Esri User Documentation

The motion detector component is coming in addition to the radio locator, in order to help the system to output a better indoor positioning. This component is often a device that a user has on him(like the mobile phone), and this device can interpret data from 3 inputs: a gyroscope, a compass and an accelerometer.

The gyroscope is able to determine the direction of the user on all 3 axes. Even if the radio locator is able to determine those movements, a second input can lead to a better accuracy of the indoor position. The advantage of the gyroscope is that it can determine the direction independently of the user environment, and it can calculate easily and instant movements that are harder to calculate with the radio locator, like going up or down, in case that a user is taking an elevator or walking on stairs to another level of the facility.

The accelerometer is able to calculate the speed of the user heading towards a direction. Using this information, it's easier to calculate real time positioning of the user in the facility and also provide a better accuracy, as we can determine the coordinates better by using a formula based on distance and speed.

The compass is able to determine the facing angle of the user, and determine where the user is heading based on an independent reference, in this case, the cardinal points. For example, we can rotate the building plan to stick to the north, so for the user it is easy to determine when it needs to take a corner.

As we can see, the motion detector can receive additional inputs from the user directly, inputs that are also determined by the old components (like the radio locator) and help to a better accuracy, or new inputs that are hardly determined in the older versions. The new version of the IPS including the new motion detector have multiple advantages and use cases:

- Better indoor location. As a new component has been added, the system will calculate the position of the user based on multiple inputs this time, and the main advantage is that in this case, the movements tracked comes from the user directly, as the mobile

device can track, interpret and send motion movements described above.

- “Offline working”. As the position is calculated now by a new component that receives data from 2 different inputs, the system now has a backup in case that the radio locator is not working. In this case, the mobile device can work independently from the radio, and outputs the movement and position.
- Reduced costs. As the new system can receive data directly from the user, we can reduce the number of beacons in the building, meaning less maintenance and less energy consumed with at least, the same efficiency on the IPS
- Better insights. As the new module is capable of getting new inputs about the user position like acceleration or facing angle, a new set of data could be tracked and monitored on the panel, like what exactly are the points of interest in a room based on facing angle, or where users tend to move faster or lower.

The new motion detector can be easily integrated also on the custom apps powered by a map sdk. As the main input of this component comes directly from the device, native apps can access these features and manipulate the result in your custom app. The documentation for accessing these features can be found for android on: https://developer.android.com/guide/topics/sensors/sensors_motion and for ios: https://developer.apple.com/documentation/coremotion