

Indoor Positioning Systems (IPS) Enhancing Safety and Security in Buildings

SupDet 2016

Here a situation all of us are familiar with.



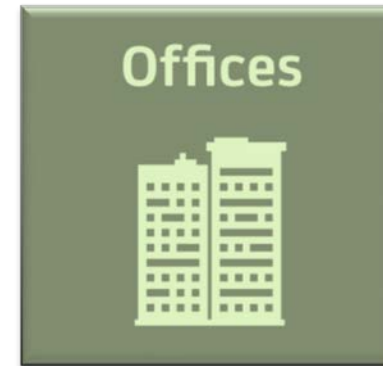
The introduction of satellite positioning made finding a simple as following instructions.



Photo from en.wikipedia.org/wiki/Global_Positioning_System

Graphic from www.tomtom.com

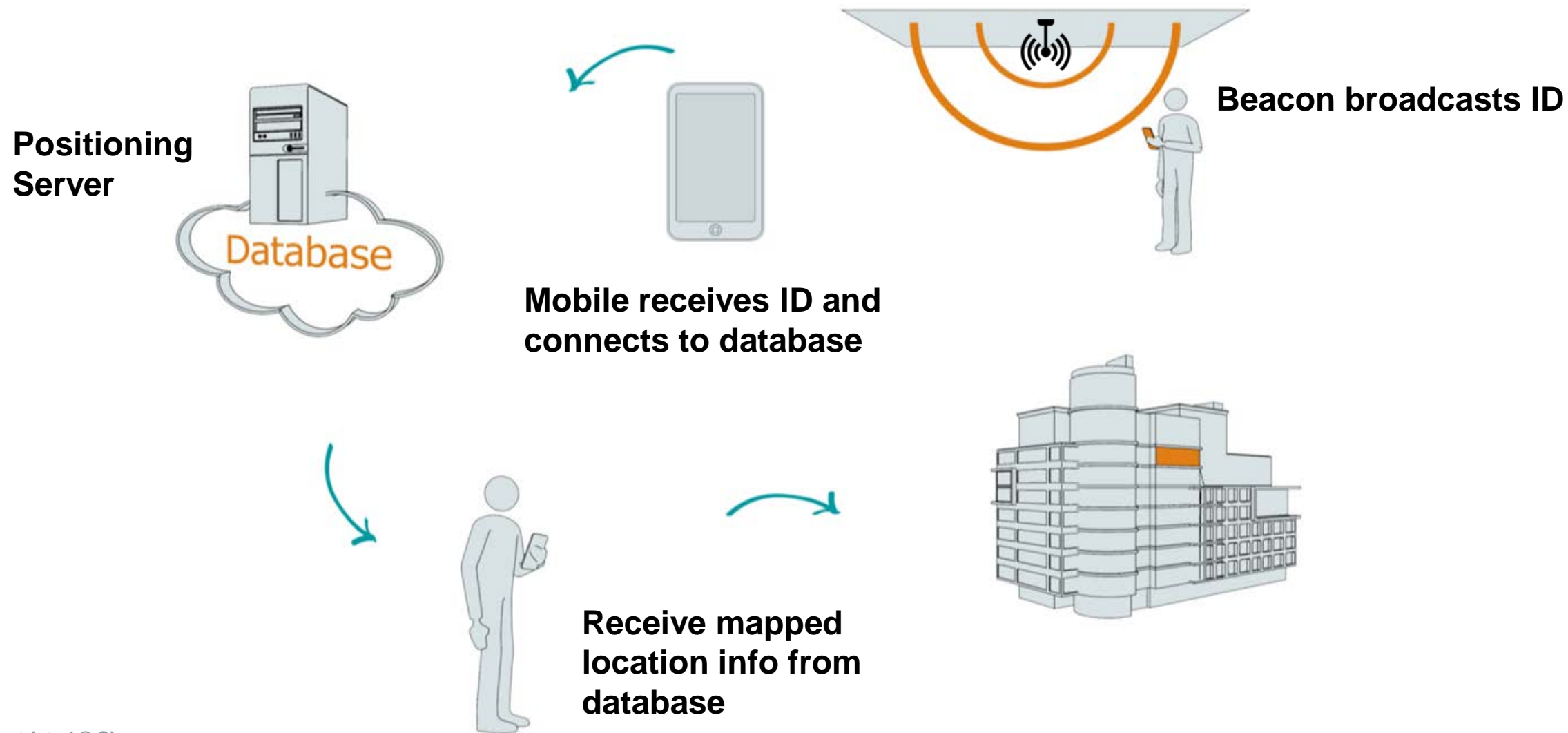
Positioning would be ideal for complex and large buildings



Industrial Example: Searching for that one device that needs attention!



How an Indoor Positioning System (IPS) works



Evaluation of the available technologies

	WiFi	Beacons	Light	Magnetic	QR codes	Camera
Requires Mapping	✓	✓	✓	✓	✓	✓
Infrastructure requirements	-	-	--	+	-	+
Precision	-	+	+ / -	-	+ / -	+
Orientation information	✗	✗	✗	✗	✓	✓
Time to position	+	+	+	-	+	+
Positioning application suitability	+	+	+ / -	+ / -	+ / -	+ / -

Accuracy vs. Coverage

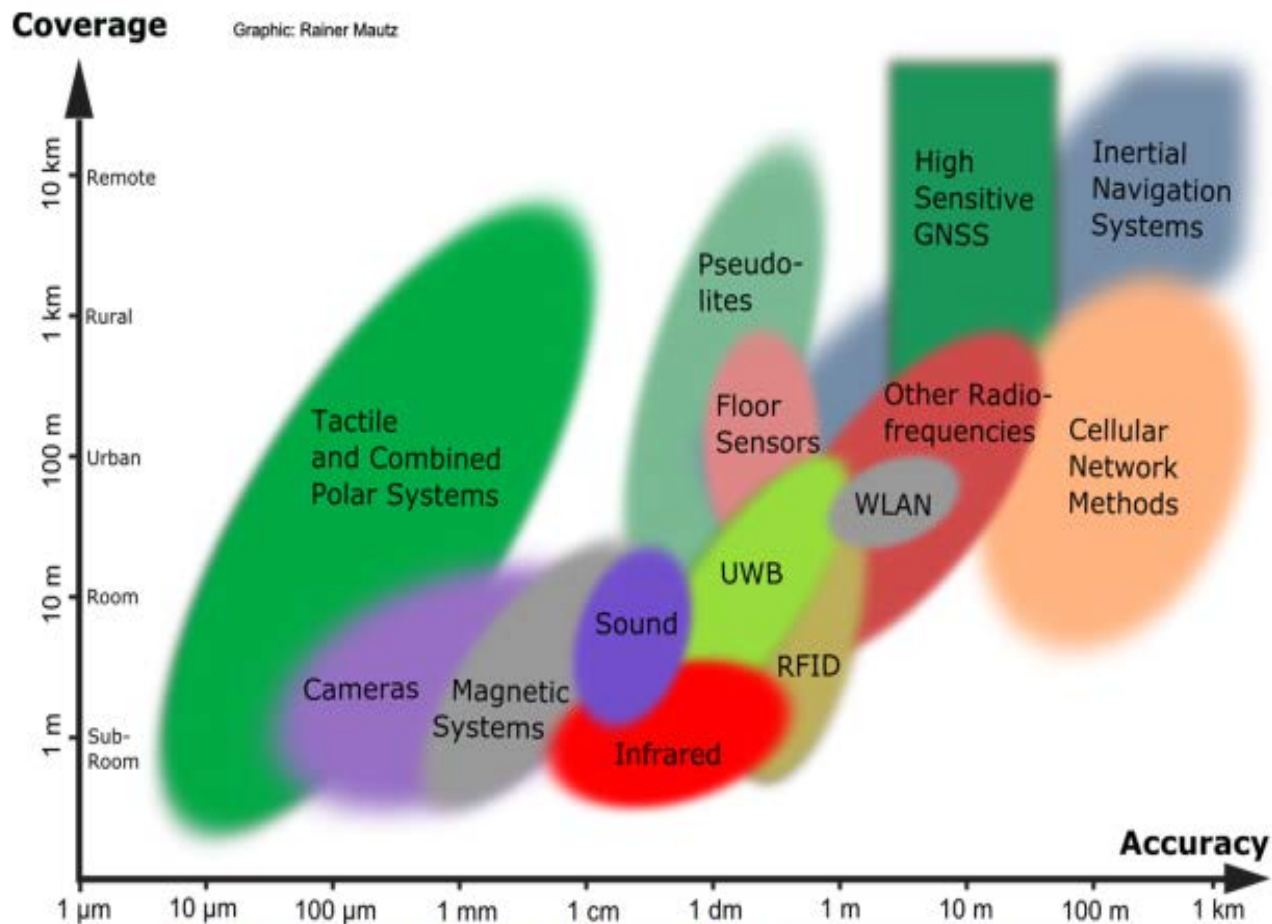


Figure 1.1 Overview of indoor technologies in dependence on accuracy and coverage

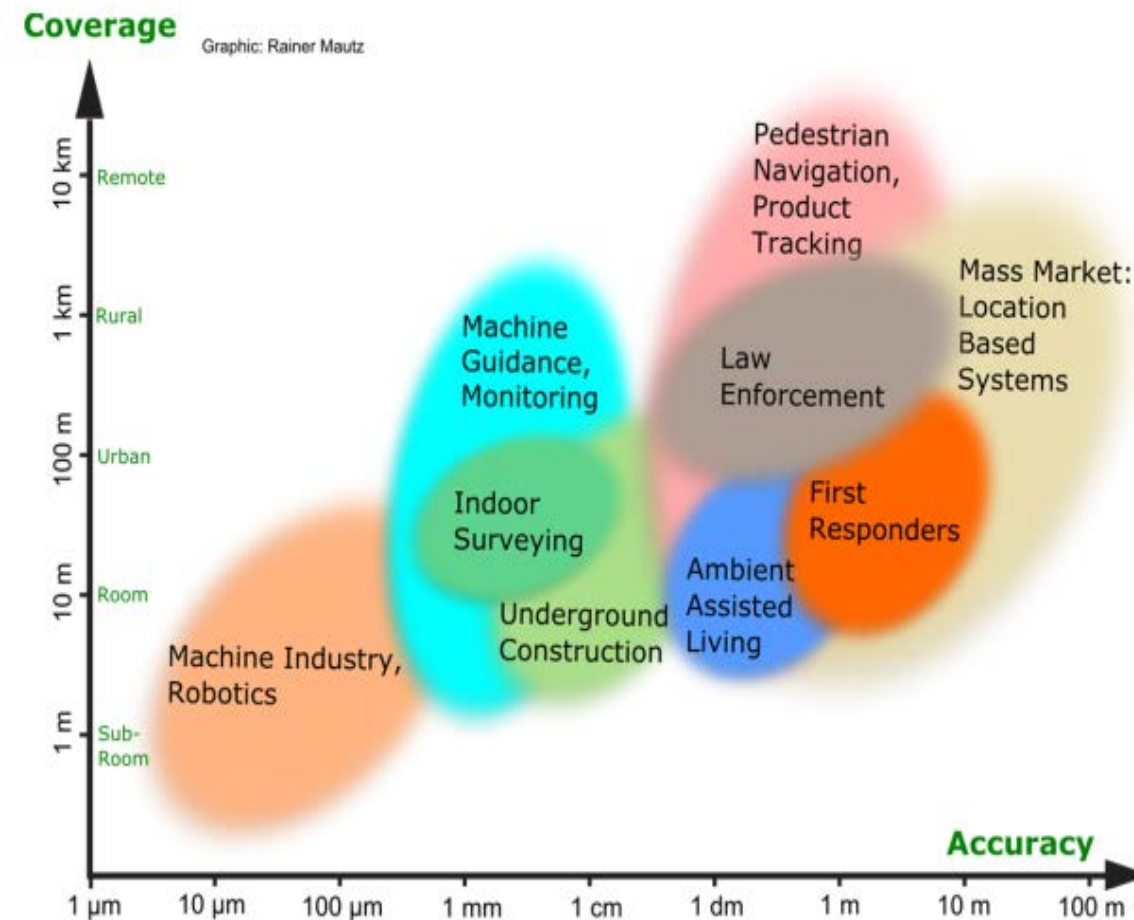
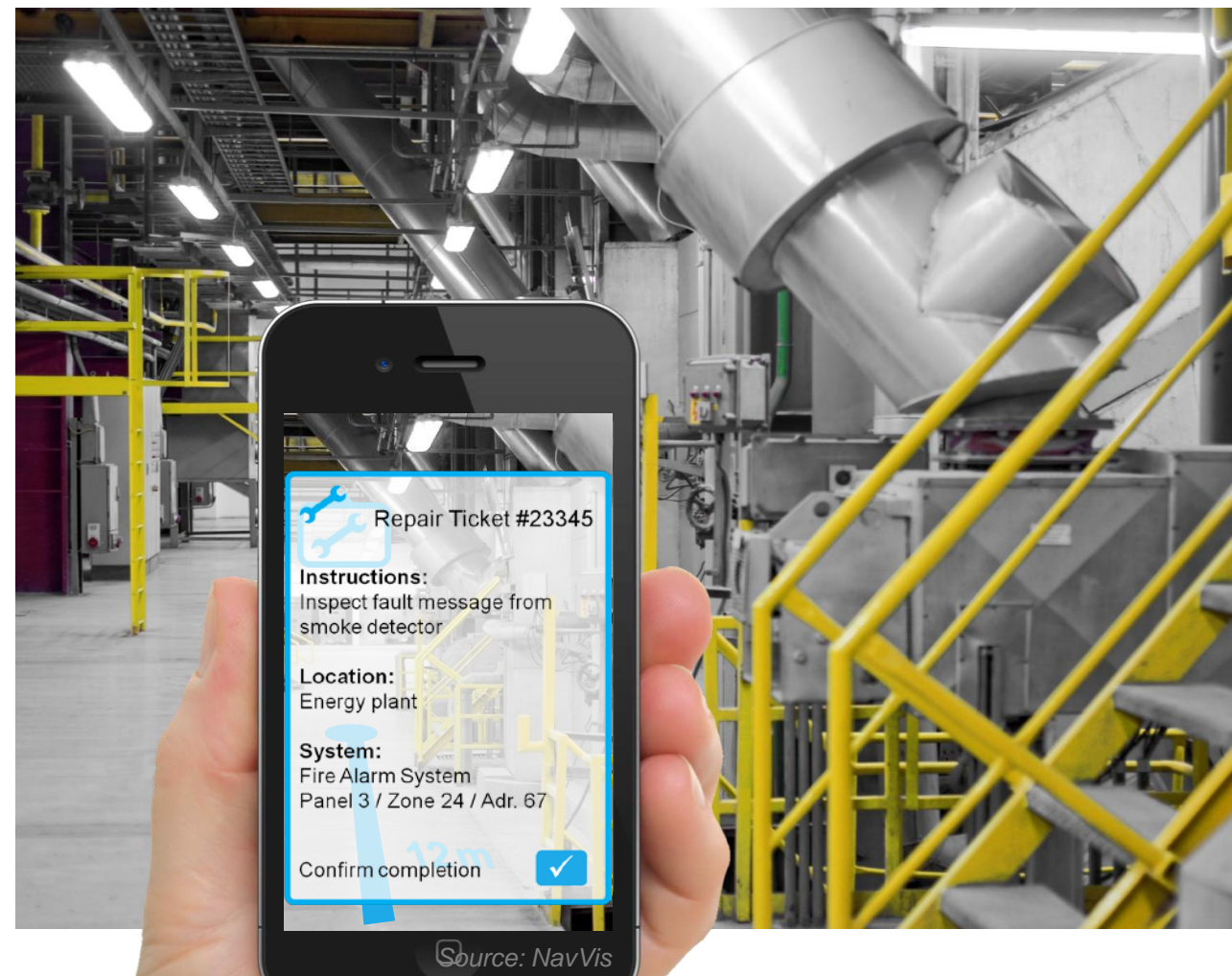


Figure 2.4 Overview of user requirements in terms of accuracy and coverage

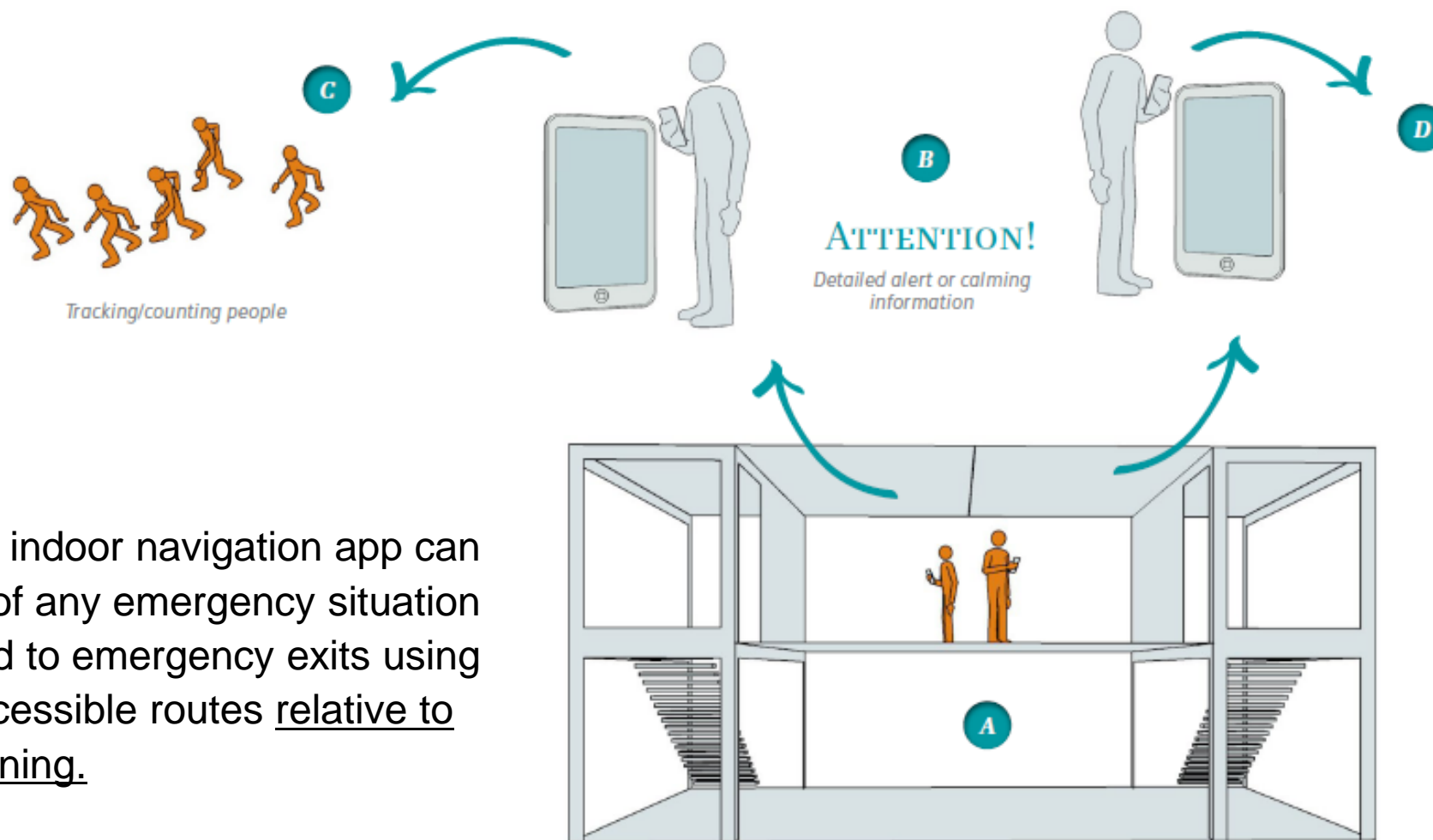
Source: <http://www.mautz.net/cv/>

Industrial Example

Being directed to that one device that needs attention!



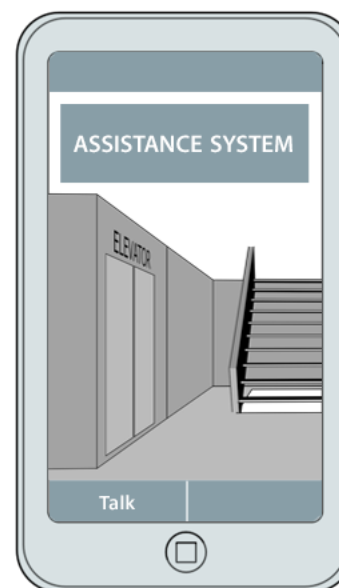
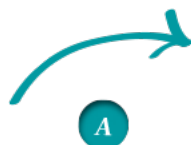
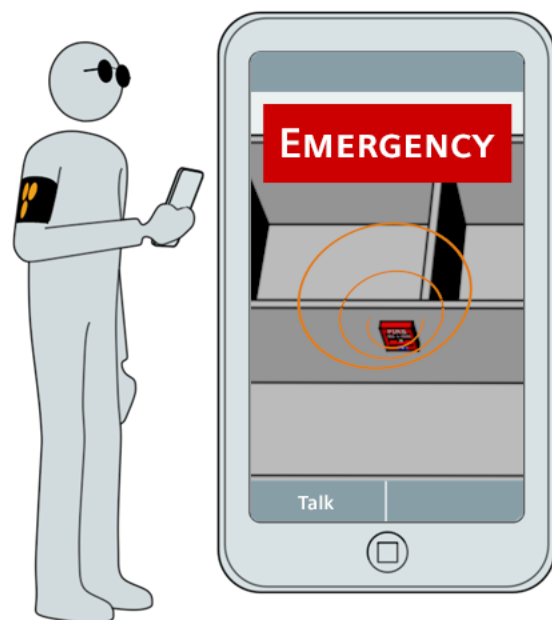
Example GUIDANCE AND EVACUATION IN EMERGENCY SITUATIONS



Users of an indoor navigation app can be notified of any emergency situation and directed to emergency exits using the best accessible routes relative to their positioning.

Example

GUIDANCE IN EMERGENCY FOR PEOPLE WITH IMPAIRMENTS

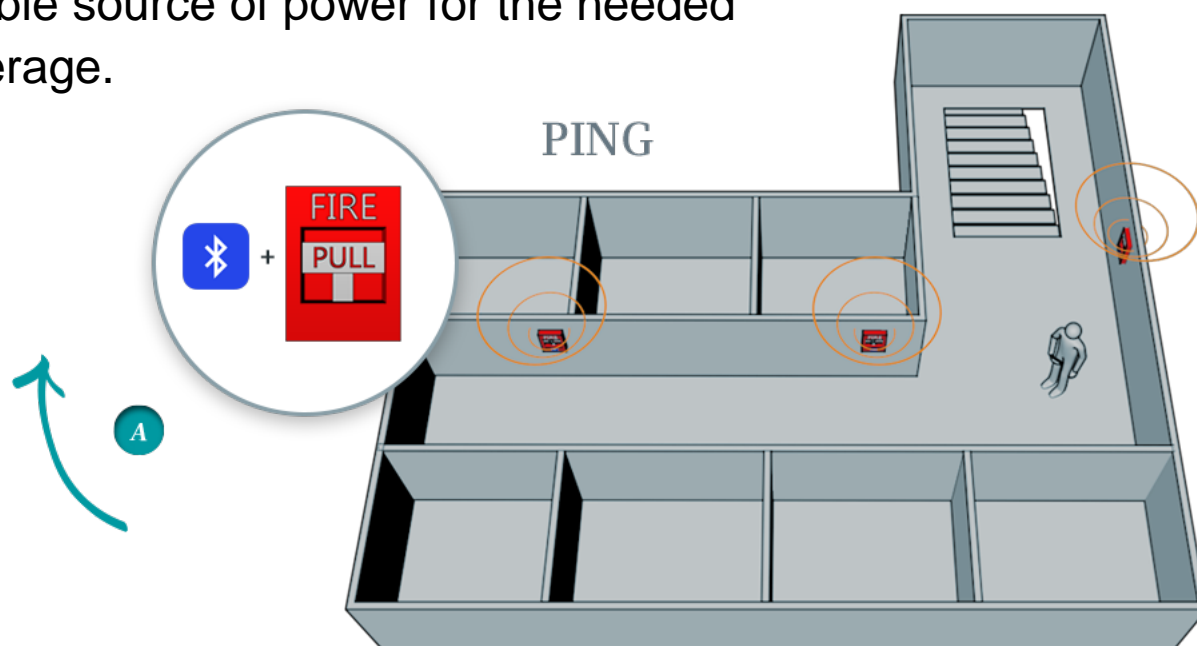


„Hello, this is your local
assistance system!“

Using a Text to Voice app, the person receives information about their location and instructions that assist and guide them a safe place.

Example VIRTUAL MANUAL STATION WITH POSITIONING

Positioning beacons could be placed for example in manual stations hence providing a reliable source of power for the needed coverage.



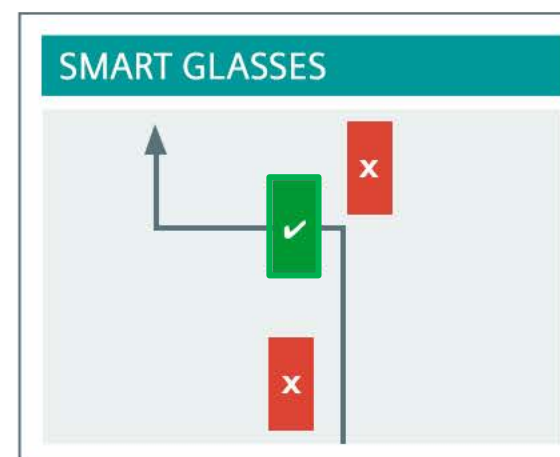
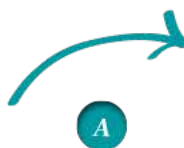
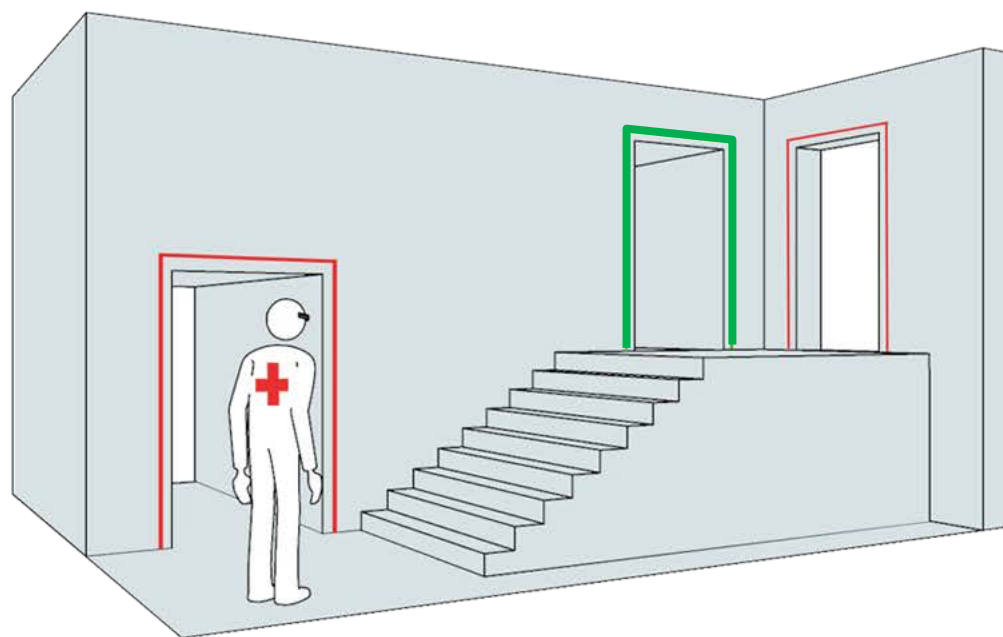
B



In addition to navigation, a mobile device can be a virtual manual station with positioning information.

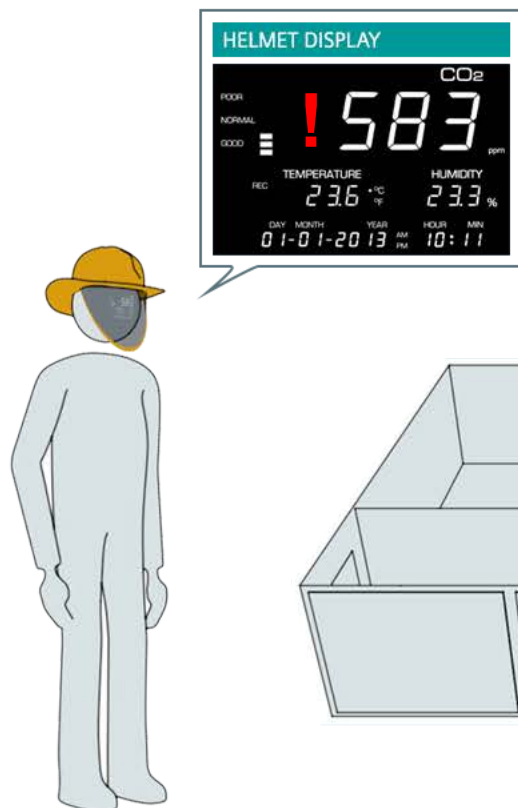
Example

NAVIGATING RESCUE PERSONAL SAFELY AND QUICKLY TO PEOPLE

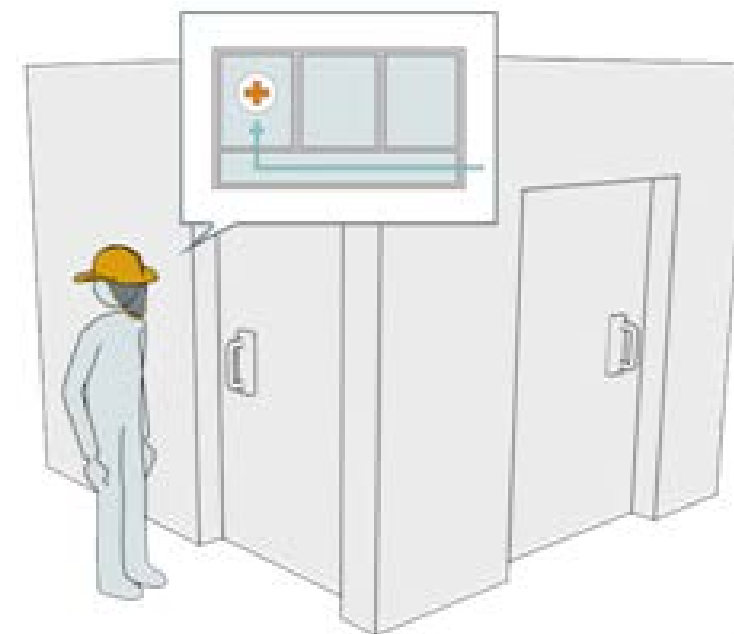
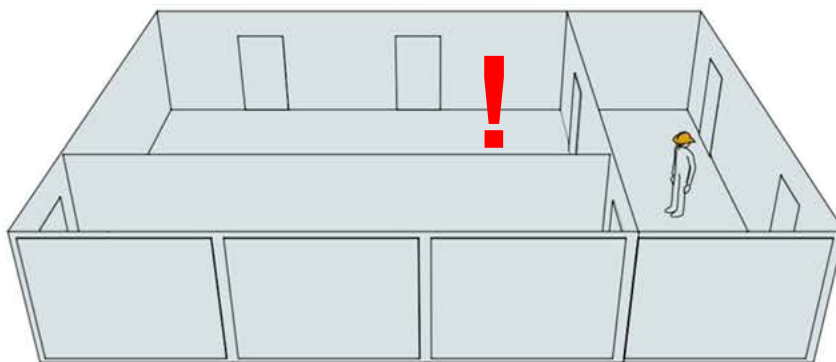


First responders can be safely guided to people in hazardous situations with additional information of blocked escape routes, fire fighting equipment, etc..

Example GUIDING AND PROTECTING INTERVENTION PERSONAL



Building specific information shown on the first responder's display can include distances with directions to areas where people are, or hazards in their proximity.



The first responder is navigated to the location of emergency / rescue equipment and resources.

Indoor Positioning System Market is at a nascent stage

Retail

Trafford Centre owner unveils indoor mapping and deals app

Intu, the UK's largest listed shopping centre landlord, hopes the app will encourage shoppers to spend more time and money in its malls

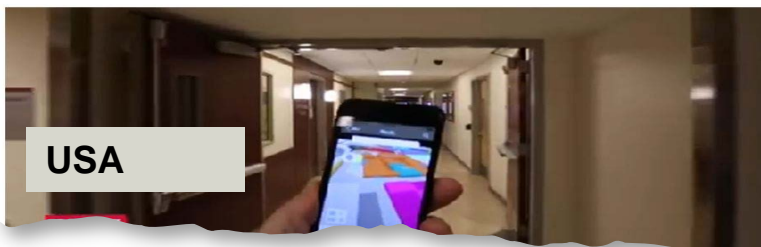


UK

Healthcare

Robert Wood Johnson University Hospital Launches Connexient's Medinav Navigator Edition 2.0 - First True Indoor Navigation in a Hospital in North America

NEW YORK and NEW BRUNSWICK, N.J., June 29, 2015 /PRNewswire/ -- Connexient and Robert Wood Johnson University Hospital, based in New Brunswick, NJ, announced today the public launch of **MediNav™ Navigator Edition 2.0**. This makes RWJUH the first hospital in North America to deliver for its patients, visitors and staff the world's first true turn-by-turn indoor navigation smartphone application, with reliable indoor positioning accuracy of 1 to 2 meters.



USA

Transportation

Per App durch den Zürcher HB

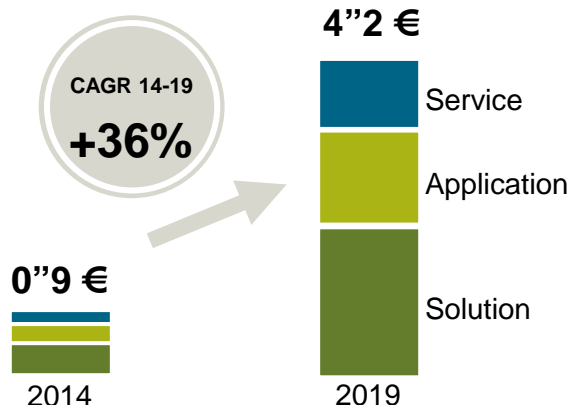
Die SBB lancieren eine App, eigens für den Zürcher Hauptbahnhof. Diese soll bei der Navigation und beim Einkaufen helfen.

von Luca Diggelmann 16.01.2015

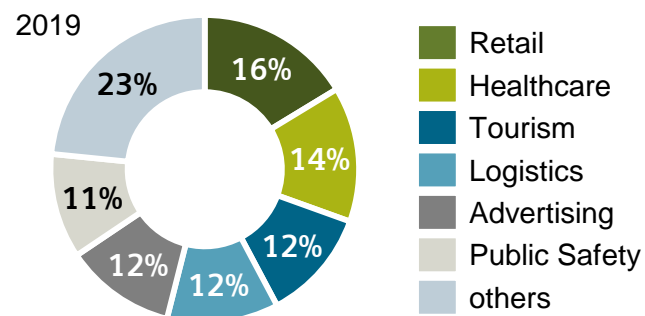


Switzerland

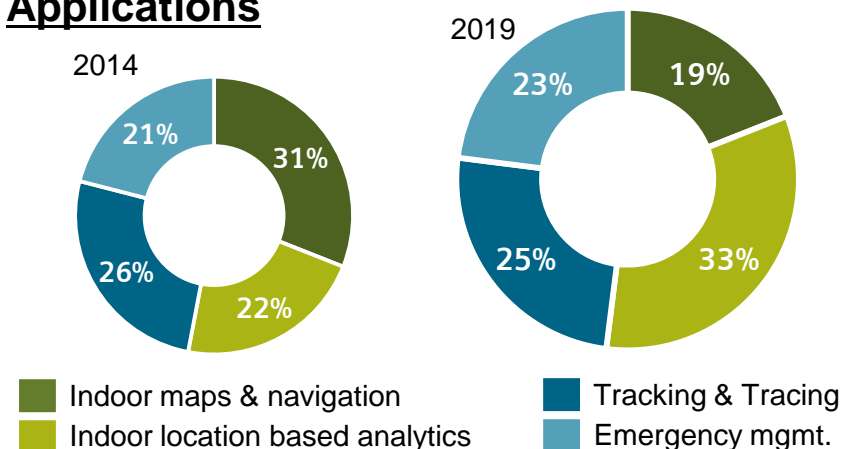
Market Snapshot



Vertical Markets



Applications



"Unlike other novel technologies indoor location is not a solution in search of a problem. And as 'evolutionary' as it appears today, several years from now we will see how 'revolutionary' it actually was."

(Greg Sterling, Senior Analyst, Opus Research)

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