the same way to address disabled discrimination in live music.

ADA

The Invisible Audience leans on government initiatives to combat the discrimination perpetuating inaccessibility. The ADA defines discriminatory activities in facilities as “denial of participation, provision of an unequal benefit and/or provision of a separate benefit” (Carlson, Katherine; 1998). Discrimination begins at ticket purchase and is perpetuated physically at event

spaces as reviewed. Whether or not these organizational choices are made consciously or ignorantly they inadvertently affect the Invisible Audience and their ability to attend an event easily and create a positive experience. It's interesting to propose this information in July of 2020 amidst the American social movements and apply a recently modernized thought process to addressing accessibility problems in live music. A study of the ADA offers insight on the results of assertive actions and adjustments, yet arises points of concern and room for improvement.

Title III of the ADA fleshes out discrimination further by detailing discriminatory behavior as anything including points of interaction that may 'screen out' from fully and equally enjoying and experience (Carlson, Katherine; 1998). Failure to make adjustments and accommodations for individuals with disabilities when necessary and achievable is of course discriminatory behavior as well (Carlson, Katherine; 1998). In theory, all festivals and built-out events have the privilege to create a seamlessly accessible environment from the start yet unequal seating distribution is still apparent first hand with disabled sections at music festivals. Even where budgets are tight, changes to other areas of infrastructure must be made to accommodate all types of attendees. Additionally in some cases with built-out events, a lack of awareness and concern for disabled attendees needs may lead to an inaccessible build. That's why an emphasis must be placed on the spread of knowledge regarding the topic and adherence to guidelines from both AiE and the ADA.

However in terms of the ADA's enforcement, there's an issue with the ambiguity regarding what's "readily achievable" and "reasonable" per situation as the Code of Federal Regulations defines both terms as fluid concepts (Carlson, Katherine; 1998). Enforcement becomes increasingly more grey and difficult when adding variables of attendees and behavior.

Typically during live events, concert goers stand up in seated areas, raise their arms and move feverishly throughout the duration of the show or festival. All these behaviors drastically reduce sightlines and predictability for organizers when crafting an accessible space prior and considering one accessible during. Carlson considered the biggest difficulty and having any control or certainty over, other attendees' behavior (1998). In her review of the ADA she referenced the MCI center's proposition in not selling seating directly in front of disabled sections and increased advocacy which discourages attendees from standing up and acknowledges disabled patrons' presence (1998). Naturally this sounds incredibly difficult to implement and enforce yet stems ideas that slightly touch on the core goals. Carlson in her study of the ADA determines that all facilities must be deemed accessible at the pinnacle of crowd excitement (1998). Additional rules around requirements talk about the "one percent plus one" rule which means that venues must allocate one percent of their capacity plus one additional seat to wheelchair users. Yes, this sounds like a fraction of allocated seating for the true needs of the Invisible Audience and has no predictable grounds for the claim that that is enough or too much allocated seating. Additionally, promoters and organizers are not fond of this ground rule in fear of unfilled wheelchair seating's impact on revenues. The work-arounds to this will be a direct product of these issues and presented in the recommendations.

Ultimately it was found that the enforcement of the ADA can only be determined on a case by case basis as it encompasses a far too large grey area for interpretation. Since each facility and operation varies drastically from the last, a how-to for general guidelines of accessible spaces rather than strict framework is a more successful way to regulate and combat accessibility. Even though the success and enforcement of the ADA could be argued, the general

goals and take-aways are of good intent and drive a more accessible live music environment.

There is room for stricter and more concrete guidelines/best practices to be circulated and adopted that would yield a more accessible ecosystem with a strong backbone and support from a government. In conclusion of Carlson's analysis, the success of the ADA and meeting its goals can be attributed to maintaining the balance disabled patrons need and the financial realities of event organizers.

MEDICAL / EDUCATION

Sarah Jones and Steve Dawkins touch on VR applications to both the medical and educational fields in their research which prompted a closer look (2017). They reference the early application of spherical still imaging and placing users inside unique fixed points that's similar to 360 degree video simulations today, therefore these industries and their applications of VR technology are important to keep a close eye on and how it may shift best practices and use in the music industry.

Medical

An overly common disability experienced with aging is the onset of a declining cognitive state. Whether it be Alzheimers or dementia or all the other diagnoses between, many can cite personal impact with such, therefore it's easier to process the size and impact of the disability. A 2019 review completed by Kim, O., Pang, Y. & Kim, J compiled studies that researched virtual reality's effect on patients with dementia or mild cognitive impairments (MCI). The conclusion of the eleven-study analysis found that "VR interventions, particularly of the semi-immersive type, are useful for people with MCI or dementia. The results should contribute to the establishment of practical guidelines for VR intervention for patients with cognitive decline"

(Kim, O., Pang, Y. & Kim, J; 2019). Before presenting the conclusion, the study measured the effects on emotion and cognition. Survey reports were discussed and found a decrease in stress in patients who were using VR to achieve either stimulation or relaxation (Kim, O., Pang, Y. & Kim, J; 2019).

The analysis also notes how each patient can be extensively tracked and studied during their VR interaction which makes collecting valuable data possible and second nature. There's possibility to collect an array of data surrounding disabled concert attendees if implemented in a festival and event setting regarding how and where they interact. What is the preferred viewing angle? How long do viewers spend at each particular view point? What/where grabs the viewers attention most? Other data can be extracted in eye tracking and if AR assistance in guides and on-screen captioning are utilized.

The study also concludes by pointing out that virtual reality is “cost effective, flexible, comprehensive and potentially useful for patient care” (Kim, O., Pang, Y. & Kim, J; 2019). This statement is greatly transferable in application to virtual reality use in easing strains faced by disabled concert goers and improving their overall on-site experience.

A separate study completed by Jason Hayhurst in 2018 outlines alternative ways VR is being used to treat patients with dementia. Hayhurst points contrasting and equally interesting ways VR intervention has proven to alleviate symptoms of this community. First VR has been implemented to provide memory retaining simulations that allow for patients to remain living independently. The other way uses VR in the gamification aspect to create calming experiences and cognitive stimulation that boosts memory in patients. The applications are proven to be broad and adjustable to best help for each use.

VR is also starting to be used in treatment for those suffering from depression, anxiety, PTSD and phobias. The VR experience either takes the route of gamification to desensitize patients or a calming, therapeutic simulation (Elara; 2020). The importance here is that VR extends beyond use in medical training and educational purposes but offers high value as medical treatment as well.

Education

The University of Kansas' Center for Research on Learning and Department of Special Education is leading the project called VOISS (Variety; 2018). The project stands for Virtual Opportunities to Implement Social Skills and is being implemented in educational settings for learning disabled students, primarily those with autism. The goal of the virtual simulations is to teach social skills that disabled students have more difficulty picking up on not in a controlled setting. The researchers argue the program's success is rooted in the immersive nature of VR and provides for more meaningful learning (Variety; 2018). Justin Ehrlich, Ph.D., Associate Professor of Computer Science at Western Illinois University and Co-Principal Investigator state that "if the virtual experience is realistic, the user is able to use this pretense to link the environment to the real world, which increases the chance of generalizing skills to the real world" (Variety; 2018).

Tara L. Jeff completed a study on virtual reality merging with special needs education as well and found more positive results. Jeff's research implies how VR teaching can be used beyond social situations and in other areas of academia to help with special needs children who struggle with "attention, language, memory, higher reasoning and knowledge acquisition" issues (2008). The broad range of applications to alleviate struggles faced by learning disabled also

means there's a broad application of VR to disabled concert attendees beyond an in-concert enhancement. However, such speculations are beyond the goals of this research.

Jeff's research continues to point out how personalized each learning experience can be made per student. Such customization brings with not only faster absorption and retention of material but also a more personal and engaging experience for the student. This provokes questions of how can a personalized VR experience be made and adapted per concert attendee? This must extend further than addressing customized experiences per segment of disability but one that is crafted by the user and for the user to maximize their potential concert or festival experience.

RAPID PASSAGE THROUGH VARIOUS AMBIENCES

The study completed by the School of Media and Performing Arts at Coventry University using a 360 degree virtual reality experience with added olfactory and somatosensory stimuli provided relevant insight in how to create a more engaging VR experience. It's interesting to see the impact of these real life stimuli to the overall experience in a controlled experimental setting. Experiences were measured in the form of surveys and interviews following two virtual reality experiences; one without olfactory and somatosensory stimuli and one with. The study directly relates to recommendations generated around offering VR headsets in disabled sections of large scale events.

Presence in user is a topic that the study highlights as being one of the primary goals in creating a meaningful virtual reality experience. The early explorers of virtual reality worlds, Pimentel and Texeira, defined presence in virtual reality as a "created environment that enables the experiencer to suspend *all* belief" of course this is with reference to head mounted devices

and other technology involved in creating the experience but it is important to perceive the experience as if the technology was not involved. It would be assumed that the study aims to see if external stimuli can increase this sense of presence. However, not only could powerful associations and triggers from scents and touch create presence but also actions that are important and beneficial to specific, targeted users in the experience. Knowing the exact needs of the user creates better understanding for how to generate presence in a virtual world.

The study also points out major concerns regarding “audience compassion fatigue” as the ‘wow’ moment fades away and the limitations of fixed 360 degree simulations prove constricting (Sarah Jones and Steve Dawkins; 2017). Since users are not active characters in a VR concert experience, just like a real life concert experience, it should be easier for users to suspend beliefs and engage with a fixed positioned VR concert as compared to another VR narrative that calls for active participation. Since concerts are typically passive experiences for users with no input and influence or reaction from actions, it seems to be an appropriate fit to experience in fixed 360 VR settings. Therefore a concert experience positions itself as a rare type of experience that can be excluded from problems surrounding agency in the VR medium. In terms of the study, one participant noted they chose not to interact with the environment because they wouldn’t have in real life either, not because they felt they couldn’t. This reinforces the notion that those in VR concert experiences wouldn’t feel the need to control anything beyond their viewpoint. It has also proved to be challenging to maintain an emotional impact in this form of immersive storytelling without introducing another dimension to create a more complex experience. The study’s aim reminds subjects how influential scents can be in triggering intense flashbacks of

feelings and moments through deep emotional associations and in a live music setting many different scents are appearing and just as quickly fading for new ones.

As mentioned, study participants were interviewed following each experience with and without external stimuli. Respondents discussed a far more present and engaging virtual experience with the introduction of external stimuli as outlined in the direct statements below...

1. I had the sensation of being in Chungking
2. There were times when Chungking was more real for me than where I was watching the film
3. I felt like I could respond to the people as if they were real people.
4. Even though the virtual body wasn't me, I had the sensation that I was there.
5. I felt like I was moving around Chungking.
6. I felt immersed in the environment.
7. My body responded to the environment.
8. I was lost in the environment.
9. I felt like I could interact with the environment and the people.

(Sarah Jones and Steve Dawkins; 2017)

It's obvious the study met its goals in deciding if when the complexities of real world experiences are more accurately replicated with sensory stimuli, participants achieved a significantly greater sense of immersion. One participant also stated having a heightened state of senses and more in touch experience with the space when sensory stimuli were introduced which translates to a more immersive experience (2017). Another participant's response noted that the added senses improved agency for his experience even though he could not move freely within

the 360 degree VR film (2017). Limitations of the study of course existed where participants felt a greater feeling of immersion was achievable if there had been more varied and more distinct scents throughout the VR film. Participants also noted that when scents linger and a new, contrasting stimulus goes too long without introduction, fatigue onsets more rapidly. Technologic and financial barriers made this inapplicable for Jones and Dawkins' experiment but flags an important takeaway for future research and implementation.

An interesting blurb from research Jones and Dawkins referenced in their study mentions that experiences “combining sound, graphics, text (spoken or written), movement (both by the interactor and the objects within the virtual environment), olfactory effects, and haptic sensations” transport audiences to a more immersive time and place (2017). The use of graphics/text can be in the form of augmented reality in a virtual world. Imposing AR graphics and animations of valuable and assisting information in a seamless way hits on the themes found in this research and leads to an enhanced experience with greater presence. Added interactivity creates a greater state of immersion that has potential to drastically increase 360 VR experiences if implemented in disabled areas at festivals and events.

The conclusion of the study found the hypothesis to be true and presented these final thoughts...

The added sensory stimuli to 360-degree film enhances the level of presence in a virtual environment, bringing us closer to the sense of total immersion that has been significant within CGI virtual environments. Heat and olfactory additions create a more immersive experience within 360-degree film and create the sense of interaction and embodiment that has been lacking within simple spherical film. To create

virtual worlds that allow the user to suspend disbelief, 360-degree films need to work that bit harder and utilise the opportunities that multimodalities bring to enhance presence in the virtual environment.

(Sarah Jones and Steve Dawkins; 2017)

Further points of research are then proposed with a focus around the limitation and exclusivity of HMD virtual reality devices for at home use and how barriers for a wide audience are still high. If the audience is provided with these experiences in a live concert setting a key concern is quickly resolved, yet shifts questions to promoters and organizations' ability to obtain VR hardware.

DIGITAL ENGAGEMENT AND INTERACTIVITY

Within the last ten years, social media has become one of the go-to platforms for delivering marketing messages and reaching an audience. Additionally, social media acts as a way to elongate a music festival or concert experience as fans and attendees flood their social feeds with an abundance of user generated content. Unfortunately a wide portion of consumers are being neglected, overlooked and left out as those with disabilities pertaining to vision or extreme mental, aren't able to access social media. It's clear a new barrier for the disabled decreasing accessibility has resulted in a modern digital culture.

On the other hand, social media may be a promising tool for deaf attendees to co-create and engage alongside the wider concert audience. Although blind and mentally disabled may be left out here, there's ways to include deaf attendees in a more engaging and enhanced experience prior to, during and following an event. This can also lead to an enhanced dialogue between

these types of disabled attendees and organizers to listen to and take note of their experiences in order to develop further ways of improvement.

Hudson and Hudson reflect on the importance of social media engagement prior to, during and following a festival or event in the *Journal of Events and Festivals* (2013).

Engagement is used to measure key performance indicators and general success of an event.

However a portion of the market is not considered when calculating and analyzing these metrics.

It's constructive to consider how in media (especially social) and digital behavior, challenge how brands and organizations deliver messages. This online culture has paved the way for concepts like fandom to proliferate. Online communities of deeply in touch and connected superfans who all share a fixation for one given artist provide highly targeted hubs to engage (Amsterdam University Press; 2020). Fandom can largely be attributed to the shift in social behavior and the digitalization and hybridization of entertainment and communication. In a time where media noise clouds a target audience's day from the moment they wake up until they put their phone down at night, buying an audience's attention is the only successful way to reach a target. These groups and communities organize and disseminate information in a striking way that offers great potential and needs more attention as a possible resource.

It's also important to reflect upon the shift to live-streamed media in response to COVID-19 as many performers and artists have no other form of live expression. The BBC defines live streaming as "listening to music or watching video in real time". It provokes questions whether or not this form of live entertainment is a substitute for being at a real festival or concert. Could live-streaming be the new reality of the music industry? Either way, there's no substituting one's communal shared interactivity with thousands of like minded individuals that

ultimately separates a real concert from a live-stream. The Journal of Events and Festivals also reinforces the importance of “shared group experiences and perceived authenticity” being highly important in attendees' perception of the experience (2020). Therefore presenting the option to live-stream VR concerts in the seclusion of your home misses the pure essence of a live music experience. Carol Humphry's from the Greener Gathering Festival reports that her experience with their live-streamed content couldn't be seen to replace the experience of actually being at the festival (The International Journal of Events and Festival Management, 2020). Jane Walsh from the Hackney Empire agreed that lives-streams are an experience but more importantly stated “you are not feeling the smells, the tastes ... you are not as immersed in the experience” (The International Journal of Events and Festival Management, 2020).

CONCLUSION

The possibility to use virtual reality to enhance live-streamed at home experiences is an apparent and approachable idea. It's feasible to stream or recreate a live music festival or large scale event using existing 360 degree cameras like NextVR has or more abstract and digitally rendered space like WaveVR. Suzanne Bull from AiE states how “this could be fairly revolutionary in allowing individuals with severe physical impairments to enjoy events which are not suitable for a wheelchair or mobility aids” (The International Journal of Events and Festival Management, 2020). Paul Hawkins, also of AiE, challenges Bull's statement and introduces the “double-edged sword” of it all. Hawkin's recognizes that there's a point to how as-live at home experiences could alleviate accessibility, but also notes the other edge of the sword furthering disabled discrimination and neglecting to include these individuals in the true experience. The research done aims to challenge the question of why can't deaf and disabled people enjoy the

experience live and in person. The recommendations also form in response to much of the data presented by the International Journal of Event and Festival Management which concludes with the following to think about...

Respondents broadly welcomed the potential for positive impacts of technology on increasing accessible live experiences at music festivals which retained a sense of authenticity and ‘liveness’. Substituting on-site solutions with remote VR based alternatives were identified as problematic. Respondents were interested in the potential for AR though the ‘new reality’. The usage of ‘as live’ content to enhance an individual’s welfare is interesting in the context of a festival and its relation to technological experiences (2020).

In forming these recommendations an emphasis on authenticity is required to generate a collective group experience between all concert goers where disabled do not feel discriminated or neglected. As long as aggressive action is taken by all players that influence the disabled concert-goer’s experience, the invisible audience will fade away and become a much more visible and included one.

RECOMMENDATIONS

Through analyzing seemingly unrelated data across virtual reality, concert accessibility, modern culture and even the medical and education industries a path can be drawn connecting them all. Following this path leads to valuable recommendations primarily for event / festival organizers or promoters as well as an off-shoot of recommendations for disabled advocacy organizations and governmental regulation.

Event / Festival Organizers & Promoters

There's an opportunity that can be immediately acted upon utilizing current technological capabilities in 360 degree filming coupled with live-streamed virtual reality. If disabled sections at festivals and large scale events offered VR headsets that attendees could opt in and out of use when they desired an elevated experience could be provided. The VR content would simply be alternate perspectives of the event from fixed 360 degree live-stream cameras around the venue or grounds. By implementing VR concert live-streams onsite to improve disabled attendees experience the raw concert experience and authenticity can still be preserved. The study on *A Rapid Passage Through Various Ambiances* detailed the importance of olfactory and somatosensory stimuli in creating presence in 360 VR and a more immersive experience. In the live concert setting, these stimuli will already be naturally occurring around the users when entering the VR world yielding more impactful responses. Of course problems and concerns associated with this recommendation arise regarding personal space. It's easy to lose yourself in relation to your real physical surroundings when in a virtual environment. Users often reach out and attempt to engage physically with the virtual world but run into real and far different obstacles, this problem can be easily mitigated if proper explanation and demonstration is covered before use and attendees are respectful and consistently reminded of their surroundings.

Recommendations go beyond just better performance views in 360 VR experiences and point out other ways technology can increase accessibility. There's an option to use augmented reality overlaid on the true-to-life VR streams to further enhance and personalize disabled attendees experiences. Inspiration from work done by GoogleGlass and other tech initiatives triggers recommendations that AR can be an assistance to disabled attendees by offering live lyric captioning and virtual guides / accessible routes to bathrooms, exits, medical areas and

other disabled zones. Of course the HMD device would be left behind as attendees make their mission to any area other than their seat but having a better understanding of what obstacles the journey may entail makes executing it far easier. AR can also enhance the ‘wow factor’ of a VR concert experience when CGI is used to create pyrotechnics, lasers or lighting and other special effects. When attendees are in the virtual world, they’ll have free reign to customize their augmented reality choices tailoring the experience exactly how they feel fit. The option of customization garners a more personal experience. To further amplify VR on site at a festival or concert the added layer of AR elevates the experience beyond current examples creating more engaging simulations that will keep people fascinated longer.

To jump off recommendations of incorporating aspects of AR into the VR world, an extension of this leads directly into recommendations that improve audience insight. The importance of audience insight has been reiterated by AiE with their mystery shoppers and surveys as well as the Journal of International Event and Festival Management and offers a primary source for effective research to improve accessibility. However such insight has been greatly limited to that gained via the previously mentioned efforts. To improve organizers and promoters abilities to listen to their audience surveys presented on screen in an augmented way while attendees are in the VR simulation can be incorporated. This benefits both disabled attendees and event organizers / promoters. Attendees feel they have a way to voice their opinions and make a difference while organizers and promoters are offered a new ear on the disabled audience. It’s important that surveys are presented cautiously and strategically in the VR experience so that they do not detract from the overall concert. If approached correctly and causally feedback gained offers valuable insight and data on the audience.

After a comparative analysis on the medical and education fields, the greatest takeaway points out potential to create highly customized and personal experiences for each disabled attendee. When on-site VR experiences are offered at large scale events and attendees begin their experience, if a short list of questions are answered before beginning, the experience is far more tailored to the individual. Questions would be in regards to the specific disability the individual faces and what slight changes to the simulation may yield a better experience. These variances could be in the form of audio adjustments for hearing impaired or even limiting flashing lights for those with neuro or mental disabilities. Whatever the slight changes and nuances may be, maximizing the personalization in turn maximizes the consumer engagement and feeling of presence.

Since music creates such polarizing fans and specific tastes for genres and artists, the general assumptions surrounding an audience can be highly specific and targeted. With this information, marketers have a better sense in who they are reaching and what will resonate well with the audience if presented. With this considered and the implementation of VR experiences in disabled sections (or even beyond) a new avenue of direct marketing to an engaged target is created. There's great value to offer big brands and marketing agencies as far as new ways to reach a clearly identified and well understood audience. There's huge potential to monetize the VR experience and generate new streams of revenues for venues, promoters and festival organizers. This brand integration could be executed as ad inserts, product placement, logo branding or in even more experiential and interactive ways. However, brand partnerships that feature subtitle placement within the virtual concert world must be executed creatively so the impression resonates well with the consumer. The revenues generated from such new ventures

could go directly in alleviating costs associated with incorporating such VR, 360 degree filming and live streaming technology as well as turn profits.

Apart from recommendations surrounding the merge of virtual reality and live music settings, research also provided insight on general accessibility gaps and ways to improve. The ADA study argues that a completely accessible design that meets the three major requirements pertaining to visible sightlines and both even integration and dispersal with GA areas is nearly impossible. Yet remembering the earliest designs from Greek and Roman history reveal an incredibly functional terraced system or descending seating arrangement that leads to a submerged center. Whether this design is replicated with a central viewing point like that of the Colosseum or in the style of amphitheaters the descending seating allows for ample viewing for all attendees. Also using ramps instead of stairs improves the majority of disabled concert attendees who face mobility impairments and are wheelchair bound. In instances where construction is required prior to an event, creating this type of seating arrangement grants the most control over accessibility that meets the three primary points of concern. This design approach also grants an ability to create transitional sections that double as disabled and GA areas. Integration and dispersal of disabled areas are easy to partition off from designated GA seating/standing areas and are accessible via ramps (ramps must consider a steepness that can accommodate wheelchairs easily). A convertible option therefore absolves any concerns regarding unsold seats to either GA or disabled concert goers as the accommodations and response is based on ticket types sold. Transitional or collapsable seating offers the most convenience for disabled attendees and the most flexibility and economy for operators and organizers. This also solves the MCI center's proposition of keeping seating in front of disabled

sections empty. This proposition that was coupled with disabled attendee advocacy to GA ticket purchases prompted an idea of disabled advocacy PSA's upon GA ticket purchase. It's important to present best practices not only to promoters and organizers but also fellow attendees but equally relevant to consider the difficulty in controlling the actions of others, especially concert attendees. Furthermore, convertible seating also resolves any concerns surrounding the 'one percent plus one' rule and enough wheelchair accessible seating. This option directly targets a clear ADA requirement that all attendees are given the same options and levels of access as the able-bodied. This transitional disabled/GA sectioning system in a descending space that accommodates needs on a per show basis also improves the general sightline for all attendees, not just the disabled. Seat pricing must also be addressed here and reflected in the range of seating options and locations for disabled attendees. Just like GA tickets experience a range of pricing depending on the exact seat, disabled sections should be sold similar yet currently are not. Disabled concert goers should be able to select the section they desire for the cost they are willing to pay if events are to be inclusive and accessible.

Legislation & Advocacy Programs

In order to facilitate an even more inclusive and accessible concert and festival ecosystem, legislation and disabled advocates should act upon the following recommendations. To combat the promoters and organizers top fear of revenue loss due to an unfair split of disabled and GA tickets sold, stricter laws must be enforced. If exit and bathroom limits were placed on newly constructed venues and indoor festivals, the restrictions would directly limit capacity and create more space to manipulate. If there's simply more square footage available in venues that cannot be used to fill up more ticketed spots, walkways can easily be made larger.

With larger walkways, wheelchair mobility becomes a breeze as well as general transport around the venue for all. Additional areas that could be used to assuage disabled attendees needs, like administering medication, are now feasible to easily fit into the event footprint. If a strict limit to the number of exits in a venue is controlled with a legal backing then come production the restricted capacity will not allow for dead space to be repurposed and sold as tickets. Of course recommendations can extend beyond restrictions on new builds and retroactively assessing venue capacity.

Recommendations specific to advocacy organizations like AiE, surround the idea of updating or modernizing their advocacy efforts. As reflected in the UK Live Music Census, promoters are willing to build and operate in a disabled friendly and accessible way. The problem here is that many do not know what they're doing wrong, how to be more accessible and the specific needs of the disabled concert goer. Although the educators are ready and willing to spread a wealth of knowledge in all the areas of concert accessibility, a lot of this information is being overlooked or not reaching the right audience. A more proactive and in your face approach to educating the public on disabled accessibility needs to be ushered in for a greater impact. Everyone that attends a concert should be aware they're attending with disabled goers as well as the organizers putting on events. One way to amplify advocacy campaigns in a more impactful way is to tap into artist and band cosigns. There's no reason these highly regarded individuals would be opposed to supporting a cause that directly affects their fans, their brand and career. It's not a novel idea to gain support for greater causes through influencers and celebrities. Therefore an easily actionable recommendation to modernize disabled advocacy campaigns highlights influencer marketing tactics.

As demonstrated across this research, many separate but supporting efforts have been made to improve communication between organizers and disabled ticket purchasers. It seems like an overstep that a clear and designated information page for prospective disabled attendees to gain all the details they need has not been made across all large scale event's websites and only where AiE has advocated change. It would be simple to add this informational hub and improve potential attendees confidence. Additionally, ticket purchase has proved to be the first great hurdle that attendees must overcome. Alternative telephone and online ticket purchasing means must be streamlined to improve accessibility for this audience. However communication improvements must not end after pre-event consumer interactions and be extended throughout the duration of the show and even following. The entire ways organizers and promoters interact with their disabled audience must be treated as separate from GA and adapted to suit. Therefore the importance of communication and ease of ticket purchase must not be disregarded.

FURTHER RESEARCH

As discussed, ticketing is one of the greatest areas of inaccessibility when it comes to a concert or festival experience. Further research must be initiated to find ways to solve struggles here. There must be changes made beyond streamlining informational pages and improving two-way communication between organizers and attendees.

In order to create a more enjoyable and inclusive concert experience for disabled attendees recommendations in this research are for immediate consideration and action. There's also further exploration necessary to define and dissect other seemingly unrelated areas that play a role in the larger workings of virtual reality and concert accessibility.

As the industry reacts to COVID and responds to drive growth and development forward, ways in which ‘live’ music is delivered and consumed have vastly changed. Concerts and live experiences from artists, bands and DJs have been transmitted globally directly to homes as interactive video streams and VR experiences. Whether or not live-streamed distribution will continue as a form of concert experience once venues, night clubs and festivals reopen will wait to be seen. The exponential increase in this format across all genres from March to June of 2020 questions what a live concert experience really is. Is prerecorded or live-streamed sets delivered digitally to millions of fans at home a concert? What is considered live music or a concert now in 2020? What does ‘as-live’ content pertain to and how can this be defined? How does ‘as-live’ digital content play a monetizable role in the music industry? The clarity of these questions will only come with time and government orders on how to reopen the live sector of the industry safely and within compliance. The result of how this uncertainty plays out will remove the physical barriers of concert accessibility but raise that of technology. Concerts taking place within the confines of one's home could impact the music industry even greater than how COVID-19 did.

Another area that warrants further exploration surrounds the idea of engagement. Measuring an audience’s engagement is a valuable metric when analyzing the success of an organization's efforts. The way society interacts both digitally or experientially can be broken down into forms of engagement and maximizing this is more and more apparent in organizations goals. Hand-in-hand with engagement, comes the idea of co-creation which also is made possible with increasing digital activity and interaction. To keep an audience engaged becomes even trickier than first capturing the initial interaction. One way to further drive engagement is by

implementing the idea of co-creation. So much digital content is made in a nature to be recycled, repurposed and restructured by anyone else in the digital realm, this can too be a form of co-creation. In light of TikTok and similar user generating content apps that create a cult like buzz, co-creation has become available in real time and even more easily repurposable. There's something to be learned from co-creation and how it successfully captures and keeps audiences engaging with media and brands for far longer than average time allotments. It seems natural to incorporate a sense of co-creation into a live music setting to great more engaging and enhanced experiences for both GA attendees and those with disabilities. In terms of this research though, ideas for how disabled attendees using VR during an event or festival can co-create with other attendees or even the artist are what holds interest. An added layer of interactivity through attendees' ability to share their co-created experience with personal social networks presents even more opportunities and ways to reach new audiences. Whilst promoters and organizers gain exposure, attendees and content creators generate personal satisfaction and increased excitement surrounding the event experience. Regardless of ways co-creation is executed in a live music setting the idea of enhancing disabled attendees experience even further with technology must be more closely investigated.

Finally, a clear plan for funding must be created to generate the streams needed to improve accessibility and acquire VR tech and hardware. Research into how government support, relief or benefits could help alleviate this would be worth investigating. Additionally, advocacy organizations and crowdfunding options should be looked into as potential sources to fund previous recommendations. If venues and event organizers don't have the financial means

to act upon recommendations then this form of support is essential to improve concert accessibility and disabled attendees experiences.

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