Esri Test Plan

1. Test Motion detector gyroscope axes detection

Description: In this scenario, we need to check if the motion detector outputs a user move in the directions performed. We should check for all movement combination that could lead to a movement of the dot on the map (heading to all cardinal points: N,S,V,E,NE,SE,SV,NV)
Precondition: Un user equipped with a device that can output motion movement using a gyroscope (a mobile phone can be the easy solution), and a facility using ESRI IPS with the motion detector module, and an app that can track user movement.
Steps: For every cardinal point mentioned in the description, perform a movement of a few meters and check the directions of the blue dot on the track app
Results: Every movement of the user should result in a movement of the blue dot in the same direction

2. Test Motion detector gyroscope misleading movements

Description: In this scenario we'll test tricky movements that a user device can track that shouldn't impact the blue dot movement, like a rotation, jumping or standing down
Preconditions: Un user equipped with a device that can output motion movement using a gyroscope (a mobile phone can be the easy

solution), and a facility using ESRI IPS with the motion detector module, and an app that can track user movement.
Steps: Perform a 360 rotation in both directions, while checking the movement of the blue dot on the map. Perform some jumps while checking the blue dot on the map. Lay down couple times and check the blue dot on the map
Results: Every action performed by the user should result in no move of the blue dot on the track app

3. Test Motion detector acceleration

Description: In this scenario the user will try to move with different speeds, and check if the dot is moving according to the speed. That means that the blue dot that locates the user on the map should advance faster/slower on the map as the user accelerates/decelerates.
Preconditions: Un user equipped with a device that can output motion movement using an accelerometer (a mobile phone can be the easy solution), and a facility using ESRI IPS with the motion detector module, and an app that can track user movement.
Steps: Heading forward with a slow speed and checking how fast the blue dot is moving. After that, move faster while observing again how fast the dot is moving. Slow down again while observing the dot.
Results: The blue dot should move faster without interruptions as the user gets more speed, and slower again when decelerating.

4. Test Motion detector compass

Description: In this scenario we'll test if the motion detector is capable of interpreting the input received from a compass, and check if the blue dot on the map is rotating accordingly.

Preconditions: Un user equipped with a device that can output motion movement using a compass (an iPhone can be the easy solution), and a facility using ESRI IPS with the motion detector module, and an app that can track user movement.

Steps: Perform a 360 rotation while checking the dot on the map, and after dat, while also checking the dot, perform different rotations.

Results: The blue dot should be oriented in the first place where the user is oriented. After that, the blue dot should rotate to 360 according to the user, and the last rotations should also have the head oriented to the cardinal points where the user is rotating.

5. Test position accuracy with a motion sensor that works fine, but a radio locator that has imprecise data

Description: In this scenario, we'll test if the motion detector component can help the accuracy of the position if the radio locators receive inaccurate data

Preconditions: Un user equipped with a device that can output motion movement using a compass, accelerometer and gyroscope, and 2 facilities: one using ESRI IPS with the radio locator working

perfect and other where the radio locator works worse, and an app that can track user movement.

Steps: Perform different movements in the environment that has the working radio locators and observe the blue dot on the map. These movements should include all of the following: Moving towards different cardinal points, at different speeds and with different orientation. After that, perform the same movements on the second environment, while observing the blue dot on the map.

Results: In the second round of testing, the blue dot should represent a better position of the user in the location. For example a case when radio locators don't work is when the processing signal is slower than the next receiving signal. In this case the blue dot should move with lag, but the motion detector component should send intermediate data about the position (while previous data are still processing by the radio) that should be represented on the map

6. Check position fusion result when motion detector have big differences compared to radio locator

Description: In this case, we'll test the influence that the motion detector output will have on the resulting position in the fusion algorithm. The idea behind the test is that if the motion detector is not accurate, the output for the position fusion should not be based too much on that, and rely more on the radio locator data.

Preconditions: Un user equipped with a device that can output motion movement using a compass, accelerometer and gyroscope,

and 2 facilities: one using ESRI IPS with the motion detector working perfect and other where the motion detector works worse, and an app that can track user movement.

Steps: Perform some movements while tracking the blue dot on the map in the first facility. These movements should include all of the following: Moving towards different cardinal points, at different speeds and with different orientation. Perform the same actions in the second facility.

Results: The second round of testing should result in the dot that's moving more relevant based on the algorithm of the radio locator. For example, if the radio locator determines a movement of the user, and the motion detector predicts a slightly different path, based on calculations from direction, acceleration and facing angle, the system should determine that the motion detector has problems, and output the movement determined by the radio locator.

7. Check if system works if motion detector is not working

Description: In this scenario, we'll test the system with a mention detector component that's not working. As this system worked before, and this new module added it's an upgrade for a better calculation of the positioning, we need to check if a client will receive an output based on the old algorithm, if its motion system dies.

Preconditions: Un user equipped with a device that can output motion movement using a compass, accelerometer and gyroscope, and 2 facilities: one using ESRI IPS with the motion detector working

perfect and other where the motion detector doesn't work, and an app that can track user movement.
Steps: Perform some movements while tracking the blue dot on the map in the first facility. Perform the same action in the second facility.
Results: The system should work fine in the second step of testing, but we must observe that the blue dot is moving based on radio locator algorithm only, so even if we don't have access to direction, acceleration and facing angle, the system should work as it worked before.

8. Check if the motion detector can replace a broken radio locator

Description: In this scenario, we'll test if the motion detector component can replace the radio locator in case that the radio locator component has problems, and can't output the positioning. This test verifies the capacity of the system to "predict" the position based on some calculation for the acceleration, direction and facing angle.
Preconditions: Un user equipped with a device that can output motion movement using a compass, accelerometer and gyroscope, and 2 facilities: one using ESRI IPS with the radio locator working perfect and other where the radio locator doesn't work(this could be done by removing items from the database with the indoor locations references strengths), and an app that can track user movement.
Steps: Perform some movements while tracking the blue dot on the map in the first facility. These movements should include all of the following: Moving towards different cardinal points, at different

speeds and with different orientation. Perform the same actions in the second facility.

Results: The system should be able to output a good approximation of the position in the second facility, even if the radio locator doesn't work.

9. Test motion sensor impact on data floor plan

Description: In this scenario we'll test the case when a motion detector calculates a position that's outside of the floor data plan (like a wall).

Preconditions: Un user equipped with a device that can output motion movement using a compass, accelerometer and gyroscope, a facility using ESRI IPS, an app that can track user movement, and the floor data plan created for the facility.

Steps: Perform some movements near a wall, and also, heading forward in the wall until you're stuck on it and simulate a run.

Results: The system should be able to determine that the user is stuck and not moving the blue dot in the direction simulated, even if the motion sensor determine a movement in that direction

10. Test motion sensor impact on deterministic model

Description: In this scenario we'll test the impact that the motion sensor will have if it detects an unusual movement of the user that must be rejected by the UX filter.

Preconditions: A machine (could be a lego car controlled remote) equipped with a device that can output motion movement using a compass, accelerometer and gyroscope, a facility using ESRI IPS, an app that can track machine movement

Steps: Set the machine performing a high speed movement in the direction, and check the output of the blue dot on the map.

Results: The blue dot on the map should not move, and remain in the same position, as the device advances with a speed that can't be achieved by a user.

11. Test radio locator impact on deterministic model when motion detector calculates well

Description: In this scenario we'll check the case when the radio locator outputs a position movement that can't be performed by a human, but the motion detector outputs a realistic move. The 2 systems should be complementary in the algorithm decisions, so the UX filter should deny the position, even if the motion component has not detected a suspect move.

Preconditions: A machine (could be a lego car controlled remote) equipped with a device that can output motion movement using a compass, accelerometer and gyroscope, a facility using ESRI IPS with the acceleration tracker set to output a much lower speed, an app that can track machine movement

Steps: Set the machine performing a high speed movement in the direction, and check the output of the blue dot on the map.

Results: The blue dot on the map should not move, and remain in the same position, as the device advances with a speed that can't be achieved by a user.

12. Check multiple motion detector inputs

Description: In this scenario, we'll test the capability of the motion detector to handle multiple signals received and sent. We need to check if a large group of people, performing different movements will results in correct positioning of their dot on the map app

Preconditions: A group of users equipped with a device that can output motion movement using a compass, accelerometer and gyroscope, a facility using ESRI IPS, an app that can track movement (app for each user in the group)

Steps: For every person in the facility, perform some movements, independently, while they track their blue dot on the map. These movements should include all of the following: Moving towards different cardinal points, at different speeds and with different orientation.

Results: Every user should see that the blue dot on the map is moving accordingly to their path.

13. Test motion detector out of range and back on range

Description: In this scenario, we'll test the capability of the system to work with a dynamic module, so the position fusion will rely on both inputs (radio and motion), after that, only on radio, and after that,

again on both. The purpose of the test is that a component that “goes offline” will not break the system, and a component that “goes online” will start delivering its outputs live

Preconditions: Un user equipped with a device that can output motion movement using a compass, accelerometer and gyroscope, a facility using ESRI IPS with 2 motion detectors placed at a distance large distance, so their interception range should not intersect and an app that can track user movement.

Steps: Perform some movements, while they track their blue dot on the map. These movements should include all of the following: Moving towards different cardinal points, at different speeds and with different orientation. The movement should start from the range of the first motion detector and heading to the second one.

Results: The system should work from the beginning to the end. The difference is that when the user leaves the area for the motion detector, the app should work only on the data from the radio locator and when the user comes in the range of the second motion detector, it should start working again at its full potential.