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Human-Computer Interaction
Exercise sheet 5

8 29.5

Exercise 1 – Interface Type

Solution:

- **Speech-based interface:**
  The best way of controlling the game is probably to say "up", "down", "left" and "right" for the corresponding moves and "Ok" for confirming things in the game. The output interface does not need to change since it mainly uses visual data as output which does not interfere with using the voice as input, and it would be impossible to deliver all output data to the user in the required speed via speech. Pros with this interface could be that it would be possible to play without touching anything, allowing for paralyzed people that still can talk to play the game. Cons would be that it sometimes would require many commands from the user with very short time interval between them, and that the game would no more be suitable in noisy environment and/or where one should be quiet, as in public transportations.

2

- **Touch-based interface:**
  A touch-based interface would require some touch buttons to be added, for example beside or under the maze, which would be used to control the game. Pros using this method could be that it would allow for the game to be played on handheld touch devices without separate buttons such as cell phones. Cons would be that the buttons would consume screen space that could have been used to display other things or enlarge the game's area. The player would also no more be able to physically feel where the buttons are of if they are being pressed or not, which would force them to either learn the button's positions in the muscle memory or look if they are hitting the buttons and if the press are being recognized which would distract them from the actual game.

2

- **Tangible interface:**
  A tangible interface would for instance be to build a physical maze with the walls from the game on a table, having diodes on the floor of the maze for representing the dots the pacman "eats" in the game, small physical ghosts moved by the computer device with the help of movable magnets under the table and a ball to represent the user character of which the position can be sensed by the computer and that the user physically can move in the maze. Pros are that the user can see, touch, feel and interact with the objects in the game and can use motions to physically move the player character in the maze. Cons are that it would be hard to make the user move the character at right and constant speed according to the game and the walls of the maze might obscure important objects such as the LEDs on the ground. It would also be hard to prevent the player from cheating (could be done as disqualify the player if a move across a wall is sensed) and of course several mechanical and technical problems that are needed to be solved.

2

- **Augmented reality interface:**
  With an augmented reality interface and a head-worn display, the game's maze could be projected onto any surface in the player's surrounding, like a table or a wall. In this case the user still needs an input device, for instance a game controller which is used to control the game character. Some pros with this interaction method would be that the game probably would feel much more real when projected onto a physical surface instead of just only shown on a computer screen and that the player easy could change where they want to play the game, making it more versatile than being forced to only use a computer screen. Some cons are that the computing device needs to be able to identify the desired surface and project the game onto it, and that the projection needs to follow every move of the player's head to prevent from motion sickness.

2

12 **Exercise 2 – Weekly pill case interface**

3P for design, which is very nice

Solution: Pill cases are one of the most important but boring equipment for the people suffering from diseases. This digital screen of pill case has patients name along with 8 tabs with 3 led each and one led at the top right which would be green if medicine is consumed on time and red if not consumed on time and is pending. The tree led at each partition displays 3 time of prescribed medicines at each day and each led is red if that portion's specified time is empty and green if filled. The three possible features we would like to recommend for the digital pill case to help patients in accessing medicines and their description easily would be;

1. Medical Notification
2. Medical Description
3. Medical Analytics

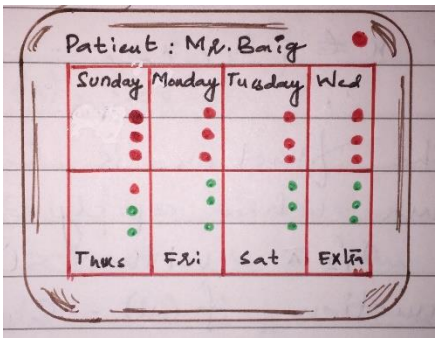

Figure 1: Digital Display view of pill case

Medical Notification: This feature will help user to get two-way notification about timeliness of the medicines. The digital screen will have some sensors and led, which will give an alarm notification along with glowing-led from the case before 10 minutes of each pill's time and the second way notification would be a notify alarm on mobile phone/ tablet after 10 minutes of each pill's time if the pill case is not nearby and incase pill is not consumed on time.

3

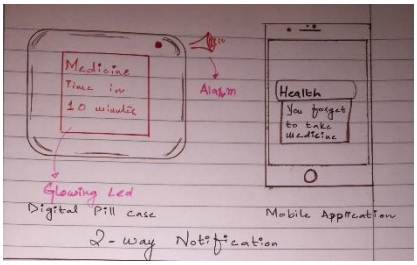

Figure 2: 2-way notification
"glowing center of led with alarm on the digital display of pill case along with mobile notification"

Medical Description: This feature will help user in remembering which medicine has to be consumed in what amount and on what time. The screen will display the name, amount and time of medicine once user has been notifying by using the first feature. Sometime patients have to consume medicine before or after their daily-meals or with gap of few minutes in between specific medicines. This feature will help user to consume right amount on right time without remembering long prescriptions.

3

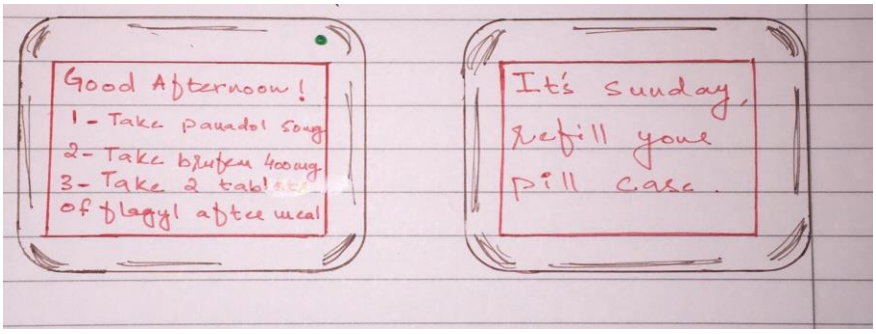

Figure 3: Medical Prescription
"this feature will not only prescribe the correct amount and time of medicines but it will make sure that the case is re-filled timely"

The sketch of the pill case includes the front digital display only and the digital display for each feature is specifically shown with the feature description. The basic display of the digital screen is shown in image 1.
*** Each feature is described in 80 words strictly as per requirement***

Medical Analytics: This feature will help in maintaining the health updates of the patients through charts and description in form of pdf to the mobile phone. Each week the digital case would ask for user's health description such as cholesterol, blood pressure, diabetic-level from the input tags on the case by using mobile application. The generated report has details of amount and time of consumed medicines along with description of patient's health and it can be send to doctor easily. 3

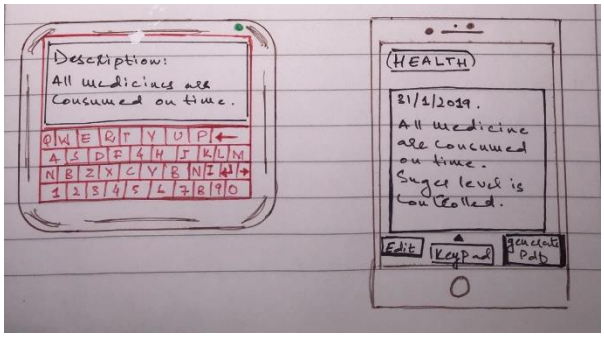

Figure 4: Medical Analytics

"this feature will be utilized either by the provided keypad on the pill case or by using mobile application linked with the case, the application will ask to generate, print, send and modify the patients report"

Exercise 3 – Body-Based Interaction 9.5

Solution Part 1: In Frozen Treasure Hunter, two players share the control of an avatar as they collect virtual items. One player controls the forward momentum of the avatar by pedaling on a recumbent bicycle, and steers using a gamepad. The other player uses a Wii Remote and Nun chuck to swat away virtual projectiles thrown at the avatar. 3 The pedaling of the player on the bike translates into power input. The swatting motions performed by the other player are classified as gesture inputs. We selected them because it involves more physical activity which is used as an exercise equipment like pedaling on a recumbent bicycle.

Solution Part 2: Game can be controlled by using the gestures because in the game Frozen Treasure Hunter, the 2.5 movement of steering using a gamepad is important for looking around, aiming and shooting whereas the pedaling of the player on the bike plays part of running. -1.5 you could go a bit more in detail at this point

Advantages:

- Immediate and powerful interaction: Unlike traditional buttons and menus, gestures do not interrupt the 2 user's activity by forcing him to move his hand to the location of a command. Instead, they can be performed directly from the current cursor position.
- Intuitiveness and enjoyability: Gestures feel very natural to perform since they mirror our experiences in the real world.

Disadvantages:

- Discoverability: A disadvantage with gestures is the fact that they are neither self-revealing nor self- 2 explanatory. A named button on a toolbar has an explicit purpose and is also easy to find, gestures, however, may be arbitrary and are usually more difficult to discover.
- Memorability: While conventional commands only have to be recognized, gestures need to be known and remembered before executing them.

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*** Each feature is described in 80 words strictly as per requirement***