

Innovative ICT Accessibility solutions in stadiums and fan zones for persons with visual impairment and blindness

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Abstract –

The present article discuss how innovative solutions can be utilized in the fan zones to ease and improve the overall experience for persons with visual impairment and blindness. First, it will examine how wayfinding solutions can help persons with disabilities navigate through unfamiliar spaces. Second, it will showcase innovative solutions that allow fans with disabilities to enjoy the match through tactile feedback. Lastly, it will discuss how the overall audio commentary can be more accessible for fans.

Introduction

With the approach of the World Cup 2022™ in Qatar, many fans can expect immersive fan zones to watch live matches. With that, it is imperative to ensure that fans with disabilities and the elderly can fully enjoy the live matches in stadiums and in fan zones. Stadiums are a large enclosure that allows football matches, and large seating capacity for fans and spectators (Zetlin, 1999). In accordance with the Americans with Disabilities Act (ADA) of 1990 (Americans with Disabilities Act, 1990), and the Web Content Accessibility Guidelines WCAG 2.1 (WCAG 2.1,) stadiums that are classified as accessible, need to comply with the key features in physical and digital aspects to all types of disabilities.

Whereas fan zones encompass a different scale of match viewing, it considers fans that were not able to be a direct part of the stadium experience and instead can watch the live matches in conjunction with other fans (El-Sayed, 2013). In addition to live watching the match, fan zones include variety of activities that invites the fans to participate in, such as: “live performances, refreshments and food, children-friendly games and activities, shop units, meet the team areas for guest appearances, experiential activities” (Rapidretail, 2018). For fan zones to be fully accessible and effective for persons with disabilities, it needs to be designed as a complete user journey, considering how accessible each activity is. Figure 1 shows the workflow of a user journey in a fan zone (Dickson et al., 2016).

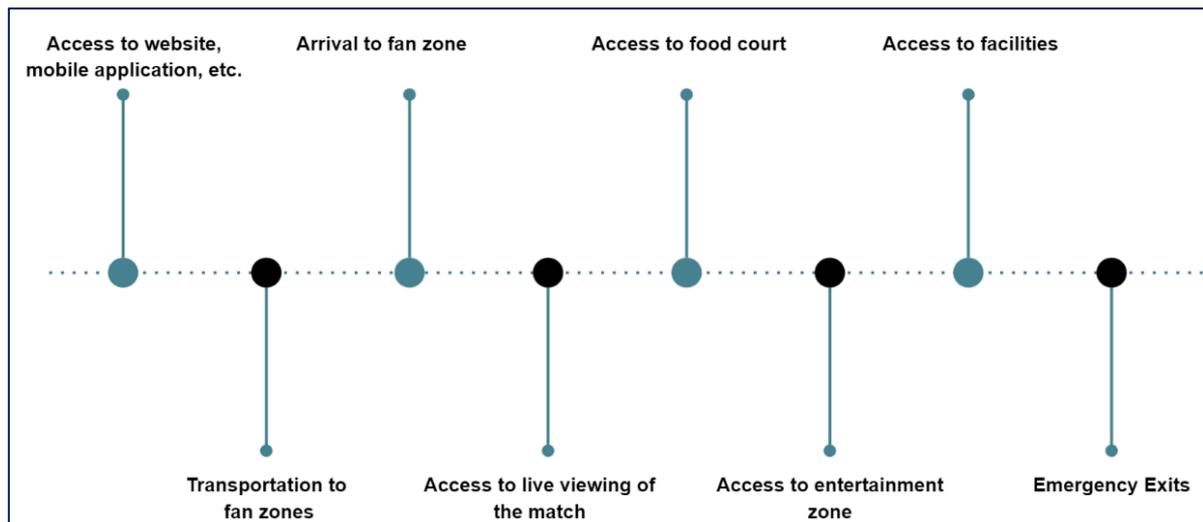


Figure 1. User journey in fan zones¹

Wayfinding Solutions

Wayfinding solutions are created to provide geospatial route technologies. Entering an unfamiliar environment could pose a navigational challenge to persons with disabilities especially persons with visual disabilities (Balata et al., 2015). To provide wayfinding solutions that operate for persons with disabilities requires various components such as audio guide assistance, accessible UI interface, and consideration for navigation barriers. That is why it is integral to provide accessible key and specific information to persons with visual impairment to ease the process of navigation in fan zones and promote independent living. Fortunately, with the rise of advancement in wayfinding technologies, users with disabilities can easily navigate indoor and outdoor spaces using their smartphones. Fan zones include a variety of pathways and landmarks that needs to be shared with persons with visual impairment in an accessible manner. For instance, in the FIFA Club World Cup Qatar 2019 – Alibaba Cloud, the location map of the fan zone included a variety of marked locations as shown in Figure (2) such as Prayer Rooms, Medical Care, Accessibility Platforms, Shuttle Buses, Ambulances, Information Desk.. etc (Club World Cup Qatar 2019 Fan Zone - Presented by Alibaba Cloud, 2019). These landmarks could lead to confusion and frustration to persons with visual impairment if they were not displayed in an accessible digital format.

¹ reproduced from Dickson, T., Darcy, S., Johns, R., & Pentifallo, C. (2016). Inclusive by design: transformative services and sport-event accessibility. *The Service Industries Journal*, 36(11-12), 532-555. <https://doi.org/10.1080/02642069.2016.1255728>



Figure 2. Location Map of the FIFA Club World Cup Qatar 2019 (Club World Cup Qatar 2019 Fan Zone - Presented by Alibaba Cloud, 2019)

Lazarillo Wayfinding Solution:

As part of the Mada Innovation Program, use cases were presented to promote innovative solutions. One challenge presented was the “Implementation of a Wayfinding system to support People with Visual Disabilities”. The issue statement was that there were depleted resources on indoor wayfinding systems which means that most people with visual disabilities are unable to extend the functionality of GPS to buildings, leaving them without any navigation support. Hence, Mada has supported Lazarillo² wayfinding solutions through different competition stream. In Seedstars Global Summit 2020, Mada Center has awarded Lazarillo with the Mada ICT Accessibility Awards 2019 to promote ICT Accessibility Solutions on an international level. Lazarillo is a free smartphone application that provides an autonomous guide for persons with visual impairment using Bluetooth beacon technology. There are several highlighted features in the Lazarillo application that would ease the overall experience for persons with visual impairment in fan zones such as:

- Recognize current locations through voiceover & customize exploration journey
- Search for different destinations and get precise location on how to get there
- The Lazarillo application is available in IOS & Android and in 25+ Language

Live Commentary

Tactile feedback and headsets are used in a live commentary to ensure equal access to instant news of the Football match. During a live match, it is difficult to receive an audio description of the status of the game, instead, abled fans depend on multi-senses to keep up with the

² (To learn more about Lazarillo solution: <https://lazarillo.app/>)

game. As such it is vital to create accessible live streaming content for fans with visual impairment. There are various innovative solutions in the market that promotes inclusivity such as:

Footbraille

Footbraille is a haptic technology that allows users with visual disabilities to track the exact location of the ball through a touch-based table ("Footbraille Digi Merdeka Campaign 2019", 2019). The Footbraille is designed by Digi, Mojo Films, and in collaboration with Naga DDB Tribal Malaysia in 2019. The Footbraille utilizes custom software that automatically detects and syncs the football match to allows users to "feel" the match (Brohier, 2019). The Footbraille works by allowing users to place their hand on carpeted device that mimics the football field pitch. During the game, a miniature ball moves in sync with the game match therefore fans can easily track the game status. As of now the technology is being developed as a prototype and has been launched in sport events in Malaysia. In the upcoming development phase, Footbraille aims to instantly sync the matches with live matches, and training videos (Brohier, 2019).



Figure 3. User experience of Footbraille (Brohier, 2019)

Accessible Live Match

Watching a sports match engages various senses, for persons with visual impairment, it is important to make sure the information relayed is accurate and precise. To provide an inclusive experience, the commentary for live matches should include the following:

- **Headsets Assistancess:** Noise in the fan zones can distract users with a visual impairment from listening to accessible information, that is why fan zones can promote inclusiveness by offering headsets to fans. An example of innovative

solutions is Unite Headsets by Beyerdynamic. The headsets allow equal participation to persons with visual impairments to listen to the match. The headsets have various features (Beyerdynamic, 2021) such as:

- High operating range and high volume that can be individually adjusted.
 - Co-presenters and monitoring are possible.
 - The transmitters balance out voices of varying volume or block out disturbing background noise.
 - Unite transmits signals up to 300 metres free-field
 - Unite can transmit foreign languages and assisted listening for those hard of hearing
- **Audio-Descriptive Commentary:**

Audio-Described commentary is unique set of service that provides fans with descriptive entail on the match. Partially sighted and blind fans can miss out on important highlights of the match during the fan zone due to relaying missing information. According to Centre for Access to Football in Europe, “The specially trained commentator provides additional narration that describes all significant visual information such as body language, facial expression, scenery, action, clothing, colours and anything else that is important to conveying the image, venue, match, event or surrounding ambience. During the match, the commentator should describe the on-pitch action rather than talking about statistics or tactics or providing lengthy summaries of previous action.” (“About Audio-Descriptive Commentary”, n.d.).

Conclusion

All in all, it is clear that many initiatives are addressing the gap in persons with visual impairments experience in stadiums and fan zones. With the use of digital solutions, more fans are able to fully experience the football experience through assistive technologies. However, with that being said, the challenge is now to fully implement the innovative solutions in stadiums and fan zones at a larger scale, such that every stadium is equipped with the solutions.

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