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BOOKSTORE ORDER SYSTEM SYSTEM DESIGN DOCUMENT



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DEFINITIONS, ACRONYMS, AND ABBREVIATIONS

API: In computer programming, an **application programming interface (API)** is a set of subroutine definitions, protocols, and tools for building application software. In general terms, it is a set of clearly defined methods of communication between various software components. A good API makes it easier to develop a computer program by providing all the building blocks, which are then put together by the programmer. (en.wikipedia.org)

ERD: An **entity relationship diagram (ERD)** shows the relationships of entity sets stored in a database. An entity in this context is a component of data. In other words, ER diagrams illustrate the logical structure of databases. (<https://www.smartdraw.com/entity-relationship-diagram>)

HTTP: HTTP means HyperText Transfer Protocol. **HTTP** is the underlying protocol used by the World Wide Web and this protocol defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands. (webopedia.com)

IMAP4: Internet Message Access Protocol, version 4 is a more complex protocol, which provides more extensive functionality than is available through POP3. With **IMAP4**, clients can not only retrieve messages from a server, but they can also manipulate the remote message folders (or mailboxes) in which the messages are stored. (msdn.microsoft.com)

ISBN: The International Standard Book Number (**ISBN**) is a unique numeric commercial book identifier. An ISBN is assigned to each edition and variation (except reprintings) of a book. For example, an e-book, a paperback and a hardcover edition of the same book would each have a different ISBN. (en.wikipedia.org)

IT: Information Technology

MAX: Maximum

MIN: Minimum

POP3: **POP3** is a protocol for receiving email by downloading it to your computer from a mailbox on the server of an Internet service provider. (google dictionary)

SQL: **SQL** (pronounced "see-que-el") stands for Structured Query Language. SQL is used to communicate with a database. According to ANSI (American National Standards Institute), it is the standard language for relational database management systems. (sqlcourse.com)

UI: In information technology, the user interface (**UI**) is everything designed into an information device with which a person may interact. This can include display screens, keyboards, a mouse and the appearance of a desktop. It is also the way through which a user interacts with an application or a website.



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OVERVIEW

The Bookstore Order System is a web based application that will allow the college's faculty and bookstore staff, to view, approve, create, and process textbook orders. The application will also allow for the system administrator to create, modify, and remove user accounts and permissions. Both bookstore staff and college faculty members, will be provided a login by the system administrator, will be able to access different interface based on their approved access level. The current specs in this document is merely an interpretation of the actual application and is subject to change in content and visual aesthetic. During the development cycle of the application, the graphical interface and functionality may change in occurrence of specification changes and or enhancements. The purpose of this document is to provide the user with a visual representation of the proposed application.

SCENARIOS

To help with visualizing the concept of an application in development, it is good to exemplify how the application will work in real life scenarios. Here we have provided you two scenarios to look at.

Scenario I: Professor Guzmán

Professor Guzmán is a Lead Instructor at a very prominent local college. Professor Guzmán realizes that the Fall Semester is quickly approaching and that he needs to order new textbooks for the course he intends to instruct this year. Because he didn't like the textbooks that were used previously, he would like a quick and easy way to search for the book or books he thinks is appropriate for the course. The last ordering system he used seemed to take too much time to process a book order due to the fact he had to search for the textbooks in one place and then had to get the information and log in the system line by line manually. After hearing several complaints similar to Professor Guzmán, from other instructors, the school took notice and search for better solution. At the request of the purchasing department, the college decided to go with R2D2 Technologies *Bookstore Order System*. This allow Professor Guzmán and all other staff the ability to research the textbooks they want and just add the ISBN into the search field of there preferred book supplier and it will return all the information and populate it in an form to order. Now that the college is using the *Bookstore Order System*, the staff is able to save time processing orders, giving them more time to prepare their agendas for the semester.

Scenario II: Robyn

Robyn is a student in college. This is her third semester and she suffers from the anxiety of having to find out which textbooks are available for her classes this Fall. The bookstore system she's been know to use seem to have the information nested in their site and it takes a little bit of time find what your looking. But, to her surprise, Robyn realizes the college has a new place she can go to see which textbooks are available. She notice that the *Bookstore Order System*, is a very intuitive site that allow students to view which textbooks the instructors have chosen for the courses they are teaching each semester. Robyn enjoys the ability to be able to select the department directly from the home page and see all the textbooks needed for each course code for that semester. Because the information is so easily accessible, Robyn can now go to the bookstore knowing that she is purchasing the correct textbook. Saving her time, and in some cases, money, due to having to return books to get refunds or loosing money on none refundable ones.



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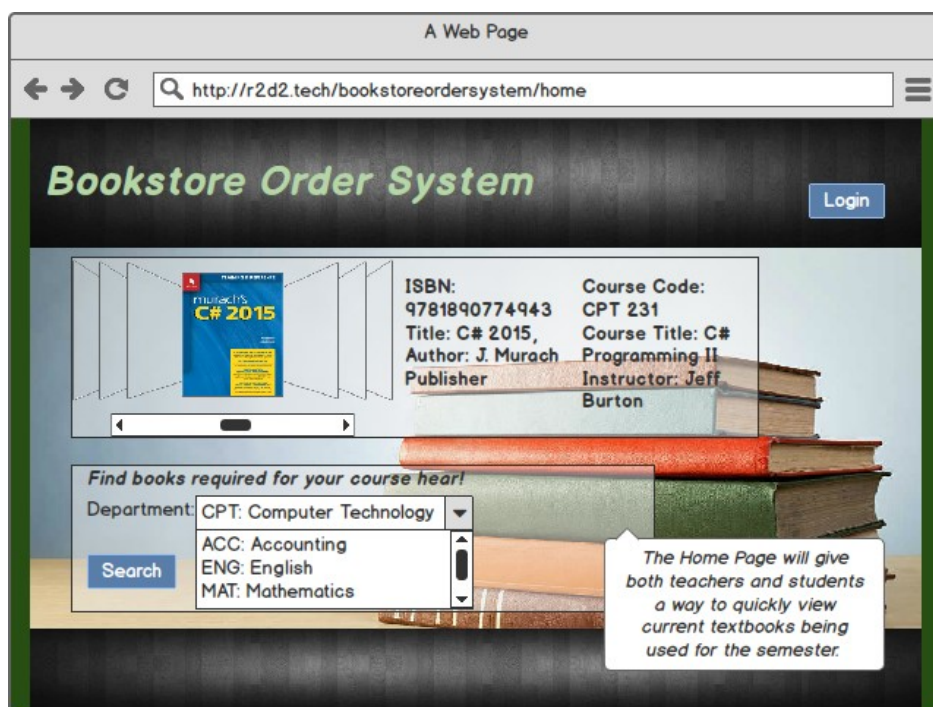
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SCREEN BY SCREEN SPECIFICATION

HOME PAGE

A JavaScript carousel control displays a few featured textbooks for the upcoming semester. The Home Page will provide a dropdown list with each department and their courses for the semester. The purpose of the **HOME PAGE** is to give students a quick access to allow them to see which books are required for their courses in the current semester. The page will provide the course code, the book name, ISBN, author, publisher, book cover, and course instructor. The page will also allow authorized users to access the login page.

Below is a representation of the **HOME PAGE**.



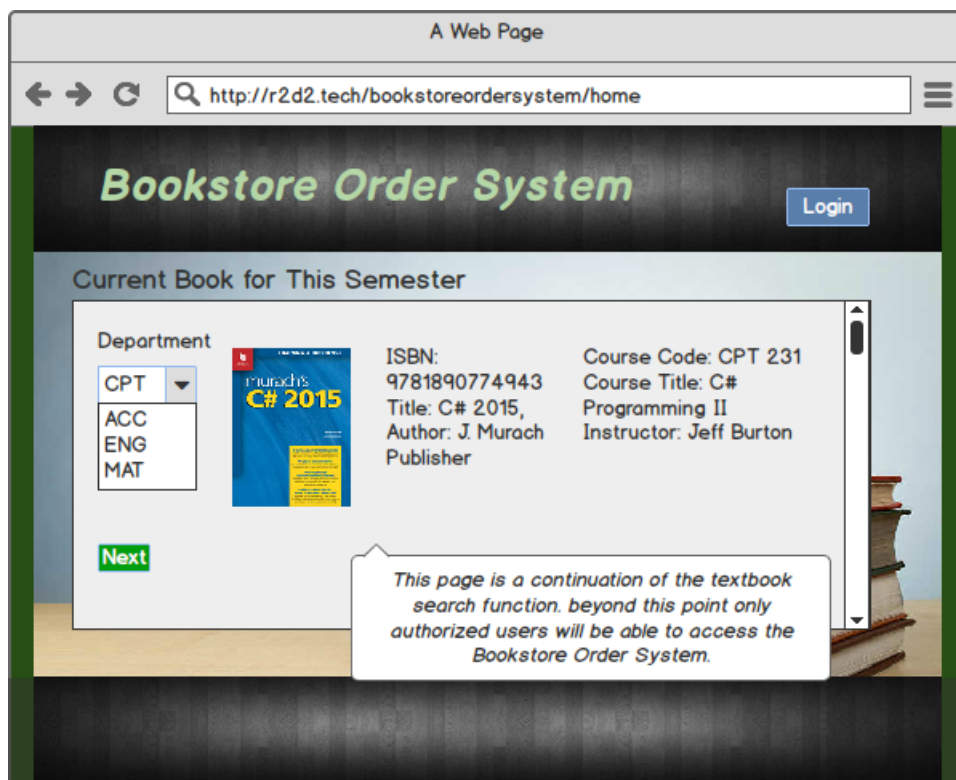
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SCREEN BY SCREEN SPECIFICATION

Below is a representation of a continuation of the **HOME PAGE**. The mock up below shows the view of what happens when the dropdown for a particular department is selected to view the course textbooks.



LOG IN FORM

The **LOG IN FORM** on the next page gives each authorized user a single place to access their account depending on their level of access. JavaScript in conjunction with PHP will provide security and input validation to make sure the user is inputting the correct values for the email, username, and password fields.



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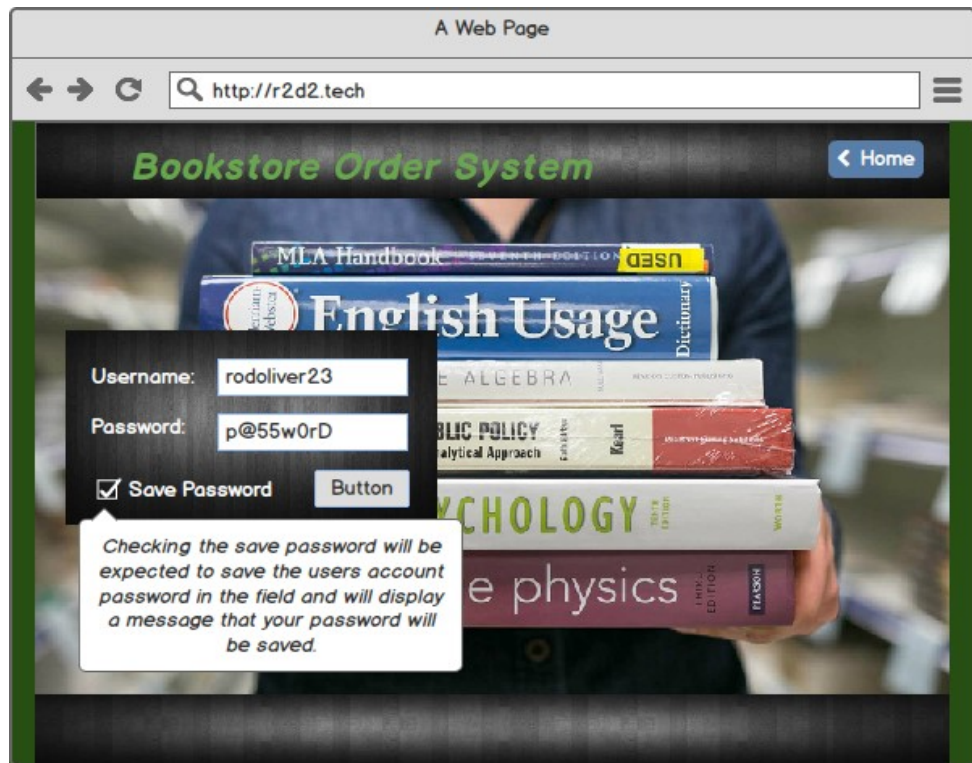


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SCREEN BY SCREEN SPECIFICATION

The **LOG IN FORM** mock up below includes an option for the user to save their password to the form.

LOG IN FORM



The next few mock ups represent the interface viewed by the **LEAD INSTRUCTOR, DEPARTMENT HEAD** and the **PROGRAM DIRECTOR**. These mock ups are very similar in appearance with the exception of the approval option. The mock ups display the functionality available to the users based on their access level. The **ORDER STATUS TAB** allows for step by step update of the status for current orders submitted by either of the three above users. The **PREVIOUS ORDER TAB** will allow each user to see the orders that were processed within the last 30 to 60 days. The next mock up in the line up is the **PENDING APPROVAL TAB**, which will allow the Department Head and the Program Director to approve and submit textbook orders created by the Lead Instructors, as well as, give them the ability to create orders themselves. The final tab to be displayed in this list is the **CREATE ORDERS TAB**. This tab allows for the **DEPARTMENT HEAD** and the **PROGRAM DIRECTOR** to create order and submit them to the bookstore for processing.



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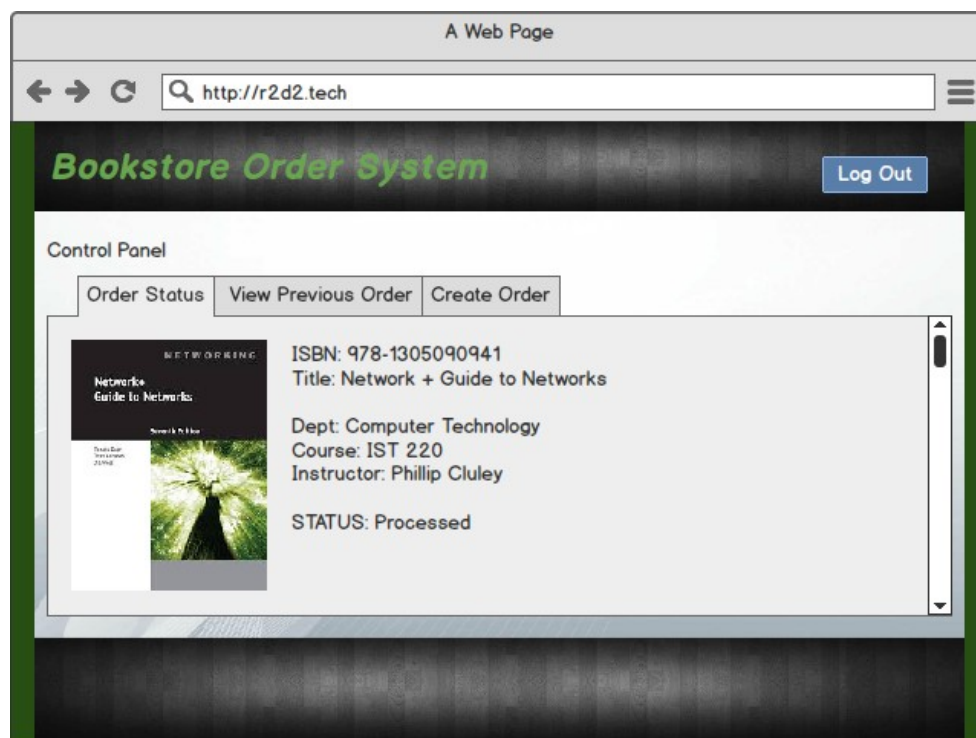


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SCREEN BY SCREEN SPECIFICATION

The **LEAD INSTRUCTOR'S ORDER STATUS TAB** mock up below, allows the user to view the status of all recently submitted orders.

ORDER STATUS TAB



The next tab to be viewed is the **PREVIOUS ORDERS TAB** which is visible in each user account. This gives each of the users the ability to view the status of order previously submitted.



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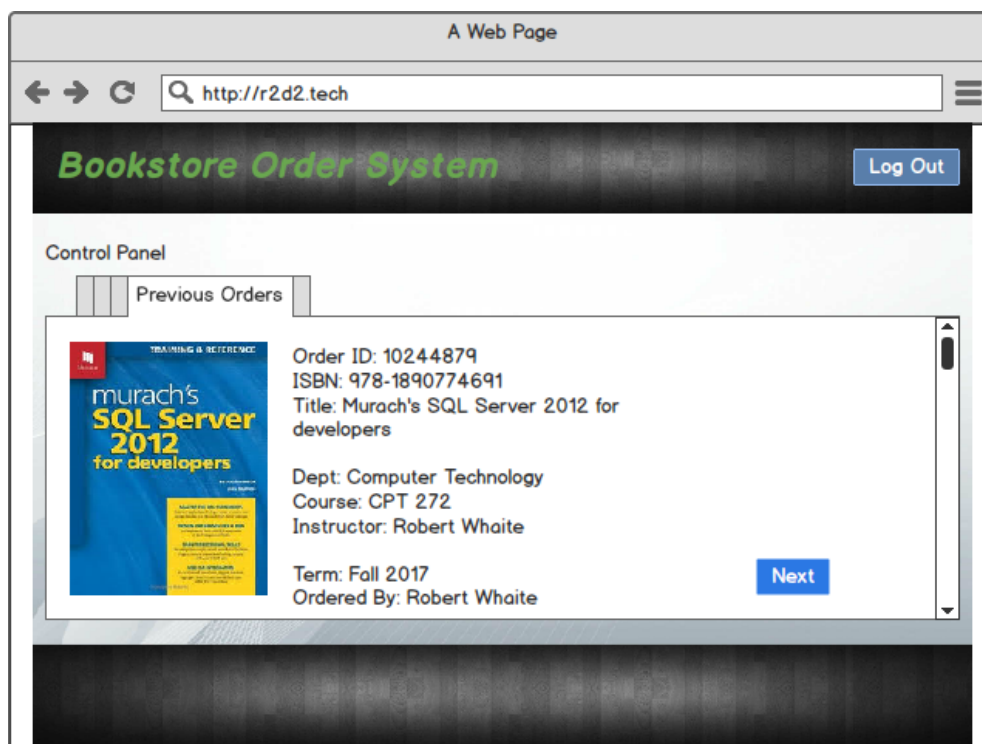


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SCREEN BY SCREEN SPECIFICATION

The **PREVIOUS ORDERS TAB** mock up below allows the user to view all orders previously submitted .

PREVIOUS ORDERS TAB



The next tab to be viewed is the **PENDING ORDERS TAB** which is visible in the **PROGRAM DIRECTOR**, and **DEPARTMENT HEAD'S** accounts. This function gives each of them the ability to approve or deny all textbook orders made by the **LEAD INSTRUCTORS**.



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SCREEN BY SCREEN SPECIFICATION

The **PROGRAM DIRECTOR** and **DEPARTMENT HEAD'S PENDING ORDERS TAB** mock up below allows the users to view recently submitted orders to approve, submit, or reject them as they see fit. All other tabs in regards to the interface for the two positions are identical to the tabs in the **LEAD INSTRUCTOR'S** interface.

PENDING ORDERS TAB

This page of the application will allow the Program Director or the Department Head, to approve or deny textbook orders submitted by the Lead Instructors, and allow them to create new orders to be sent to the bookstore for processing.

The next mock up in conjunction with the **PENDING ORDERS TAB**, is the **RECENTLY APPROVED TAB** in which the **PROGRAM DIRECTOR** and **DEPARTMENT HEAD** are able to review the orders they previously approved .



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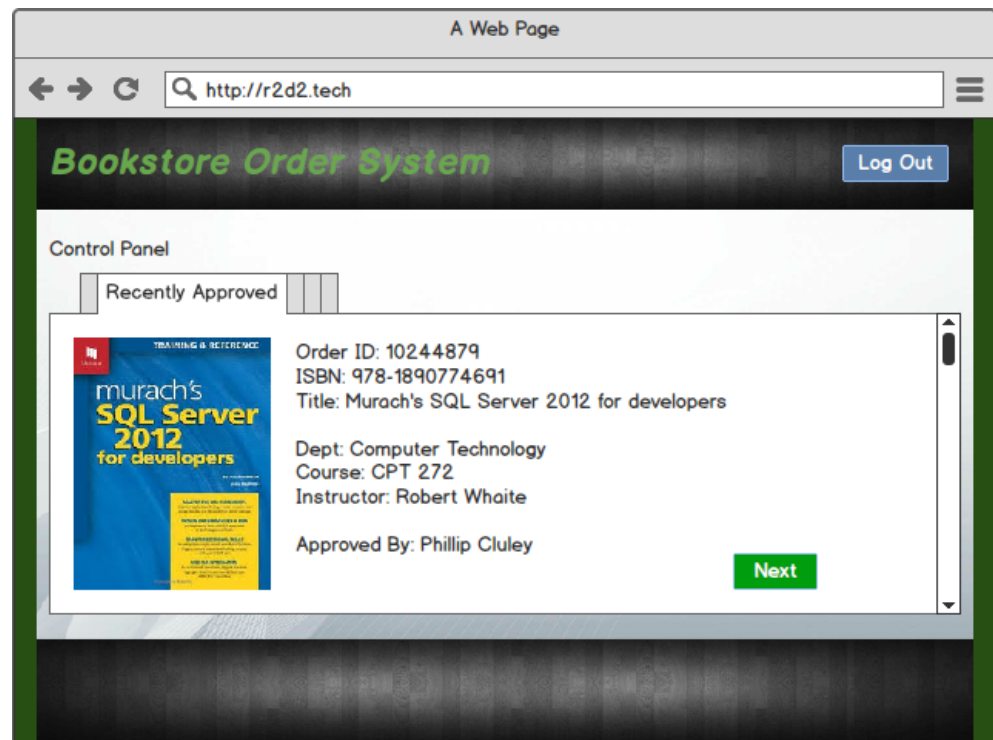


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SCREEN BY SCREEN SPECIFICATION

The mock up below is a representation of the **RECENTLY APPROVED TAB**, which **PROGRAM DIRECTOR**, and **DEPARTMENT HEAD** are able to see in their interface .

RECENTLY APPROVED TAB



The next mockup is the final mock up in the interface used by the **LEAD INSTRUCTORS**, **PROGRAM DIRECTOR**, and **DEPARTMENT HEAD** . The **CREATE ORDER TAB** allows each of the users above, the ability to create orders for textbooks which are then processed by the bookstore. The **PROGRAM DIRECTOR** and the **DEPARTMENT HEARD**, are the only users who can generate orders and submit them without a need for an approval. .



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SCREEN BY SCREEN SPECIFICATION

The mock up below is a representation of the **CREATE ORDER TAB**. This tab provides a form to be used by each user with the ability to create an order. This options will allow the users to type in the ISBN for the textbook to be ordered and an API with pull in all the information for the preferred textbook and auto fill the order form. This make for a faster ordering experience for each user .

CREATE ORDER TAB

A Web Page

← → ↻ 🔍 http://r2d2.tech

Bookstore Order System [Log Out](#)

Control Panel

☐☐☐☐ Create Order

Book Info	Order Info
ISBN <input type="text"/>	Term <input type="text"/>
Title <input type="text"/>	Course Code <input type="text"/>
Author <input type="text"/>	Campus <input type="text"/>
Edition <input type="text"/>	Course Start <input type="text"/> / /
Publisher <input type="text"/>	Submit



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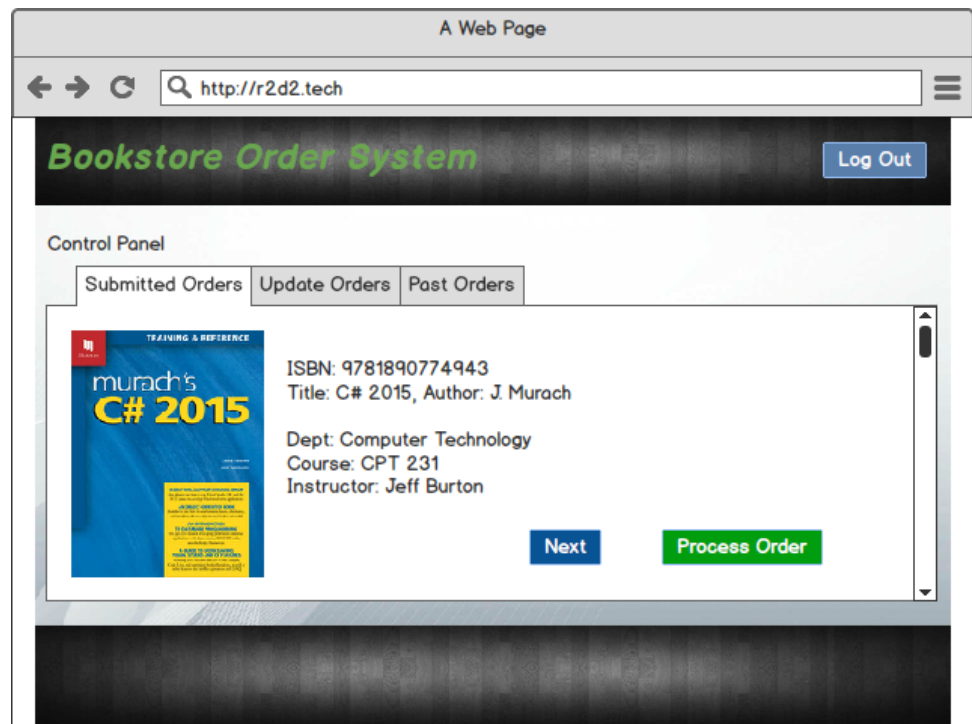


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SCREEN BY SCREEN SPECIFICATION

The next set of mock ups represent the **BOOKSTORE STAFF** interface. This interface allows bookstore employees to received the submitted orders from the **LEAD INSTRUCTOR, PROGRAM DIRECTOR, and DEPARTMENT HEAD**, and process the orders, automatically sending an email notification to the user group if the status of an order changes. The first mock up is of the interface the **BOOKSTORE STAFF** sees after logging in.

BOOKSTORE STAFF UI



In conjunction to the previous mockup, the next few interface mockups represent how the **BOOKSTORE STAFF** handles all order status updates, as well as, the re-ordering of textbooks from past order history. The first of the next two tabs is the **UPDATE ORDERS TAB**, which allows the **BOOKSTORE STAFF** to change the status of the textbook orders. This option is subject to change due to possibly automating the process.



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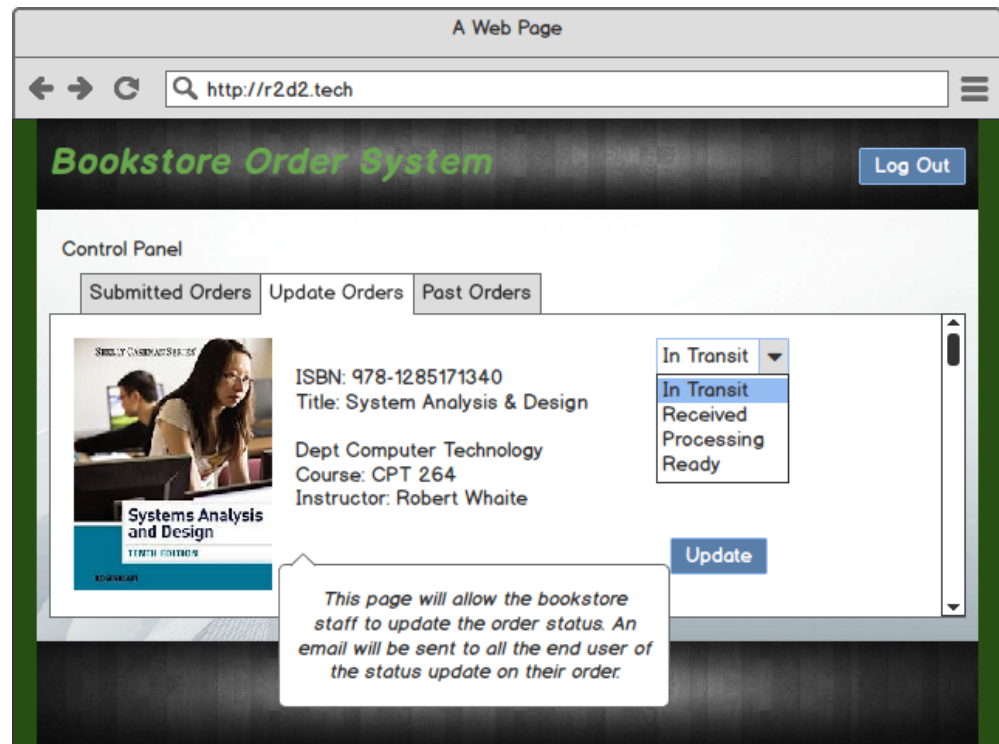


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SCREEN BY SCREEN SPECIFICATION

The mockup below is a representation of the **UPDATE ORDERS TAB** for the **BOOKSTORE STAFF**, and its options to choose a status update from a dropdown list.

UPDATE ORDERS TAB



This final mockup in reference to the **BOOKSTORE STAFF'S** interface, show a representation of the **PAST ORDER TAB** which allows the **BOOKSTORE STAFF** to look at past textbook orders and resubmit them. Though it is not represented in this mockup, the **BOOKSTORE STAFF** will be able to purge their system of any textbooks no longer used by the college.



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SCREEN BY SCREEN SPECIFICATION

The mockup below is a representation of the **PAST ORDERS TAB** for the **BOOKSTORE STAFF** and the options to chosen for status updates.

PAST ORDERS TAB

A Web Page

http://r2d2.tech

Bookstore Order System [Log Out](#)

Control Panel

Submitted Orders Update Orders Past Orders

Order N	Title	ISBN	Depar	Cour	Order	Approve
126895	System Analysis &	978-1285	CPT	CPT	R.Who	P.Cluley
102448	SQL Server 2012	978-1890	CPT	CPT	R.Who	P.Cluley
136489	PHP and MySQL	978-1890	CPT	CPT	B.San	B.Sand

[Re-Order](#)

The Past Orders feature will allow bookstore staff to reorder textbooks that were ordered in the past.



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SCREEN BY SCREEN SPECIFICATION

The final three mockups of the this document represent the **ADMINISTRATOR'S** interface. The first of the mockups exemplifies the **NEW USER SETUP TAB**, which creates the login and grants each user their access level to access the *Bookstore Order System*.

NEW USER SETUP TAB

The next mockup of the this document represent the **EDIT USER ACCOUNT TAB**. This tab allows the **ADMINISTRATOR** to edit user records.



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SCREEN BY SCREEN SPECIFICATION

The mockup below is a representation of the **EDIT USER ACCOUNT TAB** that give the **ADMINISTRATOR** the ability to search user records and reset passwords, change access levels, and remove user from the system.

EDIT USER ACCOUNT TAB

Bookstore Order System

New User Setup | **Edit User Account** | Reports

Search:

Name (job title)	Username	Access Level	<input type="checkbox"/>
Roderick Oliver\Program Director	rodoliver1	[admin]	<input type="checkbox"/>
Alicia Oliver\Bookstore Staff	allycat67	[user]	<input type="checkbox"/>
Jill Oliver\Instructor	chilljill26	[user]	<input type="checkbox"/>

Activate deactivate

This page of the interface is an example of how the Edit User will work. It will allow for a search to be done a users name and will return a user table that can be edited. This will allow for user password reset, edit user access level, and delete users.

The final two mockups are representations of the **USER ACCOUNT REPORTS TAB** which gives the **ADMINISTRATOR** the ability to query user records and to generate a user friendly report and which can be exported.



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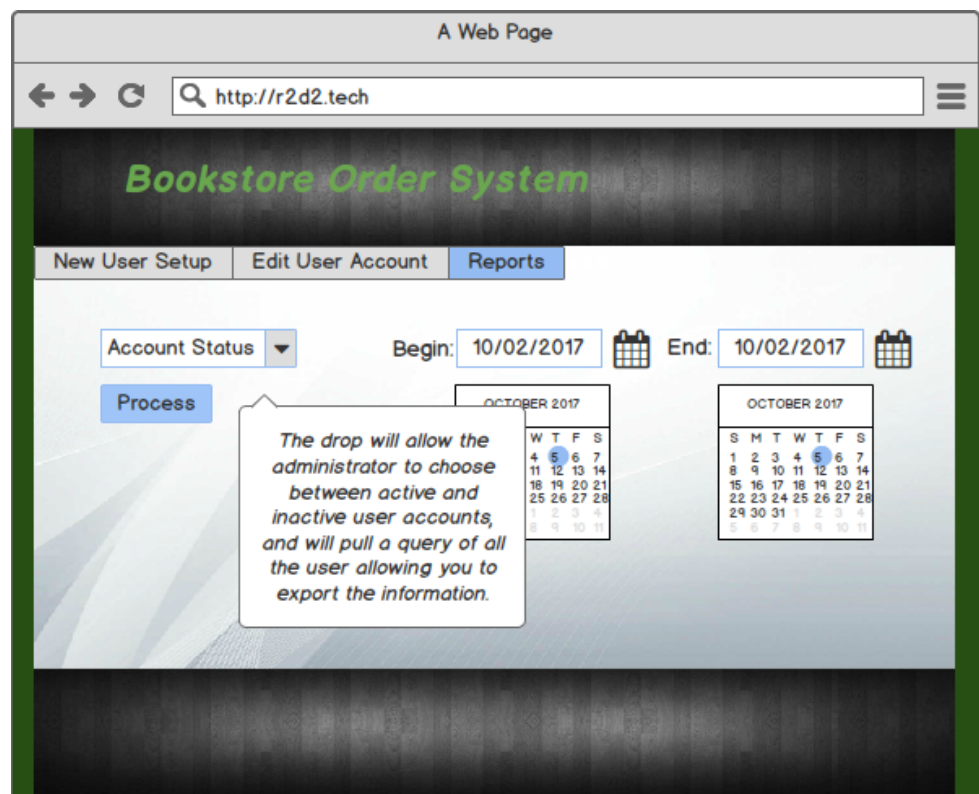


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SCREEN BY SCREEN SPECIFICATION

The mockup below is a exemplifies how the **USER ACCOUNT REPORTS** are generated by selecting the account status of the user accounts and the choosing the date range in the date picker to process all the user accounts that are active or inactive in the system.

USER ACCOUNT REPORTS



The final mockup of the **USER ACCOUNT REPORTS TAB** shows a more detail view of how the generated report will populate in the interface.



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SCREEN BY SCREEN SPECIFICATION

The mockup below is a displayed queried table of the user information in the **USER ACCOUNT** with all the user information. The is table can then be exported to a document such as an excel spread sheet. **Notice:** the queried table does not contain the user's passwords.

USER ACCOUNT REPORTS CONTINUED

Name (job title)	Username	Access Lev
Chad Nelson\Campus Director	nailsen74	[admin]
Alicia Oliver\Bookstore Staff	allycat67	[user]
Jill Paterra\Instructor	jill4u!	[user]
Adam Richardson\Department Hea	ar1617	[admin]

The remaining pages of this system design document consist of a more comprehensive breakdown of the project life cycle, including the project definition, its current status, a system context diagram, use cases, an application action list, a feasibility analysis, and the database **ERD**. This document is merely a visual expression of the application to be developed after proof of concept.

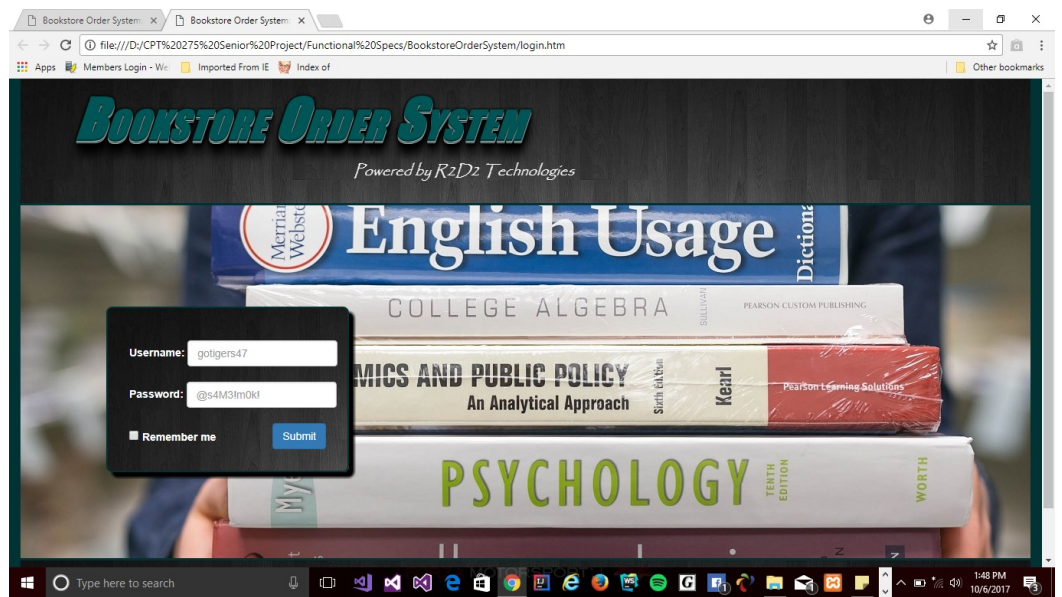
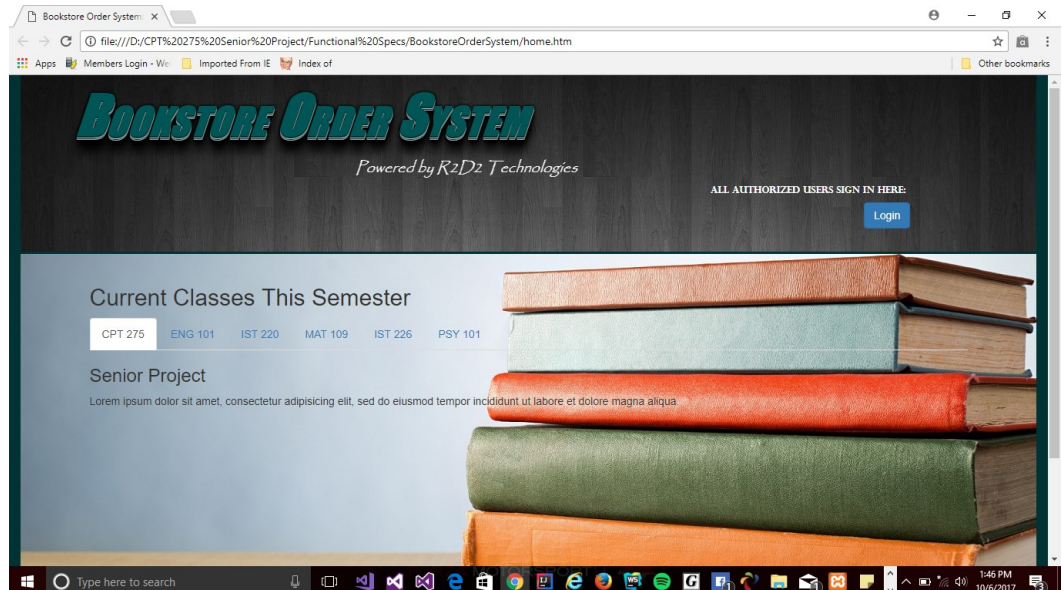


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PRE-PRODUCTION WEB PAGE EXAMPLES



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PROJECT DEFINITION

The Bookstore Order System is a database-driven web application designed to facilitate the book ordering process for members of the college's faculty. Staff members will be provided a login by the college's IT department; the provided logins will be used to access the site. The authentication will then set the role of the user based on their position at the college and enable or disable features accordingly. The main features of this application are the ability to view previous orders, view the status of current orders, and place an order – which includes both new orders and reorders. Other features include email notifications and order updating. Order updating will be handled by bookstore staff, who will also be provided with a login.

The development cycle for this project will consist of five phases: Documentation, Database Development, Application Development, Testing, and Finalization.

PHASE ONE, “Documentation,” will consist of organizing both the group and the ideas surrounding the project. This includes drafting functional specifications and system design specifications.

PHASE TWO, “Database Development,” will consist of creating and setting up the database. This will be a multi-stage phase, first beginning with an analysis of the system – a paper exercise in which the data will be sorted into tables, key relationships will be examined, and all data normalized. The next stage will be the creation of the database followed by testing.

PHASE THREE, “Application Development,” will consist of developing the user-interface and the functionality of its back-end.

PHASE FOUR, “Testing,” will run concurrently with the previous phase. It will, however, feature a ‘longer’ deadline as finding and fixing bugs on the nearly-complete application will shift to highest priority.

PHASE FIVE, “Finalization,” will consist of application review and further documentation. Documents that have changed, due to feature inclusion or feature exclusion, will be updated accordingly. Furthermore, this phase will include the creation of a user-guide and will be capped with a general review of how the project currently stands against what was requested. This phase will end with the submission of the project.

CURRENT SYSTEM

At this time, the system is currently in **Phase Three**. The team has submitted several required deliverables pertaining to the creation of the application. Task have been divided amongst team members for the project development, as we move into the interface development stage. At the beginning of this document, mock ups were provided as visual aids to the expected final design. The interface development is expected to be completed within a week to two weeks period. All other deliverables are expected to be completed the following weeks.



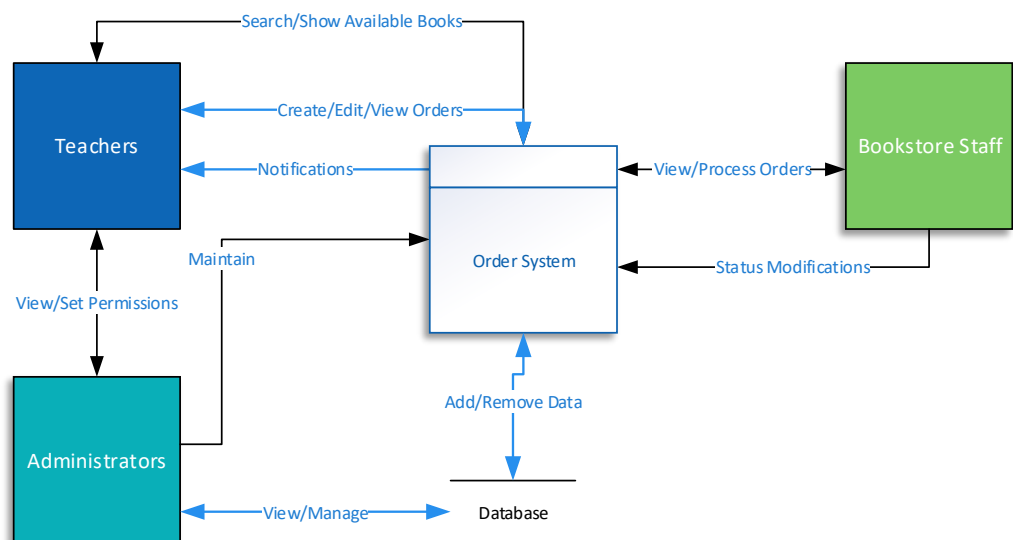
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SYSTEM CONTEXT DIAGRAM



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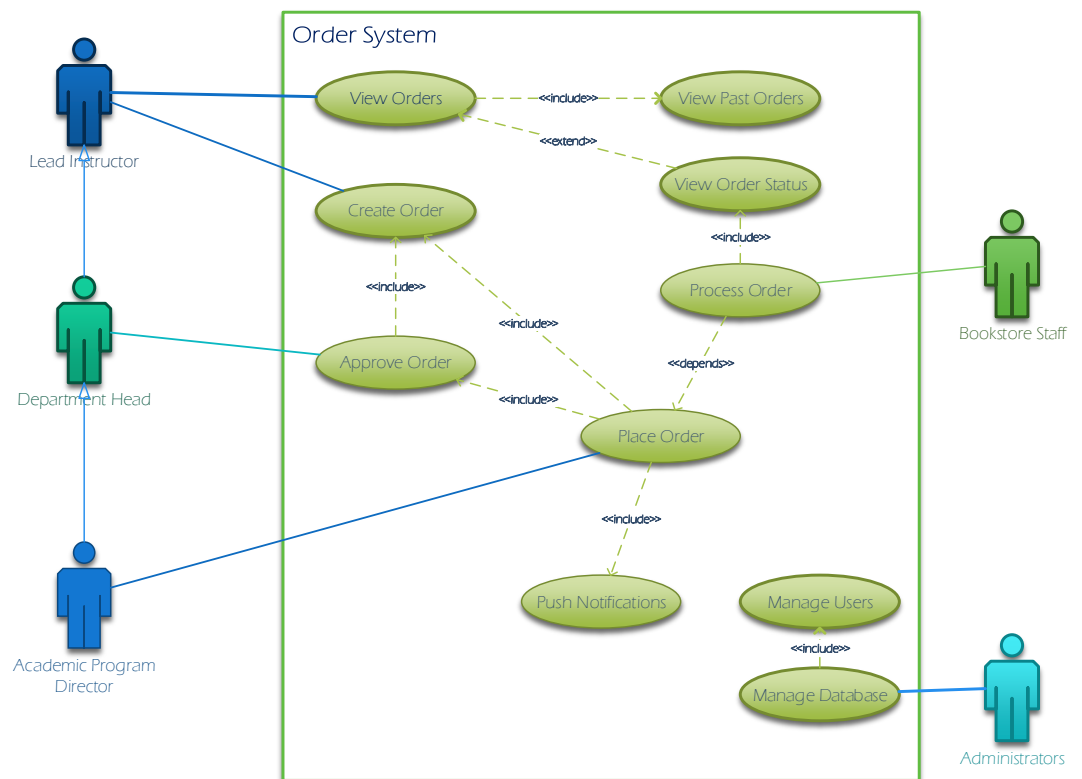
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USE CASES

Objective: Produce, view, process, and manage orders for the college bookstore.

Primary Actors: Lead Instructors, Program Director, Department Head, Bookstore Staff.

Use Case (a)



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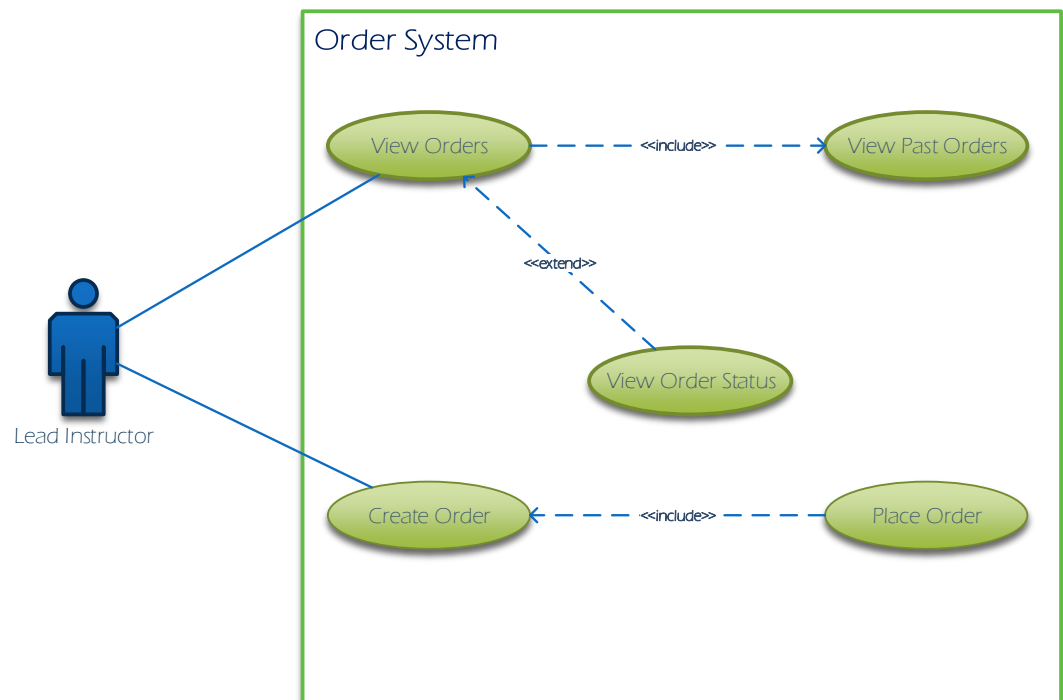


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Objective: View previous and create orders

Primary Actors: Lead Instructors

Use Case (b)



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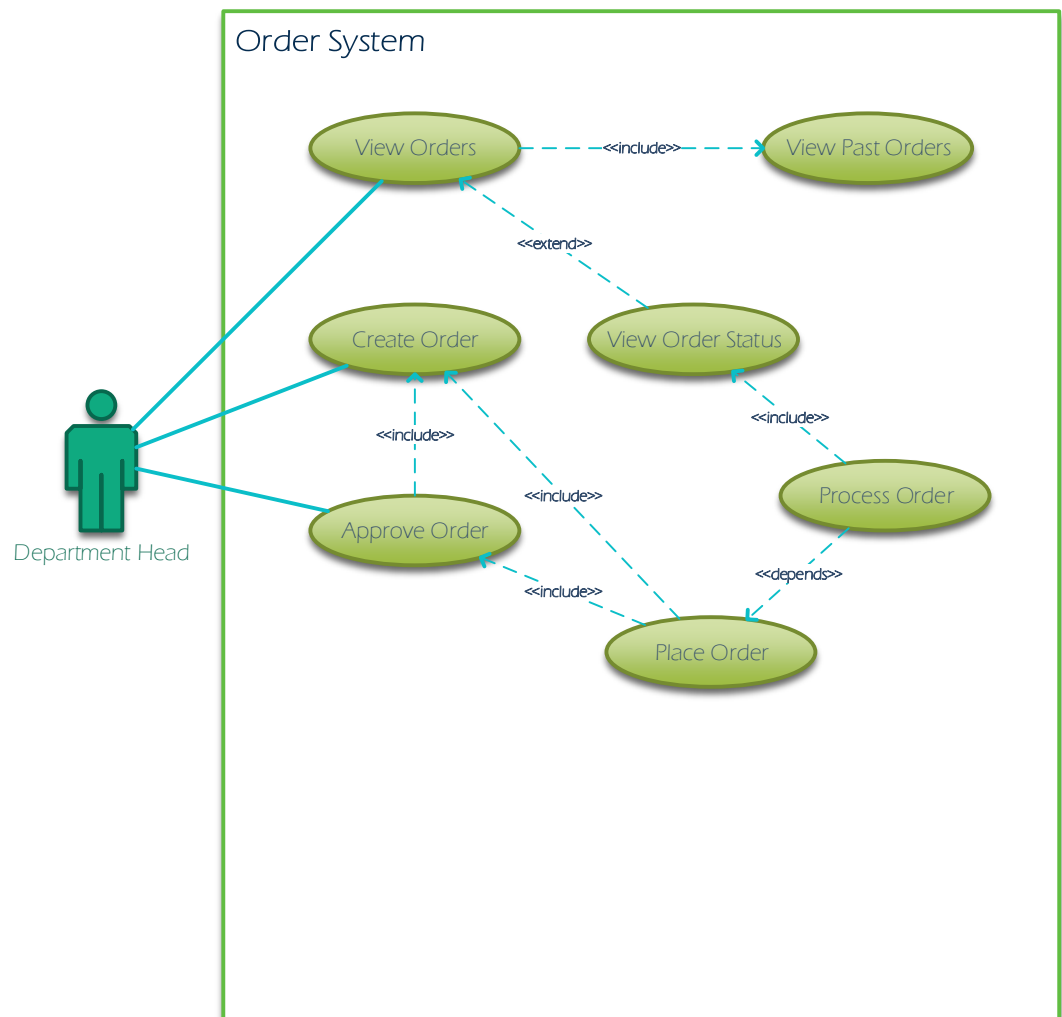


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Objective: View previous, create, approve, and place orders

Primary Actor: Department Head

Use Case (c)



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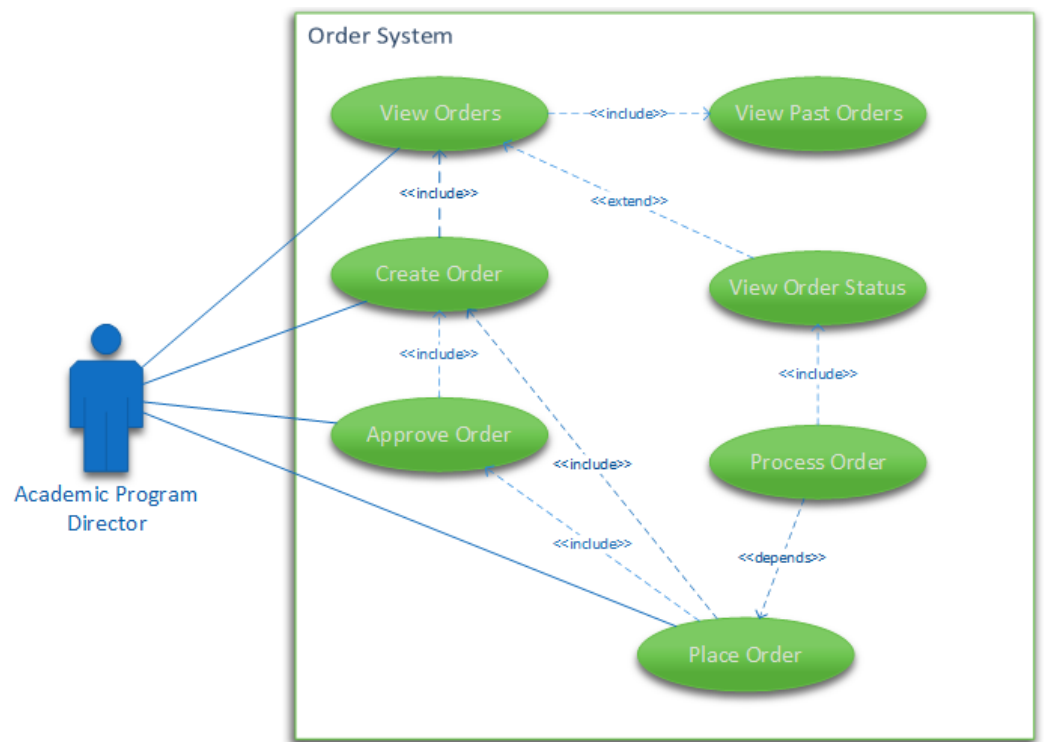


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Objective: View previous, create, approve, and place orders

Primary Actor: Academic Program Director

Use Case (d)



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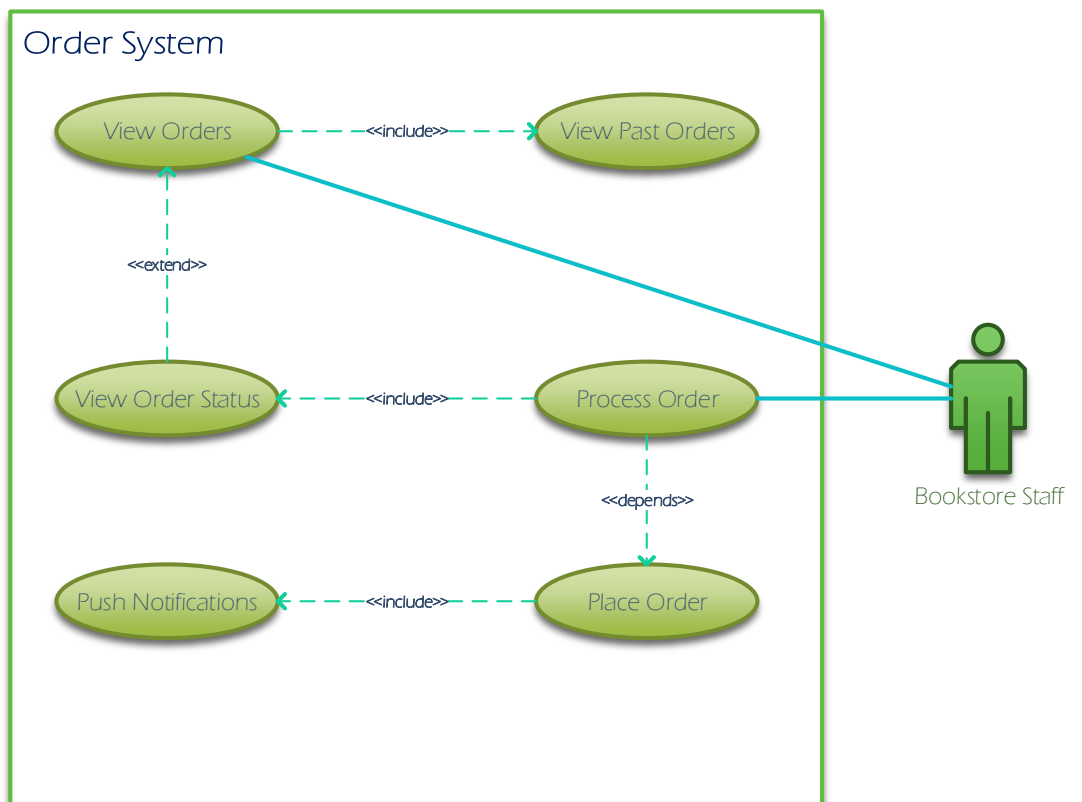


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Objective: View previous, view order status, and process orders

Primary Actors: Bookstore Staff

Use Case (e)



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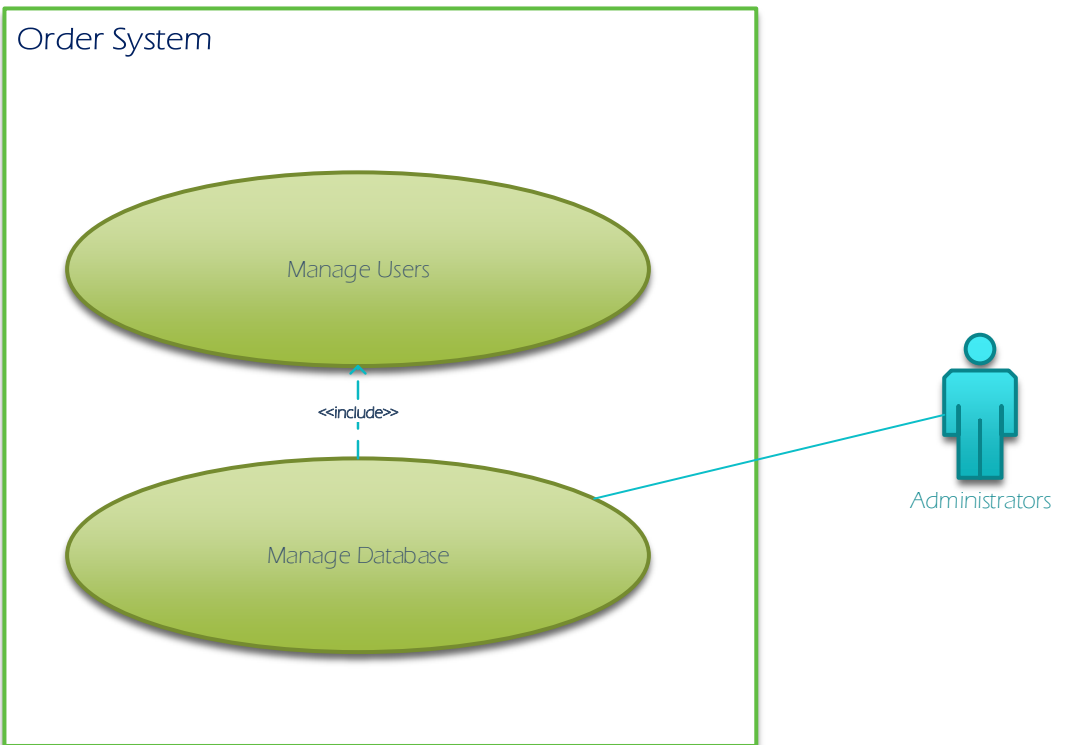


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Objective: Manage database and create user login account and access levels

Primary Actor: Administrator

Use Case (f)



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Use Case: Book Searches and Past Orders	
Actor	Teachers and Above.
Description	Describes the search process.
Successful Completion	<ol style="list-style-type: none"> 1. Actor requests a specific publication. 2. Software queries available suppliers for publication. 3. Query results are sorted and viewable.
Alternative	<ol style="list-style-type: none"> 1. Actor searches previously placed orders. 2. Available suppliers are queried for previously ordered publication. 3. Query results are sorted and viewable.
Precondition	None.
Postcondition	Availability is determined.
Assumptions	That access level has been assigned.

Use Case: Create Order	
Actor	Lead Instructor and Above.
Description	Creating an order request.
Successful Completion	<ol style="list-style-type: none"> 1. A search result is selected. 2. Course information, quantity, and additional comments are entered. 3. Order request is submitted.
Precondition	A search query or past order selection has been performed.
Postcondition	The order request begins an approval process.
Assumptions	That access level has been assigned.

Use Case: Approve Order	
Actor	Department Head or Academic Program Director.
Description	Approving an order.
Successful Completion	<ol style="list-style-type: none"> 1. The order request is reviewed. 2. Modifications to the order, if necessary, can be made. 3. Approve or deny order request.
Precondition	An order request.
Postcondition	Order moves to placement.
Assumptions	High access level.



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Use Case: Place Order	
Actor	Academic Program Director.
Description	Confirming a book order.
Successful Completion	<ol style="list-style-type: none"> 1. Approval process is complete. 2. Orders are placed.
Precondition	Approval process.
Postcondition	Order moves to processing.

Assumptions	Final step in selection.
--------------------	--------------------------

Use Case: Process Order and Change Order Status	
Actor	Bookstore Staff
Description	Initiating and processing book orders.
Successful Completion	<ol style="list-style-type: none"> 1. Book order is sent. 2. Order updates (confirmation, shipping, delivery) are noted. 3. Books arrive and are stocked.
Alternative	<ol style="list-style-type: none"> 1. Book order update requires action. 2. Order is modified, or removed. 3. Notifications are sent of changes.
Precondition	Successful or rescinded orders.
Postcondition	Books are stocked.
Assumptions	All previous steps successful.

Use Case: View Order Status	
Actor	All Relevant Users
Description	Viewing the status of a non-stocked order.
Successful Completion	User views order.
Precondition	Order is not yet stocked
Postcondition	None
Assumptions	Order exists in database.



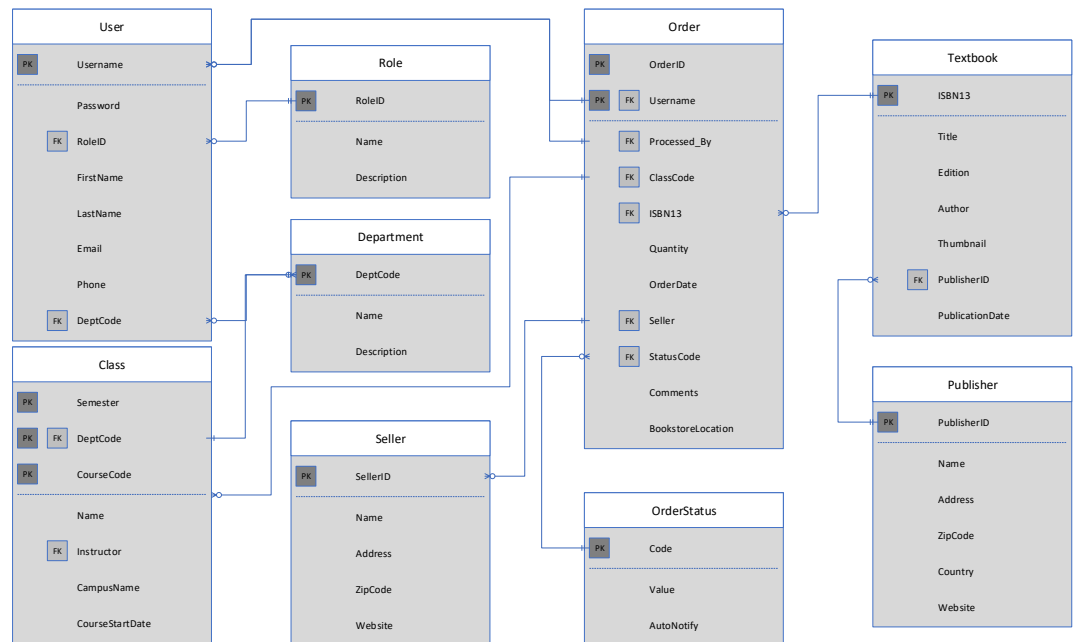
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BOOKSTORE ORDER SYSTEM ENTITY RELATIONSHIP DIAGRAM

ERD



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BOOKSTORE ORDER SYSTEM FUNCTIONAL SPECIFICATIONS

Appendices



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Appendix A: Task List

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TASK AND RESPONSIBILITIES

NAME	POSITION / FUNCTION
<i>Roderick Oliver</i>	Project Manger
<i>Daniel Greer</i>	Lead Database Architect/Analyst
<i>David Slama</i>	Database Architect/Analyst
<i>Ray Hill</i>	Lead UI Developer
<i>Roderick Oliver</i>	UI Developer
<i>Roderick Oliver</i>	Lead Application Developer
<i>David Slama</i>	Application Developer
<i>Ray Hill</i>	Technical Writer
<i>Roderick Oliver</i>	Technical Writer



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Appendix B: SDSSIC Chart

SYSTEM REQUIREMENTS

System Input: *The system must be able to accept all of the following but not limited to*

- ⇒ ISBNs
- ⇒ Semester Month/Year
- ⇒ Course Code
- ⇒ Course Start Date
- ⇒ Phone numbers
- ⇒ Email Addresses

Data Processing: *The system must be able to perform all of the following but not limited to*

- ⇒ Process SQL statement to search the data records
- ⇒ Modify database tables and records with product change
- ⇒ Compare time and date stamps for matching records
- ⇒ Compare Min/Max quantities for matching records
- ⇒ Backup and store all previous, current, and future data
- ⇒ Create itemized product reports
- ⇒ Email notifications

System Output: *The system must be able to produce the following output*

- ⇒ Emails and printable content
- ⇒ Book Title, Author, Edition, ISBN, Publisher, Semester, etc.
- ⇒ Semester, Course code, Campus Name, and bookstore location
- ⇒ Order date and order quantity
- ⇒ Email notifications for order approvals and order status

Storage & Backup: *The system must maintain the following data*

- ⇒ MySQL Server Database
- ⇒ Backup files stored

Interface Requirements: *The system must be accessible from the following but not limited to*

- ⇒ External system interfaces (desktop and laptop computers)



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Communications interfaces: *The system must be able to do the following but not limited to*

- ⇒ Transmit information via the network to the server using HTTP protocols
- ⇒ Send email over the network using POP3 or IMAP4 protocols
- ⇒ Process information from the user interface using SQL statements
- ⇒ Send to, and retrieve data, from external database via web APIs



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Appendix C: Feasibility Analysis

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Operational Feasibility:

The capabilities in which the Bookstore Order System will provide is an intuitive way for Greenville Technical College, bookstore to be able to catalog all textbooks ordered for previous, current, and future semesters. Giving the Lead Instructors, the Program Director, and the Department Head, more transparency and visibility of textbooks ordered for the program curriculum. The ability to use the application will take very little training and therefore should not interfere with any responsibilities the CPT may already be committed to.

Technical Feasibility:

The technical components for the Bookstore Order System include the using of a MySQL compatible server, a hosting domain with email protocols capabilities, the ability to send and receive emails. The CPT department currently are running servers that are currently compatible with MySQL and have email capabilities, and also have Microsoft Office O365, for retrieving emails and generated reports. Due to the college having met these requirements already, there should not be any constraints to prevent the application from working as it should.

Schedule Feasibility:

Due to the demanding timeframe in which this project has to be done, all the requirements associated and other deliverables for this project are to be, and have so far, been completed on-time. Because of the nature surrounding the project, the team is committed to assuring the delivery of a functioning completed application. The success of the project will express that the team is dedicated to providing a quality product and superb service.



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Team Sign-off,

David Slama

Ray Hill

Daniel Greer

Roderick Oliver



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