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# WEB-BASED INDOOR NAVIGATION

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# Powered by Immersal

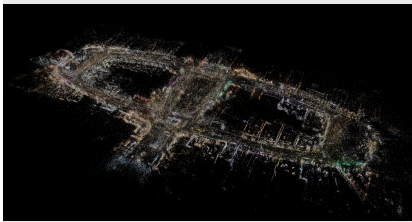
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## Mall of Tripla

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Immersal created a pilot indoor navigation project for one of the largest shopping centers in the Nordics, Mall of Tripla – a 85 000 m<sup>2</sup> shopping mall in Helsinki.

With 250 stores spread out across five floors, the mall is part of a larger complex that includes offices, a hotel, and residential units.



## Mapping the Space

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Mapping is the first step to enabling VPS. It can be done with devices such as Leica's BLK2GO (handheld imaging laser scanner), 360 cameras, or with a standard mobile phone.

The Immersal team mapped 3 floors of the Tripla mall in less than 2 days without causing any interruptions to operations or service.

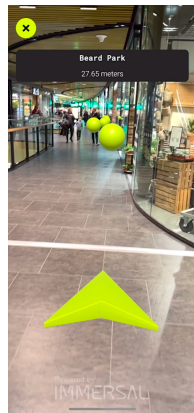


## Indoor vs Outdoor

Indoor navigation presents a unique set of challenges compared to outdoor navigation, mainly due to the inaccuracy or even absence of GPS signals inside buildings which is crucial for determining precise location.

This means that there is a need to develop alternative methods of accurate and reliable positioning. Additionally, indoor environments are dynamic, with frequent changes in layouts and obstacles, adding further complications.

Most common solutions are expensive and require installing extensive hardware, leading to high maintenance costs. They also typically require users to download an application, which lengthens the procedure and adds friction to the user experience.

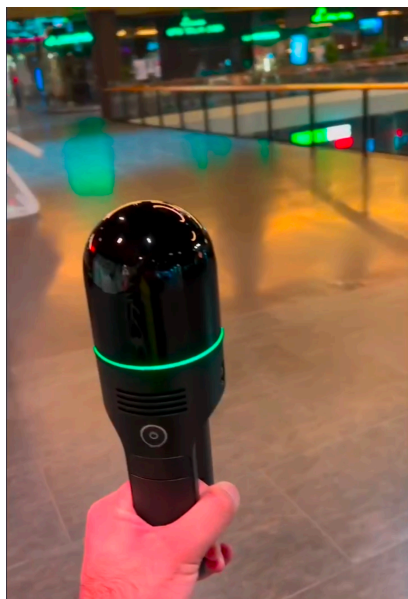


## Cost-Effectiveness

Immersal's solution costs less than €1 per m<sup>2</sup> and can be deployed within 2 - 4 weeks.

It leverages standard web technologies and eliminates the need for investments in bluetooth beacons, smart tokens/kiosks, and hardware maintenance.

Our tests have demonstrated accuracy down to 2cm indoors and 15cm outdoors. This performance far surpasses the capabilities of bluetooth beacons, which offer up to 5m accuracy, and Wi-Fi, with up to 10m accuracy.



As urban planning and architecture become more complex, there has been a surge in demand for efficient navigation and enhanced visitor experiences in large indoor venues such as airports, hospitals, and shopping malls.

This, combined with the increasing interest in immersive technologies, creates a need for innovative solutions that blend digital and physical interactions.

Immersal meets this demand with its advanced Visual Positioning System (VPS) technology, offering a state-of-the-art navigation system that enhances visitor experiences through spatial computing and web-based applications.

Immersal's flexible system supports 2D navigation with optional 3D Augmented Reality (AR) enhancements, all accessible via mobile phone web browsers without the need for app download or additional hardware.

By integrating the latest in web technology, Immersal provides a seamless, immersive experience that caters to the evolving needs of urban and retail environments.

## Technology of the Future – Available Today

Immersal's web-based indoor navigation solution marks a significant innovation in the way people interact with large indoor spaces.

By offering an easy-to-access, flexible, and cost-effective navigation system, Immersal is redefining visitor experiences across various venues. This approach not only simplifies navigation but also enhances the overall visitor experience and satisfaction.

Upgrade your venue with Immersal's next-generation navigation system. See how our flexible, browser-based solution can transform visitor interactions at your site.

Get in touch today to learn more about our technology and start enhancing your visitor experience with minimal effort and maximum impact.

## Comparison of similar technologies

Key selling points of Immersal's system include its cost-effectiveness and quick deployment timeline. It is distinguished by its use of Babylon.js, a powerful web-based framework that enables rich, interactive 2D and 3D experiences. This technology allows the system to run entirely within a browser, eliminating the need for app downloads and specialized equipment. This makes it an appealing choice for venues looking to enhance visitor experience without significant upfront investments in bluetooth beacons, smart tokens/kiosks, or hardware maintenance fees.

During our localization tests we achieved around 2cm accuracy indoors, and 15cm outdoors, with up to 89% success rate. These figures compare very favorably against the accuracy measurements of Bluetooth beacons and Wi-Fi which can drift as much as 5 - 10m.

See below for a detailed comparison.

Technology	Accuracy	Response Time	Interference Resistance	Deployment	Hardware Required?	App Downloads	Cost
Immersal VPS	<10cm	Fast	High	Very easy	No	No	Low
UWB	10cm	Fast	High	Medium	Yes	Yes	High
iBeacon	<100cm	Fast	Medium	Easy	No	Yes	Medium
Wi-Fi	~100cm	Slow	Medium	Hard	Yes	Yes	High
Geomagnetic	100-200cm	Medium	Medium	Easy	No	Yes	Medium
BLE	200-300cm	Fast	Low	Medium	Yes	Yes	Medium
RFID	100-500cm	Fast	Medium	Medium	Yes	Yes	Medium
ZigBee	100-500cm	Medium	Medium	Medium	Yes	Yes	Medium
Ultrasonic	100-500cm	Medium	Low	Hard	Yes	Yes	High