1. Specific Requirements
   1. External Interface Requirements
      1. User Interfaces

[Table 3] Basic user interface for instructor

| **Name** | **Basic user interface for Instructor** |
| --- | --- |
| Purpose/Description | Basic interface for Instructor user in PC and open, close bookmark table/  Users transmit their instructions through a click button |
| Input source/ Output destination | User/ User's screen equipped with chrome in PC and server |
| Time/ Velocity | Asynchronous user input /  Communication time between the server and the user device |
| Function/ Relationship of input/outputs | Open or close the bookmark table/  After receiving the inputs, the user device transmits the input data to the server for processing the input data and request desired output data |
| Format and configuration of screen | 1. PC : An activity screen connected to an html file, mainly composed of btn.  1. Smart Phone : An activity screen connected to an XML file, mainly composed of TextViews  2. The button provides a basis for choosing the following input, and it is ready to receive the inputs from users  3. Users are to click a button to interact with the system |
| Data type | PC : btn class  Smart Phone : int type value of a button code |
| Instruction type | Instruction mapping according to the class name of a button. |
| Exit message | N/A |

[Table 4] Basic user interface for learner

|  |  |
| --- | --- |
| **Name** | **Basic user interface for learner** |
| Purpose/Description | Basic interface for learner user in PC and open, close the book mark tables/  Users transmit their instructions through a click button |
| Input source/ Output destination | User/ User's screen equipped with chrome in PC and server |
| Time/ Velocity | Asynchronous user input /  Communication time between the server and the user device |
| Function/ Relationship of input/outputs | Open or close the bookmark table/  After receiving the inputs, the user device transmits the input data to the server for processing the input data and request desired output data |
| Format and configuration of screen | 1. PC : An activity screen connected to an html file, mainly composed of btn.  1. Smart Phone : An activity screen connected to an XML file, mainly composed of TextViews  2. The button provides a basis for choosing the following input, and it is ready to receive the inputs from users  3. Users are to click a button to interact with the system |
| Data type | PC : btn class  Smart Phone : int type value of a button code |
| Instruction type | Instruction mapping according to the class name of a button. |
| Exit message | N/A |

[Table 5] Interface for user's own bookmark table

|  |  |
| --- | --- |
| **Name** | **User's own bookmark table** |
| Purpose/Description | Jump the timeline or make, edit the bookmarks/  Users can jump to bookmark and make or edit their own bookmarks.  Users transmit their instructions through a click button |
| Input source/ Output destination | User / User's screen equipped with chrome in PC and server |
| Time/ Velocity | Asynchronous user input /  Communication time between the server and the user device |
| Function/ Relationship of input/outputs | Jump to marked timeline and open note. Edit or make bookmark and note/  After the work of input finished, the bookmark table is re-opened and delete the output result from the previous input. |
| Format and configuration of screen | 1. PC : An activity screen connected to an html file, mainly composed of btn and input.  1. Smart Phone : An activity screen connected to an XML file, mainly composed of TextViews and EditText  2. The bookmarks created by the user are displayed, and the set time and note are written in each.  3. When the user clicks the button ’edit’ or 'make', show another interface for input function. |
| Data type | PC : btn and input class  Smart Phone : int type value of a button code and EditText |
| Instruction type | Instruction mapping according to the class name |
| Exit message | N/A |

[Table 6] Interface for make bookmark

| **Name** | **Bookmark – make** |
| --- | --- |
| Purpose/Description | Make new bookmark for it's leacture video/  The inputs that set the flag and edit bookmark and create button |
| Input source/ Output destination | User / Server |
| Time/ Velocity | After all the input data(flag, note) were received and create button clicked/  Communication time between the server and the user device |
| Function/ Relationship of input/outputs | Set the time flag and write note/  The time of flag should not overlap with existing bookmark. |
| Format and configuration of screen | 1. PC : An activity screen connected to an html file, mainly composed of btn and input.  1. Smart Phone : An activity screen connected to an XML file, mainly composed of TextViews and EditText  2. The input class enables users to set time and write note. And create button that exit this interface  3. If the time overlaps, a warning message appears, and note indicates the limit of the number of characters and the number of written characters. |
| Data type | PC : btn and input class  Smart Phone : int type value of a button code and EditText |
| Instruction type | Instruction mapping according to the class name |
| Exit message | “Bookmark created successfully” |

[Table 7] Interface for edit bookmark

|  |  |
| --- | --- |
| **Name** | **Bookmark – edit** |
| Purpose/Description | Edit the existing bookmark for it's leacture video/  The inputs that edit the flag and edit bookmark and save, delete button |
| Input source/ Output destination | User / Server |
| Time/ Velocity | After all the input data(flag, note) were received and the save or delete button clicked/  Communication time between the server and the user device |
| Function/ Relationship of input/outputs | Edit the time flag and write note or delete bookmark/  The time of flag should not overlap with existing bookmark. |
| Format and configuration of screen | 1. PC : An activity screen connected to an html file, mainly composed of btn and input.  1. Smart Phone : An activity screen connected to an XML file, mainly composed of TextViews and EditText  2. The input class enables users to set time and write note. And save, delete button that exit this interface  3. If the time overlaps, a warning message appears, and note indicates the limit of the number of characters and the number of written characters. |
| Data type | PC : btn and input class  Smart Phone : int type value of a button code and EditText |
| Instruction type | Instruction mapping according to the class name |
| Exit message | “Bookmark edited successfully” or “Bookmark deleted successfully” |

[Table 8] interface for instructor's bookmark table for learner user

| **Name** | **instructor's bookmark table for learner user** |
| --- | --- |
| Purpose/Description | Jump the timeline/  Users can jump to bookmark/  Users transmit their instructions through a click button |
| Input source/ Output destination | User / User's screen equipped with chrome in PC and server |
| Time/ Velocity | Asynchronous user input /  Communication time between the server and the user device |
| Function/ Relationship of input/outputs | Jump to marked timeline and open note./  After the work of input finished, the bookmark table is re-opened and delete the output result from the previous input. |
| Format and configuration of screen | 1. PC : An activity screen connected to an html file, mainly composed of btn.  1. Smart Phone : An activity screen connected to an XML file, mainly composed of TextViews |
| Data type | PC : btn class  Smart Phone : int type value of a button cod |
| Instruction type | Instruction mapping according to the class name |
| Exit message | N/A |

* + 1. Hardware Interfaces

[Table 9] Hardware interface of applicable device for the system

| **Name** | **Applicable device for the system** |
| --- | --- |
| Purpose/Description | PC : Enable users to take advantage of the service provided by chrome web browser.  Smart Phone : Android OS At least Android 5.0 |

* + 1. Software Interfaces

[Table 10] Software interface of PostgreSQL database

| **Name** | **Postgres Database** |
| --- | --- |
| Purpose/Description | Query input/output for managing multimedia/meta data |
| Input source/ Output destination | Host server/ User, User/Host server |
| Range/  Accuracy/  Margin of error | Depends on the performance of the PostgreSQL |
| Unit | Query |
| Time/ Velocity | Instant reaction  Within 3 seconds when make or delete a bookmark |
| Relationship with other input/outputs | Related to all inputs/outputs from server |
| Format and configuration of screen | N/A |
| Format and configuration of window | N/A |
| Data type | Query |
| Instruction type | Query statement |
| Exit message | N/A |

* + 1. Communication Interfaces

[Table 11] Communication interface of client and host

| **Name** | **Client and Host** |
| --- | --- |
| Purpose/Description | Each client requests the connection to the host, requesting list of results of bookmarks  Host provides a bookmark table to the client |
| Input source/  Output destination | Client/Host server |
| Unit | packet |
| Time/ Velocity | Within 3 seconds when make or delete a bookmark |
| Relationship with other input/outputs | Related to all inputs/outputs from server |
| Format and configuration of screen | N/A |
| Format and configuration of window | N/A |
| Data type | Query |
| Instruction type | Query statement |
| Exit message | N/A |