

Evaluation Plan

Since we are really trying to design an architecture that can support a smart homes, what we want to test is not so much the Android user interface, but more the bootstrapping and configuration concepts, and how the user bridges the gap between their virtual buttons and statuses on their phone vs. their normal physical actuators.

One interesting observation we want to get out of this evaluation is if users can understand how each of their thingies work and thus trust them to work correctly even in remote scenarios where they cannot verify by observation. Since the users are supposed to install and configure each device themselves they get a much more intimate understanding and trust in the devices they install, and if the thingies individual are simple in their nature.

With that in mind, we want to test:

1. Bootstrapping a thingy
2. Configuration of a thingy
3. "Presets" concept – i.e.
 - 3.1 Creating a preset
 - 3.2 Using presets
4. Regular control of thingy
5. "Remote" control of a thingy (i.e. control from a different room, where the user cannot directly see the effect)
6. Mini "lock down" scenario

1, 2, and 3.1 both relate to one of the smart home challenges - i.e. "require experts to install smart home devices" and "users don't want to be sys-admins".

4 will mainly be a test that we do to have people establish trust in the system (hopefully). They will push the button on their smart phone, see an indicator on the smart phone change AND see things happening in the real world, i.e. establishing a mental link between the indicator on the smart phone and the physical device.

5 will be to test a remote scenario, i.e. where the user is not able to see the physical effect of the device they are controlling. This will hopefully give them an "ahaa" moment where they should be able to imagine doing that from work, at the grocery store, etc.

3.2 and 6 is mainly related to our Lock Down scenario, i.e. showcasing that use scenario where they can use it set a bunch of actuators in a certain state and read sensor values.

Hardware

For the test we will have the following hardware:

- An Android phone running our prototype app
- A "Wizard website" that works as mock thingies
- A physical mock thingy – a power adapter that allows the user to remotely turn the power on/off to the attached device, e.g. a lamp.

How we will test

In general, we take pictures, and generally ask the participant to “think out loud” while executing the different tests.

This is how we will do the actual test with a participant:

1. Thank the participant and assure the participant that he/she is not the one being tested.
2. Tell them about the concept of remote controlling “thingies” in their home from their smart phone.
3. Ask them if they are familiar with Android or smart phones in general, if not we give them a brief introduction so they are able to operate the test hardware (we don’t want to test Android!)
4. Run the (1, 2) bootstrap/initial configuration test:
 - a. Explain the scenario – i.e. you went to the electronics store and bought this thingy to be able to remote control your light.
 - b. Hand them the physical mock thingy with the installation instructions printed out.
5. Run the (4) regular use test
6. Run the (5) remote use test
 - a. Take them to another room and ask them to check if they left the light now and if so, turn it off.
7. Install extra thingies on Android device
8. Run the (3.1) preset test:
 - a. Tell them about presets and the idea behind them
 - b. Ask them to go to the Android app and set up a preset
9. Run the (3.2, 6) lock down test:
 - a. Tell them about the lock down scenario (e.g. you are going to sleep...)

Test evaluation with the participant

After we are done we will sit down with the participant and conduct a semi-structured interview based on the following questions:

- What do you think about the installation process?
- What do you think about controlling thingies from your phone?
- How comfortable was it controlling thingies with your phone?
- What do you think about remote controlling thingies?
- What did you like about remote controlling thingies?
- What did you **not** like about remote controlling thingies?
- What did you **not** understand about the system?
- What would you change?