CSE 542 Software Engineering Concepts

Software Requirements Specification for project 'Care'

Version 1.0

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1 Assumptions / Limitations / Constraints

1.1 Assumptions

- The user has basic computer knowledge.
- The user has no visual impairment.
- The computer on which the software will run is pre-connected to the Internet.

1.2 Limitations

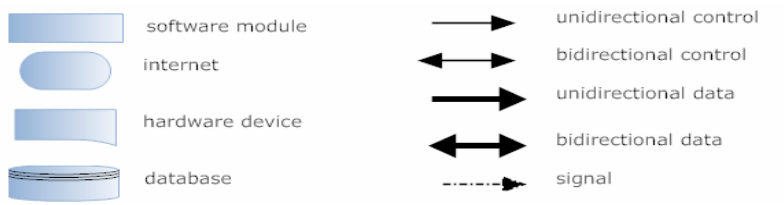
- The user can select, add/remove and run programs in desktop navigation, but can't change the settings or preferences of the programs. The programs will run with default setting.
- There will be some time delay as a confirmation message will be displayed before executing any command just to prevent from unexpected outcomes of mistaken choice of options.
- Only a predetermined number of appliances can be controlled by the system.
- Advanced multimedia player control options will not be available.
- For appliance management the devices are limited to fan, bulb and TV.

1.3 Constraints

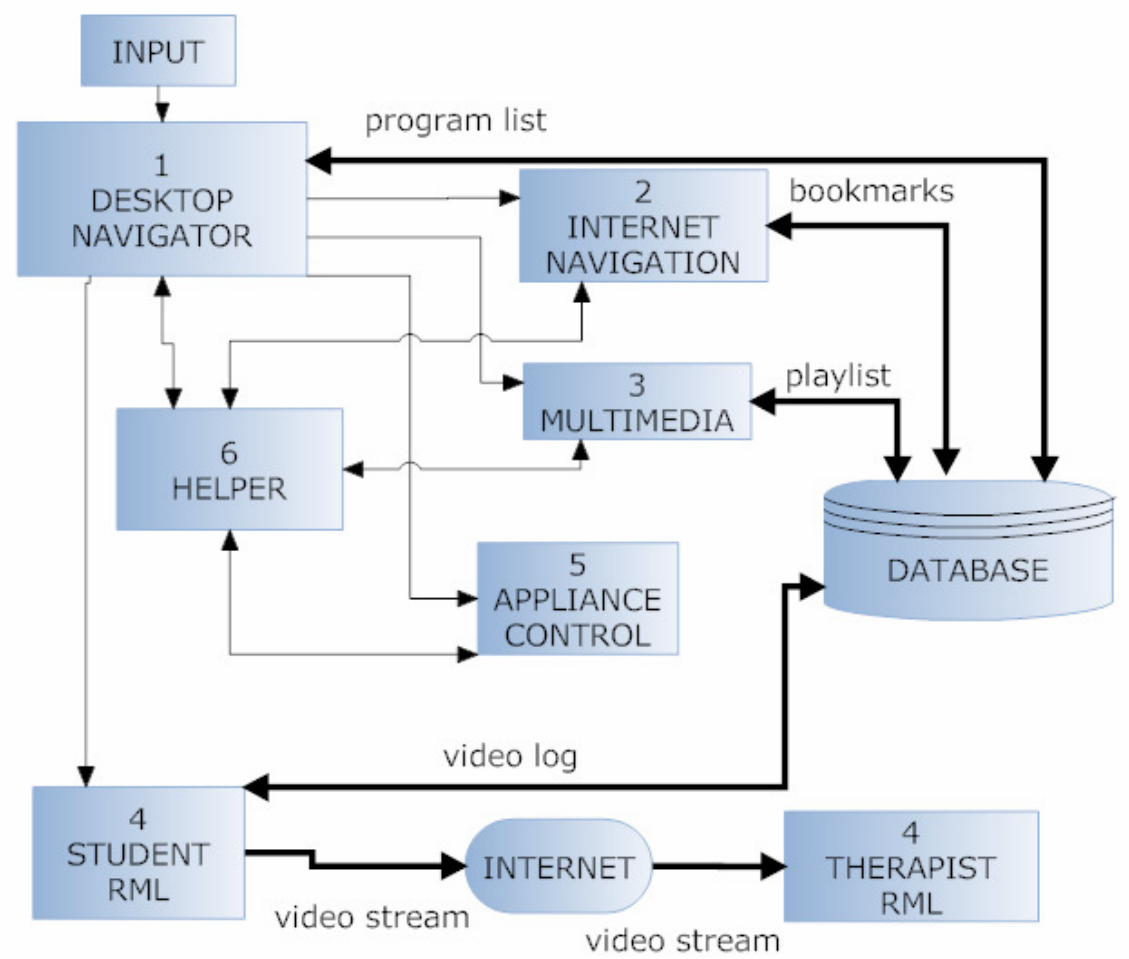
- Must be used with a Windows installed computer
- The system should have sufficient memory (more than 256 MB recommended).

2 Software Architecture Block Diagram

2.1 Block Diagram Legend

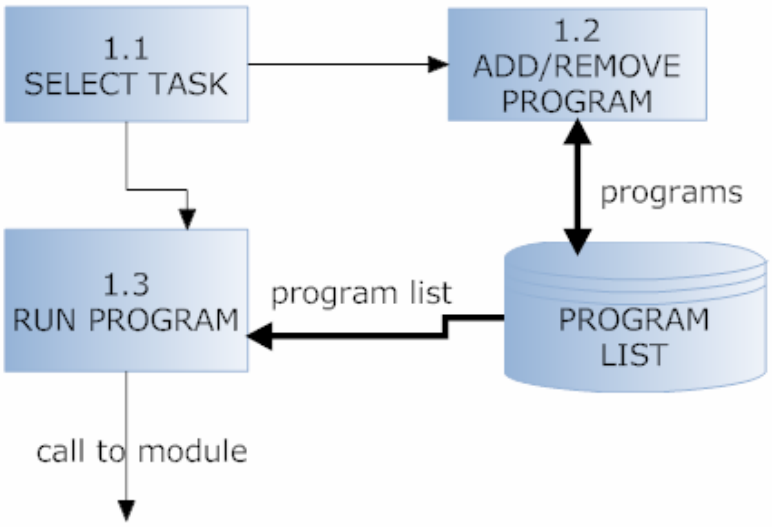


2.2 Level 1 Block Diagram



2.3 Level 2 Block Diagram and Module description

1 Desktop Navigation



1.1 SELECT TASK

This module will provide the user interface to select a task from Add/Remove programs and to run a program. SELECT TASK Helper module will be reused. Once the selection is made control will pass to the ADD/REM PROGRAM module or the RUN PROGRAM module depending on the user selection.

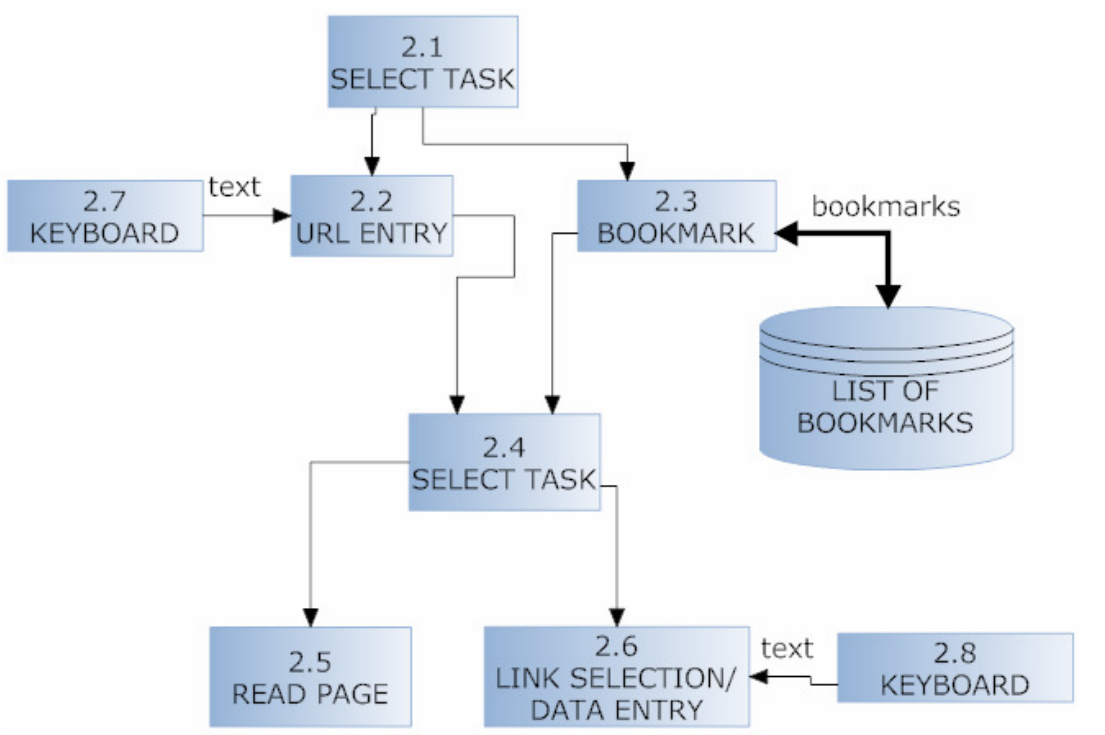
1.2 ADD/REMOVE PROGRAM

This module will provide the user interface to add/remove the single click compliant programs from the Program list. The Program list will be retrieved and stored in the repository.

1.3 RUN PROGRAM

This module will provide the user interface to select a particular program from list. The Program list will be retrieved and will call the corresponding module of the selected program.

2 Internet Access



2.1 SELECT TASK

This module provides the interface to select either of the two ways of opening a webpage, by entering the URL or by using a stored Bookmark. SELECT TASK Helper module will be reused.

2.2 URL ENTRY

The URL selector module will allow the user to either type in a URL or select from one of the available bookmarked items. For typing in the URL the keyboard module will be called which will give the text input.

2.3 BOOKMARK

If bookmarks option is selected, the stored bookmark will be iterated throughout the page and the required link will be selected. There will also be an option for saving the current page in the bookmarks.

2.4 SELECT TASK

Once the page is displayed, the user will have 2 choices. He can either read through the page or choose to click on a link on the page or enter some information (search, enter information, etc). SELECT TASK Helper module will be reused.

2.5 READ PAGE

For reading the page, the user will be given the option of scrolling the page.

2.6 LINK SELECTION/DATA ENTRY

The focus will automatically move among the links and the text box. When a particular link is selected, it will be opened. When a text box is selected, the keyboard module will be invoked to enter the text.

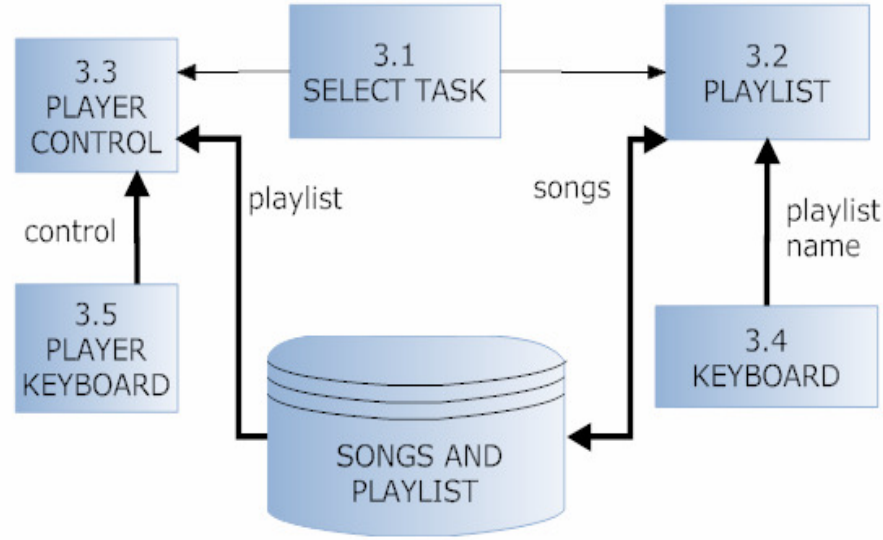
2.7 KEYBOARD

This module will be the same as other KEYBOARD Helper module. It will provide text input for entering the URL.

2.8 KEYBOARD

This module will be the same as other KEYBOARD Helper module. It will provide text input for entering the data on the textbox on the webpage.

3 Multimedia Application



3.1 SELECT TASK

This module will provide the user interface to select a task to edit the playlist or control the player options. It will pass the control to the PLAYLIST module or PLAYER CONTROL module depending upon the user input. SELECT TASK Helper module will be reused.

3.2 PLAYLIST

This module will provide the user interface to add/remove the songs from the current playlist or load the saved playlist. The playlist will be saved in a repository. The user can save the current playlist.

3.3 PLAYER CONTROL

This module will provide the user interface to control the multimedia player by providing options to play, pause, stop, increase/ decrease volume and mute. It will also show the current playing song, current playlist etc.

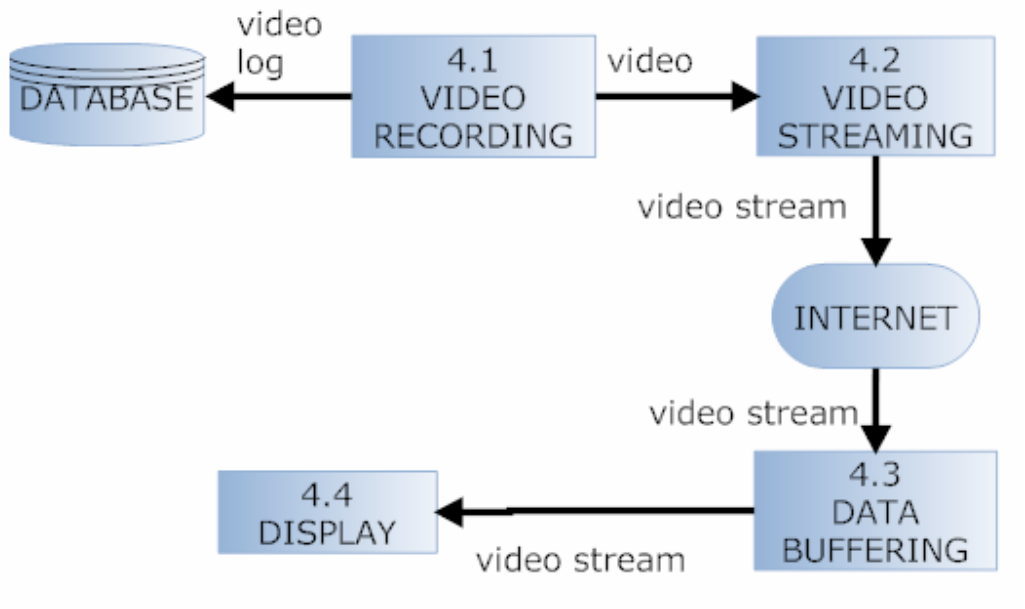
3.4 KEYBOARD

This module will be the same as other KEYBOARD Helper module. It will provide text input for saving the names of the playlist.

3.5 PLAYER KEYBOARD

This keyboard will have the keys needed to control the player options. It will have keys like play/ pause, stop, increase/ decrease volume and mute. The normal keyboard keys will be absent.

4 Remote Management and Logging



4.1 VIDEO RECORDING

This module will record all the activities of the user in the form of a video file. If the therapist selects the logging option, the video file will be saved in the database. Else if the therapist selects the remote monitoring option, the video will be passed to the video streaming module.

4.2 VIDEO STREAMING

This module will take the video file from the video recording module and will perform all the actions related to the streaming of the video and creation of a stable and secure connection with the therapist module over the internet.

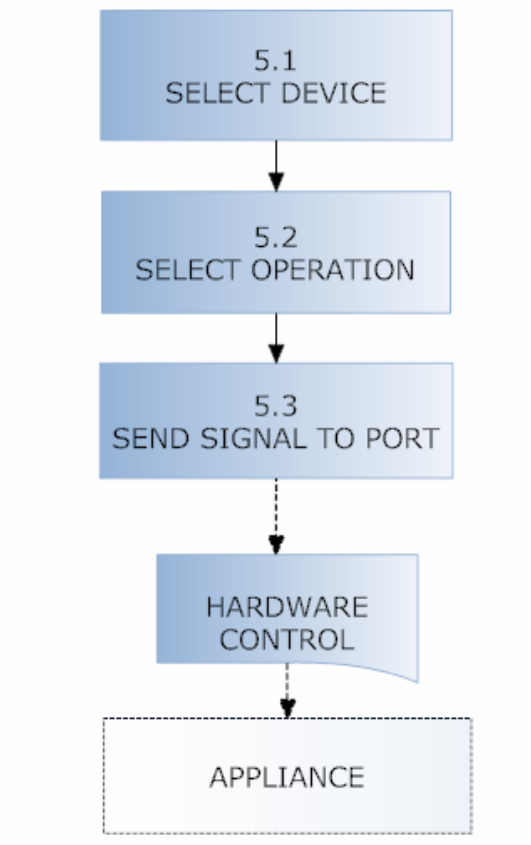
4.3 DATA BUFFERING

This module will perform all the actions related to accepting the connection with the student module over the internet. It will also perform all the actions related to the buffering of the received data stream.

4.4 DISPLAY

This module will interface with the data buffer and will display it on the therapist machine.

5 Appliance Management



5.1 SELECT DEVICE

This module will provide the user interface to select the device he/she wants to operate. SELECT TASK Helper module will be reused.

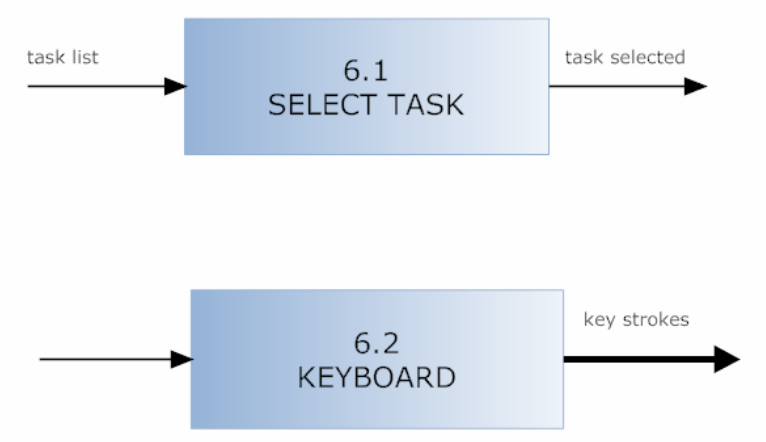
5.2 SELECT OPERATION

Provides the user interface to choose the operation to be performed on the device, which is either, switches, it ON or OFF.

5.3 SEND SIGNAL TO PORT

Here the user does not play any role. Appropriate signal is sent to the serial port depending on the type of operation to be performed

6 Helper



The helper module will be one of the core modules of the system which will provide the SELECT TASK module to the user along with a Virtual KEYBOARD. These modules can be reused by other modules.

6.1 SELECT TASK

The SELECT TASK module will continuously iterates through any list provided to it. The user will be able to select any option so that the intended operation is performed.

6.2 KEYBOARD

Each key of the keyboard will be highlighted continuously after a fixed delay. When a highlighted key will be selected by pressing the single switch, the character will be sent to the corresponding textbox.

3 Configurability/Flexibility

Since the user will have limited motor abilities, the user interface will be kept very simple. Hence the user will not be provided any configuration features. An advanced user/technician will be able to make certain changes to enhance the usability of the system.

3.1 Delay

Configuration of the delay time for command execution.

- Different users may be comfortable with different times for moving between options, depending on their abilities.

3.2 Internet Browsing

Updation of the list of programs.

- Additional programs with the required interface maybe installed on the system.

3.3 Hardware Change/Update

Change of switch and updating the device driver.

- New peripheral devices like switch or multimedia devices may have to be upgraded and corresponding driver updated.
- The connected appliances can be configured.
- New appliances can added on the system or earlier ones may have to be removed. Changes in the appliance may require a change in the interface.

4 Risks

4.1 Schedule

The time required to deliver the software may exceed the estimated time schedule depending on:

- Changes or additions made after the initial design.
- Change of deployment scenario.
- Change of user profile/abilities.

4.2 Technical

- There might be issues with the interface of single switch hardware.
- There might be issues regarding interfacing the hardware for appliance control.

4.3 Budget

- Cost involved in the electronic equipment might differ from the estimated cost and may exceed the budget.
- Using additional manpower to deliver the software on time may add to the total expenditure.

5 Change Management

PROJECT CHANGE REQUEST FORM

Project Name:	
Requested by:	
Date (MM/DD/YYYY):	

1. **Requester Information**					
Fill in with appropriate information or place an "X" next to those that apply:					
Area of Change:					
Function	[ ]	Schedule	[ ]	Budget	[ ]
Other (Please Specify) [ ]					
Proposed Change Description and References:					
Description:					
Justification:					
Reference No:					
Impact of Not Implementing Proposed Change:					
Alternatives:					

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2. **Primary Review:**			
Initial Review Date: (MM/DD/YYYY)		Review done by:	

2. **Primary Review:**		
Action		Comments
Approved for CSR Impact Analysis	[ ]	
Reject	[ ]	
Defer Until (MM/DD/YYYY)	[ ]	
Immediate Implementation	[ ]	

3. **Initial CSR (Cost-Schedule-Resources) Impact Analysis**			
Cost / Schedule Impact Analysis Required? (check one)	Yes [ ]	No [ ]	
Impact on Cost:			
Impact on Schedule:			
Impact on Resources:			
Risk associated with implementing the change:			
Risk associated with not implementing the change:			
Final Review Results:			
Review Date: (MM/DD/YYYY)			
Priority: (check one)	High [ ]	Medium [ ]	Low [ ]

4. CSR Impact Analysis Results		
Specific Requirements Definition:		
Additional Resource Requirements	*Work Days*	*Cost*
Totals		

1. Final Review and Agreement:			
Final Review Date: (MM/DD/YYYY)		Review done by:	
Action		Comments	
Approved for Implementation	[ ]		
Reject	[ ]		

6 Cross Reference Listing

Functional Requirement Number	Functional Requirement	Module Number	Module Operation
3.1	Desktop Navigation	1.1 1.2 1.3	SELECT TASK ADD/REMOVE PROGRAM RUN PROGRAM
3.2	Internet Browsing	2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8	SELECT TASK URL ENTRY BOOKMARK SELECT TASK READ PAGE LINK SELECTION/DATA ENTRY KEYBOARD KEYBOARD
3.3	Multimedia Applications	3.1 3.2 3.3 3.4 3.5	SELECT TASK PLAYLIST PLAYER CONTROL KEYBOARD PLAYER KEYBOARD
3.4	Remote Management and Logging	4.1 4.2 4.3 4.4	VIDEO RECORDING VIDEO STREAMING DATA BUFFERING DISPLAY
3.5	Appliance Management	5.1 5.2 5.3	SELECT DEVICE SELECT OPERATION SEND SIGNAL TO PORT

7 Integration Thread

The Desktop Navigation module and the Internet Navigation module will serve as a good foundation system. The Desktop Navigation module will be the basic system with which the user will first interact. Again, giving Internet access to the users with gross motor disabilities will be a major requirement of this project. Thus, the Internet navigation module should also be present.

All the other modules like of Multimedia, Appliance Management and Remote Monitoring and Log can be added on afterwards. If we have a stable working module of Desktop and Internet navigation, we can add these with minimum impact on the basic and more important working part of the system.