Memo

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Subject: Ventana Final Deliverable Test Plan

0 Set-Up through Web Portal

0.1 Description and Goal

In order to utilize Ventana, the user first needs to install her devices. This involves connecting to a web portal, hosted by the HoloHub, that can be conveniently accessed on any smartphone. The page will display all the devices currently connected to the HoloHub, and display the corresponding VuMark. Upon launching Ventana, the HoloHub will also send a Ventana.Config file to the HoloLens, so that the HoloLens can recognize each of these supported devices. This initial discovery process allows the user to interact with all the devices in their home supported by Ventana.

0.2 Procedure

0.2.1 Connect to the web portal on any web browser at 192.168.0.108:8081.

0.2.2 Start by pairing the supported devices to the HoloHub. On the web portal's splash screen press the top right menu, and then select add a device.

0.2.3 Select "Connect to Sonos Devices" from the supported devices menu.

0.2.4 The user will be presented with a list of Sonos speakers on the network. Tap on "Pair Device" to pair the Playroom speaker.

0.2.5 Repeat steps 2-4 to pair the "Living Room" speaker.

0.2.6 The user will now repeat the process to pair the wink devices. Once again, from the splash screen tap the top right menu, and then add a device.

0.2.7 Tap "Connect Wink Devices," this will bring the user to a login screen for Wink. Sign in with the username "contact@ventanaiot.com" and password "Ventana1" then tap sign in.

0.2.8 Now the will be presented with a list of Wink devices to pair. Tap pair device.

0.2.9 Repeat steps 6-8 to add the remaining Wink devices.

0.3 Verifiable Result

0.3.1 A web page will load with a "Device List" and a header that says, "Ventana IoT."

0.3.2 The user should be taken to the "Add Device" screen, and Sonos and Wink should both show up.

0.3.3 The user should see a list of Sonos speakers on your local network including, “Playroom” and “Living Room”
0.3.4 After “Pair Device” is pressed, the user should be taken back to the Device List, and a new device should appear in the list.
0.3.5 When Repeating steps, previously paired devices will no longer appear available on the “Add Device” screen.
0.3.6 The user should see the same “Add Device” screen with the selection of Wink and Sonos.
0.3.7 The should be brought to the “Add Device” screen with a list of available Wink Devices to pair with.
0.3.8 When the user presses pair, she will return to the “Devices” screen with a new device in the list.
0.3.9 Going through the process with each device will add a new device to your “Device List” on the splash screen. At the end of this process, a total of five devices will be in the “Device List.”

The set-up process represents a key aspect of making the Ventana experience easy and intuitive for a user. A user successfully navigating through these steps proves that this process will be an effective means of running Ventana, initially. Furthermore, the web portal can provide information to the user at any time, so she can check the status of devices connected to the HoloHub, and HoloLens. In the future, when a user needs to add a new device to Ventana, she will utilize this web portal.

1.0 Set Up Holograms

1.1 Description and Goal

This test initializes the holograms, using VuMarks and the Vuforia SDK, and attaches them to permanent locations in a room. The goal is to place at least one of each controller in the room, after being generated from their respective VuMarks.

1.2 Procedure

1.2.1 Open Ventana on the HoloLens by opening the HoloLens’ main menu with a bloom gesture and tapping the Ventana icon from the application list.
1.2.2 Tap start new session, when Ventana’s Welcome scene loads.
1.2.3 Tap “Open VuMark” next to a Sonos speaker on the HoloHub Device list on the phone. Look at the VuMark through the HoloLens and the controller for the sonos speaker should appear.
1.2.4 Tap and hold the controller for 1 second then release to spawn a new hologram of the same controller.
1.2.5 Air tap, hold, and drag the controller to a new position. At the desired location, let go to place the hologram.
1.2.6 Tap the green done button at the bottom of the controller to leave edit mode.

1.2.7 Repeat steps 3-6 for the light and powerstrip controllers.

1.3 Verifiable Result

1.3.1 The application should open to a splash screen with the Ventana logo, and then go to a Welcome screen. Ventana has now finished loading.

1.3.2 The Welcome scene will disappear, and Ventana's main scene will load. When the blue, circular cursor is visible, Ventana has finished loading.

1.3.3 The user will see the controller associated with that VuMark, along with brass circles at the four corners of the controller, and a "Done" and "Delete" button below it.

1.3.4 When the user taps, holds, and releases the controller, another controller of the same type will appear. The new controller's location is no longer tied to the VuMark.

1.3.5 When the user air taps and holds the controller, the black and white spatial mapping mesh should appear, acting as a guide. When the user releases, the mesh should disappear and the controller should remain in place.

1.3.6 By selecting done, the four brass scaling handles and Done/Delete controls should disappear.

The test facilitates the initial setup process of Ventana. Once this has been successfully completed, the user can begin interacting with the holograms, to control devices within her home. Therefore, this step represents a means of enabling the main objective of Ventana.

2.0 Control Multiple Sonos Speakers Simultaneously

2.1 Description and Goal

Ventana has the capability to control multiple Sonos speakers at the same time, so we need to test that each of the spawned controllers works. This tests the functionality of each controller individually to see if the functions like play, pause, next, and previous work, as well as the volume slider, album artwork, and song title, by comparing it to what the Sonos app on a computer is displaying.

2.2 Procedure

2.2.1 Confirm that the two speakers are currently playing music.

2.2.2 Direct the gaze pointer to the controller associated with the Sonos Play:1.

2.2.3 By air tapping, click on the pause button.

2.2.4 Click the play button again to continue playing music.

2.2.5 Click the next button.

2.2.6 Click the previous button.

2.2.7 Air tap, hold, and drag the volume slider to adjust the volume.

2.2.8 Repeat steps 3-7 with the Sonos Play:3 speaker.

2.3 Verifiable Result

2.3.1 The two separate controllers should be displaying album artwork, be in the play state, and the speakers should be playing music.
2.3.2 The user should see the gaze pointer in the center of her vision, and the controller placed near the Sonos Play:1 speaker.
2.3.3 Music should pause from the speaker.
2.3.4 Music should continue playing from the speaker.
2.3.5 The next song should start playing and the album artwork should change.
2.3.6 The previous song should start playing and the album artwork should change.
2.3.7 The volume should increase when dragging to the right, and decrease when dragging to the left. When the user lets go of the slider, it should return to the center.
2.3.8 Repeat steps 2-7 with the Sonos Play:3 speaker.

3.0 Control Multiple Lights

3.1 Description and Goal

This test shows that the functionality of the lights within the Ventana application. The two light bulbs used are GE Link Light Bulbs, connected to the Ventana Wink account through the Wink Hub device. This tests shows that these lights can be controlled with the Ventana application through the HoloHub server. The lights can be individually turned on and off and the brightness of the bulbs can be adjusted.

3.2 Procedure

3.2.1 Confirm that the two lights are in the Wink powered "off" state.
3.2.2 Direct the gaze pointer to the controller associated with the first light.
3.2.3 Click the rectangular power button by performing a HoloLens airtap.
3.2.4 Use the brightness slider to turn the brightness up and down by dragging the circle to the right or left respectively.
3.2.5 Repeat steps 2-4 on the second light bulb by gazing at the controller associated with the second light bulb.

3.3 Verifiable Result

3.3.1 The Wink app will show both devices as "off" by greying the icon out.
3.3.2 The cursor will highlight when the gaze is successfully over the power toggle.
3.3.3 The user will hear the Ventana "click" feedback noise and the light will power on.
3.3.4 The brightness of the bulb will increase when the slider is pulled to the right and will decrease when the slider is pulled to the left.
3.3.5 The results from steps 2-4 will be repeated on the second Wink light bulb.

By demonstrating the power toggle and brightness slider functionalities on two separate Wink Light Bulbs, the team has completed support of a second device, the GE Link Light Bulb from Wink.

4.0 Control Both Outlets on Power Strip

4.1 Description and Goal

Power Pivot Genius represents the third type of device controlled by Ventana, a Wink enabled power strip. This test will examine both the functionality of the server to handle requests to toggle two of the outlets on the power strip on and off and the ability of the HoloLens to send and receive requests for the power strip to and from the Wink Module. The outlets on the powerstrip can be individually and consistently turned on and off by the Ventana application.

4.2 Procedure

4.2.1 Verify that the two outlets on the Pivot Power Genius powerstrip are turned off.
4.2.2 Direct the gaze pointer at the powerstrip controller.
4.2.3 Click the left power toggle rectangle by using the airtap motion while gaze is over that rectangle.
4.2.4 Click the right power toggle rectangle in the same fashion.
4.2.5 Repeat steps 3 and 4.

4.3 Verifiable Result

4.3.1 This can be done through the Wink App, specifically the power strip screen where it should show both outlets in the off state.
4.3.2 The gaze cursor will be over the controller.
4.3.3 The power toggle will be highlighted and the Ventana feedback "click" will sound when the user has successfully clicked the power toggle. The light that displays power on the first outlet will turn on and the device plugged into outlet 1 will also power on.
4.3.4 Same result as step 3, except the highlighted button will be the right button instead of the left button. The outlet light on the second outlet will turn on to show the outlet is powered and the device plugged into that outlet will power on.
4.3.5 As the power toggle buttons are selected again, the power lights on the outlets will turn off, when the left toggle is clicked the first outlet will turn off and when the right toggle is clicked the second outlet will turn off. When these outlets turn off, the devices plugged into them will also power off.

This test demonstrates that Ventana and the HoloHub support a third Wink device, the Quirky Pivot Power Genius. The device has full support through Ventana's ability to toggle the power of the separate outlets individually and through one controller.

5.0 Test Hologram Persistence Across Multiple Sessions of Ventana

5.1 Description and Goal

This test examines Ventana's capability to store and load the appropriate holograms through the World Anchor Manager. This allows the user total control to place holograms at a desired position in a room, fully close the application, and still have the holograms in those same positions upon relaunching the application.

5.2 Procedure

5.2.1 Make note of the current locations of the holograms, and close Ventana. To close the application, the user does a bloom gesture, finds the Ventana application tile, and taps the remove button in the top right corner of the tile.

5.2.2 Once the application has exited, the user does a bloom gesture again to open the HoloLens' main menu, and taps to select Ventana from the list of applications, in order to relaunch the program.

5.2.3 From Ventana's Welcome Scene, the user taps to select "Load Last Session."

5.2.4 The user looks around to verify that Ventana has reloaded the appropriate holograms in the correct positions. The user interacts with at least one of the buttons on each of the holograms to ensure that they have each been functionally restored, as well.

5.3 Verifiable Result

5.3.1 The user will not see any of Ventana's controllers or its application window, once it has been exited.

5.3.2 The user will see the Ventana logo to indicate that the application has been launched, and is in the process of loading.

5.3.3 The Welcome Scene will disappear, and the Ventana scene will load. The user will see the blue, circular cursor to indicate the scene has finished loading.

5.3.4 The user will see the holograms restored to the same positions as the previous session, and experience the normal user feedback when the user selects a button. For example, if the user selects the button on a light controller, that light's state will change from either on to off, or off to on, and the user will receive audio feedback to confirm the button has been pressed.

Successful completion of this test proves that Ventana can utilize the World Anchor Store for the persistence of holograms across sessions. Positional tracking represents one of the main requirements of Ventana, and the hybrid utilization of Vuforia and World Anchors achieves this.

6.0 Test Edit Mode Functionality

6.1 Description and Goal

This test observes the quality of the user's experience while manipulating Ventana's holograms at runtime. When a user spawns a new controller through a VuMark, tap, hold, and release on that controller creates a new controller in "edit mode." This mode includes four scaling handles at each corner of the controller. The user can click and hold the body of

the hologram and drag it to a new location. The user can also delete the hologram, if she no longer needs it. This simply deletes that instance of the hologram, therefore the user can still have other holograms of that same controller elsewhere in the room, or look at the VuMark that corresponds to the controller to see another instance of it. Lastly, when the user has finished making these edits, the done button returns them to "regular mode." If the user wishes to enter edit mode again, the user gazes down, below the controller, and can tap on the more button that will appear. The test focuses on the functionality of the aforementioned controls, as well as the user's overall experience when interacting with them.

6.2 Procedure

6.2.1 Look bellow a hologram and tap the "More" button then tap and hold the body of the hologram, and drag it to a new location.

6.2.2 Tap and hold the bottom left scaling handle and move hand across the HoloLens' field of vision.

6.2.3 Repeat step 6.2.2 with the other three scaling handles in the corners of the controller.

6.2.4 Tap the green done button, at the bottom of the controller.

6.2.5 Gaze down, below the controller, and tap the "More" button.

6.2.6 Tap the red delete button, at the bottom of the controller.

6.3 Verifiable Result

6.3.1 A black and white wireframe of the room will appear, for as long as the user is holding and dragging the hologram. When the user is satisfied with the hologram's location and stops holding it, the black and white wireframe will disappear.

6.3.2 The hologram will decrease in scale, in proportion to how far the user moves her hand across the HoloLens' field of vision.

6.3.3 The hologram will increase in scale when the user drags right and decrease when dragging left. Again, the change in size will be proportional to how far the user moves her hand across the HoloLens' field of vision.

6.3.4 The scaling handles, delete button, and done buttons will disappear. The user will still see the regular controller.

6.3.5 The scaling handles, delete button, and done buttons will reappear. The user will be able to interact with them, as she did in the steps above.

6.3.6 The hologram will be removed from the user's room.

The test examines the overall user experience with increased customization incorporated into Ventana. Since Ventana strives to make technology in the home easier to use, it is important that the user finds Ventana not only simple and intuitive, but also something that complements the physical world, and personal customization of controls enables this feature.