

Software Requirements Specification (SRS)

Project Blackboard Bookmarking Bar

Team: 2

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Customer: Students and Teachers

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1 Introduction

This document will go over the software engineering project that Group 2 decided to do. The project is how to improve a learning management system, such as Blackboard and SIS, therefore our group decided to do a bookmarking bar. Therefore, this document will go in-depth about the bookmarking bar, how it is supposed to work, and the process behind how we made it.

1.1 Purpose

The SRS document organizes ideas and creates a system that fulfills the system's requirements decided by the students. Essentially provided a detailed overview of the finished product along with the requirements that were set before moving on to the modeling requirements of the product to figure out how the product is supposed to work. Along with it is a preview of the bookmarking system that was made, along with a guide on how to use it and a sample scenario.

1.2 Scope

The scope of the Blackboard Bookmarking Bar is to make traversing through Blackboard simpler, rather than going through several layers of links to reach your destination. The product will allow the user to create a bookmark on Blackboard for any items they would want to return to, by clicking on ribbons within the page, and would allow the user to edit and organize their bookmark however they wish using renaming, removing, adding, or moving their bookmarks. They will also be able to store their bookmarks in folders.

1.3 Definitions, acronyms, and abbreviations

BBBB – Blackboard Bookmark Bar

Blackboard Folder– A type of folder that the instructor creates for their class page that holds Blackboard Resources.

Blackboard Resource – A resource that the instructor creates for their class page. For example, Assignments, Blackboard Folders, Class Recordings, PDFs, etc.

Bookmark Folder – A type of folder that the student creates for their BBBB that holds Bookmark Resources.

Bookmark Resource – Resource that holds the link of a Blackboard Resource in the BBBB.

Blackboard – The Learning Management System the is being improved upon

1.4 Organization

The remaining sections of the document will go over a general description of the assignment, along with the development process of the software, which includes their requirements, the models of those requirements to make it work, and how to run the

prototype, along with examples. Section 2 is the general description of the software, which includes things such as functions, characteristics, and difficulties. Section 3 is the project requirements sorted in importance and subgoals per requirements. Section 4 is all the model requirements, along with descriptions of each model. Finally, section 5 is the prototype, which is how to use the software, and real-life examples.

2 Overall Description

This section will go over the current system. From a brief description of the product that was made, along with its current functions and characteristics. It will also go over current issues with the current product, and other constraints that were placed on the system. It will also go over the requirements set by the client, that may be implemented in the future, but is not in its current model, or any assumptions made about the product.

2.1 Product Perspective

Students in college and university are given access to a learning management system in order to organize their work and grades. It also helps the professors submit notes and homework for the students to adhere to. The authors of this project are students at university who use this system every day. Many students have at least four classes per semester and there are a lot of notes, homework, and resources to keep track of. In this learning management system, Blackboard, students do not have ease of access in order to switch between certain Blackboard Resources. This project creates a bookmark system called the BBBB, to help with student and instructor navigation through the system.

The BBBB is inserted as part of Blackboard itself. The interface is inserted directly below the header on the original site. It follows the user to every page they navigate to. The following figure gives a pictorial representation of the BBBB.



The BBBB is a functional bookmark system that creates easier navigation among students and instructors. In order to express the usage of the BBBB the developers needed to recreate Blackboard from scratch. As well as all the interfaces concerned with this navigation tool.

When the user interface is concerned, some constraints can cause user difficulty. The developers chose to imitate the original BlackBoard. This will limit the exploration of the functionality of the BBBB.

There are no hardware limitations for this project since there has been no attempt to improve any hardware. This project only looks to improve on the existing software.

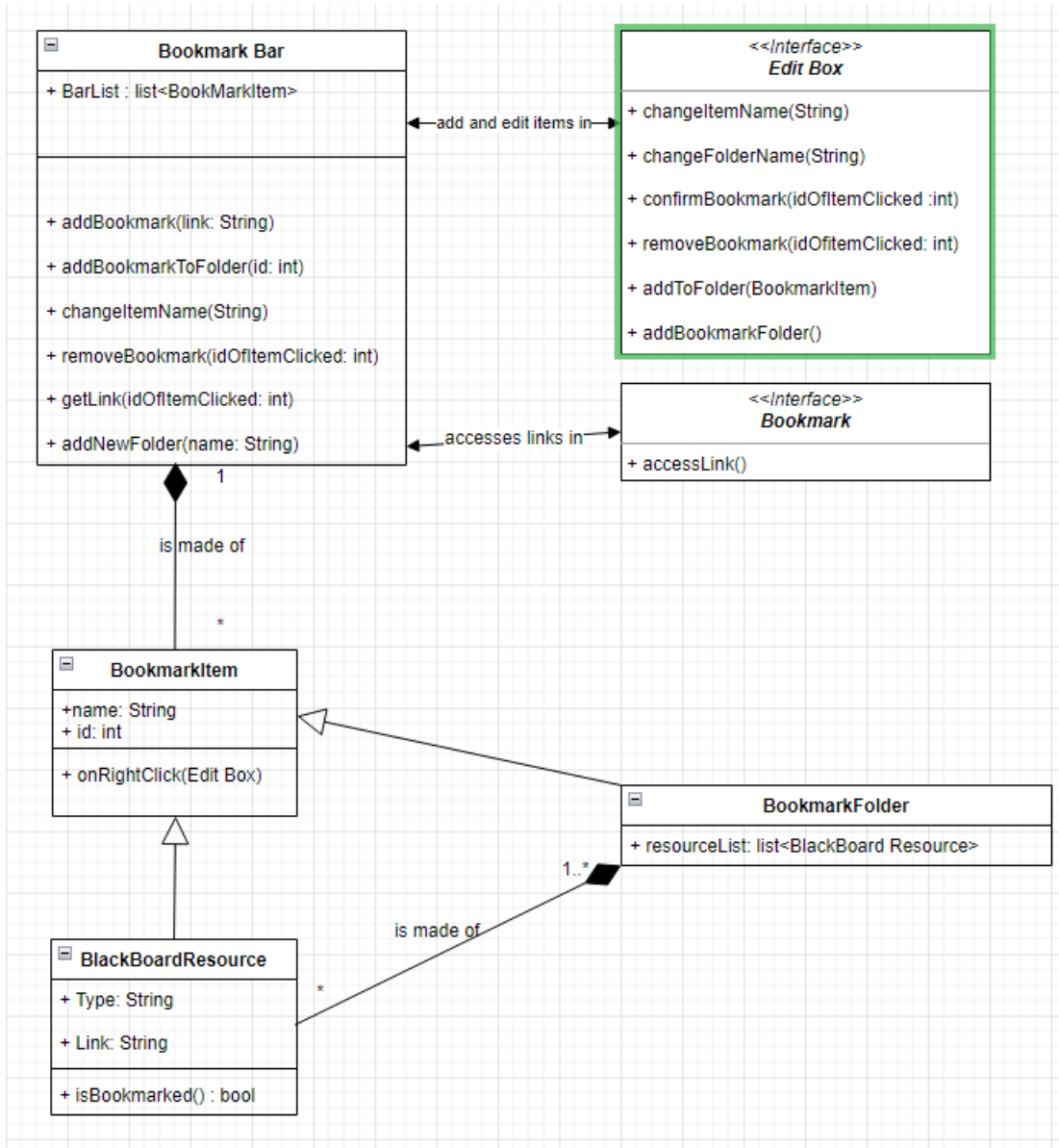
Since the developers have created their own version of BlackBoard, there could be some software limitations. Normal BlackBoard software allows the user to look at their grades for each of their classes. The developers limited the functional aspects of the homebrew Blackboard to how it would apply to the BBBB.

2.2 Product Functions

User clicks on bookmark icon of a resource in Blackboard that they want to put on the Bookmark bar. It then creates an Edit Box in which the user can name and add their new bookmark.

User can left click on a bookmark item that is currently on the bookmark bar; the stored link in the bookmark is then navigated to.

The user can create and select folders through the Edit Box and add the currently clicked bookmark resource to the folder they created or selected.



2.3 User Characteristics

We expect the users of our product will be students and or teachers that are already familiar with other LMS (Learning Management Systems). We expect a baseline knowledge and literacy with web browsers and web browsing. Users of Chrome and Chrome adjacent products will be familiar with the bookmark feature that they offer, and we seek to do something similar. Given this nature, the bar for the baseline user for our product is set incredibly low, meaning accessibility for our product is high.

2.4 Constraints

The product's current constraints are that you need a browser with JavaScript enabled. A user of this product needs a machine that can run Chrome or a similar browser.

2.5 Assumptions and Dependencies

For users of our product, the hardware requirements should be a system that can handle running Chrome or a similar browser. JavaScript should be enabled and working on the system. A mouse and keyboard should be present and working on the system as well so that the user can interact with the page and bookmarks. No cookies are required for the website to work now, but they should be enabled anyways in case of future updates.

2.6 Apportioning of Requirements

Having talked to customers about the release of the project, there are several functionalities that are not implemented in the current version. In the future, there will be a functioning grade page that is able to be bookmarked.

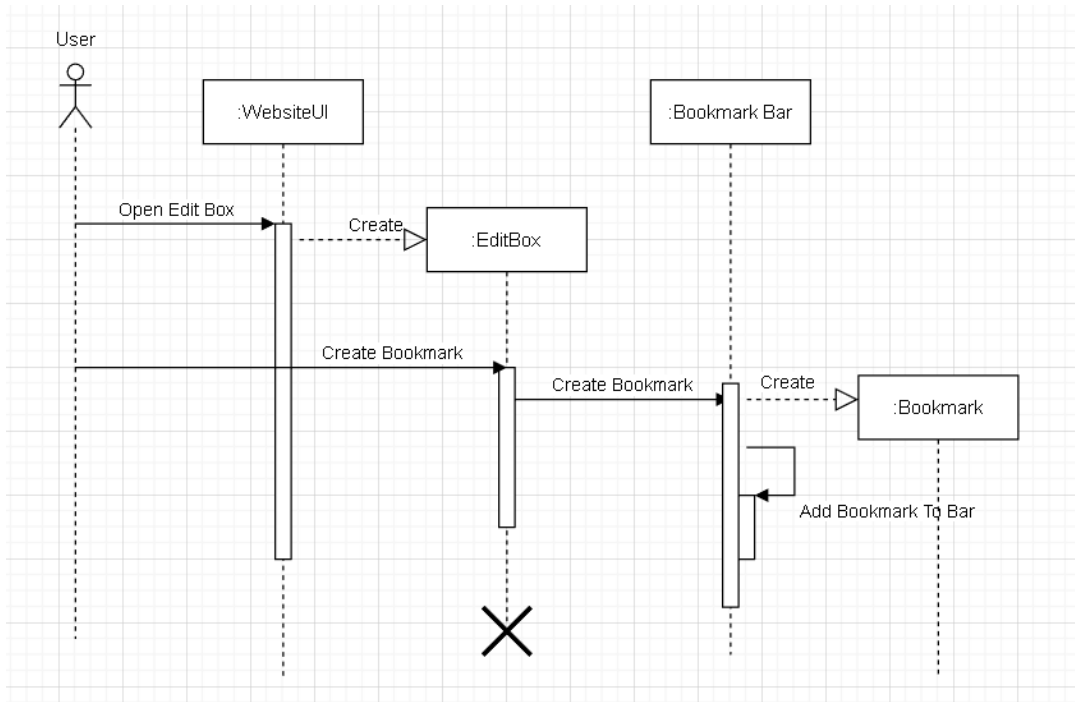
3 Specific Requirements

1. Addition of an icon for Blackboard Resources
 - 1.1. The resources can be Assignments, Blackboard Folders, Class Recordings, PDF's, etc.
 - 1.2. When interacting with the bookmark icon, a non-bookmarked Blackboard Resource becomes bookmarked, and vice versa.
 - 1.2.1. Bookmarking a Blackboard Resource will create a Bookmark Resource that links the Blackboard Resource to the fixed bookmark bar.
 - 1.2.2. Unbookmarking a Blackboard Resource will remove the Bookmark Resource that links to the Blackboard Resource from the fixed bookmark bar.
2. Addition of a fixed bookmark bar.
 - 2.1. The bookmark bar is visible on every page on Blackboard.
 - 2.2. The bookmark bar holds bookmarked items by users.
 - 2.3. Interacting with the bookmarks leads to either opening an Edit Box or sending the user to the location of the bookmarked item.
3. Addition of an Edit Box.
 - 3.1. Allows the user to create an empty Blackboard Folder.
 - 3.1.1. Blackboard Folder used to hold Bookmark Resources.
 - 3.1.2. Cannot add a Bookmark Folder inside a Bookmarking Folder.
 - 3.1.3. Located inside the bookmark bar.
 - 3.2. Allows users to add bookmarked items to the folder.
 - 3.3. Allows users to add/remove bookmarks and bookmark folders from the bar.

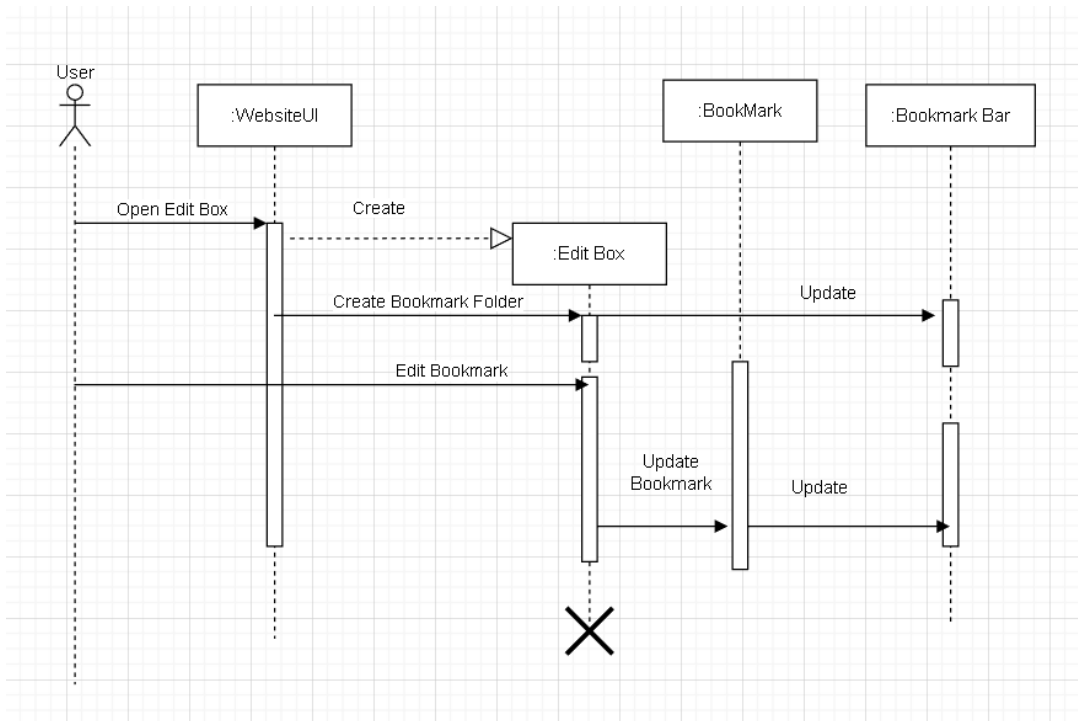
4 Modeling Requirements

Sequence Diagrams describe the interactions between the different objects in the system with each of the diagrams below describing a different use case. Each box represents an object or role, with the vertical line downwards representing the lifeline or the instance where the object exists. You can see as objects get created, they are put at lower levels which means they have been “alive” a shorter amount of time. Objects can also get destroyed which are represented by the ‘x’ at the bottom of a lifeline. The solid arrowed lines are function calls to different objects where the actions are performed. Each sequence starts with the User interacting with UI components, that then make and open objects to complete the following tasks.

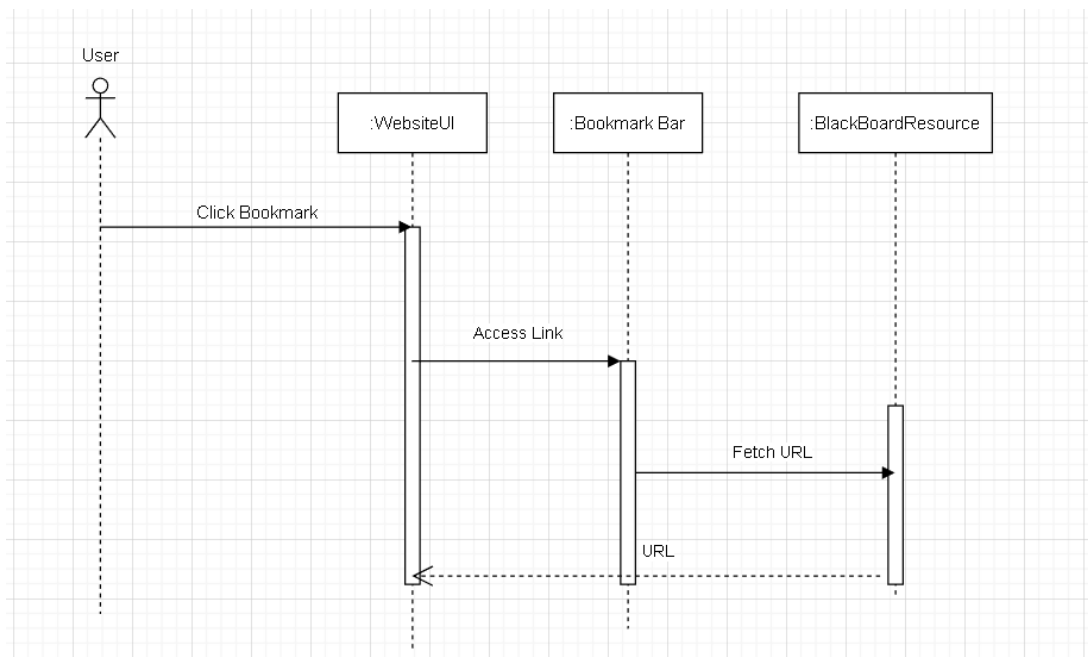
The user can open the Edit Box and create a Bookmark that will be added to the Bookmark Bar.



A user can open an edit box, which can create a Bookmark Folder, which will update in the Bookmark Bar. The user can also edit the Bookmark’s info, which will update the selected Bookmark and update the Bookmark Bar with those changes.

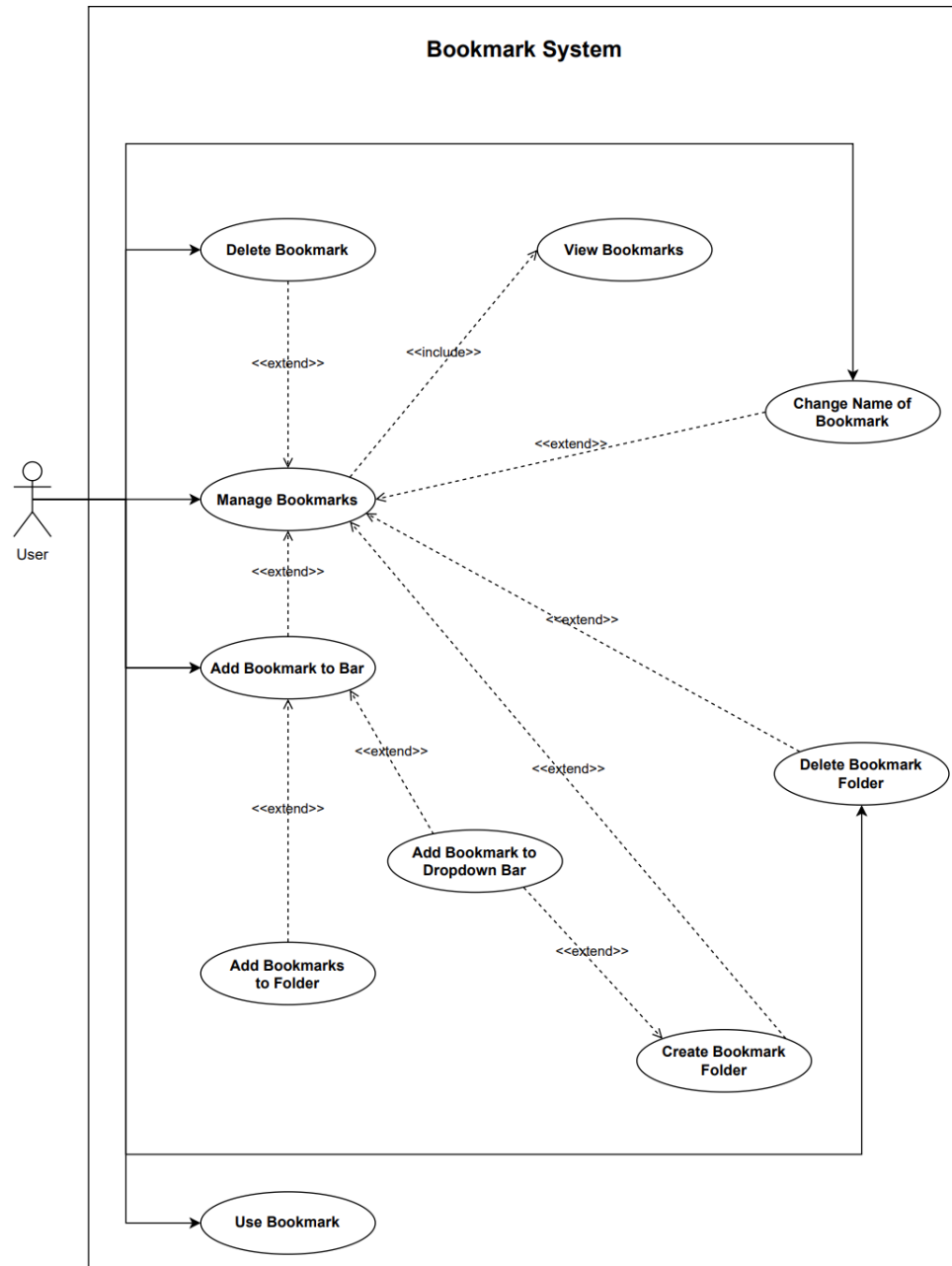


The user can click on a Bookmark in the Bookmark bar, which will redirect the user's page to the link of the BlackBoard Resource.



The UML Use Case Diagram describes the behavior of the software system. It focuses on the changing aspects of the system and how it works for each case of use.

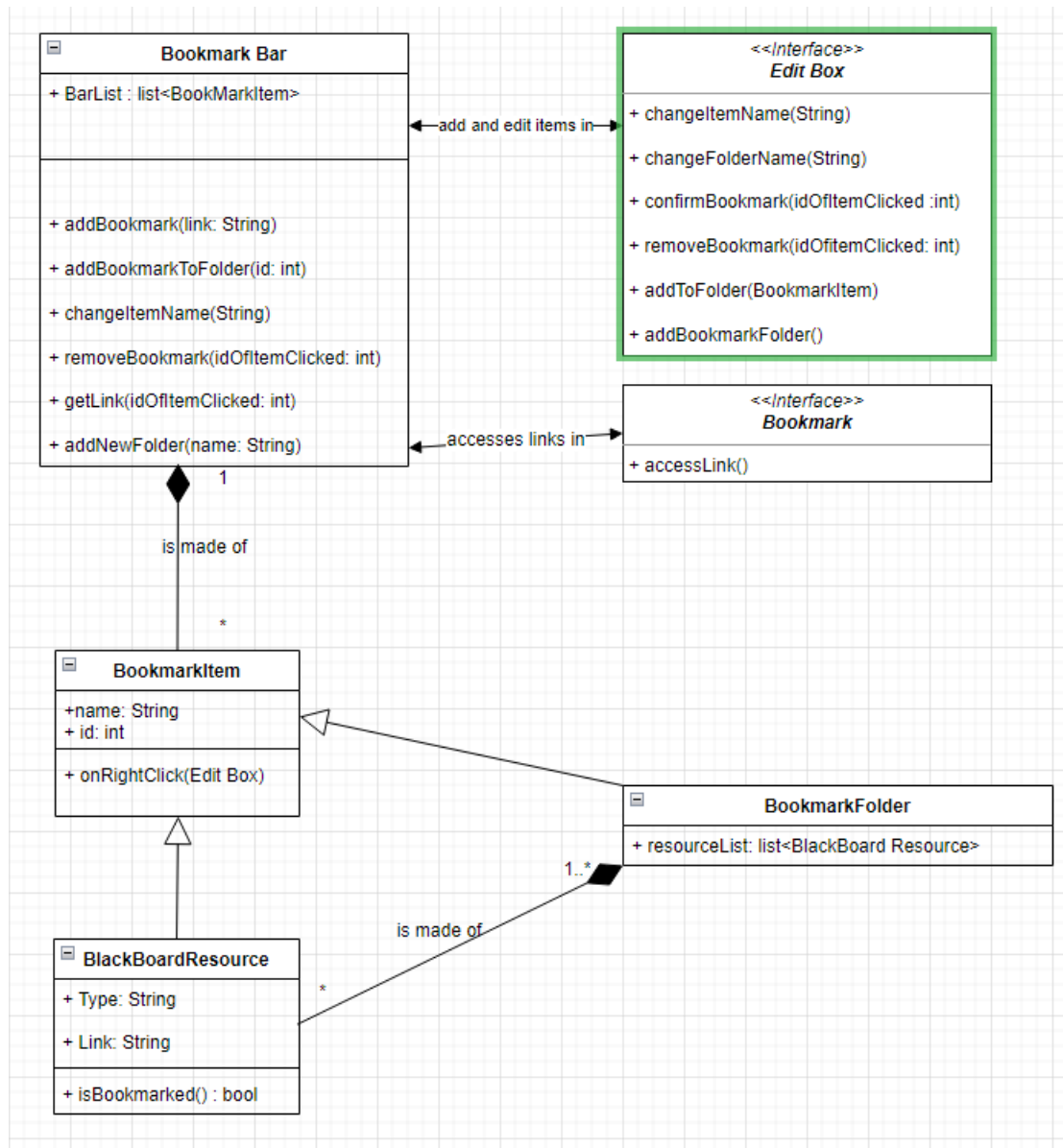
Refer to the diagram below to understand the notation described here. The diagram consists of actors important to how the system will work. In this case, there is only one actor, the user. The system boundary holds all the use cases designed for the system. The name of the system is at the top of the boundary. The actor will have arrows pointing to each case that it will be interacting with. Within the system boundary, multiple use cases are held in ovals. Every use case defines something that the user can change and do. Between certain use cases, there are multiple arrows that can be used as well. A line defined as “includes” means that the case being pointed to is a sub-goal that needs to be done. There are also “extends” arrows that can modify the original use case.



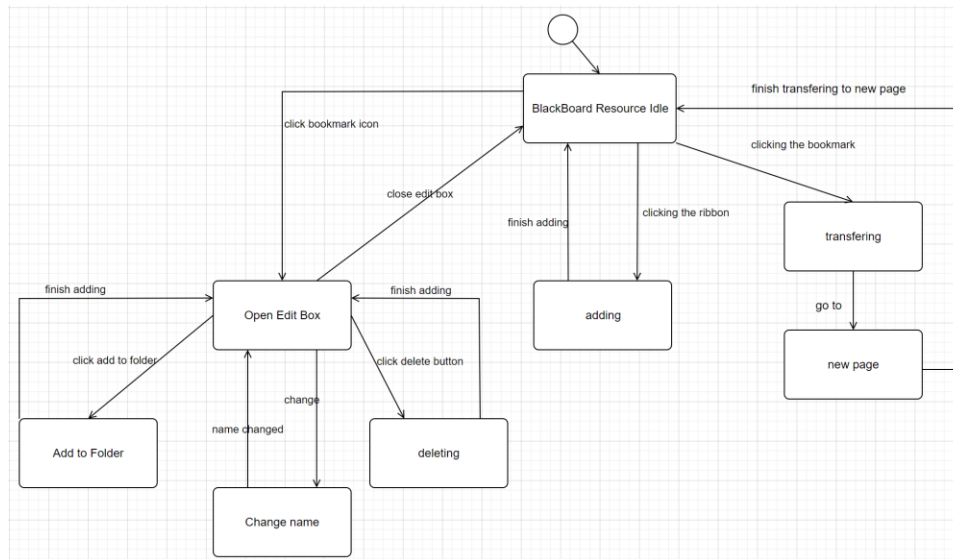
Use Case Name:	Manage Bookmark
Actors:	User
Description:	The user
Type:	Primary
Includes:	View Bookmarks
Extends:	Add Bookmarks to Bar, Delete Bookmark, View Bookmark, Delete Bookmark Folder, Create Bookmark Folder
Cross-refs:	
Uses cases:	

Moving past the Use-Case Diagram comes the Class Diagram. It is another UML Diagram that focuses on the relationships of the objects working within the system. The diagram below will be described here.

A class diagram consists of class cards that hold important information about each object. The class card has three sections, names, attributes, and methods. The object's name on the top section of the card defines what the object will be called. In the section directly underneath are the attributes. These define the object. Certain attributes are only visible to certain classes as well. The following notation is used to define the visualization for each attribute. Public attributes use a "+" while private attributes use a "-." Any protected attribute will use a "#" symbol which are attributes only visible to sub-classes. A package attribute is only visible to classes in the same namespace denoted with "~." Finally, a derived attribute "/" is one that is calculated from another class. The section below the attributes holds the methods for the class. These show what each class does and how they interact with the other ones. Each of the methods have the same delimiters as the attributes.



The UML State Diagram is a variation on finite automata. It represents the current state of the system when certain events occur. States have three actions that can occur. Entry occurs when transitioning into the state. Do is performed continuously while in the state. Exit occurs when transitioning out of the state.



5 Prototype

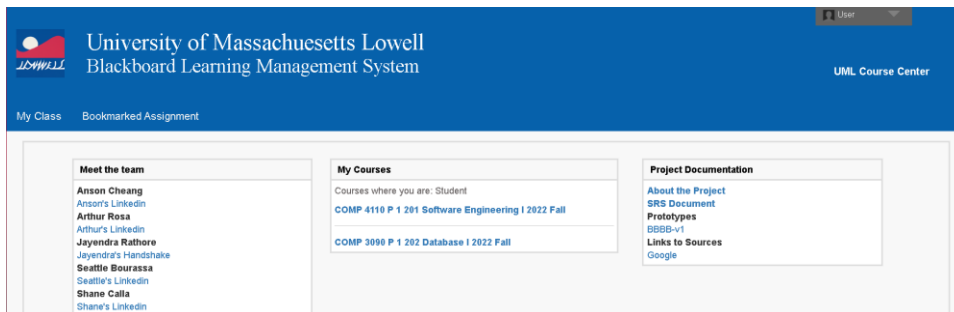
The prototype for the BBBB will show the defined area for the location of the bar in terms of the actual Blackboard website. The prototype is set up exactly like the normal site in terms of functionality with our added feature of the BBBB.

5.1 How to Run Prototype

The prototype runs better on the computer and looks better on full screen. The type of browser does not matter, and there are no plugins needed to run it. The constraint I can think of is that it takes GitHub a while to update the website to the newer version, and as such the version would sometimes be on an older version. The URL link to the website is <https://ansoncheang50.github.io/BlackboardBookmarkingBar-B-Cubed-Bar-/website%20skeleton/HTML/homepage.html>

5.2 Sample Scenarios

A student named Billy taking college courses wants to get to his Software Engineering I course page because there is an assignment he wants to submit. There are two ways he can access this assignment; first Billy clicks the Software Engineering I link to access its' course page.



Then Billy clicks on assignment link to access the assignment page, however, there is a faster way to get to the assignment page.

The top screenshot shows the Blackboard Learning Management System interface for the University of Massachusetts Lowell. The header includes the university logo, name, and 'Blackboard Learning Management System'. A user profile dropdown is visible in the top right. Below the header, there are navigation links for 'My Class' and 'Bookmarked Assignment'. The main content area is titled 'Home Page' and contains three items: 'Welcome to the gum zone', 'Assignment', and 'Extra Section: filler text'. The bottom screenshot shows the 'Assignment' page for the course 'COMP 4110 P 1 201 Software Engineering I 2022 Fall'. The page displays the due date 'Wednesday, November 30, 2022 1:00 PM', points possible '10000', and a description 'Finish the website skeleton. Due Wednesday, Nov 30 on Blackboard.' with links to 'Website.pdf' and 'WebsiteV1-Rubric.pdf'.

Billy can bookmark the assignment which will put the link to the assignment in the Blackboard Bookmark Bar.

A blue navigation bar with two white text links: 'My Class' and 'Bookmarked Assignment'.

Clicking this bookmark will redirect the page to the assignment page, no matter where you are in Blackboard

6 References

Blackboard, design of the website

W3schools, help with the code

- [1] D. Thakore and S. Biswas, "Routing with Persistent Link Modeling in Intermittently Connected Wireless Networks," Proceedings of IEEE Military Communication, Atlantic City, October 2005.

7 Point of Contact

For further information regarding this document and project, please contact **Prof. Daly** at the University of Massachusetts Lowell (james_daly@uml.edu). All materials in this document have been sanitized for proprietary data. The students and the instructor gratefully acknowledge the participation of our industrial collaborators.