

# PROJECT IMMERSIVE DEMOCRACY

Part of the European Metaverse Research Network

## Virtual realities, real participation. Challenges and opportunities of public participation in the metaverse

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## 1 INTRODUCTION: THE METAVERSE HYPE IS OVER – NOW WHAT?

In 2021, *Meta Platforms* presented its vision of the metaverse and promptly sparked a polarised debate about the future of digital environments (Dolata & Schwabe, 2023). The decision to change the company's name from Facebook to Meta was also announced during this presentation, thus making it clear to all those present and other interested parties: Facebook and its founder were serious about virtual environments. Perhaps this was also what the company intended: namely, to interrupt the long-running debate about Instagram's platform mechanisms and their detrimental effect on health, and the debate around Facebook's role in calls to violence with fatal outcomes in India. In this complex and very tense situation for the company, the decision was taken to rebrand, thereby signalling to the tech industry that the future of the Internet lay in the metaverse. The surprise succeeded, as journalists and technology enthusiasts proceeded to debate Web3 and the potential of immersive systems for months afterwards.

Meta did not invent the term or the immersive environment. The term metaverse was first used by author Neal Stephenson in his 1992 science fiction novel "Snow Crash" (Stephenson, 1992), in which the vision of an enhanced and virtual environment gradually becomes reality. The metaverse is described as a hypothetical, immersive and interactive virtual space that is intended to represent a next generation of the Internet (Dwivedi et al., 2022; Xi et al., 2023). Currently, a number of virtual worlds exist, provided and organised by various platform operators under the collective term metaverse. What these environments have in common is that – regardless of whether they are used in a gaming context or an e-commerce context – they consist of a variety of virtual spaces, objects and entities and can be accessed by users via a range of different devices. The metaverse is thus an extension of the concept of immersive systems. It does not describe an individual technology, but rather the goal of creating a seamless, interconnected digital world that lets the boundaries between reality and virtuality become blurred and enables new forms of social interaction, trade and entertainment (Dwivedi et al., 2022). The metaverse is thus described, but not the technologies of which it is composed. XR is used as an umbrella term covering all immersive technologies that aim to expand the human perception of reality. XR technologies include AR, VR and everything in between (Xi et al., 2023). Other authors criticise the fuzzy definition of XR and suggest XR should not be understood as an abbreviation of extended reality but of xReality, in which X represents any digital reality (Rauschnabel et al.,

2022). Dwivedi et al. (2022) argue that, in the context of the metaverse, immersion can be achieved either through AR or through VR, but not both at the same time. While simultaneous use is still unresolved, the AR and VR hardware market is changing rapidly and enabling more and more mixed formats. Various devices were used in the past and are still used today for AR and VR, such as head-mounted displays, smartphones and tablets, and so it is likely that the future of XR hardware will allow both realities to intertwine. Hardware like Apple Vision Pro blurs boundaries between the physical and digital worlds by seamlessly connecting real and virtual environments. Meta did therefore succeed in introducing the term metaverse into the mainstream market; however, the process of developing XR technologies and platform infrastructure is proving more difficult than expected, meaning that the first wave of hype around the metaverse appears to have already died down (Robinson, 2023). Accordingly, we find ourselves in a situation in which it is foreseeable that the metaverse will be a future of digital environments, but the path to get there will be rockier than many expected. This period of development should be used as an opportunity to think about what the metaverse can and should be used for.

The discussion around the metaverse in 2021 is reminiscent of debates about social networks like Facebook and Twitter at the beginning of the 2010s. Their use also unleashed great expectations and concerns, and deliberative powers were also attributed to them, particularly in the course of the Arab Spring (Wolfsfeld et al., 2013). Over time, social media platforms have turned out to be not only deliberative discourse platforms but services where problematic aspects of social discourse – such as hate, exclusion and disinformation – are also found, and the platform design of social networks plays no small part in this. Their mechanisms are based on principles of the platform economy, in which there are customers who should not be confused with users. Their customers are advertisers, for whom the data-driven platforms offer new opportunities for personalised advertising and sales. And thus the expectations of the metaverse have also been strongly driven by economic interests up to now. Research into immersive systems also seems to focus largely on e-commerce issues. However, to ensure that similar mistakes are not made when designing this new environment, it is important to highlight opportunities for civil society and political use in order to set out early on how democratic entities, states and also smaller units like cities and local communities could engage in the metaverse. One possible vision of use is for immersive systems to be used for citizen participation, e.g. in urban planning. Demand for digital participation offerings has been increasing in recent years, in part due to the coronavirus pandemic (United Nations, 2020). How these offerings could be combined with immersive systems and thus used in a metaverse context will be discussed below.

## 2 THE CURRENT STATE OF IMMERSIVE PARTICIPATION

Back in the 1990s, Lombard and Ditton (1997) found that telepresence and immersion can lead to a greater sense of involvement and engagement among users. This finding is, to some extent, groundbreaking for dealing with XR in public participation. A technology that succeeded in inspiring people's enthusiasm in the first scientific experiments and manages to do so in the context of video games in particular seems highly relevant for public participation.

### 2.1. (Digital) participation

In *Reconstructing Democracy* (2020), Taylor, Nanz and Taylor emphasise the importance of local participation in giving citizens opportunities to make their concerns heard, including in representative democracies. In times of major transformation in particular, the authors see the necessity of including citizens in change processes (e.g. the energy and mobility sector). The village of Langenegg in Austria is cited as a positive example. As a rural area very much affected by a general population decrease, the public authority succeeded in involving citizens in creating a vision for the future of the region. This long-running consultation and cooperation process helped to keep the village attractive for its residents and, contrary to forecasts, even positively affected the general population development (Statistik Austria, 2021; Taylor et al., 2020). Langenegg is mentioned as an anecdotal example of the positive impact of participation projects. In contrast to this are the bigger debates about citizen participation in Germany. These often relate to problem cases where participation projects have been initiated in order to resolve conflict situations caused by democratic deficits. One such example is the debate around the rebuilding of Stuttgart's main railway station as part of the Stuttgart 21 infrastructure project. Remodelling of the station began in 2010 when the building was partially demolished, which led to numerous protests. The conflict could only be resolved through an arbitration process and a referendum. As a result of this case, the general public across the nation became very aware of the implications and cost dimension of a lack of early involvement in

construction planning (Brettschneider, 2013). The clients' failure to communicate properly is cited as a reason that triggered this conflict. For example, construction plans were not made available locally for people to view, which meant the implementation plans caused confusion once construction began (Thaa, 2013). Lack of inclusion and non-transparent communication like this can damage confidence in politicians and local authorities. The conflict in Stuttgart was de-escalated through a public referendum; nevertheless, this avoidable conflict has had a long-lasting effect on construction planning.

Despite the genesis of this prominent case of problematic non-participative construction planning, a recurring criticism of participation processes relates to their timing, organisational and financial aspects. Participation processes are viewed as costly, lengthy and, from the initiators' perspective, complex and difficult to control. However, the obvious knowledge gap between the initiators of building projects and the citizens affected by these projects makes it necessary to look for new, easy-to-implement approaches here. Since the 2010s, providers like Consul, Liquid Democracy, LiquidFeedback, CitizenLab and Zebralog have established themselves in the field of digital public participation, also referred to as e-participation (Macintosh, 2004) and digital citizen participation (Fegert, 2022). The providers have developed modular systems, some of which are open source, and aim to enable participation procedures and in some cases also voting procedures using digital web platforms. Compared to traditional outreach and/or postal participation methods, these have a relatively low implementation threshold. Digital participation projects are therefore praised for their relative cost efficiency (Spirakis et al., 2010). Nevertheless, these platforms had a relatively niche existence in the public sphere until the Pirate Party started using LiquidFeedback to organise itself. The Covid-19 pandemic also prompted a rethink here: when German parties were suddenly forced to use appropriate platforms to enable the political participation of their members and delegates at party conferences, the practical benefits and efficiency of these were brought to the attention of a wider public. Rottinghaus and Escher (2020) and Novo Vázquez and Vicente (2019) show, however, that general political interest and individual concern about the subject matter remain the crucial motivating factors for public participation using digital resources. In addition, other researchers give evidence of sex-specific differences in the use of e-participation offerings (Kim & Lee, 2019). There are thus also certain groups and milieus online that participate primarily digitally. Usability issues can be cited as a reason for this. Here, the current tools do not appear to be state of the art as regards user friendliness (Fegert et al., 2021). While big tech platforms for e-commerce or social media continually test and refine their usability in the background in order to avoid usage problems that might scare off users, e-participation falls short of its potential in this regard. For this reason too, it is important to look for new approaches to digital participation that boost people's willingness and motivation to participate. Think tank Democracy Technologies predicts that market volume in the field of digital public participation will grow from €100 million in 2022 to €300 million in the next five years (Democracy Technologies, 2023). Cities and local authorities thus appear to be slowly getting ready for online participation processes, and so the task now is to design these according to use interests.

## 2.2. Digital participation with immersive systems

To enable public participation in local decision-making processes, it is necessary to create easy-to-understand visualisations as well as reliable and user-friendly feedback mechanisms. Here, the use of immersive systems has scope to effectively expand participation platforms. Even if none of the participation platforms currently use immersive systems on their platforms, their use has been researched for a long time. This state of research is not comparable with the resources channelled into researching immersive systems for industrial and commercial contexts, but some of the research results from these other contexts can be transferred to participation with immersive systems. For example, Suh and Lee (2005) were able to show quite early on that VR use left users with a higher level of knowledge about products. My own studies for the participation context have confirmed this. Funded by the Federal Ministry of Education and Research (BMBF), the FZI Research Center for Information Technology has created the House of Participation and is currently carrying out a second research project on the use of immersive systems in digital citizen participation. Here, immersive participation applications have been and are currently being developed and researched in the projects Take Part (2018–2021) and VIRTUS (2021–2024), also with the aim of critically evaluating the marketing potential of such use. In line with participative technology development, standards for such platforms are developed and defined together with citizens and building planners. The prototypes were then evaluated and refined in various studies with different methodological approaches, one of the aims being to give e-participation platform operators, cities, local authorities and building planners suggestions for the use of immersive participation. Examples of results are shown below:

In a qualitative interview study (n=27) carried out in 2018 as part of a specific construction planning process in a major German city, we observed a high level of interest among very different stakeholders in the idea of using immersive systems for citizen participation (Fegert et al., 2020). Overall, our study showed strong appreciation for the idea of using digital technologies for public participation: a large majority of the study participants found that digital technologies were a valuable complement to public participation and expected that digital technologies would promote access to information about public building projects. Accordingly, two thirds of the participants preferred 3D visualisation of building projects to traditional architectural plans. We proved that the future design of the application should support this process by harnessing the potential of VR- and AR-based visualisations in order to include citizens in the planning of public building projects and minimise the gap in knowledge between them and experts (Fegert et al., 2020).

In a field study carried out in 2019 (n= 339) we showed that immersive systems, particularly VR, significantly help to stimulate the imagination of individuals with regard to building sites and urban planning and thus can be important support for digital participation processes. Immersive systems can concretise and improve spatial understanding in e-participation; however, significant differences between AR and VR become apparent here, with VR performing significantly better than was the case for AR (see Figure 1, Fegert, 2022).

## Informationsgehalt der Visualisierungen

*Die Nutzung des Demonstrators half mir dabei, mir vorzustellen, wie sich das Bauvorhaben in den Zoologischen Stadtgarten einfügt. (selbstentwickeltes Item)*

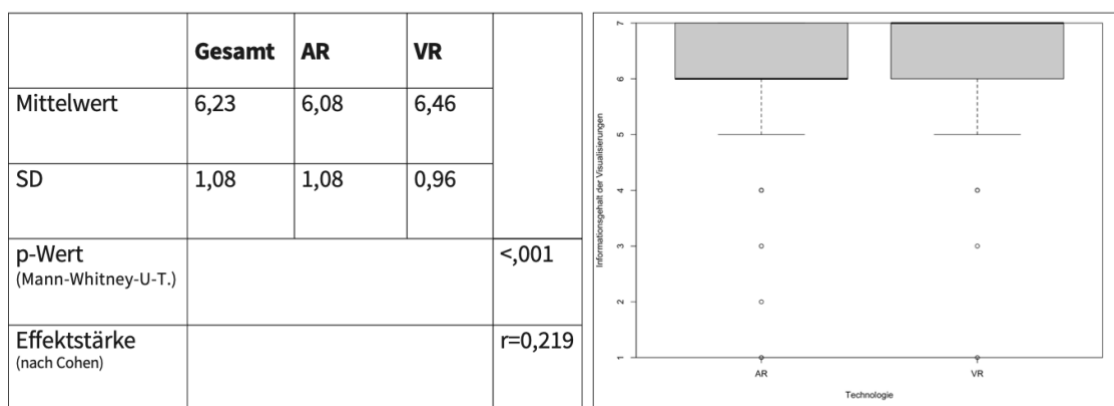


Figure 1: Information content of visualisation measured with a 7-point Likert scale, in which 7 indicates strong

We showed that immersive components allow users to better assess the proportions of a building project. This result was verified in our study by an estimation question: here, immersion helped people correctly classify proportions, thus demonstrating that the use of immersive systems in participative construction planning actually enhances spatial understanding (Fegert et al., 2020). AR and VR also have the ability to lower the participation threshold by motivating citizens to take part. The quantitative field study also showed that immersive systems have a positive effect on willingness to engage with building projects and on willingness to contribute to these. We were thus able to demonstrate the relevance for other participation concepts, such as participatory budgeting. The qualitative and quantitative studies also made it possible to identify criteria for the design of an immersive participation platform. We asked ourselves how an immersive AR- and VR-based digital participation platform for urban and construction planning should be designed for the purpose of increasing citizens' willingness to get involved. Based on the studies, design principles were formulated and refined. They are presented in brief here (Fegert, 2022): platform development for immersive e-participation in urban planning should give consideration to accessibility (1). An immersive participation environment should be easy to navigate and work on different devices. The design principle of information quality (2) emphasises the importance of hardware-appropriate forms of visualisation, which should play to the strengths of various technologies and immersion levels. For example, while VR tends to be perceived as an entertainment medium, AR is considered more effective for conveying information. Motivation (3) represents another design principle. When designing such environments, everything should be done to involve users at all stages. From updates on the progress of

the participation project to incentives such as badges or other elements of gameful design, efforts should be made to continuously maintain the interest of users. In immersive environments too, it is very important to users that people interact respectfully when participating. Fear of hate speech is a factor for immersive environments as well, and this can prevent citizens from getting involved. As a design principle, transparency (4) aims to ensure something that poses a challenge in less text-intensive immersive environments: namely to represent the process-related participation setting, among other things. For instance, this means relying much more on shorter text blocks or video content in immersive environments in order to communicate, for example, how binding a consultation or decision-making process is. The final design principle is data protection and data sovereignty (5). E-participation applications mostly adhere to the data minimisation principle, so when it comes to participation in immersive environments it is also true that users largely want to participate anonymously. This is contrary to the use of personalised avatars, as used in the metaverse. Above all, when selecting and configuring the hardware, close attention must be paid to how this is set up to ensure that the data which is often collected, like eye tracking, is not recorded in a personalised manner.

In addition to this long-term examination of immersive participation platforms in government funded research projects, a number of student projects very creatively demonstrate what can be implemented with simpler approaches. For example, in 2020 Paulina Porten developed Augmented Participation: an exciting and well designed participation tool that combines voice messages with immersive presentations (see Figure 2, Paulina Porten, 2020).

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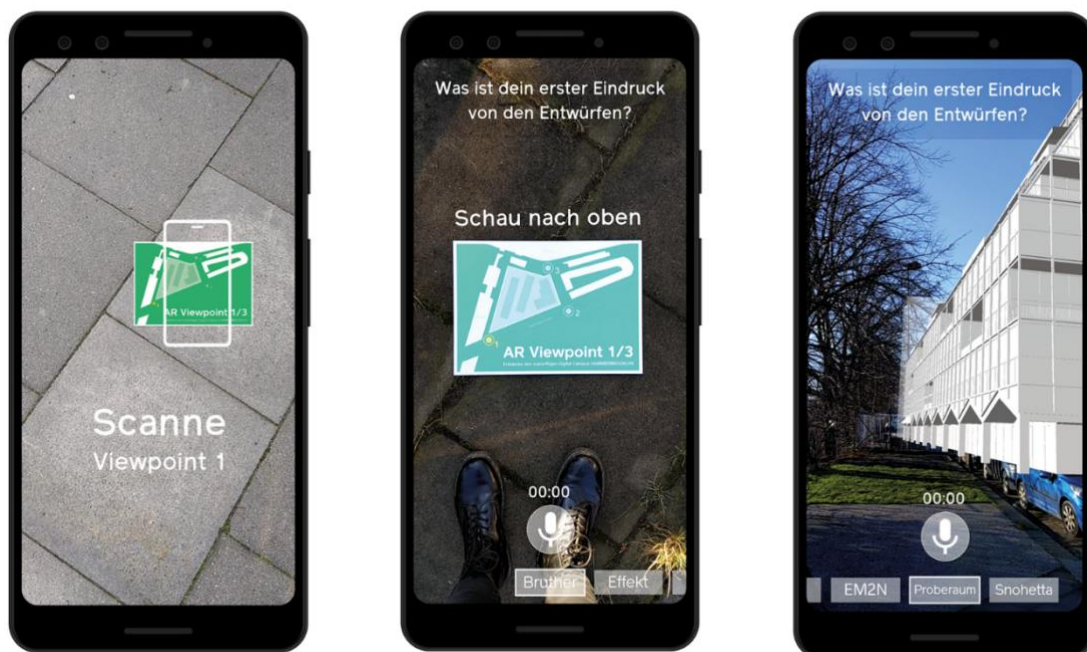


Figure 2: Augmented Participation application (Paulina Porten, 2020).

After this overview of participation using immersive systems, study results on the use of the metaverse for immersive participation will be used below.



## 3 OPPORTUNITIES AND CHALLENGES OF PUBLIC PARTICIPATION IN THE METAVERSE

The announcements made by Meta Platforms in October 2021 led, as mentioned above, to increased public interest in immersive systems. Consequently, within the VIRTUS research project, it made sense to reassess the relevance of the combination of immersive systems and public participation in the context of the metaverse. Therefore, at the beginning of 2022, a further qualitative interview study (n=14) was carried out to assess the effects of the Meta platform launch on the relevance of the combination of immersive systems and public participation. In another major German city, stakeholders involved in public construction projects were again spoken to and specifically asked about their knowledge and concerns regarding the metaverse. Some of the results are reported below.

- **Knowledge of the metaverse:** Most participants had little to no knowledge of the metaverse. Those who were aware of the metaverse had heard about it primarily as a result of media reports relating to Facebook's name change. There was general scepticism about whether the metaverse was a longer-term phenomenon, with comparisons repeatedly made to the Second Life platform.
- **Opinions and attitudes about the metaverse as Web3:** The study showed mixed opinions on the use of the metaverse for civic participation. While respondents saw the potential for e-commerce and gaming, they were more cautious regarding its use in e-participation – unlike with the much more concrete use of AR or VR. In particular, concern was mentioned about alienation from reality if political participation were to shift into immersive environments. This concern was not associated with the use of individual technologies. On the other hand, others saw promising potential in the modelling of cities in the metaverse as digital twins. In particular, respondents saw an opportunity here in being able to participate in a detailed reproduction of their urban environments, regardless of location.
- **Democratic design of the metaverse:** The respondents expressed concerns about the democratic control of the metaverse. There was a specific concern that authoritarian states could undermine these virtual environments and exploit them for their own benefit. Respondents were also worried about the non-transparent design of environments by platform operators. The fear of manipulation by powerful individuals was repeatedly emphasised here. Many misgivings were addressed regarding the exclusivity of the metaverse in particular: on the one hand, in the sense of the digital divide, generational differences determine who can take part in participation settings in the metaverse, but above all it was feared that people with visual impairments or poor vision would be excluded from the metaverse itself and, accordingly, also from participation settings in this immersive environment. At the same time, the view was expressed that participation projects in the metaverse could be interesting for children and young people in particular and would encourage them to get involved.

In summary, it can be said that the respondents in the qualitative study responded cautiously to the idea of the metaverse as a place of participation. Unlike with the technologies behind it, AR and VR, the association with the platform operator seems to be more problematic when it comes to trust, which is the prerequisite for successful participation.

## 4 CONCLUSION

The presentation of the state of research has shown that use of immersive technologies in digital public participation is not yet a reality integrated into existing software. Their use can strongly motivate people to participate and inspire spatial imagination in participation processes.

Since participation processes are initiated at municipal or city level – and digitalisation of these administrative units is badly lagging behind, particularly in Germany – it is also not foreseeable that the metaverse will play an important role in public participation here in the next five years. Immersive technologies will certainly be used in various places, but it will probably not be the operators of e-participation platforms who will move to Web3 as early adopters. Financial and staff resources, particularly for development, are limited among these providers. By contrast, small, rich countries like Saudi Arabia are already focusing heavily on digital twins now, which is why it is more conceivable that these countries will approach the subject of digital twins in the metaverse as prestige projects and will experiment with participation projects here. However, local circumstances mean that the participation space would not

happen in a democratic environment there. In the use of digital twins, it will also be interesting to see whether the real participation of people is desired here in the future, or whether their behaviour will increasingly be simulated. Here, the use of generative AI (generative agents and memory streams (Park et al., 2023)) represents an alternative to real participation, in which participatory behaviour could be simulated. These possibilities should also be monitored in order to be able to take a position if they should become reality in the context of digital twins or the metaverse.

Perhaps the question that should be specifically asked now is what are the actual interesting applications for citizen participation in the metaverse. Use for small, non-representative participation processes seems to be the most feasible. For example, it could be exciting to enable the inclusion of diaspora communities in the planning of memorial sites, irrespective of where they currently live. Another useful setting could be participative gatherings as part of citizens' councils. As a general trend in participation, these randomly selected advisory boards have gained importance in recent years, including in federal politics. The personal is in the foreground here, which could be interesting for the metaverse with its embodiment and implementation of real-time interactions in the form of avatars.

The following challenges still stand in the way of enabling citizen participation in the metaverse: high costs and the availability of hardware; the performance of hardware, which involves its own challenges with short battery life and strong light sensitivity; the interconnectivity and interoperability of platform and hardware standards. These practical points create an obstacle when it comes to designing inclusive participation processes in the metaverse. As mentioned above, scepticism towards platform operators is also an obstacle to usage. In addition, the desire for personal interaction and the use of avatars contrast with the need for anonymity in participation processes. Nevertheless, it is fascinating and important to consider how the metaverse could also be used for democratic procedures and how it might complement existing analogue formats. There is huge potential to clearly illustrate the subject matter of participation and organise gatherings from different places on the subject matter. This gives rise to a task for e-participation platform operators, virtual environments like Meta, and research: when designing the metaverse, consideration should be given from the outset to how the spaces can be designed in order to enable democratic participation. Mistakes made in the case of social media – where content moderation issues and thus also the level of hate speech always depend on the willingness of the platforms themselves to take action against these occurrences – could be completely rethought for the metaverse. It is to be hoped that places for democratic experiments will emerge and be researched in the metaverse and that, conversely, it does not come to be known for exclusion and hate.

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