

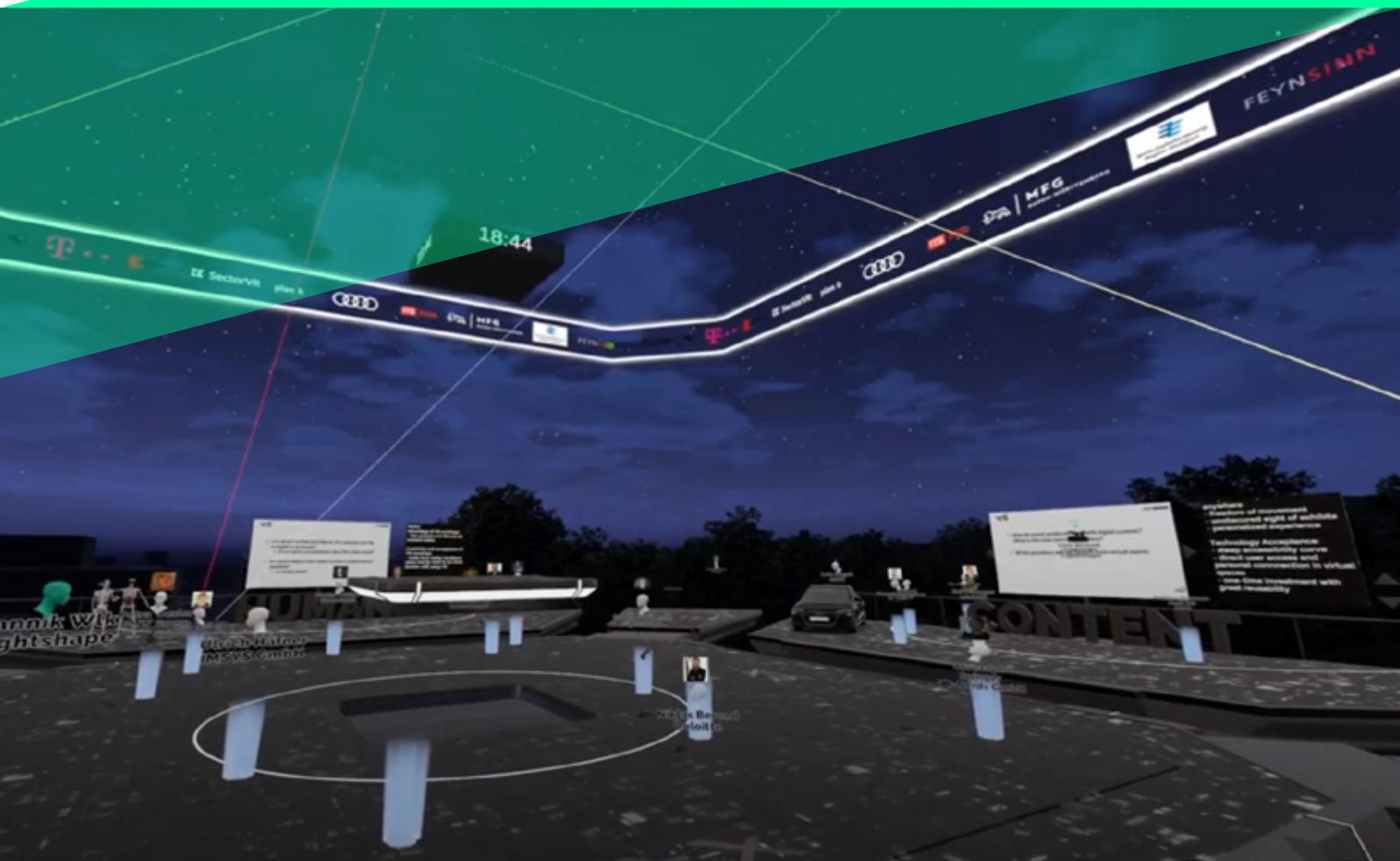
REPORT - XR EVENT

SUNSET GATHERING -

CREATING AN XR EVENT

Status 18.08.20

This Report has been translated with a translator application.



1. INTRODUCTION

The Corona Pandemic has brought about massive changes in many places and can be seen as a forced catalyst for the digital society. Long tried and tested procedures and partly encrusted structures are broken up by this disruptive event and now have to find new ways at a rapid pace.

Both VDC Fellbach and LIGHTSHAPE see themselves as promoters and at the same time parts of this digital society with a special focus on XR technologies. For this reason, both have jointly launched the XR Expo 2017.

Due to the pandemic, XR Expo 2020 suffered the same fate as other events 3.5 months before the event. The event in the originally planned framework had to be cancelled. As the organizer, we are faced with the challenge of examining alternative possibilities.

Many aspects had to be weighed up in an extremely short time:

- What is technologically possible?
- What are the legal obligations and risks?
- Do sponsors support the event in such a situation?
- How can an attractive program be made possible under the circumstances?
- And of course: how great is the risk of failure?

On the other hand, there are also a number of opportunities:

- The opportunity to break new ground
- To be able to take a pioneering position in the field
- Contribute to the community together with the community
- Gain experience with XR events

2. MOTIVATION

As the organiser of the XR Expo, which also sees itself as a pioneer, it was clear to us from the outset that we wanted to deliver something special beyond the more common formats with webinars and video conferences.

The evening event, the Get-Together, in all previous events had always been a special highlight, where the community and interested parties could exchange ideas in a relaxed atmosphere. Since this get-together would otherwise have been cancelled, it was soon obvious to concentrate on this part in the form of a virtual reality event.

Choice of the Collaboration Software

At LIGHTSHAPE we have been working on collaborative virtual reality solutions since 2014. Even before HTC brought its first VIVE to the market, LIGHTSHAPE was already working with different tracking methods and wireless, large-scale VR solutions. In the beginning, the focus was on location-based VR, but always with the long-term goal of being able to connect these different sized installations with varying numbers of users across different locations.



SOURCE: WWW.LS-HCC.COM

As the hardware changed over the years, we focused more and more on the control software that could and does control such extremely flexible sessions. In contrast to other collaborative solutions, which usually only connect individual users at different locations, the development requirements here were much more complex. In addition, the system was built around the control instance, the eponymous "**Holodeck Control Center- HCC**", with which sessions can be changed during runtime. In addition, the central control system allows the integration of non-technological users without any problems.

The HCC has so far mainly been used for reviews and training situations, but in our opinion these factors also seemed to be advantageous for XR events.



SOURCE: AUDI HOLODECK/ DKM AUDI INGOLSTADT: [HTTPS://WWW.YOUTUBE.COM/WATCH?V=6Z4N6KZUGPC](https://www.youtube.com/watch?v=6Z4N6KZUGPC)

As co-organizers of the XR Expo and at the same time developers of an own collaboration platform with the described advantages, the decision was obvious to use the HCC for the evening event. Combined with the possibility as a developer to design the experience according to our wishes without the limitations of other platforms.

An additional motivation was that we could use the event for testing in the new context. At the same time, the HCC should give us the opportunity to explore the potential of new virtual formats: Is it attractive to integrate groups into virtual reality via local hubs (Location-Based VR/ local multi-user)? Can delegations with non-technological user groups participate more easily? This could significantly lower the access hurdle.

3. CONCEPT

XR Expo focuses on professional business solutions as opposed to pure entertainment or gaming, even though the underlying technologies and principles are very similar.

For us, this orientation meant that we wanted to create a reference to real context in the virtual event scene instead of creating a completely fictional fantasy world.

Another goal should be to transfer the spirit of the real Get-Together into virtual reality.

VR has some shortcomings compared to reality and is at least for the moment still essentially a visual/auditory experience. Haptics or body representation is still underdeveloped or principle is limited conditionally. On the other hand VR offers possibilities that go far beyond reality. This is exactly what we wanted to consider, which is why a copy of a real event was out of the question for us. If possible, we did not want to take any legacy from reality with us and instead concentrated on the strengths of VR.

But what is the spirit of a real event that can be transferred? And what can be offered instead of the deficits to ensure a holistic experience?

For us the following points have proven to be central and transferable:

- Free movement
- Free/ private communication in spontaneously occurring groups
- Entertainment based on staging and entertainment promote interpersonal communication

Especially with the last point, VR offers a huge range of possibilities that go beyond reality. A pure meeting in VR seemed to us to be too little in terms of content, which is why we were looking for a further added value. The result was the concept of a large discussion round with event character.

4. PANEL DISCUSSIONS

As the overriding discussion topic and currently central problem definition, the question was: "What does the future of XR Events look like"?

We wanted to approach this question in 4 discussion rounds from different perspectives with experts from different areas. And all this simultaneously in the form of a self-experiment. It was also important for us to have an honest discussion, which is why not only XR experts were invited to the discussion, but also specialists from the areas of marketing, social media and events, who sometimes had no XR experience at all.

The moderation of the topics was done by the committee members of the XR Expo and was divided as follows:

- **Human – Perception & Experience**
 - Discussion about the perception and impressions of users.
- **Content – Contents & Benefits**
 - Discussion of requirements and possibilities with regard to content.
- **Staging – Virtual Environments & Staging**
 - Discussion about the meaning of the staging and environment.
- **Technology – Soft- & Hardware**
 - Discussion of requirements with regard to usability.

Since the hosts could not take notes themselves during the VR session, a note screen was added to the virtual presentation screen on each platform. The most important comments were then recorded on this screen by a member of staff via keyboard input.

In order to enable at least one form of participation in addition to the invited participants, 4 YouTube streams were set up to broadcast the discussion rounds in parallel, and the chat function provided the opportunity to ask further questions or make comments from outside.

Tip: Other streaming solutions were discussed, but had to be discarded, because other platforms are often not allowed by company computers.

5. REALIZATION

Design of the scenery

The previous XR Expo events took place in Stuttgart/ Germany. In order to create a real connection between the virtual scenery and the location and to set itself apart from fictional gaming worlds, the evening event was virtually placed in the heart of the Swabian metropolis. Directly next to Stuttgart's main station. And not in its current state of construction, but what it will look like after its completion.

For the meeting and discussion area itself, we did not want to be limited by the real conditions. The discussions should take place on floating platforms and show the possibilities of VR.



SUNSET GATHERING PLATFORMS IN THE SCENERY OF THE FUTURE STUTTGART MAIN STATION

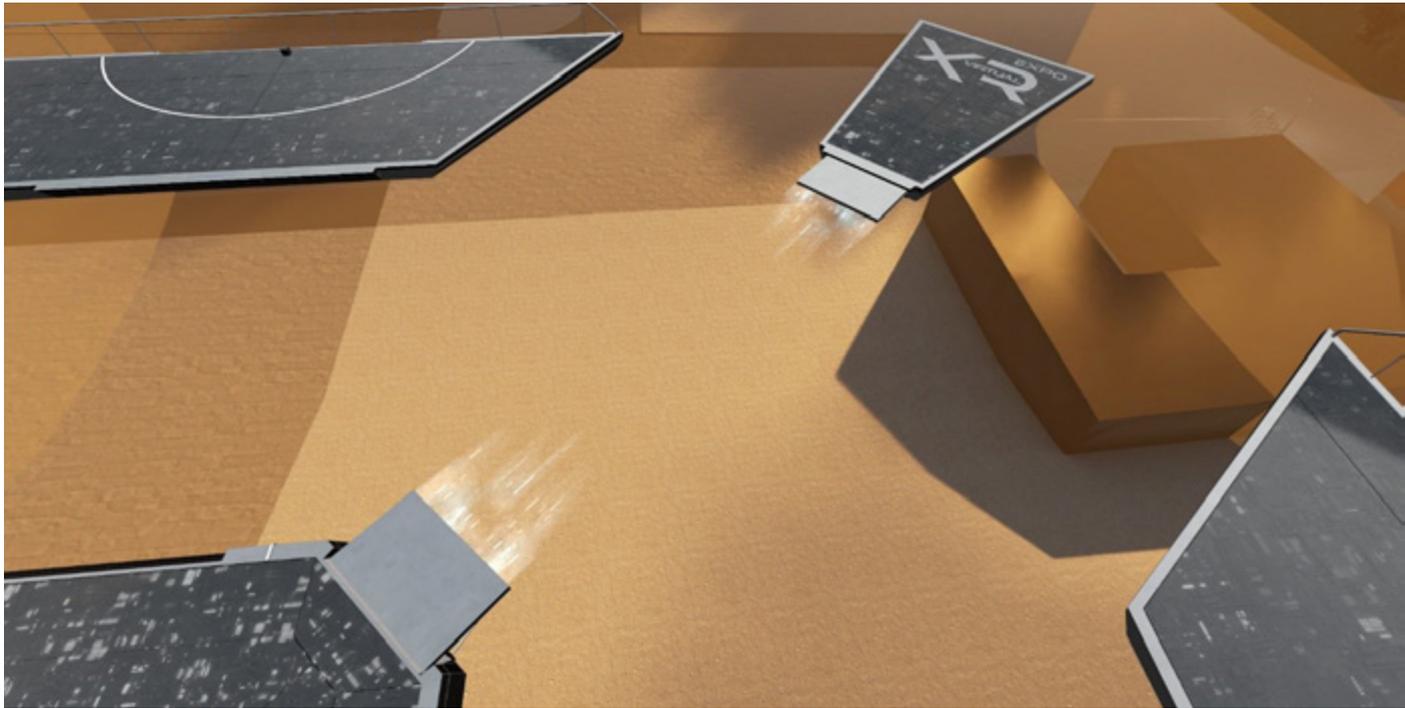
LIGHTSHAPE's roots are in architecture, which is why design and visual impressions have always been our focus.

In the design we attached importance to a clear, reduced form language with futuristic appearance in a high-quality look. Always with the aim of finding a healthy mixture of fiction and reality. Fantasy and seriousness should represent a balanced relationship.

The total load of the scenery in terms of performance could not be ignored.

Staging

The scenery consisted of a central main platform, 4 discussion platforms, which could be reached via teleport function and 4 private platforms. The latter were only accessible via a teleport bridge. These platforms could be locked from the inside and were then no longer accessible for others.



PRIVATE PLATFORM WITH TELEPORT BRIDGE

On the discussion platforms 2 screens were provided to the discussants for a presentation and for notes.

To make these platforms even more interesting, and because a discussion in VR has its advantages over video conferences, especially in connection with three-dimensional content, these platforms were equipped with thematically matching 3D objects.



"CONTENT" DISCUSSION PLATFORM

On the content platform there was a vehicle of the main sponsor AUDI, on the human platform an anatomical skeleton, on the technology platform there were shader exhibits and on the staging platform a living miniature model of the surrounding platforms.

Shading

A shader developed by LIGHTSHAPE was used, which is characterized by high quality and optimal performance. In contrast, the conventional standard shaders are neither designed for virtual reality nor for CAD models from the industrial sector. In VR, these weak points are clearly visible and also put a strain on the computing capacity.

To name a few examples:

- Additional shader properties were implemented, which, for example, allowed a strong impression of depth with frequently illuminated surfaces. This gave the impression of moving on a glass, living high-tech surface.
- The smoothing of the edges of the objects was optimized, which is why they stand out much sharper from their respective background. Subjectively, the impression of higher image resolution could be achieved.
- Much looked complex and high-quality, but hardly affected the graphics performance of the scene.
- Numerous other shading details, some of which were subtle effects, but contributed to a positive overall impression

Script

A virtual event very similar to a real event in terms of organization. A meticulous schedule had to be drawn up, whereby it was difficult to estimate in advance how long especially VR inexperienced users would be willing to participate in a discussion with VR glasses.

The following timing was set:

- 17:45 (CET) Virtual entrance
- 18:00 (CET) Start of the event with welcome by the organizers
- 18:05 (CET) Invitation to the participants to follow the hosts
on the discussion platforms
- 18:10 (CET) Start of the discussions
- 18:40 (CET) End of the discussions
- 18:45 (CET) Presentation of the respective discussion
results by the hosts
- 19:05 (CET) Possible discussion about questions from the Youtube stream
- 19:20 (CET) Closing of the official part with entertainment
- 19:30 (CET) Opening of the scenery for the viewers of the stream

To make this possible quite a lot of people were needed.

The following personnel had to be provided during the session. Sometimes they even had to occupy several functions simultaneously:

- 3 organizers of the XR Expo
- 4 moderators
- 4 cameramen
 - Control of the camera
 - Operation of the note screen
 - Chat in the Youtube stream keep an eye on
- 1 Master
 - Administrator
 - Responsible for all orchestrated interactions of the scenery during the session

Tools/ Functions

As mentioned before, the HCC was mainly used in a different context so far, so we were missing some functions at the beginning. Thanks to the Software Development Kit (SDK) and the flexible architecture, it was possible to develop the most important functions in a short time.

Here is a list of functions that were classified as elementary and implemented for the event:

- **Audio zones**
 - Each platform also served as a separate audio zone.
- **Overwatch platform**
 - In the middle of the central platform there was another small platform which could be raised. This was developed for the presenters and organizers. Whoever stood there was heard the same way all over the world and could make announcements to all participants.
- **Private rooms**
 - The teleport bridge and a shutter function had to be created.
- **Installer**
 - For easy distribution to all participants
- **Presenter Screen**
 - PDF with control
- **Note Screen**
 - Interactive screen that could be written to by external people using the keyboard to take notes during the discussion.

6. ORGANISATIONAL CHALLENGES

TIME! As expected, the short-term rescheduling of the real XR Expo into a virtual event, including the evening event with numerous unknown components, meant that the participant organisation and testing could not take place to anywhere near the extent we would have wished. Therefore, the Sunset Gathering was designed as an experiment, which all participants supported, and for which some of them showed great flexibility. Many thanks at this point again!

7. IMPRESSIONS FROM THE EVENING EVENT SUNSET GATHERING

Impressions from the Virtual Reality Session

[Here you can find a video with some impressions.](#)



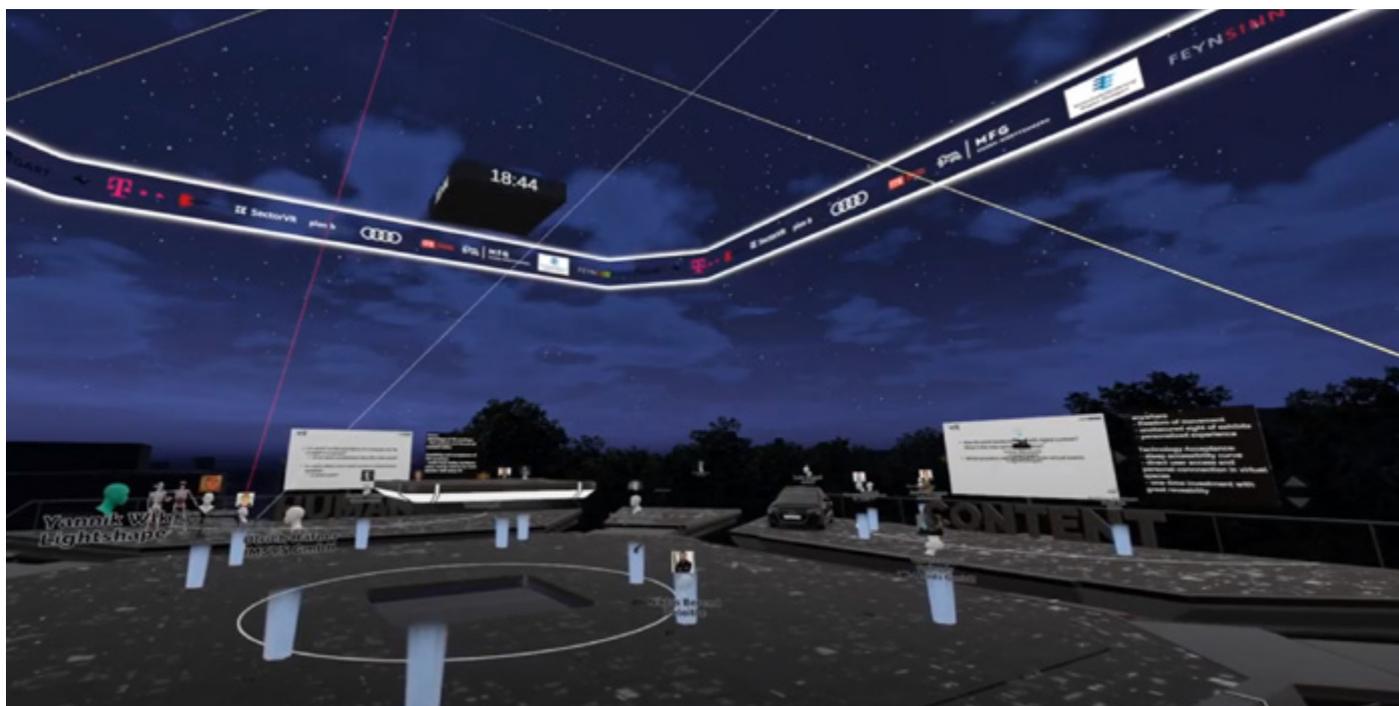
1. OPENING OF THE SUNSET GATHERING BY THE ORGANIZERS ON THE OVERWATCH PLATFORM IN THE MIDDLE OF THE SCENERY.



2. LIVELY DISCUSSION ON THE "HUMAN" PLATFORM.



3. FURTHER DISCUSSIONS ON THE "STAGING" PLATFORM.



4. AFTER THE DISCUSSIONS, THE OUTER PLATFORMS WITH THE PARTICIPANTS WERE SLOWLY MOVED TO THE MIDDLE, WHILE THE SCENERY CHANGED TO THE EVENING ATMOSPHERE.



5. AT THE END THE MODERATORS PRESENTED THE RESULTS OF THEIR DISCUSSIONS FROM THE OVERWATCH PLATFORM TO ALL PARTICIPANTS.

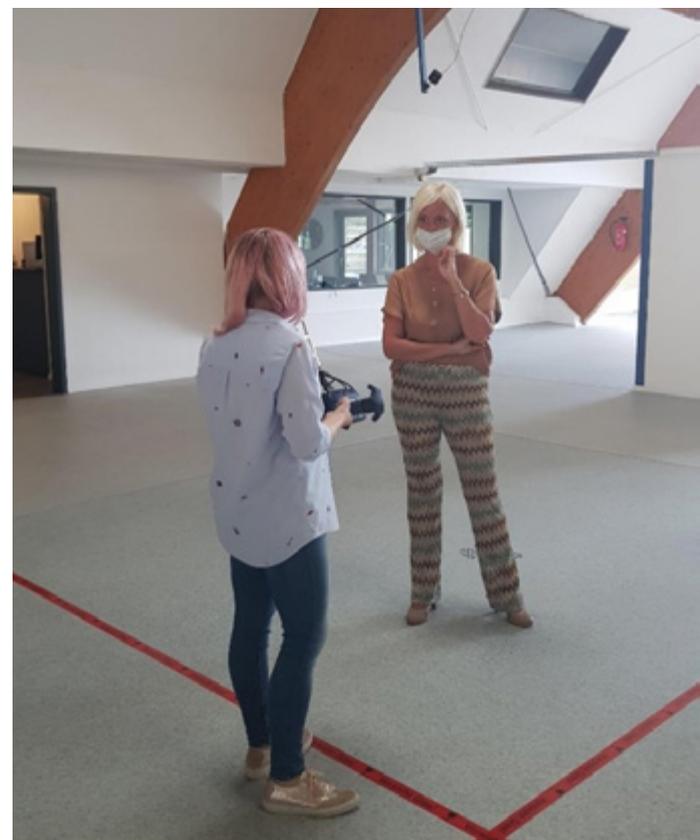


6. FINALLY, THE MAIN PLATFORM WAS TRANSFORMED INTO A GLASS PANE AND THE FLOATING PLATFORMS TOOK UP VARIOUS POSITIONS AROUND THE FUTURE STUTTGART CENTRAL STATION. SOMETIMES AT EYE LEVEL NEXT TO THE STATION TOWER, SOMETIMES ENTHRONED AT A HEIGHT OF 100 M ABOVE STUTTGART CITY CENTRE WITH A VIEW OVER THE ENTIRE CITY BASIN.

Impressions of the user setups during the VR session



1. UP TO 4 PARTICIPANTS WERE CONNECTED TOGETHER FROM THE AUDI HOLODECK IN INGOLSTADT AND TOOK PART IN THE SUNSET GATHERING AS PART OF A LARGE-SCALE INSTALLATION (15X15M). DUE TO THE SIZE, THE MINIMUM DISTANCES CAUSED BY THE CORONA COULD BE KEPT WITHOUT PROBLEMS.



2. PARTICIPANTS, WHO WERE EITHER TECHNOLOGICALLY UNFAMILIAR OR HAD NO ACCESS TO APPROPRIATE HARDWARE, HAD THE OPPORTUNITY TO PARTICIPATE IN THE SECTORVR GAME ARENA. WITH SEVERAL, UP TO 10X10M LARGE AREAS, THERE WAS THE OPTION TO CONNECT FURTHER USER GROUPS FROM THERE.



3. EVEN INFLUENCERS WITHOUT XR EXPERIENCE WITH A BACKGROUND IN FASHION, BEAUTY, LIFESTYLE ETC. WERE OPEN TO EXPLORE THE POTENTIAL OF XR EVENTS FOR THEIR FIELD AND PARTICIPATE IN THE DISCUSSION.

8. KEY DATA OF THE SESSION

- Up to 30 users simultaneously
- 55 users in total
- 21:27:29 the last user left the session >2h after the end of the official part!
- Session total duration 4h
- Various devices participated, even hardware that had not been tested before
- ~75% VR user / ~25% desktop user
- 100 - 150 viewers on each of the 4 Youtube channels
- Used hardware:
 - HMDs: HTC VIVE, Oculus Quest (with link cable), Microsoft HMD
 - Tracking systems: HTC Lighthouses, Oculus, Optitrack
 - Participating graphics performance min.: Intel HD graphics 620 (desktop users without HMD). This computing capacity is below the recommended minimum requirement.
 - Participating graphics performance max.: Intel GTX 2080 TI

9. RECAP OF THE DISCUSSION CONTENTS

In 4 parallel sessions, the central question "what does the future of XR events look like" was discussed with different experts under a specific focus. In the following, they summarized the respective focal points and the results of the discussion.

- **Content:**
Here the questions circled around the communication of content/products.

The results:

- *Products can be experienced in a simple and detailed way.*
- *Personalized experiences are possible.*
- *Products lack haptics, taste and smell.*

- **Panel Staging:**

The staging and its influence on the experience was the focus here.

The results:

- *Real examples from stage, theatre or concert can be templates.*
- *The communication and presentation of content is more natural and therefore "cooler" than in web sessions.*
- *Spatial Sound enhances the experience*
- *Mixed reality in combination with haptics is definitely an advantage.*

- **Panel Human:**

The human being and his perception were discussed here.

The results:

- *VR meetings are better at discussing and presenting 3D content.*
- *For a wider acceptance, users need to become more familiar with VR.*
- *VR meetings almost feel like real event*

- **Panel Technology:**

Hardware and software solutions as well as necessary tools were discussed.

The results:

- *Access hurdle must be lowered (lighter HMD, easier to operate).*
- *Entertainment factors are important for VR meetings.*
- *With the current state of the art, simple avatars are preferred. A reduced representation is preferable to false or misleading representation.*

10. TECHNICAL RECAP OF THE EVENT

Participation of Holodecks/ Location-Based VR

The integration of user groups (delegations), which are physically located in a room, could only be tested to a limited extent. Only the DKM Holodeck of AUDI in Ingolstadt was able to comply with the distance regulations caused by COVID19. Experience has shown that technology from outside the company can actually be integrated more easily, but this also means that some flexibility is lost elsewhere. The users must always act as a team in the virtual world. Which, depending on the group, may well be desirable. With a large running surface, which is 15x15m, it is still possible that the users can mix with other groups within this radius.

The real users, with whom one can physically collide, must be visually distinguishable from the others.

Since the virtual platforms in the scenery were similar in size to the real space of the AUDI Holodeck, it was sometimes difficult to meet the discussion platforms when teleporting groups.

What did not work?

The biggest problem was AUDIO! Below is a list of difficulties as far as we could identify them so far:

- Conventional difficulties with the hardware, as known from video conferences:
 - Individual hardware combination of the user does not work.
 - Feedback and doubling when audio input and microphone are not shielded from each other. This was most common among desktop users, but also among users with HMDs like Oculus Quest. These users are advised to expect to record audio while not speaking. The VIVE from HTC, for example, provides much better shielding.
- The audio zones / discussion platforms were actually designed in such a way that only users within a certain area could hear each other. However, after a certain number of users, the calculation of the command sequence got confused, which led to the fact that this audio lock no longer worked properly for some users. In our previous tests this number was never reached, so the problem only occurred during the event. This led to the unpleasant effect that during the conversation some could easily hear the other participants from the other areas in the background.

- In order for the virtual streaming cameras to capture the contributions of all the discussion participants, the decrease in volume was slightly modified, which in retrospect turned out to be a hindrance. According to the effect, users talking 2m away were as loud as if they had been standing right next to each other. This meant that for conversations after the official part, you had to be relatively far away from others to be able to talk.
- In one case, 2 users with a wireless setup were inside the same room. During the session, one of the two covered the wireless transmitter of the other, which led, among other things, to the loss of the audio signal. In case of doubt, a wired solution is preferable to a wireless receiver.

Findings/ possibilities for improvement:

- *Participants should be distributed at the beginning of the session, and not in places that are central to the Orga Team & facilitators.*
- *When starting in VR, the users should first be intercepted in a test room where the most important general sources of error are queried by the users before they join the session with others. It does not help anyone to listen to how individual users are trying to get their hardware problems under control.*
- *Small popup at application startup to explain the operation*
- *More admin functions, e.g. for voice zone assignment*
- *HCC installer was probably still partially blocked by virus scanners*
- *Easier access to the "mute function" so that users in VR can quickly and flexibly switch to "mute" to avoid echoes.*
- *Although there was a symbol that indicated who was speaking, this was felt to be too small with the large number of users, and especially at a distance.*

What was positive?

- **The feeling of being on an event!**

At the beginning I had written that a pure meeting was not enough for us, because we were sceptical about how attractive it could be. The feeling to meet others, to talk to them, to experience something together and to feel personally connected, surprised us ourselves, and also corresponded with the feedback of the other participants.

The impression is actually very close to a real meeting and not comparable to what you know from video conferences.

What makes the difference?

We have identified the following points:

- The freedom to move and talk as in reality
- Spontaneous group formation
- 3D localized sound and the naturalness with which conversations can be conducted, in contrast to the generic transfer of conversations in video conferences.
- This combination of factors conveys a much higher level of participation and conversation focus than in video conferencing.
- The previous points enabled lively discussions
- The choreographed sequence with the entertainment factors went very well and contributed significantly to the atmosphere.
- Apart from the audio problems, the application ran completely stable and the voice quality was also very good.
- The duration of the event of about 1.5h was well chosen, but one should plan one or more breaks.

11. FEEDBACK OF THE PARTICIPANTS

- In addition to the verbal explanation, some had also asked for a board for the agenda, on which one could have read along in parallel, or it would have been helpful as backup for participants with audio problems.
- The ability to travel via teleportation and portal was felt to be good. As there were relatively many users in the scene via teleportation, individual users felt a little irritated by the sudden appearance and disappearance of these users.
- The length of the individual discussion rounds was evaluated differently. Some would have liked more time for this.
- The staging, the ambience and the virtual location were rated as "very good" and "inspiring". The combination of discussion, information and entertainment was also very well received.
- For many people, the exhibits on the discussion platforms were so remarkable that they would have wished that more space had been given to them and that they had not just been considered "accessories". Moreover, they apparently caused too much distraction during some of the discussions. They could have been featured as an intro or even at the end of the discussion.
- Although there was always (carefully!) playing with height differences and moving platforms, no user complained about problems or discomfort.
- There was different feedback about the length of the event. Some felt it was too long, or would have liked a break, while others found it too short. More surprisingly, inexperienced users would have liked to have had more time, while experienced users pleaded for a break.
- The individualization of the avatars was done by text input and a profile picture. Some users had subsequently pleaded for a set of rules to ensure more uniformity.
- The UI/ UX design was felt to be still a bit too technical.
- The moderators would like to have more special tools for the future.
- Individual users would have liked to sit more and therefore wished that the avatar could have been configured to allow a sitting position while standing virtually.
- Instead of accompanying the discussion rounds mainly with text on the screens, the desire arose to support this in the future with more 3D models if possible.
- The stability of the application was explicitly praised several times.

12. CONCLUSION

With increasing technological possibilities, one will want to revise the avatars, but for the current state of technology, simplicity was sufficient, and even brought about a liberating democratization of the conversation, because typical cliché thinking, caused by the optical appearance or the company position, was thus defused.

Although there is much room for improvement, the participants themselves were surprised how positively they had reacted to this experience.

The overall concept of the format worked very well and was convincing. After the official part of the event, relaxed discussion groups formed as in reality.

13. SPECIAL THANKS

Many thanks again to all our supporters and partners of the Sunset Gathering:

SPONSORS

- AUDI: Main Sponsor
- ITS (Infoturm Stuttgart): Sponsor and release of the environment model of Stuttgart main station
- Deutsche Telekom: Sponsor with the OTC Cloud for the Sunset Gathering

ORGANIZERS

- VDC Fellbach: Co Organizer of the XR Expo and orga team of the XR Expo
- LIGHTSHAPE: Co Organizer of the XR Expo and orga team of the XR Expo and Sunset Gathering

PARTNERS

- Plan B: Creator of the visualization model of the Stuttgart train station
- CDM Tech: Support for the 3D model of the environment
- SectorVR: Provision of hardware, premises and support during the evening event

PANEL MEMBERS/ MODERATORS

- Günter Wenzel
- Henning Linn
- Jan Pflüger
- Dr. Lars Riedemann

SUPPORTERS/ PARTICIPANTS

- All supporters who contributed to XR Expo in the background and participants of the Sunset Gathering

If you have further questions about this topic, you can always contact us or visit our [blog](#) to find out about other interesting topics and techniques related to the topic.

**THANK YOU FOR
YOUR ATTENTION!**

LET'S GET IN TOUCH

**WE WOULD LOVE TO HEAR ABOUT
YOUR PROJECT**

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