

### Summary of Agile Pilot

Company name	Venus Ai GmbH & Co. KG
Company location	Bogen, Germany
Domain	Digital services and communication, Health and Well-being
Municipality	Bad Alexandersbad, Germany
Project period	July 2025 - March 2026, 9 months
Solution	<p>Venus Ai GmbH &amp; Co. KG developed and implemented a smart, QR code-based information and navigation system along an accessible circular hiking trail in the spa town of Bad Alexandersbad as part of the pilot project. The system was built on existing open data sources.</p> <p>The original concept envisaged a browser-based augmented reality experience that would allow hikers to access location-specific digital information directly on their smartphones, without requiring the installation of an app. By overlaying this information onto the real-world environment, the system aimed to create an intuitive and immersive visitor experience. The pilot project examined whether such a system could be meaningfully integrated into existing trail infrastructure and whether it would be accepted by visitors under real-world conditions.</p>
Stakeholders	Bad Alexandersbad municipal administration, tourism department of the Wunsiedel district, end users, ZDE as coordinator
Lessons learned	<p>The present pilot project led to one main learning: agility is key. In fact, the project team was not only influenced by disadvantageous meteorological conditions, but also by some drastic changes in the technological setting they had to operate within. Along the 1.1 km barrier-free circular hiking trail (level II), 13 QR code signs were installed. A total of 57 validated user interactions were recorded. The signs at positions 1 and 10 achieved the highest usage frequency, with 9 clicks each. The contractually agreed KPI target of 20 signs could not be fully met due to the limited length of the trail; 13 signs represented the technically and spatially optimal maximum density for this route.</p> <p>Three key external factors influenced the project outcome: First, the installation of the signs was delayed, which shortened the effective operational period. Second, an unusually early and snow-rich winter significantly reduced trail usage, making meaningful user feedback collection practically impossible. Third, the WebAR component had to be completely redeveloped twice: the open-source solution AR.js proved incompatible with iOS, and the commercial fallback platform 8th Wall ceased operations in the middle of the pilot phase. As a stable final solution, a map-based web application based on MapLibre GL JS was deployed.</p> <p>Thus, the main lessons learned can be summarized as follows:</p> <ul style="list-style-type: none"> <li>• The underlying data infrastructure—QR code management, location-based content delivery, and dynamic linking of route data—works reliably and is ready for scaling.</li> <li>• The WebAR component remains strategically important, but is currently blocked by Apple Inc.'s restrictive browser policy on iOS.</li> <li>• The map-based fallback solution (MapLibre) is technically mature, but positions the product too close to established platforms such as Komoot, Outdooractive, or Google Maps.</li> <li>• For robust usage data, a larger seasonal operating window (spring/summer) and a longer trail segment are required.</li> </ul>
KPI 1 Number of QR codes installed	<p>The project originally stipulated the installation of at least 20 QR code signs along at least one hiking trail. On the barrier-free circular hiking trail in Bad Alexandersbad (level II), 13 signs were installed. The deviation from the target value is solely due to the length of the trail: at 1.1 km, the reasonable signage density was limited to 13 positions. Installing additional signs would have resulted in an overly dense and non-user-friendly setup. Artificially increasing the number of signs solely to meet the KPI target would therefore not have been substantively justifiable. The chosen route selection was a direct response to the unforeseen early onset of winter. On a longer, originally planned nature trail, the installation of 20 or more signs would have been fully feasible and appropriate.</p>

<p>KPI 2 Number of users / QR code user stats</p>	<p>All 13 QR code signs were equipped with an individual tracking URL. For evaluation purposes, only accesses originating from Germany were considered in order to exclude bot traffic and automated requests. Across the entire measurement period, a total of 57 validated user interactions were recorded.</p> <p>The signs at position 1 (trailhead) and position 10 recorded the highest usage frequency, with 9 clicks each, indicating typical entry-point and orientation-related usage patterns. Sign 13 at the end of the trail also achieved above-average interaction with 6 clicks. The total of 57 interactions should be interpreted as a minimum value rather than a representative indicator of the trail's seasonal usage potential, given the exceptionally snow-rich winter and the shortened operational period.</p>
<p>KPI 3 quality of user feedback</p>	<p>User feedback collection via an optional online survey as well as through the local tourist information office was contractually foreseen. However, due to an early and exceptionally severe onset of winter in the Wunsiedel district region, meaningful on-site surveying of hikers was practically not possible. The barrier-free circular hiking trail was barely frequented during the evaluation period. As a result, no robust conclusions regarding user satisfaction or acceptance of the solution can be drawn from this pilot. The feedback collection infrastructure is in place and will be activated as part of a potential continuation of the project in spring/summer 2026.</p>
<p>Evaluation of the business model focusing on its viability and potential for growth</p>	<p>The map-based solution ultimately delivered in the pilot (MapLibre) is technically robust, but it likely positions the product too close to established and freely available alternatives such as Komoot, Outdooractive, or Google Maps. A differentiation based solely on map display and QR code infrastructure is unlikely to be sufficient in the long term to support an independent business model.</p> <p>The strategically relevant distinguishing feature of the project remains the AR component. Only a location-based, browser-based augmented reality overlay clearly sets the product apart from existing navigation solutions and creates a genuine, experience-oriented added value for hikers. However, the current market situation in the WebAR segment makes the short-term implementation of this component unfeasible.</p> <p>Venus Ai GmbH &amp; Co. KG is actively monitoring developments in Apple Inc.'s WebKit policy. Within the framework of the EU Digital Markets Act (DMA), Apple is under increasing regulatory pressure to relax browser engine restrictions on iOS, which could significantly simplify WebAR development on Apple devices in the medium term. In parallel, alternative approaches are emerging, such as successors to 8th Wall and native integrations like Apple AR Quick Look, which may open up new technical possibilities.</p> <p>The pilot project therefore primarily functions as a technical feasibility study under real-world conditions. It demonstrates that the underlying infrastructure is operational, but also clearly shows that the key differentiating feature of the solution—the AR component—can only be fully realized once external market conditions make this technically feasible.</p>
<p>Impacts</p>	<p>The pilot project has demonstrated that the technical infrastructure of the signage system—comprising QR code management, location-based content administration, dynamic linking of route data, and usage analytics—functions reliably. The operational model, in which individual signs are uniquely linked to route data and deliver locally adapted information, has been technically validated and proven suitable for real-world application.</p> <p>The solution developed can be transferred to additional trails, municipalities, and regions with minimal effort. The underlying data infrastructure is designed in such a way that new locations can be integrated without requiring redevelopment. This represents a key advantage for scalable commercialization in the municipal and tourism sectors.</p>
<p>Suggestions for future actions, especially focusing on sustainability and replication</p>	<p><b>Recommendations for Future Pilot Projects</b></p> <ul style="list-style-type: none"> <li>• Technological dependencies on third-party providers should always be anticipated with clearly defined fallback scenarios, particularly when working with emerging technologies such as WebAR.</li> <li>• Seasonal conditions should be given greater consideration during pilot planning. Outdoor applications require a minimum period of favourable seasonal usage in order to generate reliable and meaningful data.</li> <li>• Agile pilot formats enable honest and practical insights that conventional procurement and contracting models often cannot provide. This added value should be given greater weight when assessing project success.</li> <li>• The infrastructure established during the pilot remains in place beyond the formal end of the project. Although this outcome is often not captured in KPI-based evaluation systems, it represents a strategically significant result.</li> </ul>

<p>Next steps</p>	<p>Venus Ai GmbH &amp; Co. KG continues to operate the installed infrastructure and has offered the municipality a free extension of the project; a response is still pending.</p> <p>The company is actively monitoring developments in Apple Inc.'s WebKit policy as well as emerging alternative WebAR technologies. Based on these developments, Venus Ai plans to scale the solution to a longer hiking trail for the 2026 season, taking advantage of a more favourable operational window.</p> <p>Short-Term Objectives (Q1 2026):</p> <ul style="list-style-type: none"> <li>• Continued operation of the existing MapLibre-based infrastructure in Bad Alexandersbad.</li> <li>• Activation of the user feedback infrastructure in preparation for the 2026 spring tourism season.</li> </ul> <p>Medium-Term Objectives (2026)</p> <ul style="list-style-type: none"> <li>• Scaling the system to a longer, nature-oriented hiking trail in the region, including at least 20 information signs, with an optimal operating window from April to October.</li> <li>• Evaluation of alternatives to 8th Wall for WebAR, with a particular focus on native Apple AR Quick Look integration and potential new providers in the WebAR ecosystem.</li> <li>• Monitoring the implementation of the EU Digital Markets Act (DMA) by Apple Inc.: A potential opening of browser engine restrictions on iOS would significantly simplify the realization of AR functionality.</li> </ul>
<p>Provider's Reflection</p>	<p>The PilotInnCities agile pilot format proved to be an exceptionally valuable testing framework for us, precisely because it was not focused on the success of a predefined solution, but rather on learning under real-world conditions.</p> <p>This is exactly what occurred during the project. We encountered two external system disruptions that we could neither foresee nor influence: the incompatibility of AR.js with iOS and the short-notice discontinuation of 8th Wall. The fact that we were able to remain operational in both cases and deliver a stable and usable alternative through the MapLibre fallback solution demonstrates the resilience of our technical approach.</p> <p>At the same time, we are candid about the limitations of the project's current stage. The map-based solution alone does not constitute a standalone business model. The product will only realise its full potential once WebAR technology becomes reliably available on iOS devices. Until then, we will continue to operate the infrastructure, monitor market developments, and remain prepared to continue and scale the project within the region, ideally during the tourist season beginning in spring 2026.</p> <p>A particularly encouraging finding was that the region's existing Social Knowledge Graph platform and the open data it contains could be used directly in the project without requiring any technical modifications. Beyond hiking trails, one promising application area could be the enhancement of tourist signage within towns and villages.</p> <p>We can recommend the agile pilot format without reservation. It provides the necessary space for technical experimentation in a public-sector environment without the usual risks associated with full-scale procurement. For small companies such as ours, it represents one of the few opportunities to test innovative solutions under real-world conditions.</p>
<p>Municipality's Reflection</p>	<p>All stakeholders involved in the pilot project—including the contracting authority, the contractor, and the municipal partners—share the view that the project generated valuable and actionable insights, despite the fact that the original technical objectives were not fully achieved.</p> <p>The pilot demonstrated the external dependencies associated with the development of browser-based augmented reality solutions and showed how an agile team can respond effectively to such challenges.</p>
<p>Expert's Reflection</p>	<p>External independent experts did not participate in the pilot project.</p>