

# Scalable, complete solution localization and navigation inside buildings

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Our location and navigation solution is:

- Scalable from single units to retailers and galleries
- Complete - we provide the entire process of implementation of location and navigation (from simple plug and play solutions to complex networks with WiFi and Bluetooth tags) with business applications
- Location and navigation links based on Wi-Fi, Bluetooth tags and QR codes (in different parts of the building, you can use different technologies to provide a uniform system for the end user)
- Maximum use of the existing infrastructure in order to minimize the cost of implementation

We also offer:

- Analysis and design of WiFi and Bluetooth tags for localization and navigation of mobile devices
- Dedicated to the development of business models that allow to make money on us to provide
- Develop a dedicated mobile application and Web

The system uses ambient radio signals to determine the position smartphone or tablet using a mobile application. The application can run on smartphones, tablets or custom devices.

The system has been designed to maximize the use of existing infrastructure in buildings, minimizing implementation costs. In this way it is possible to create a location and navigation system in just a few steps (which is ideal for events, meetings, and events of time).

## Why localization and navigation inside buildings

The location of mobile applications provides a very important function - the context. User benefiting from the mobile application in a particular place and time, we can provide better information and present it in a more convenient way. The application becomes aware of where the user is located (eg. Floor of the building, a store in a shopping mall, supermarket department, exhibit in the museum). This information is important and offers great opportunities for both commercial galleries, each lokalom, and the users of the information.

Supported Bluetooth Tags:

iBeacon, Bluetooth Smart (Bluetooth Low Energy / BLE / Bluetooth 4.0).

What are tags Bluetooth

Bluetooth is a technology that generally everyone knows but too many do not like it. Mainly because it was difficult to Bluetooth gadgets connect and have a tendency to

rapid depletion of the battery. Bluetooth or Bluetooth Low Energy 4.0-Smart, a Bluetooth 4.0 is more intelligent (hence: Bluetooth smart) especially when it comes to saving energy. The new generation of Bluetooth technology puts less emphasis on maintaining a steady stream of information. Instead, it focuses on sending small data bits, if needed, then, during periods of non-use, it goes to sleep.

Test WiFi hardware:  
TP-Link, Autelan, Cisco

## 1. The wireless signals identification system

The identification system for wireless signals provides the location and positioning of mobile devices anywhere. With its unique approach, we combine a variety of available wireless technologies: WiFi, Bluetooth, GPS and inertial navigation (in case of shortage of wireless signals). Thanks provide the location of smartphones, tablets (Android, iPhone, iPad), and laptops.

Designed specifically for mobile use system identification and location of wireless signals is designed for individual and professional use (eg. Navigation, evacuation).

Identification solution is a system of wireless signals used to real-time location with wireless devices inside buildings (eg. Shopping malls, office buildings), on the outside and in the mixed areas (eg. Land campuses, factories)

How the system works

The system receives wireless signals that are available in the environment of mobile devices and on this basis sets out on a regular basis (in real time) his position. By identifying the various wireless signals (WiFi, Bluetooth / iBeacon, GPS) - provides location and navigation via smartphones, tablets and laptops.

If you can not implement wireless signals suggest inertial navigation.

## 2. Measurement System

It was designed specifically for navigation and location of mobile devices (smartphones and tablets).

The solution is dedicated to the analysis of wireless networks to support the planning and design of wireless networks (both WiFi and Beacon). The method of measurement, as well as the range of the measured signal has been designed for the implementation of the highest quality and location services of mobile navigation.

The system provides visualization of the wireless signal levels in different locations on a map. The software works with a dedicated mobile application, which simplifies the process of auditing the network and makes it easier to carry out measurements.

System features:

Preview range of a Wi-Fi on the map  
Preview Bluetooth network coverage map  
finding all the wireless signal sources  
find available networks  
802.11n support, as well as a / b / g  
unique way of measuring, dedicated for use in smartphones and tablets

### **3. Management Panel (cloud)**

The platform has been designed to meet the needs of both corporate and small businesses. Shared governance structure corresponds to the structure of the individual locations of customers, eg .:

- Shopping malls have access to information concerning the passages and corridors, and individual units
- Retail chains have standardized management panel individual shops in different locations and the ability to compare data for individual stores

Thanks to its flexible structure and hierarchy of the organization within the application

- we provide not only simple management of data on end-users location and navigation systems, but we also offer a range of additional services:
- Management of promotions in different premises
- Management of promotions at shopping malls, office buildings, etc.
- Management of business cards dedicated premises
- Access to information about users located in a specific location (social networking functionality for people in a particular place)
- Determination of locations on the map special characters, logos
- Inform users about events and promotions (last visited, close, etc.)

### **4. Active positioning system**

The system uses ambient radio signals to determine the position smartphone or tablet using a mobile application. The application can run on smartphones, tablets or custom devices.

The system has been designed to maximize the use of existing infrastructure in buildings, minimizing implementation costs.

#### **4.1. Location Bluetooth**

The most precise localization system version requires the installation of the active site in lokalizowanym tags Bluetooth or using already existing tags Bluetooth.

In order to reduce the cost of deployment - the system allows the use of already existing tags and retrofitting Bluetooth accessory. The solution allows the use of tags in a single system Bluetooth different vendors.

This solution locates the presence of nearby Bluetooth tags users with smartphones or tablets based on Android and iOS systems (iPhone, iPad).

How to implement a system

In order to implement Bluetooth tags should be positioned in areas where it has to be localized presence smartphones or tablets. To lokalizaować presence of smartphones in the near spaced tags - you need to install the application receiving the signal smartphones with Bluetooth (application also ensures that the inclusion of the smartphone Bluetooth receiver).

This application can also result in additional actions - such as., Notifying the user about finding a specific place, presenting additional information about the place where you was like.

Using the control panel, the owners of Bluetooth tags are supplied data and analysis on the behavior recorded in the vicinity of tags eg .:

- The number of emerging (eg. In a day, week)
- The amount of time spent by people in different places (eg. Time average, maximum)
- The number of new people who appeared in the vicinity (eg. New people this week compared to the previous)
- The number of returnees (eg. Number of the same people who appeared in the previous week)

system Components

- Tags Bluetooth - a number of which depends on the number of localized sites
- The application download for smartphones / tablets (Android & iOS iPhone / iPad)
- Management Panel (application available on-line)

Advantages of the system:

- High accuracy location
- Easy to install
- Low costs

## 4.2. Location WiFi

This solution is recommended if there is a Wi-Fi network in the building, which is designed to ensure access to the Internet. There is the possibility to expand its functionality to the location. Depending on the manufacturer Web - rely on this model for the location of the IT-Factory or API network provider.

This enables efficient use of existing infrastructure and to provide a uniform covering location services and Internet access.

In this version of the system is used to locate a WiFi network. We offer:

- Design and installation of the new WiFi network - through which we provide location functionality and Internet access throughout the building,
- The use of existing WiFi network - so extend its functionality for location services

This solution locates users with smartphones or tablets based on Android and iOS systems (iPhone, iPad).

How to implement a system

In order to implement, please contact our staff, who will propose the optimal solution, tailored to the needs and WiFi infrastructure.

Persons whose presence you want to monitor install this application to monitor the presence of their smartphone or tablet near certain places. This application may result in additional actions - such as., Notifying the user about finding a particular place.

Using the control panel provided data and analysis on the behavior near localized sites:

- The number of emerging (eg. In a day, week)
- The amount of time spent by people in different places (eg. Time average, maximum)
- The number of new people who appeared in the vicinity (eg. New people this week compared to the previous)
- The number of returnees (eg. Number of the same people who appeared in the previous week)

Advantages of the system:

- Providing access to the Internet and location services on a single infrastructure

system Components

- The application download for smartphones / tablets (Android & iOS iPhone / iPad)
- Management Panel (application available on-line)

#### **4.2.1. Use of Managed WiFi**

This solution is recommended if there is a single building a WiFi network, which aims to ensure access to the Internet. There is the possibility to expand its functionality to the location. Depending on the manufacturer Web - rely on this model for the location of the IT-Factory or API network provider.

In this case, checked is the ability to reconfigure the network through the extension of its license or software change, then check the measurements are localized signal coverage area. On this basis, shall be carried out any modifications of the existing network, determines the localized space and provides a program for end users. This solution locates users with smartphones or tablets based on Android and iOS systems (iPhone, iPad).

#### **4.2.2. The use of unmanaged networks (AdHoc WiFi)**

This solution is recommended where there is a building WiFi access points, to ensure access to the Internet. There is the opportunity to build on existing routers - location functionality. We rely on this model with its own motor IT-Factory location.

In this case no reconfiguration is carried out or extend the license. Using the measuring system is carried out to measure WiFi signals in localized areas and provides a program for end users.

This solution locates users with smartphones or tablets based on Android systems.

The location of this type is generally not necessary to install a dedicated infrastructure.

### **4.3. Location WiFi + Bluetooth**

This solution is recommended if you wish to ensure the location and access to the Internet. Flexible areas covered signals combine WiFi and Bluetooth tags increases the efficiency of the infrastructure while ensuring the optimum level of location accuracy.

It is a cost-effective solution for providing location services in the building and access to the Internet. We provide a solution for locating and navigation and users with smartphones or tablets based on Android and iOS systems (iPhone, iPad).

How to implement a system

Contact your IT-Factory, our staff will carry out for your dedicated resource audit and network documentation. On this basis, the implementation plan will be developed and dedicated functionality for your application.

Advantages of the system:

- Low costs
- Providing access to the Internet and location services
- High accuracy location

## **5. passive location system**

The easiest way to locate smartphones using QR codes are graphic. Placing them in the appropriate places in the building allows them to scan with your smart phone to automatically identify your location.

This system is ideal for places where there is limited ability to use Wi-Fi router or tags Bluetooth / iBeacon, eg. In some places hospitals in the strong field ees elektromagnetyczne.

How to implement a system

Please contact your IT-Factory, prepare a set of stickers with QR codes for placement in localized areas, and will develop a dedicated application functionality to users.

Advantages of the system:

- Easy to install (stickers with QR codes)
- Does not require wireless signals (WiFi, Bluetooth tags)

## 6. Active Navigation System

The system uses ambient radio signals to determine the position smartphone or tablet using a mobile application. The application can run on smartphones, tablets or custom devices.

The system has been designed to maximize the use of existing infrastructure in buildings, minimizing implementation costs.

### 6.1. Navigation Bluetooth

The most accurate navigation system version requires the installation of the building of active tags use Bluetooth or Bluetooth existing tags.

In order to reduce the cost of deployment - the system allows the use of already existing tags and retrofitting Bluetooth accessory. The solution allows the use of tags in a single system Bluetooth different vendors.

This solution locates the presence of nearby Bluetooth tags and navigate to a specific location based on the received signals Bluetooth users with smartphones or tablets based on Android and iOS systems (iPhone, iPad).

How to implement a system

You can use Google maps, or develop a dedicated digital maps. On the basis of the transmission to the IT-Factory data on the building - we develop a deployment plan Bluetooth tags in individual rooms. In the next step, the bonding in designated areas Bluetooth tags. Then, using a dedicated measurement system measurements are received signals in different parts of the building. In the last step - enter the processed measurement data to the application, which is available to end users.

To navigate smartphones and tablets - you need to install a dedicated application (app also keeps an eye on your smartphone incorporate Bluetooth receiver).

This application can also result in additional actions - such as., Notifying the user about finding a specific place, presenting additional information about the place where you was like.

The requirements for the deployment of Bluetooth tags

Depending on the accuracy, we recommend installing BluetoothBeacon by the following rule:

- The accuracy (1-3m) - which 15m (one from the other)
- The accuracy (3-5m) - which 20m (one from the other)

An example of the arrangement Bluetooth tags:

Using the control panel are supplied data and analysis on the behavior recorded in the building, eg .:

- The number of people appearing in certain locations (e.g.. A day, a week)
- The amount of time spent by people in different places (eg. Time average, maximum)
- The number of new people that have appeared in various places (eg. New people this week compared to the previous)
- The number of returnees (eg. Number of the same people who appeared in the previous week)
- Paths that move people

system Components

- Tags Bluetooth - the number depends on the area of the building
- The application download for smartphones / tablets (Android & iOS iPhone / iPad)
- Management Panel (application available on-line)

Advantages of the system:

- High accuracy navigation
- Easy to install
- Low costs

## 6.2. Navigation WiFi

This solution is recommended in cases where there is a Wi-Fi network in the building, which is designed to ensure access to the Internet. There is the possibility to expand its functionality to navigate. Depending on the manufacturer Web - rely on this model for the location of the IT-Factory or API network provider.

This enables efficient use of existing infrastructure and to provide a uniform covering location services and Internet access.

In this version of the navigation system is used for WiFi. We offer:

- Design and installation of the new WiFi network - through which we provide navigation functionality and Internet access throughout the building,
- The use of existing WiFi network - so extend its functionality for navigation services

To navigate smartphones and tablets - you need to install a dedicated application (the application also ensures that the inclusion of WiFi smartphone receiver).

This application can also result in additional actions - such as., Notifying the user about finding a specific place, presenting additional information about the place where you was like.

This solution navigates users with smartphones or tablets based on Android and iOS systems (iPhone, iPad).

How to implement a system

In order to implement, please contact our office staff, which based on the transmitted map, description and measurement network WiFi signals propose an optimal solution, tailored to the needs of the building and infrastructure.



Using the control panel are supplied data and analysis on the behavior recorded in the building, eg .:

- The number of people appearing in certain locations (e.g.. A day, a week)
- The amount of time spent by people in different places (eg. Time average, maximum)
- The number of new people that have appeared in various places (eg. New people this week compared to the previous)
- The number of returnees (eg. Number of the same people who appeared in the previous week)
- Paths that move people
- Map of the most and least popular sites (Heat Map of the building)

Advantages of the system:

- Providing access to the Internet and location services on a single infrastructure

system Components

- The application download for smartphones / tablets (Android & iOS iPhone / iPad)
- Management Panel (application available on-line)

#### **6.2.1. Use of Managed WiFi**

This solution is recommended if there is a single building a WiFi network, which aims to ensure access to the Internet. There is the possibility to expand its functionality to navigate. Depending on the manufacturer Web - rely on this model for the location of the IT-Factory or API network provider.

In this case, checked is the ability to reconfigure the network through the extension of its license or software change, then the measurements are viewing signals cover the building. On this basis, shall be carried out any modifications of the existing network, signal measurements carried out in the building and provides a program for end users.

This solution locates users with smartphones or tablets based on Android and iOS systems (iPhone, iPad).

#### **6.2.2. The use of unmanaged networks (AdHoc WiFi)**

This solution is recommended where there is a building different WiFi access points, to ensure access to the Internet. There is the opportunity to build on existing routers - location functionality. We rely on this model with its own motor IT-Factory location.

In this case no reconfiguration is carried out or extend the license. Using the measuring system signal measurements performed in the building and provides a program for end users.

This solution locates users with smartphones or tablets based on Android systems.

For this type of installation is generally not necessary to install a dedicated infrastructure.

### 6.3. Navigation WiFi + Bluetooth

This solution is recommended when the whole building we want to provide navigation and access to the Internet. Flexible areas covered signals combine WiFi and Bluetooth tags increases the efficiency of the infrastructure while ensuring the optimum level of navigation accuracy.

It is a cost-effective solution for providing navigation services in the building and access to the Internet. We provide a solution for locating and navigation and users with smartphones or tablets based on Android and iOS systems (iPhone, iPad).

How to implement a system

Contact your IT-Factory, our staff will carry out for your dedicated resource audit and network documentation. On this basis, the implementation plan will be developed and dedicated functionality for your application.

Advantages of the system:

- Low costs
- Providing Internet access and navigation services
- High accuracy location

## 7. Passive navigation system

The easiest way to navigate using a smartphone QR codes are graphic. Placing them in the appropriate places in the building allows them to scan with your smart phone, which will automatically locate your position on a map of the building. Additionally, the system is equipped with an inertial navigation, which analyzes the movement and direction of movement of people in order to update its current position on the map.

This system is ideal for places where there is limited ability to use Wi-Fi router or tags Bluetooth / iBeacon, eg. In some places hospitals in the strong field ees elektromagnetyczne.

How to implement a system

Please contact your IT-Factory, prepare a digital map of the building and set of stickers with QR codes for placement in the building and will develop a dedicated application functionality to users.

Advantages of the system:

- Easy to install (stickers with QR codes)
- Does not require wireless signals (WiFi, Beacon, Bluetooth)