Sarah Walker TMA02

**Question 1**

a) One user capability that the designers should take in to account is that dogs have dichromatic vision, meaning that they see in only yellows and blues. This means that dogs do not perceive things in the same way that humans do, and this should be considered when designing the interface. Any parts of the interaction that will rely on sight, particularly related to the distinction of colours, will have to be designed to consider the user capabilities, since colours that are clearly distinguishable to humans may appear as similar for dogs. For example, interfaces typically use red and green to indicate good and bad, particularly for feedback if an action has been carried out incorrectly. With an interface designed for use by dogs, this colour distinction may not be clear enough, leading to poor usability.   
 Another capability that should be considered is the lack of fingers and reduced level of mobility that dogs have compared to humans. For this reason, dogs may struggle to use an interface if controls are not big enough or are too close together. Also, the kind of control should be considered due to the lack for fingers. For example, in interactive devices, we might associate the control of a light with some sort of switch, but due to reduced dexterity this control may not be appropriate for a dog, and so an increase in size, or different control all together should be considered.

b) One activity that the system might be expected to support is that of operating an elevator inside the home. The scope of this task is fairly limited, with a small number of well-defined functions that can be carried out, such as opening the doors or moving up/down. As the user is a dog in this case, to utilise the interface we would have to assume that the dog will require some training, and that they do not understand the concept of a lift, or the functions it performs. Simply, trained behaviours will be instilled in the dog to allow then to carry out the task. This fact would influence the interface design, as it will need to be kept as simple as possible to enable training to be quick and straightforward.  
 In my opinion, the physical environment should not affect the interface design too drastically. When designing a device for use inside the home it could be assumed that the home environment is fairly stable and invariable, even on a home-to-home basis.

**Word count: 411**

**Question 2**

One technique that I think could be used to identify the dogs’ requirements is direct observation, particularly in homes where the trained dogs are currently operating interactive devices. This would require the installation of video recording equipment to view the day to day operation of the devices, including any issues that may occur with the interactions. I think that this would be a good choice as it provides information obtained in the user’s natural environment, providing the most realistic view of the user’s interactions with the products. As the dog is unable to communicate their requirements verbally to a designer, observation gives the designer an opportunity to see the possible requirements for themselves.   
A second technique that I think could be used effectively to gather the dog’s requirements is to carry out interviews, including interviews with the trainers who train the dogs to use the current controls, and the dog owners. Without the dogs being able to communicate themselves, I feel interviewing these groups would still offer a good view of the users’ capabilities and daily activities that they need to perform, and as such offer an insight into interface requirements.

**Word count: 191**

**Question 3**

The design problem that I have selected is that of a smartphone application that can be used to control various devices around the home. This solution would give a home owner a single place in which they are able to control aspects of their home environment with the use of smart devices they have installed there. This could include control of things such as lighting, central heating, home security systems, smart plugs and household appliances. I have chosen this design problem as I find that I use multiple interfaces to control the smart devices inside my home and would find interaction with these products much more satisfactory and efficient if I could do it in one application.

I have chosen this project idea as I think that it offers an interesting context to explore, since potential users will be varied in both physical and cognitive capabilities, the environment could also be varied, and the possible activities have a fairly large scope, but not so large that the interface will become too complex. For these reasons I have not changed or refined the choice much from that chosen in TMA01, and I feel this design problem will make an interesting project.

**Word count: 200**

**Question 4**

The activities the user will be carrying out will namely be that of controlling a smart device within their home. Due to the nature of the product, the scope of the activities that the user is carrying out will be well defined. The application has a specific use, meaning that there will be particular activities that the user will be attempting to perform, although the possibility that multiple devices will be connected to the application means that there are multiple activities that could be carried out. Each activity should be simple, although could be complex depending on the smart device that the user is interacting with. For example, a smart bulb could have either an on or off state, which would be simple to control, but some smart bulbs available allow dimming and colour changing, which would lead the activity to become more complex. Nevertheless, the activity should not become so complex that the user is unable to achieve their goals without some training in using the application.   
 The product does assume that the user will have the knowledge of how to operate the smart products around their home, and understand the various states they can be in, or behaviours they can perform. I envisage one main user perspective, which is that of the everyday user of the app, who is a member of the public with one or many smart devices in their home. Additional to this there might be a form of administrative user who requires additional functionality, such as the developers of the application or support staff, and so the needs of this type of user should be considered also.

The physical environment in which the activity is carried out could vary greatly, as it will predominantly be carried out on a mobile device. This means that as long as the device has a connection to the internet, the application can be used in any location. Due to this variable environment there could be times when it’s extremely noisy or very quiet, meaning I will have to consider the use of sounds in the application carefully. The changing nature of the environment means that security will also be a consideration, as the application could control security devices within the home, and access cannot be allowed to those who are not authorised.

**Word count: 386**

**Question 5**

a) One method that I could use for exploration and requirements gathering is conducting interviews. These interviews could be conducted to gather information about the types of smart devices that people use within their homes, which could then lead to requirements regarding what kinds of devices the application should support. The interviews could also cover questions related to the use of mobile applications in general, eliciting further information about the environment in which the application might be used, and aid the creation of scenarios. A second method that I could use would be focus groups, which would include potential users of the application. During the focus group I could use artefacts including smart home devices to invite discussion about them. This would allow me to gather points of view from many different potential users, and identify any areas of possible conflict between requirements for different for users with differing levels of physical, cognitive or technological abilities.

b) Both of these methods of data collection would produce a lot of qualitive data that would need to be analysed further to extract requirements. Neither method is self-documenting, and so would need to be recorded in some way. During interviews it may be possible to record information in note form, but it would probably be prudent to record it in some way as well. Due to the multiple participants in a focus group it would be difficult to take notes to capture all that is discussed, and so it would be sensible to record the session for transcription and analysis afterwards.

c) The benefit of combining methods is that data can be collected from different perspectives and combined to give a fuller picture of the design context. The focus group would be good at expanding on the information collected during one-to-one interviews, allowing for multiple viewpoints to be expressed, including those that could potentially conflict with points raised in the interviews. Combining the methods in this scenario would allow me to collect very detailed and specific information in interviews, which I would then be able to expand upon with a focus group.

**Word count: 348**

**Question 6**

a. The user that I have chosen to interview is a colleague, who has no prior knowledge of the module that I am participating in, or the project that I am completing for the module. This is to ensure that their responses to the questions I pose could not be biased in any way towards project ideas that I may have previously expressed to friends or colleagues that I speak to more regularly. I have chosen a user that I know has smart devices in their home, as interaction with these is the main activity that my interactive product will facilitate. The user is also an experienced mobile phone user and generally quite technologically capable. I feel that this type of user is ideal to begin my explorations with as they have previous experience in the product domain and can hopefully offer some insights as a user of smart devices, and their associated control interfaces.

b. Please see appendix A.

c. The interview will be conducted at my work place, in a meeting room that I have reserved for the purpose. This will ensure that there are no interruptions, and our full focus can be on the interview. I will be using a pre-installed voice recorder application on my laptop to record the audio of the interview, which I have already tested for sound quality and available recording time. This is to ensure the interview runs smoothly. I have decided to take brief notes in conjunction with the audio, but predominately will rely on the audio for data as this will provide the most accurate account of the interview, and will allow me to be undistracted while conducting it.

d. The main questions I will pose are:

1. Could you tell me what you understand by the term ‘smart home’ device?
2. Which smart home devices do you have in your own home?
3. Could you tell me about how you use these devices on a day-to-day basis?
4. Are you considering buying any further smart devices for your home? If yes, which ones?
5. How do you currently control your smart home devices?
6. Do you mainly interact with them when you are inside your own home, or outside?
7. Do you currently have any applications on your phone that can control some/all of your smart devices? In what way are you able to control these devices with these applications?
8. Do you feel that the current applications could offer any additional functions that would be useful?

**Word count: 417 words**

**Question 7**

a) One activity that the interviewee currently carries out is switching the smart light bulbs on and off within her home. Currently this activity can prove challenging as she does this in multiple ways, depending on the situation. My design project would offer her a way to interact with the light bulbs in any situation. For example, in the morning she turns the lights on or off with voice commands to her home assistant, but cannot do this when her son is asleep due to the noise. In this case she uses the home assistant application on her phone to control them. This application does not provide an interface for the dimming function of the light bulbs, and so when she wants to dim them she must use the application provided by the manufacturer of the light bulbs to do this.

b)

1. The interface should provide functionality for turning a smart light bulb on or off.
2. The interface should provide the ability to set timers and add scheduled routines for the light bulbs, so that they do not have to manually be turned on and off, for example, while away on holiday
3. The interface should allow for the brightness and colour of the bulbs to be adjusted.

c) Bob is woken up by his bedside smart light bulb turning on and waking him up at the set time of 7am. After getting ready for work, he calls to his home assistant, on his way out of the house, to turn off the lights as they are no longer needed while the house is empty.

After a long day at work, Bob returns home to find that the hallway lights have not turned on as they have been programmed to do, even though it is past sunset. He logs in to his home assistant app, forgetting that he can’t control the light timers there, and so opens the light bulb manufacturer app to check the light timer. He realises he’s accidentally disabled the timer, and so reactivates.

As the evening draws to a close Bob logs in to the smart bulb application to dim the lights around the house, letting his daughter know that it is approaching time for bed.

At the end of the day Bob logs in to the home assistant application to turn off the smart bulbs’ downstairs, as he does not want to use the home assistant and risk waking his daughter

d)

1. What is it that makes you decide to use your home assistant application to control some of your smart devices over the manufacturer developed application?
2. Typically, what kinds of controls, e.g. switches, dials do you use within these applications to control the difference aspects of the device?

**Word count: 434**

Appendix A

TM356 TMA02 Interview Consent Form

As part of TMA02 for module TM356 I am required to conduct an interview to ascertain potential requirements for an interactive product of my design. Said product will be a mobile phone application used to control various smart devices within the home. The interview will focus predominantly around your use of smart home devices, and use of mobile phone applications

The interview will take approximately 30 minutes, and you have the right to withdraw from the interview at any time.

This interview will be audio recorded, and a transcription created of this recording. Any data collected will be used to elicit requirements that will be shared with my tutor, but the recording of the interview and transcription will not be shared with others, unless required for future assessments.

By signing this form, you confirm that you understand and agree that:

* Your data is being collected for the above-mentioned purposes.
* You may terminate the interview at any time.
* The interview will be recorded, and a transcript created.
* The data will be analysed by Sarah Redway, and not shared unless necessary for assessment purposes.
* The audio recording will be kept until June 2018 when the TM356 module ends.

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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