

SERAPHIM



E-Book Application System Integration (E.A.S.I.)

Preliminary Design

Prepared By:

Tyler Carpenter-Rivers, Document Analyst
Kevin Mango, Development Director
Lauren Mathews, Team Leader
Nicholas Roth, Database Manager
Daniel Street, Web Master

11/25/2014

Prepared For:

Ms. Jen Cannell	Questar III
Ms. J'aimé Pfeiffer	Capital Region BOCES

Table of Contents

Product Overview	2
Development Life Cycle	2
Environments	2
Development Environment	2
Operating Environment	4
Maintenance	4
Use Case Narratives	4
Student	4
Teacher	5
Administrator	5
UML Diagrams	6
Use Case Diagram	6
Use Case Diagram Legend	6
Use Case Diagram	6
Deployment Diagram	8
Deployment Diagram Legend	8
Deployment Diagram	9
Activity Diagram	9
Activity Diagram Legend	10
Login	10
Withdraw	11
Edit User Information	12
Add/Remove User	13
Add/Remove Book	14
Search Books	15
Remove Vendor	16
Add Vendor	17
Website Maps	18
Website Map Legend	18
Website Map	18
Data Flow Diagrams	19
Data Flow Legend	19

SERAPHIM

Context Diagram	19
Level 0 Diagram	20
Level 1 Diagrams	22
Withdraw	22
Add/Remove Vendor	22
Structure Diagram	23
Overview Structure	23
Student Structure	23
Teacher Structure	24
Administrator Structure	24
Requirements Inventory	24
Functional Requirements	25
Student	25
Teacher	25
Administrator	25
Non-Functional Requirements	26
Data Dictionary	26
Data Dictionary Legend	26
Data Dictionary	27
Prototype Screens	29
Access Screen	29
Main Page	33
Testing Plan	37
Overview	37
Exception Handling	37
Acceptance Test	38
Unit Tests and Test Cases	38
Directory	39
Login	40
Add Book	41
Appendices	42
Glossary of Terms	42
Project Timeline	42
Bibliography	43

Product Overview

Seraphim's clients, Ms. Jen Cannell and Ms. Jaime Pfeiffer, are in need of a single sign-on system for students to access and download e-books from their district's libraries. E-Book Application System Integration (E.A.S.I.) will be a web application capable of storing e-books from multiple vendors' sites and will act as a central repository for all e-books that the districts will have available. E.A.S.I. will be autonomous – as administrators update the site with new e-books and vendors, the system will automatically access the new content, granting E.A.S.I. service to students for years to come.

Development Life Cycle

Seraphim's Software Development Life Cycle, located to the right, describes the process Seraphim will go through in order to plan, create, test and eventually deploy E.A.S.I..

Requirement Analysis: Obtaining the client's needs.

Identification: Identify the client's needs.

System Design: Configure the blueprints of the system.

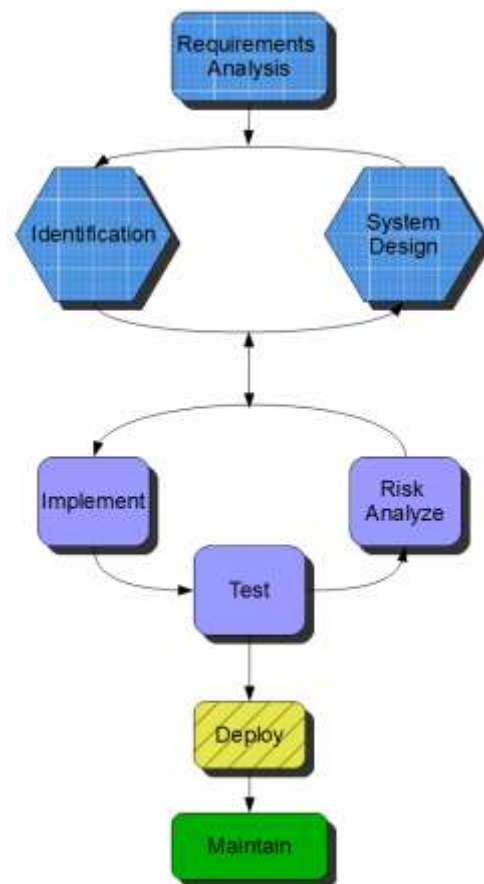
Implementation: Code and initiate the system requirements.

Testing: Confirm that the system meets established standards.

Risk Analysis: Determine criticality the system can perform.

Deploy: Bring the system to a live state.

Maintenance: Keep the system functioning once completed.



Environments

Seraphim will be using the following environments to create, test and complete the project.

Development Environment

The development environment listed below is the hardware and the software that Seraphim plans to use in producing the project:

Software Engineering Lab – Computer #1:

- Operating System: Windows 7 Enterprise (x64)
- Memory: 6100 MB
- Disk Space: 499.78 GB
- Processor: 3.20 GHz Intel Core i5-3470
- Relevant Software: Adobe, Google, Microsoft Office programs, Mozilla Firefox, Oracle, Audacity, SmartDraw, Eclipse

Software Engineering Lab – Computer #2:

- Operating System: Mac OS 10.7.5
- Processor: Intel Core i5
- Memory: 4 GB Ram
- Speed: 2.5 GHz
- Relevant Software: iMovie, iPhoto, Photo Booth, Safari

Server:

- Operating System: CentOS 5.2, Kernal 2.6.18-92e15
- Server Name: oraserv.cs.siena.edu
- CPU Type: Intel Xeon 2.66 GHz
- Memory: 8GB Memory

Ms. Mathews' Development Environment:

- Operating System: Microsoft Windows 7 Home Premium
- Processor: Intel® Core™ i7-3610QM CPU @ 2.30Hz 2.30 GHz
- Memory: 8.00 GM
- Relevant Software: Adobe Reader X, BlueJ, caliber, Eclipse, GIMP, Git Bash, Google Chrome, Google Drive, HTML-Kit, Mozilla Firefox, Notepad++, Putty, Skype, SQL Server Management Studio, WinSCP

Mr. Mango's Development Environment:

- Operating System: MS Windows 7 Home Premium 64-bit SP1
- Processor: Intel Core i7 720QM
- Speed: 1.60GHz
- Memory: 8.0GB Dual-Channel DDR3 @ 659MHz
- Audio: NVIDIA High Definition Audio
- Monitor: Vizio 42" Internet TV
- Relevant Software: Aptana, Eclipse, GIMP, Audacity, Notepad++, Google Chrome, Mozilla Firefox, Opera web browser, Android 4.4.2 on Samsung galaxy s3

Mr. Street's Development Environment:

- Operating System: Windows 7 Home Premium 64-bit
- Processor: Intel(R) Core(TM) i7-2600 CPU @ 3.40 GHz
- Memory: 8192 MB RAM
- Display: NVIDIA GeForce GTX 550 Ti
- Audio: Dual Speakers IDT High Definition Audio

SERAPHIM

- Monitor: 23" Cross Width High Definition Video
- Relevant Software: Eclipse

Mr. Roth's Development Environment:

- Operating System: MS Windows 7 Home Premium 64-bit SP1
- Processor: Intel Core i7 2675QM
- Speed: 2.20GHz
- Memory: 8.0GB RAM
- Audio: Intel ® Display Audio
- Relevant Software: Audacity, Notepad++, Google Chrome, Mozilla Firefox, Microsoft Office 2007, Adobe Reader, PageBreeze 5

Mr. Carpenter-River's Development Environment:

- Operating System: Windows 7 Home Premium Service Pack 1
- Processor: Intel i5-3317U - 20 GB SSD in cache
- Memory: 6 GB
- Speed: 1.70 GHz
- Audio: Dolby Home Theater v4
- Monitor: Generic PnP Monitor - Intel(R) HD Graphics 4000
- Relevant Software: Eclipse, Notepad++, Google Chrome, Firefox, Skype

Operating Environment

The operating environment for this software will be any Mac, PC or smartphone that has internet capability and access our server.

Maintenance

The maintenance environment will consist of all hardware and software used to create our software (to be determined by the client).

Use Case Narratives

Use Case Narratives are used to describe the processes that each user type can activate when navigating throughout the system. Seraphim will have the following user types to access E.A.S.I.: Student, Teacher and Administrator.

Student

The Student will log into E.A.S.I. using a district, username and password, and will only be allowed access into the system if providing the right credentials. The Student will have access to all the books available to the Student's district and level. The Student has the ability to view the books as Genres, Subjects, and Levels or as a unique search. Each of these options will display the e-books found in the corresponding categories. The Student can search by title, author or ISBN-13, or use the advanced search to find e-books across categories and file types. The Student can access their account, which will display the Student's first and last name, user type, district, and history of the e-books viewed or downloaded. The Student will have the option to log out, or will be automatically logged out after being inactive for five minutes.

Teacher

The Teacher has access to all processes that a Student does:

The Student will log into E.A.S.I. using a district, username and password, and will only be allowed access into the system if providing the right credentials. The Student will have access to all the books available to the Student's district and level. The Student has the ability to view the books as Genres, Subjects, and Levels or as a unique search. Each of these options will display the e-books found in the corresponding categories. The Student can search by title, author or ISBN-13, or use the advanced search to find e-books across categories and file types. The Student can access their account, which will display the Student's first and last name, user type, district, and history of the e-books viewed or downloaded. The Student will have the option to log out, or will be automatically logged out after being inactive for five minutes.

The Teacher has access to all books available in the Teacher's district, regardless of level. The Teacher has access to a level known as "Education", which has teaching e-books. The Teacher has the ability to edit Student accounts, either by individually adding or removing accounts, changing their level of access, or adjusting individually which e-books a Student has access to.

Administrator

The Administrator has access to all processes that a Student does:

The Student will log into E.A.S.I. using a district, username and password, and will only be allowed access into the system if providing the right credentials. The Student will have access to all the books available to the Student's district and level. The Student has the ability to view the books as Genres, Subjects, and Levels or as a unique search. Each of these options will display the e-books found in the corresponding categories. The Student can search by title, author or ISBN-13, or use the advanced search to find e-books across categories and file types. The Student can access their account, which will display the Student's first and last name, user type, district, and history of the e-books viewed or downloaded. The Student will have the option to log out, or will be automatically logged out after being inactive for five minutes.

The Administrator has access to all processes that a Teacher does:

The Teacher has access to all books available in the Teacher's district, regardless of level. The Teacher has access to a level known as "Education", which has teaching e-books. The Teacher has the ability to edit Student accounts, either by individually adding or removing accounts, changing their level of access, or adjusting individually which e-books a Student has access to.

The Administrator has access to a suite of tools accessible from the "My Account" page: "User Types", "Vendors", and "Books". The Administrator, clicking the "Edit Accounts", will allow them to find a Student, Teacher or Administrator and change their information. Changing their information could mean: adding or removing a Student, Teacher or Administrator, changing which districts a Student or Teacher is associated with, etc. The Administrator, accessing "Vendors", will access a page of all vendor sites currently in the system, their corresponding

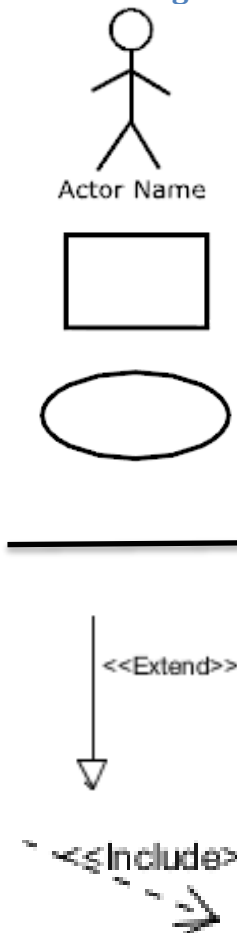
credentials, and the ability to add, remove or update a vendor site's information. The Administrator, viewing "Books", will have the ability to find e-books brought into the system from the vendor sites and change the information attached to the e-books. This information includes: the district it's available to, the description, the Subject, the Genre, or the Level. The Administrator may choose to remove individual books from the system.

UML Diagrams

Use Case Diagram

The idea of a UML Use Case diagram is to display the full functionality of the system in a visual manner. It shows the relationship between each of the user case narratives and the activities on which they will partake onto the system. It also displays the actions that the system will participate in without the user initiating the action.

Use Case Diagram Legend



Actor: Actors (human or non-human) interact with the system. Human actors will be found on the left side of the System Boundary, while non-human actors will go on the right side. Each actor name will be displayed below the actor icon, and will be attached to one or more actions found within the System Boundary.

System Boundary: Contains all actions an Actor is capable of performing within the system.

Scenarios/Uses: The actions (or activities) that will occur within the system, and often are used to show how actors interact with the system. These actions may also show system-initiated actions, without the need for users to activate them.

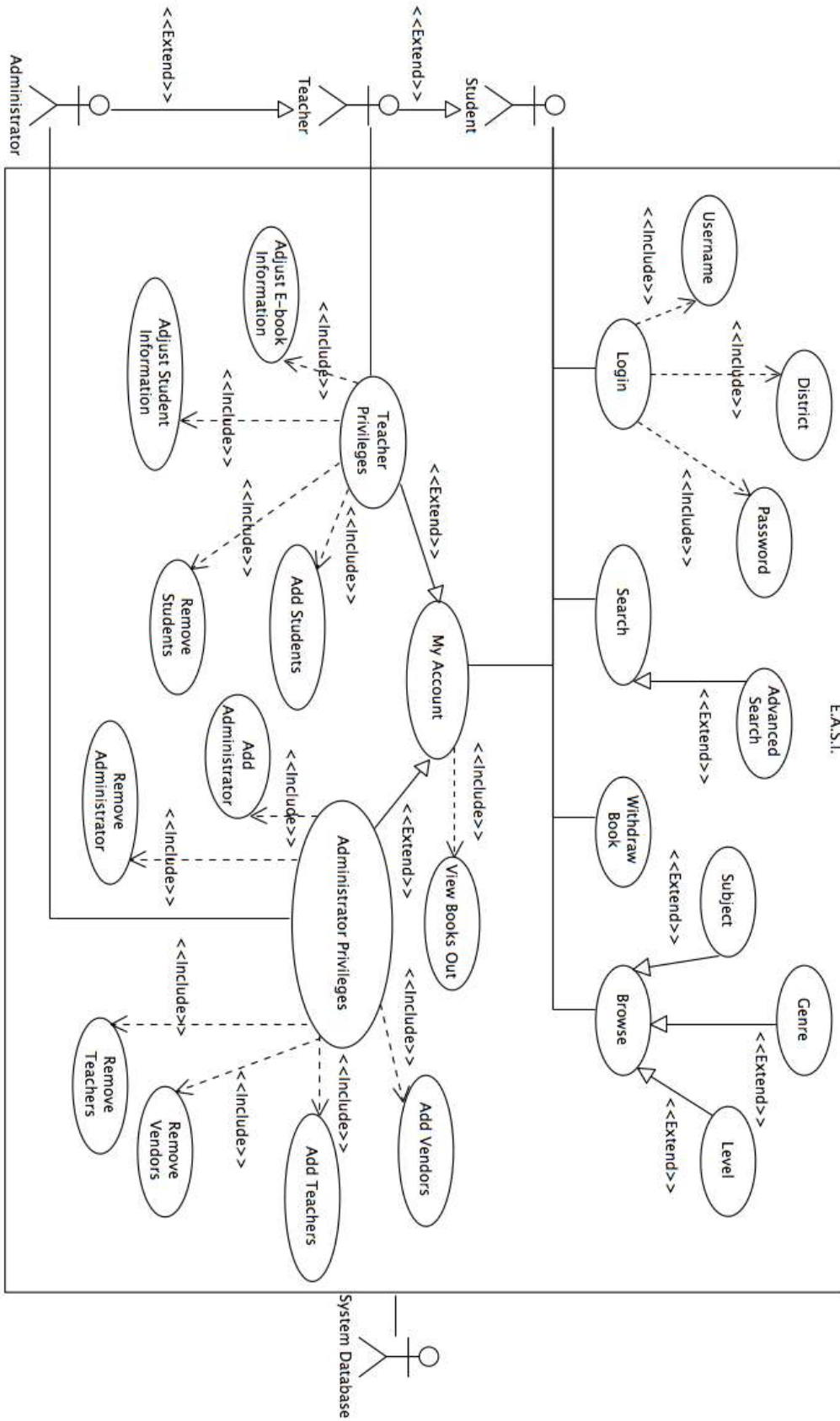
Participation Line: The Participation Line will connect actors with their appropriate use cases, showing which uses the actor will be participating in.

Extend Relationship: Is a "Is-A" relationship, where the object is expanding on its parent's domain. For example, Advanced Search Is-A Search and Teacher Privileges Is-A My Account.

Include Relationship: Is a "Has-A" relationship, where the object is always included in its parent. For example, Login Has-A Username, District and Password.

Use Case Diagram

The next page shows the E.A.S.I. system as represented in a UML Use Case Diagram, using the legend above.



Deployment Diagram

The deployment diagram displays the physical layout of the system and its components.

Deployment Diagram Legend



System Boundary: All objects within the system boundary are considered part of the system, while those outside of it are not. The system boundary will show interactions between the system and the outside components.



Connection: Displays the flow of information between objects.

<HTTP>

HTTP: Hypertext Transfer Protocol (HTTP) describes the format of the messages (packets) being transferred between objects and the actions servers will take when activating various commands.

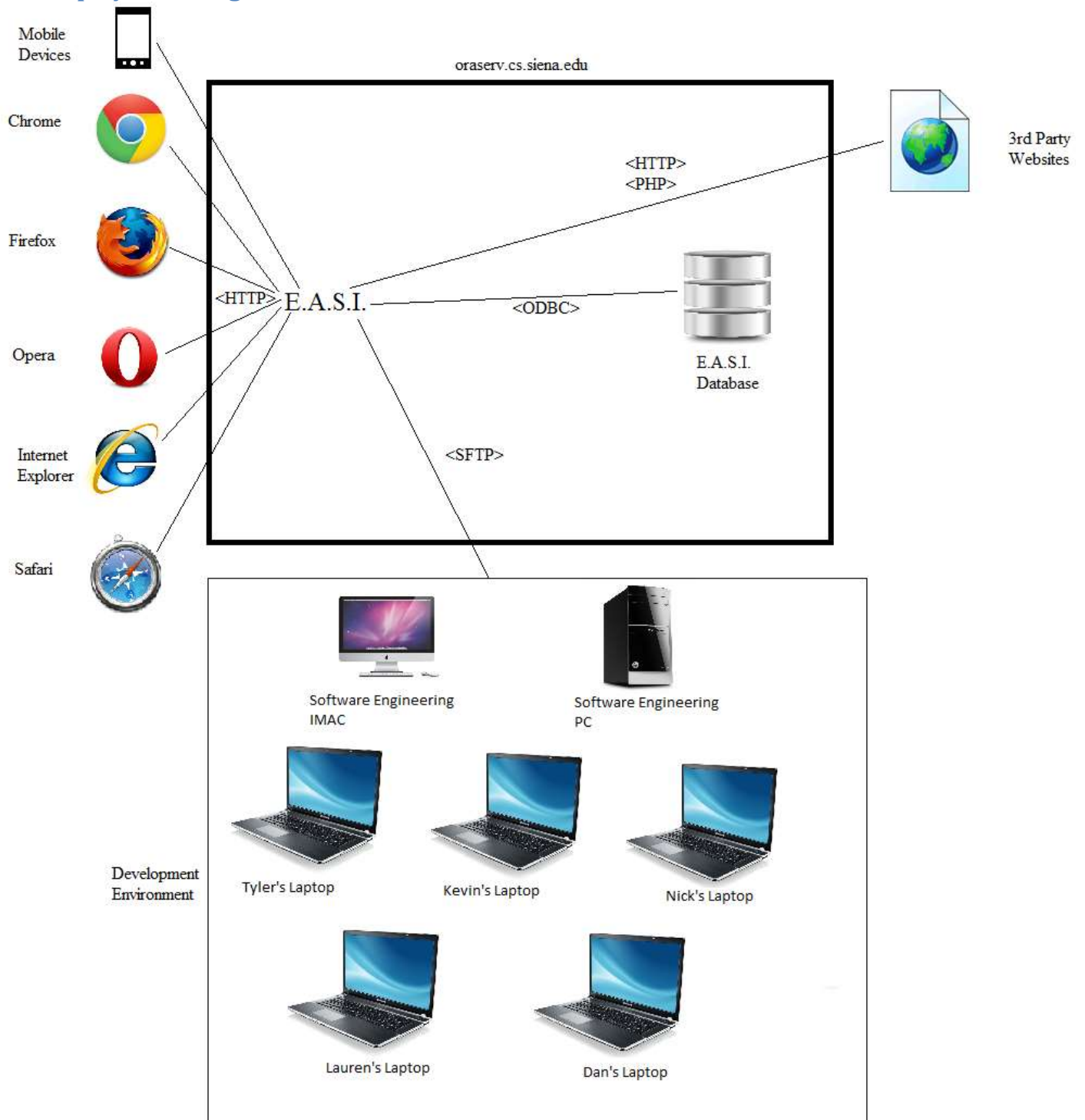
<SCP>

SCP: Secure Copy (SCP) describes the process of transferring information safely across local and remote servers.

<ODBC>

ODBC: Open Database Connectivity (ODBC) represents the flow of data between the user end and the system's database.

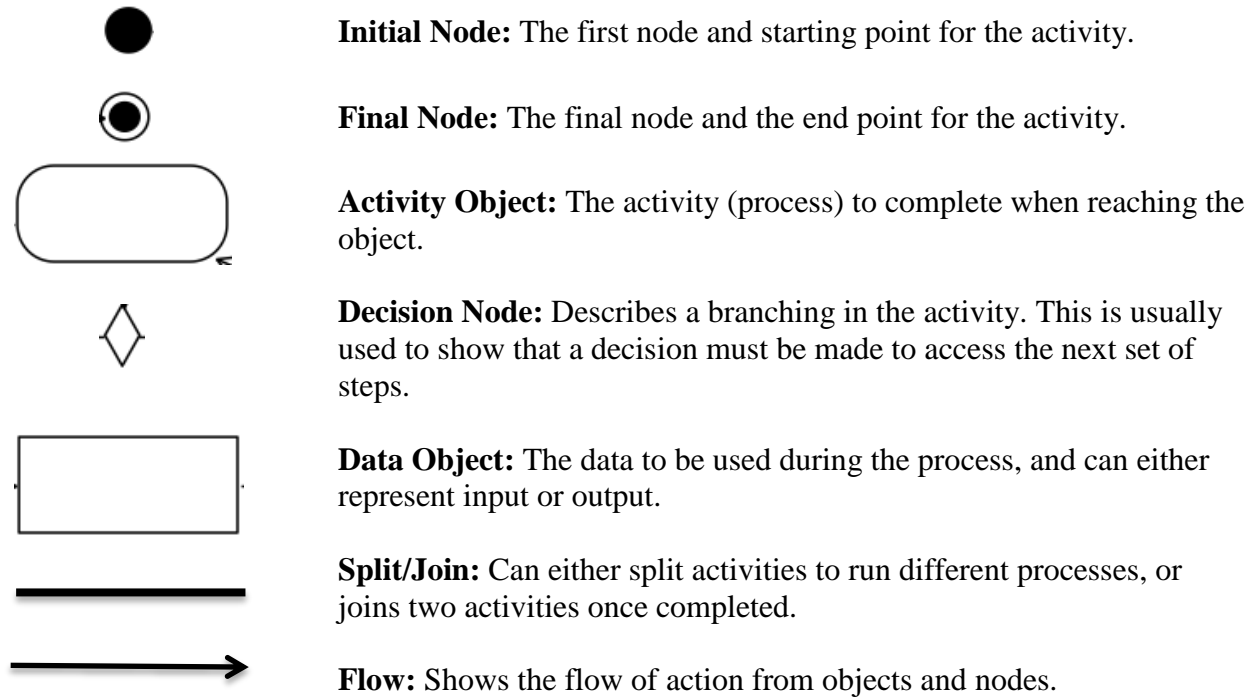
Deployment Diagram



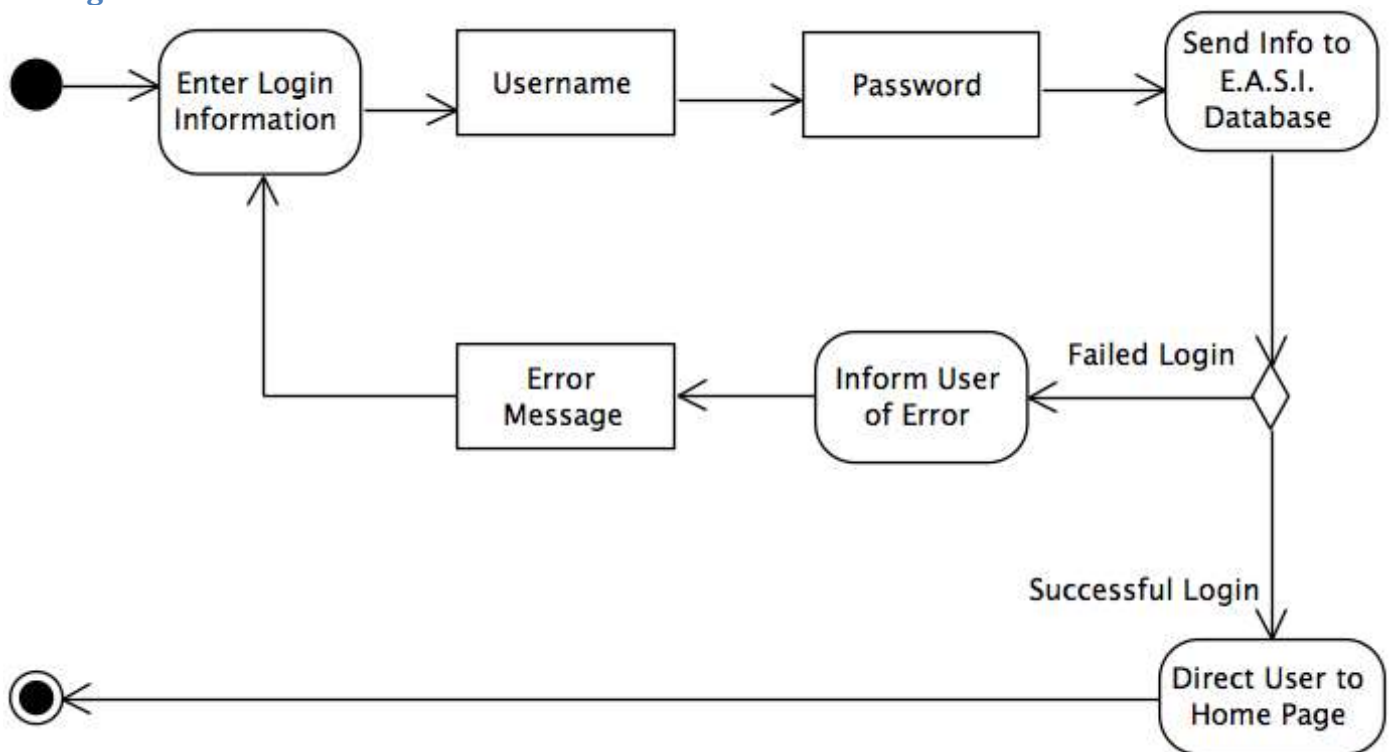
Activity Diagram

Activity diagrams describe the flow of activities, decisions and actions that the system can take. Each part of the diagram shows an activity or data and the actions that can be performed with it.

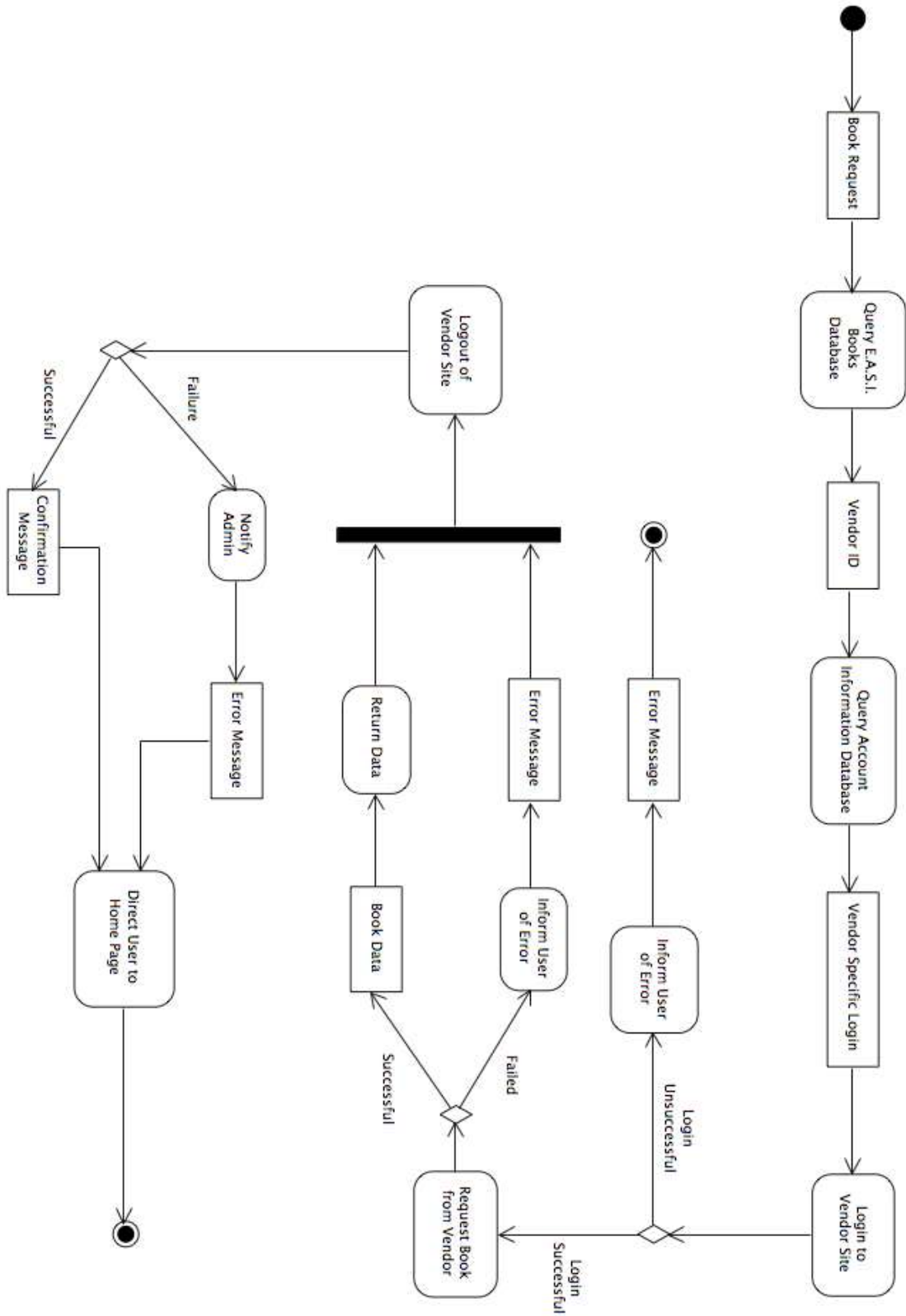
Activity Diagram Legend

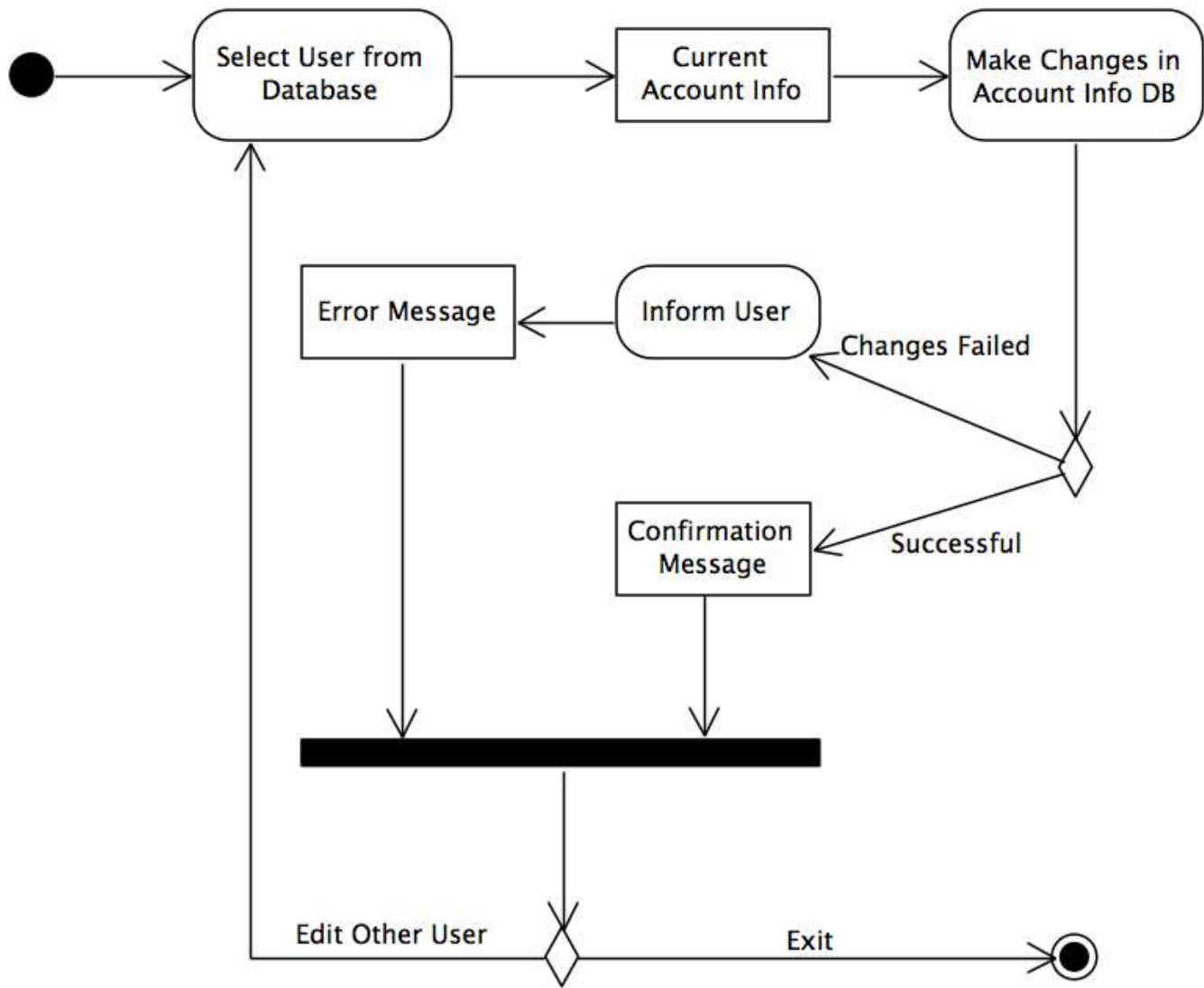


Login

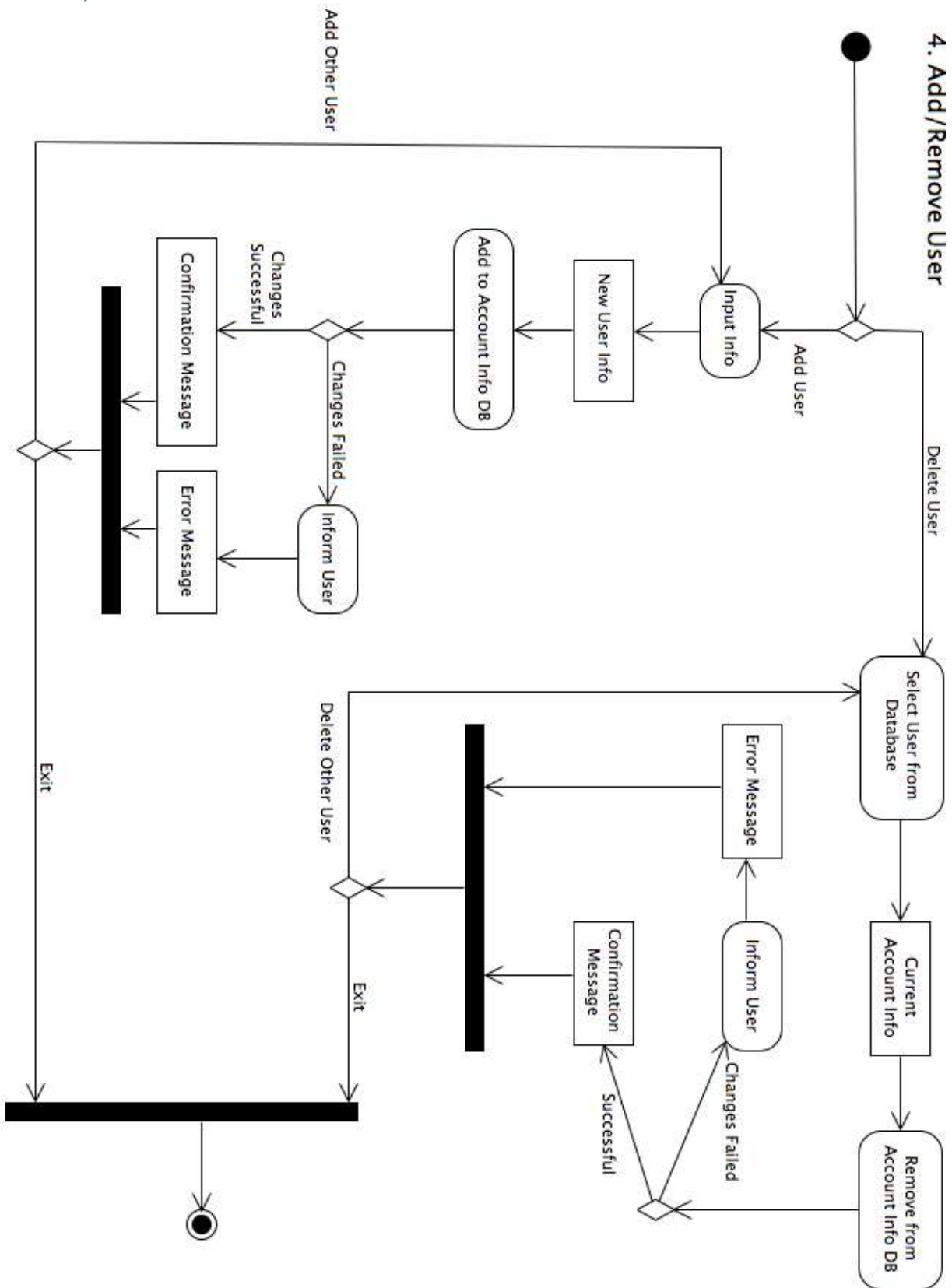


Withdraw

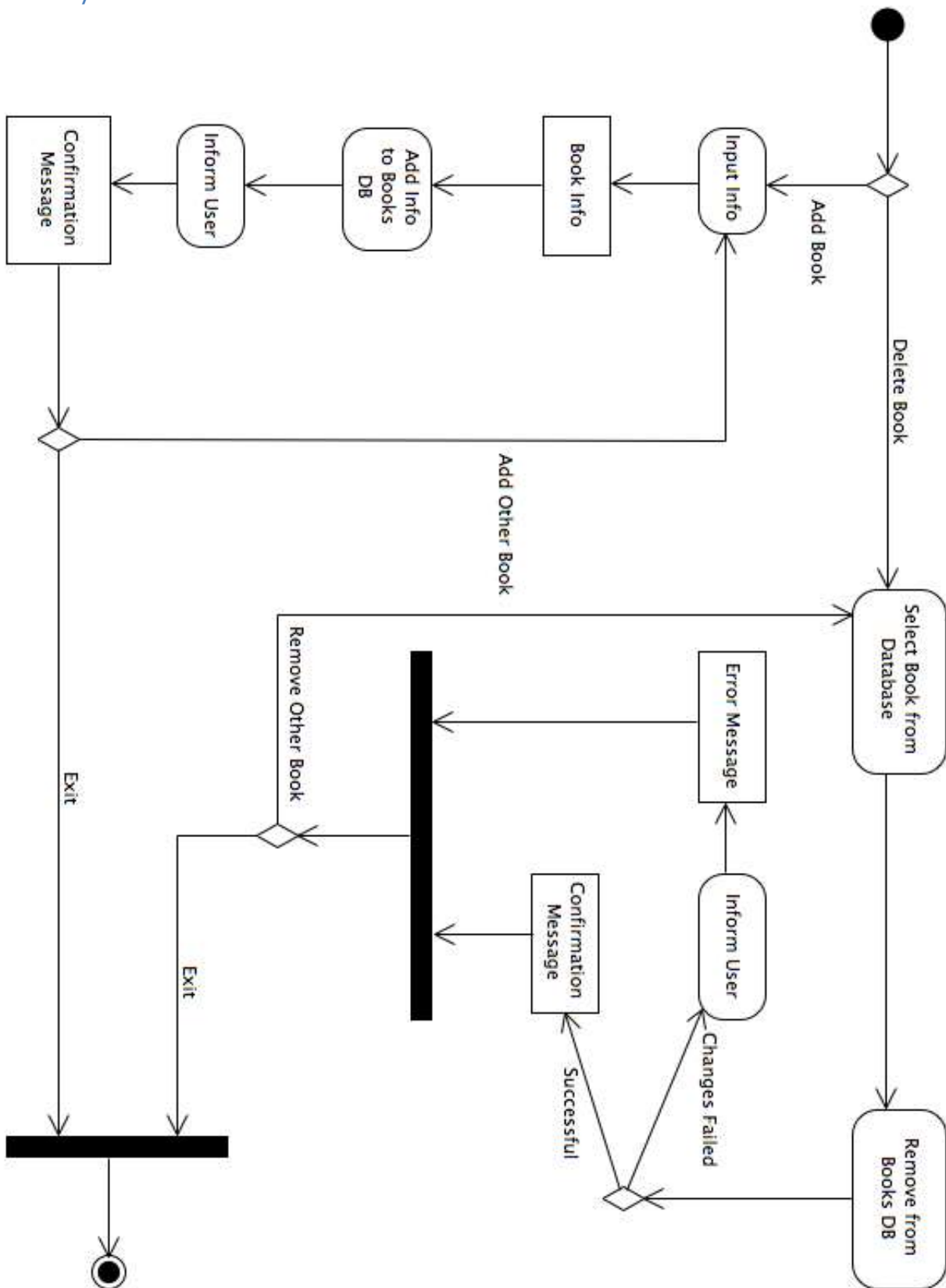


Edit User Information

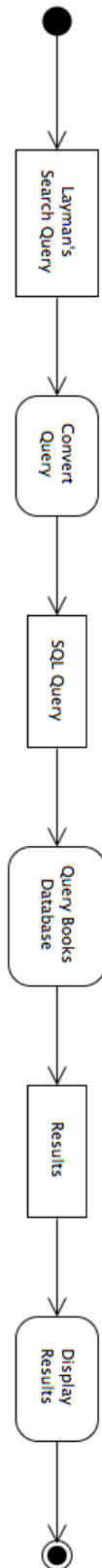
Add/Remove User



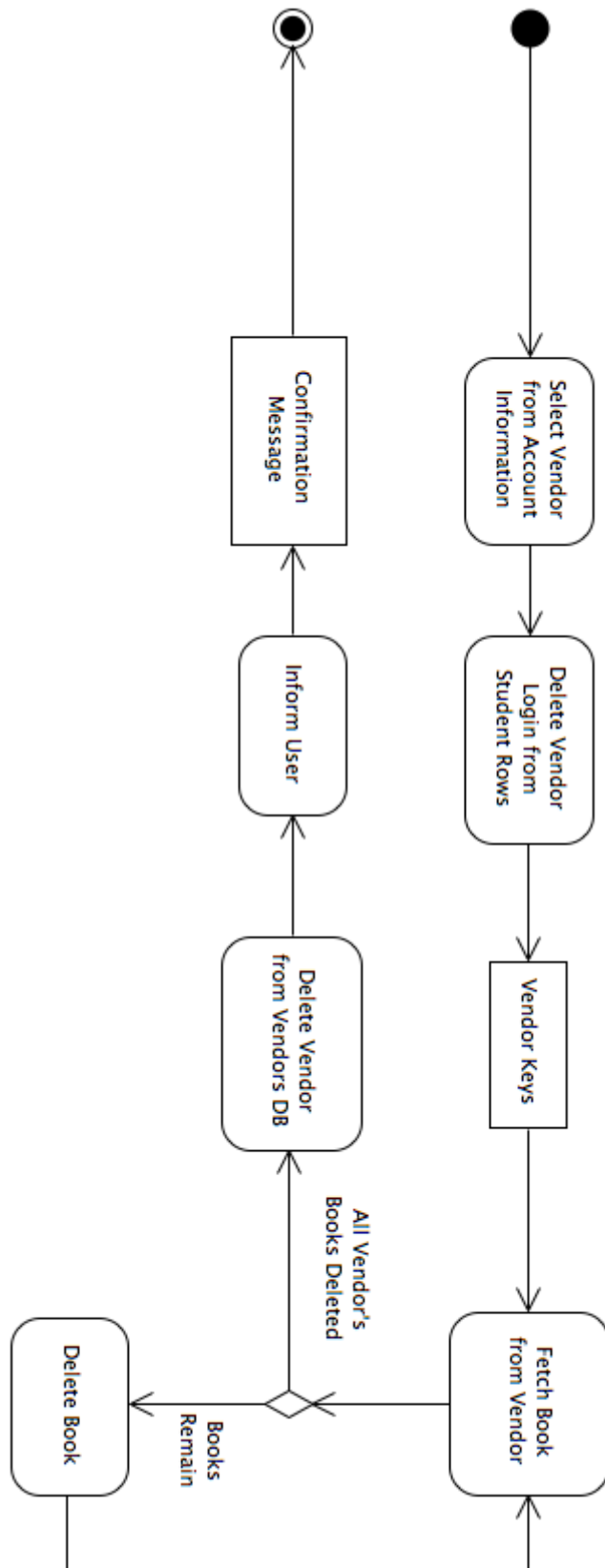
Add/Remove Book



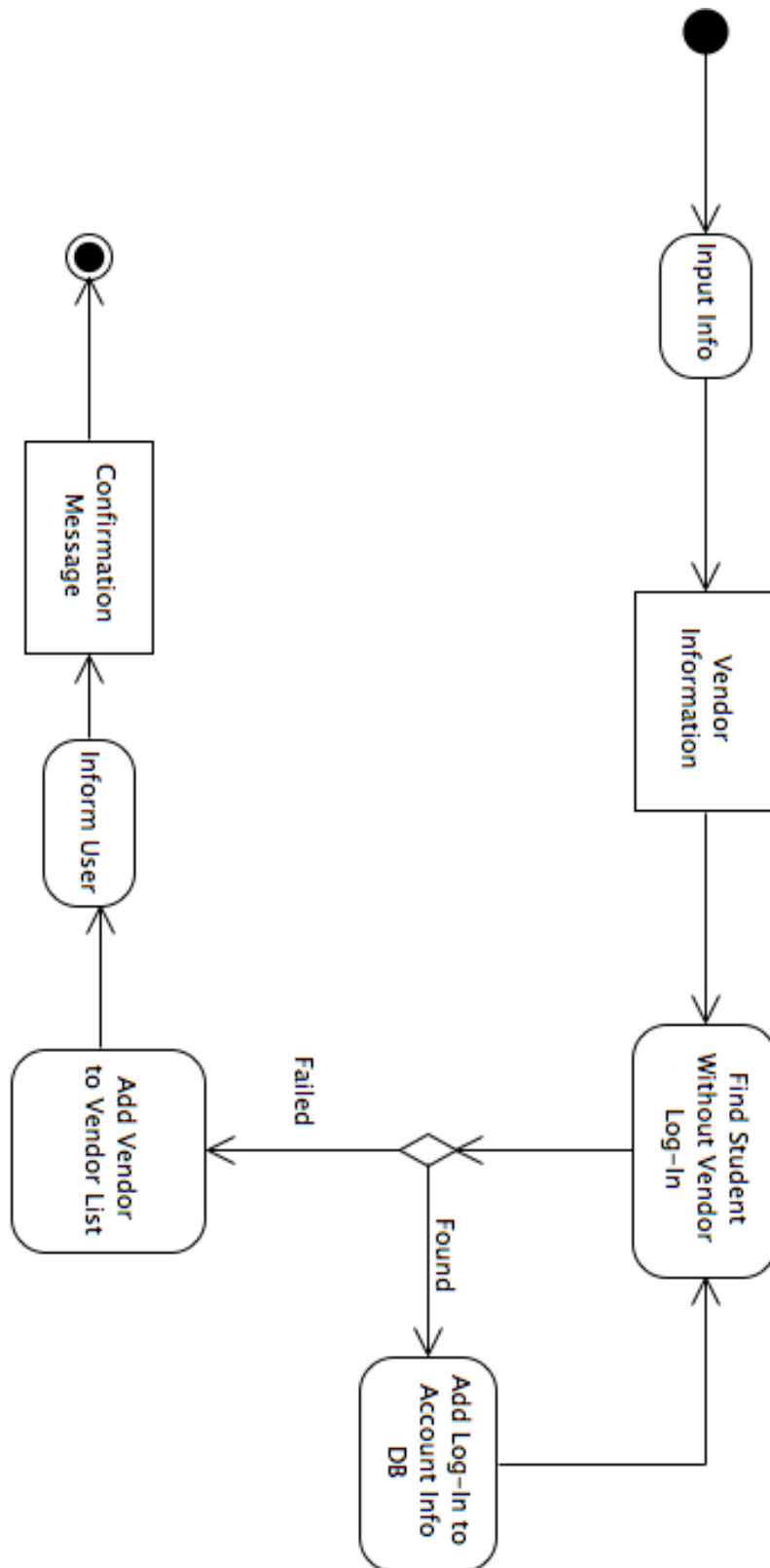
Search Books



Remove Vendor



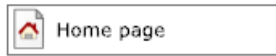
Add Vendor



Website Maps

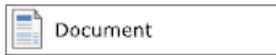
Website Maps displays the structure of the website in a tree hierarchy, showing each page that will be displayed for every user, and how users navigate across the website.

Website Map Legend



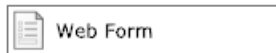
Home page

Home Page: The access screen of E.A.S.I., before the user access the main page of the system.



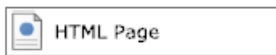
Document

Document: Represents a document that will be seen by the user.



Web Form

Web Form: A form where user input is required for an action to occur.



HTML Page

HTML Page: Represents any single web page within E.A.S.I.

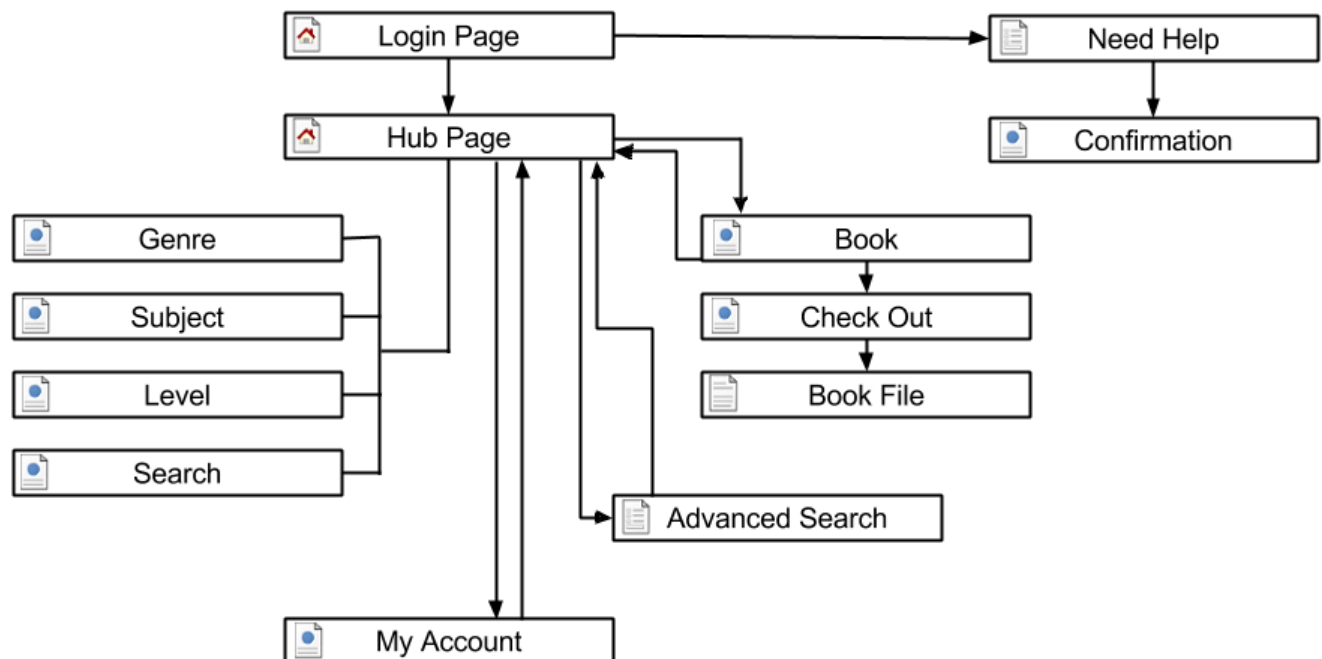


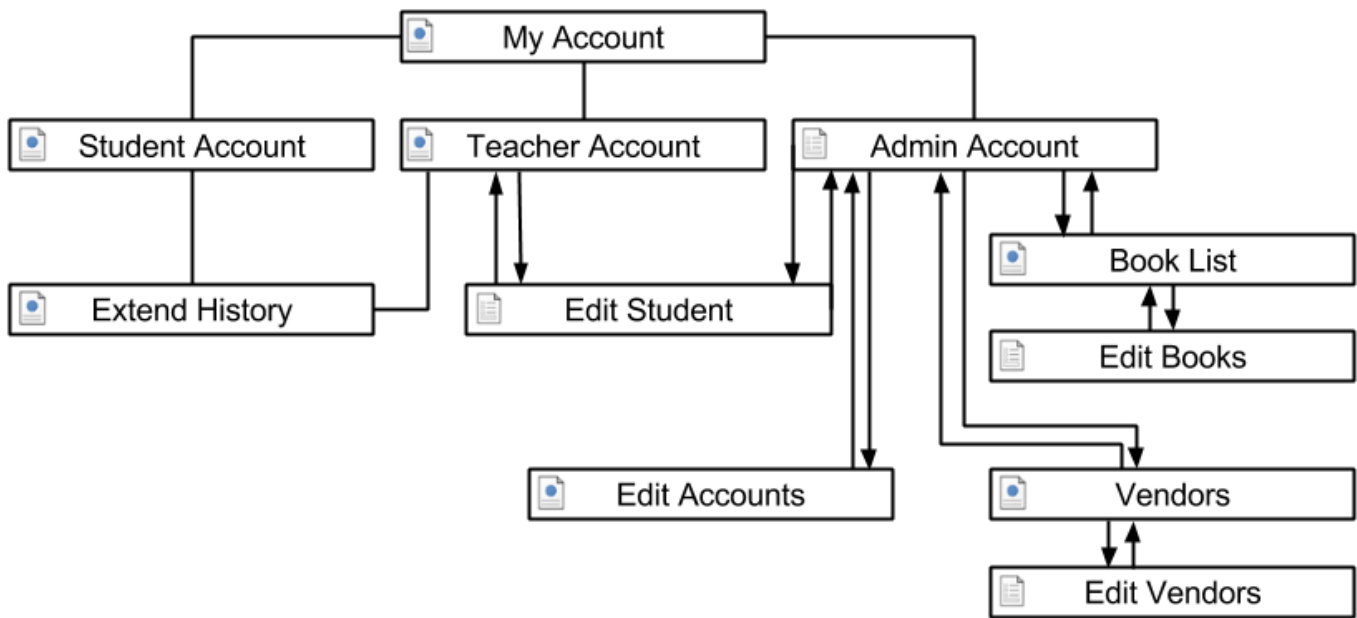
Link: A page the will be accesses from another page (inside or outside of the system).



Page Redirect: Indicates a change in the user's screen, based on the user's action.

Website Map





Data Flow Diagrams

Data Flow Diagrams (DFDs) are a visual representation of the information between different system processes. The DFDs are used to describe the way data will be stored and retrieved by the system and those that influence the system. Each DFD examines a system component at a different level of detail.

Data Flow Legend



Process: A process is a system function that will represent data that is being stored, transferred or otherwise manipulated.



Entity: An entity represents sources of data into the system and the destinations of which data is sent from the system.



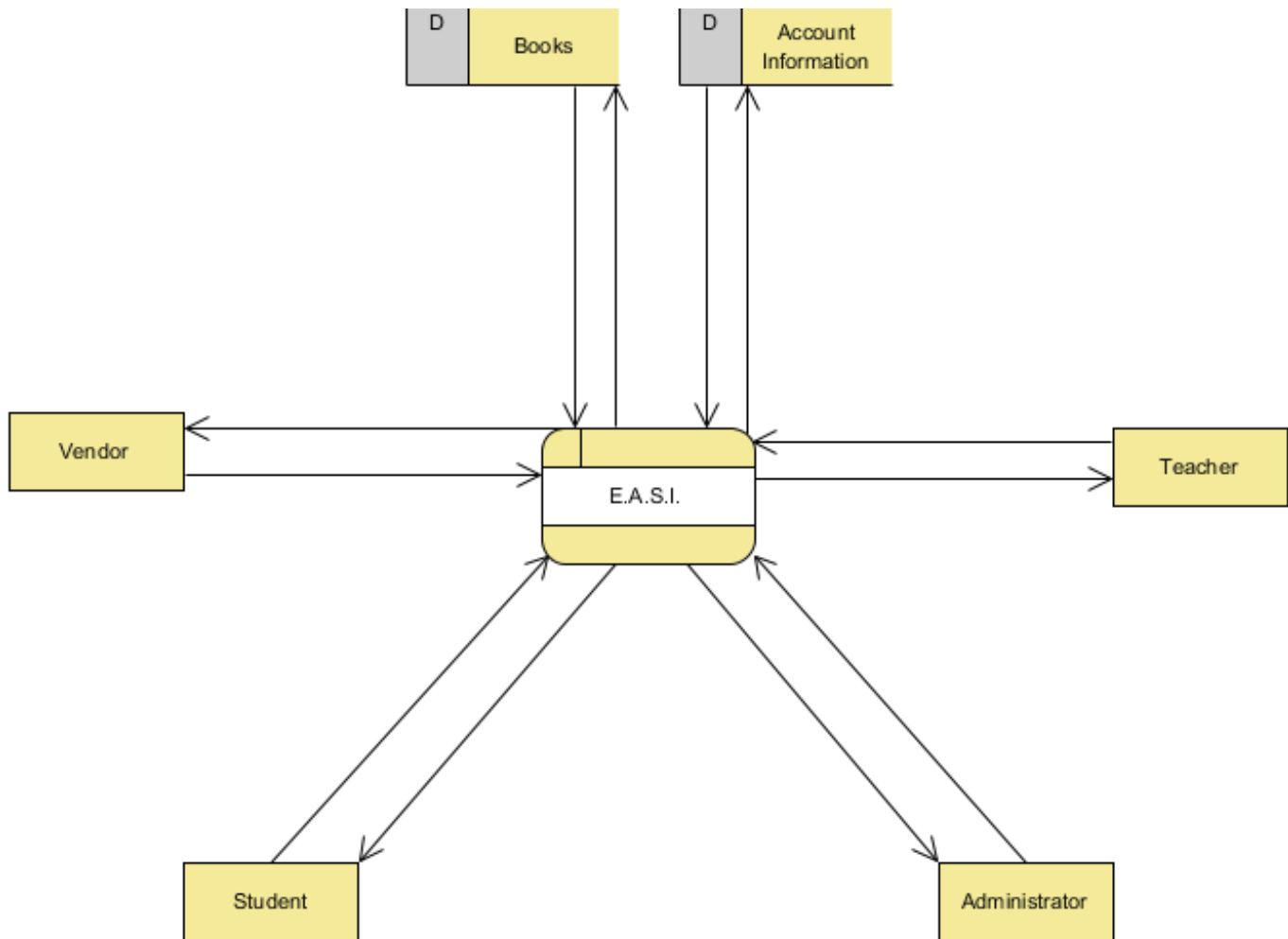
Data Flow: A data flow arrow shows the movement of information between entities.



Data Store: Data storage shows the location where data is held, either temporarily until it moves onto another location, or permanently, for the system's own use.

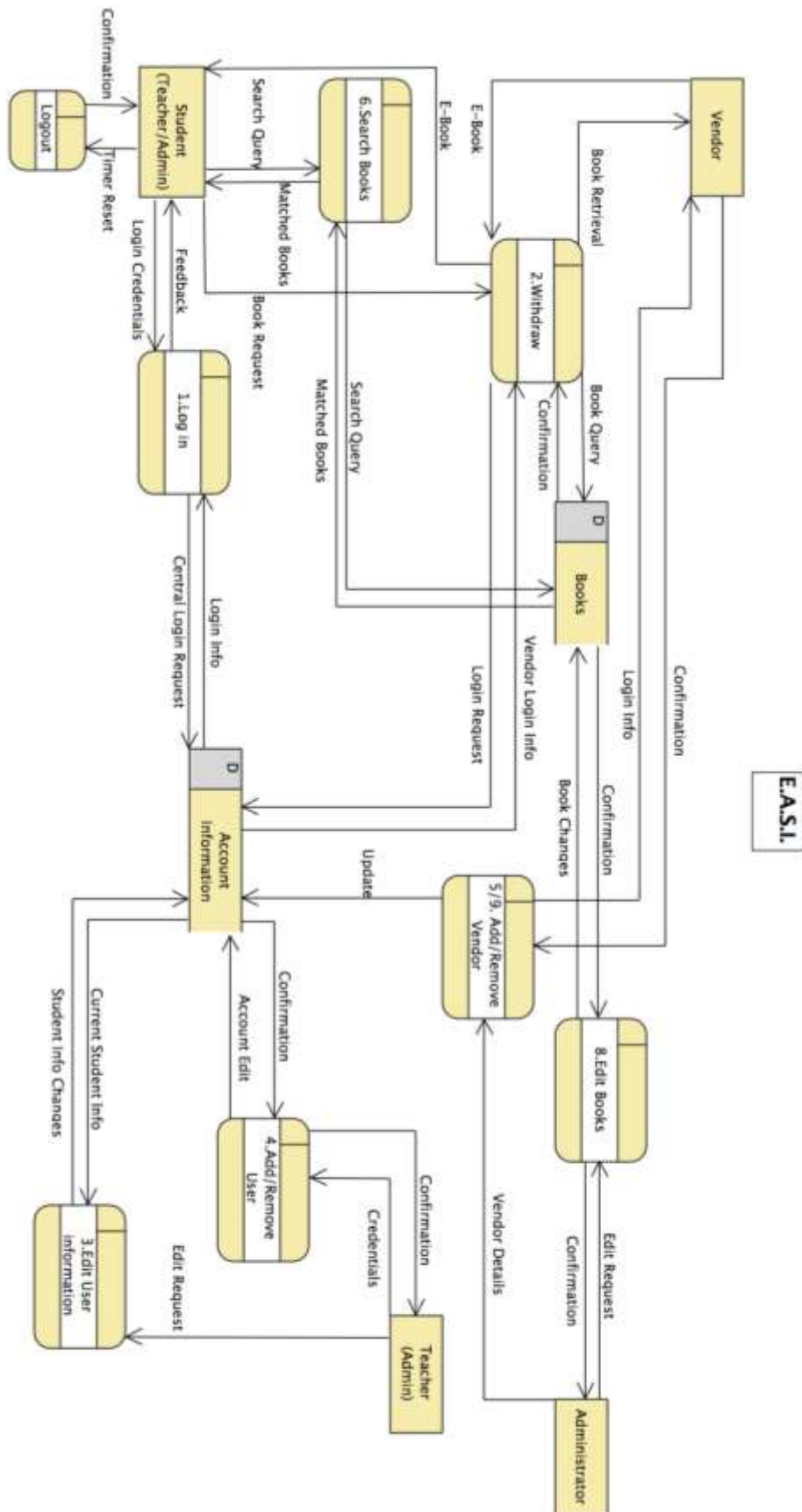
Context Diagram

The Context Diagram describes the users and processes that interact with E.A.S.I. This includes, but is not limited to, databases such as Books and Account Information, users such as Student, Teacher and Administrator, and access to information given and taken from the Vendor sites. This diagram is the highest level of the Data Flow diagrams, and hopefully clarifies how the system receives and outputs information.



Level 0 Diagram

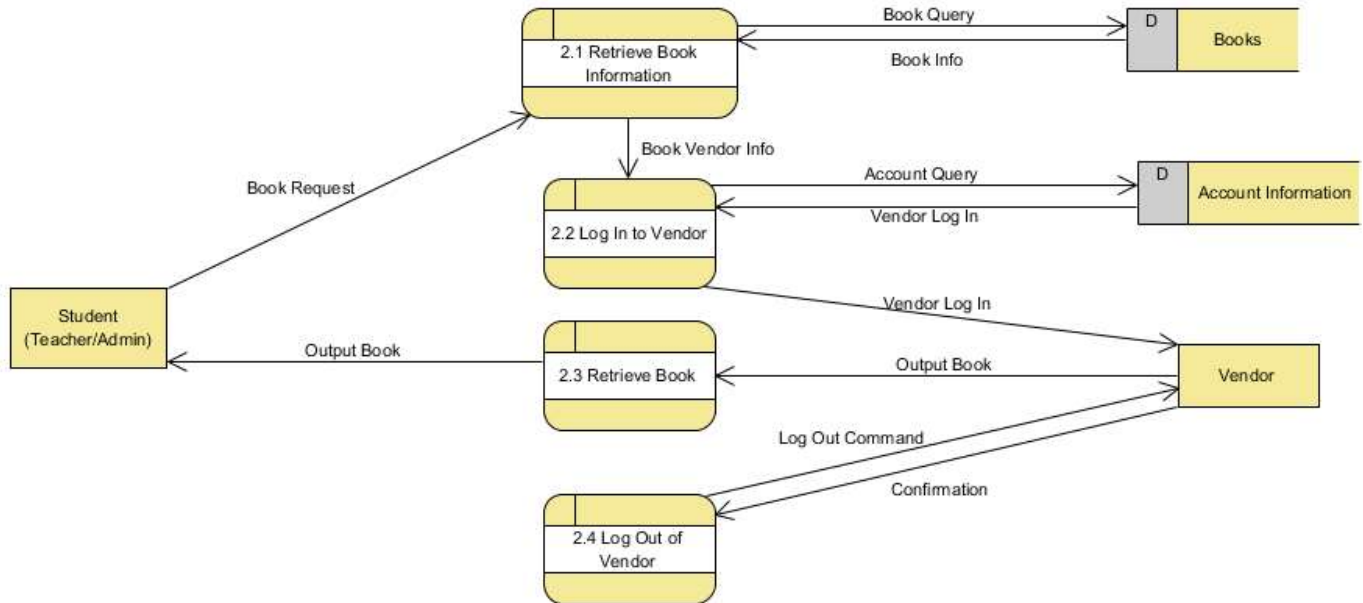
The Level 0 Diagram, as shown on the next page, is the next highest level of Data Flow diagram, and expands on the initial information provided in the Context Diagram. It shows the major processes that will be present in E.A.S.I., as well as how information is controlled among and in-between the processes. The Level 0 Diagram shows what the major activities the system and users will be engaged in.



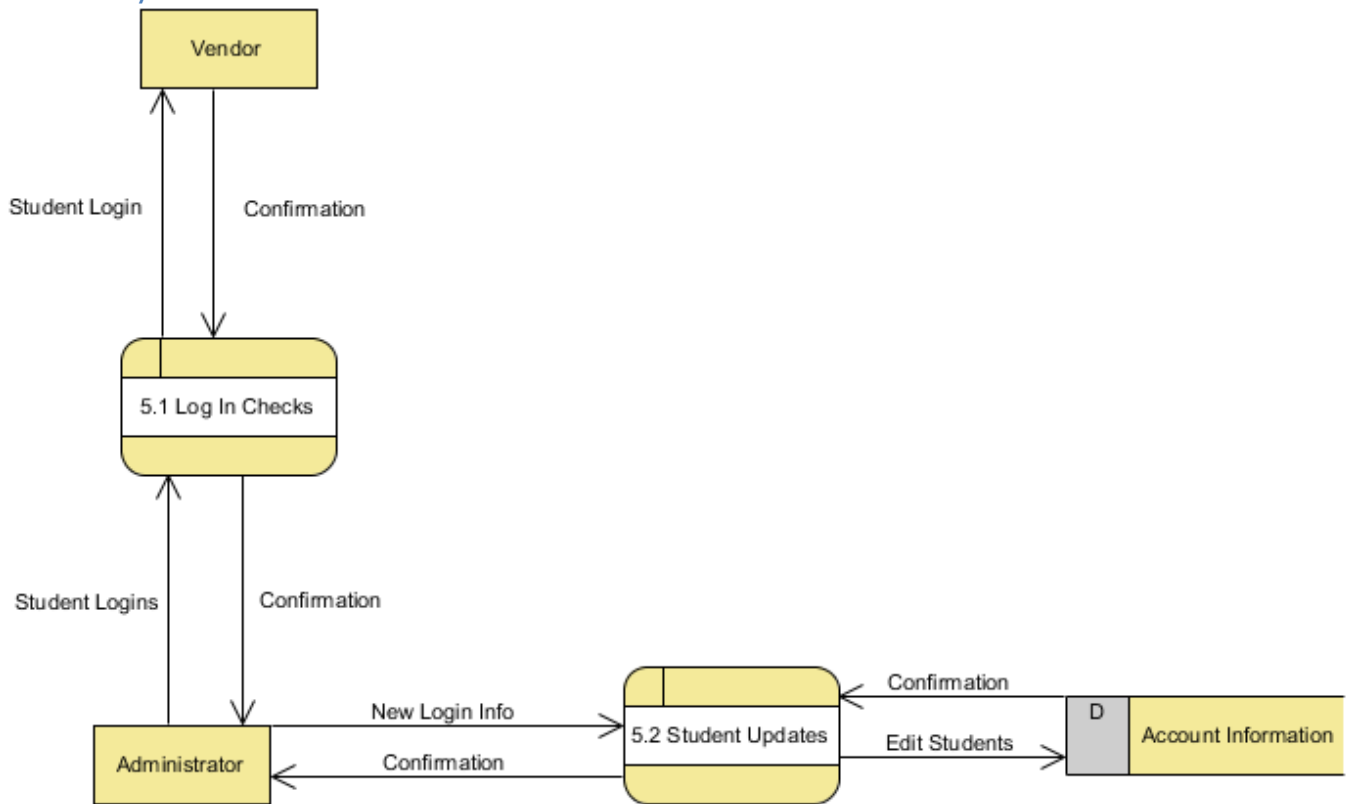
Level 1 Diagrams

All subsequent diagrams after a Level 0 expand on the specific processes originally displayed in the Context and Level 0 diagrams.

Withdraw



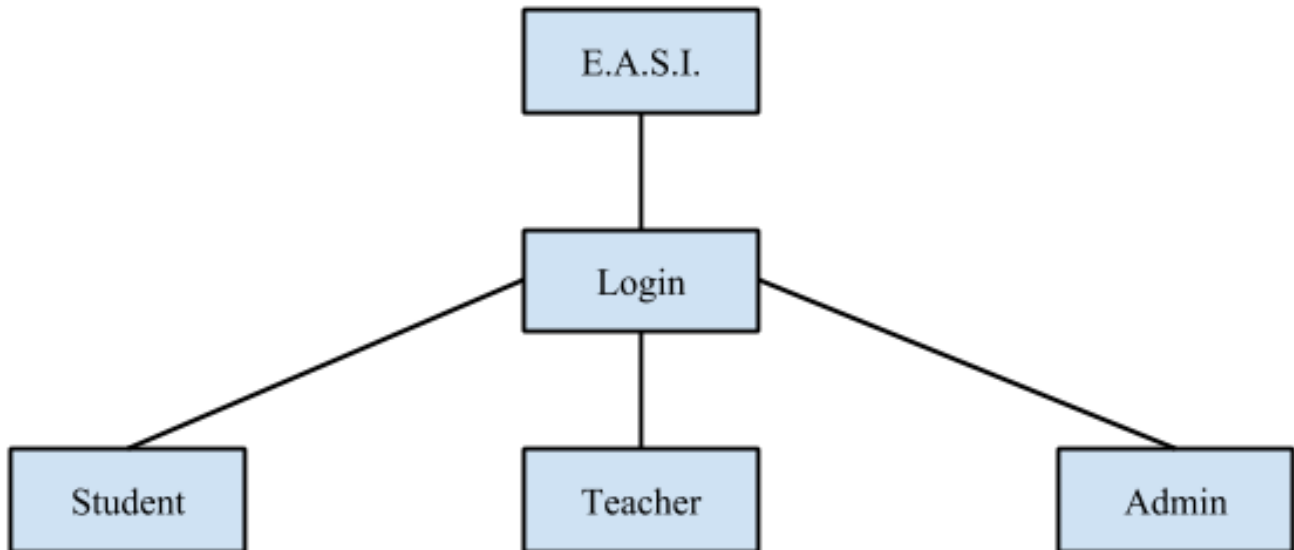
Add/Remove Vendor



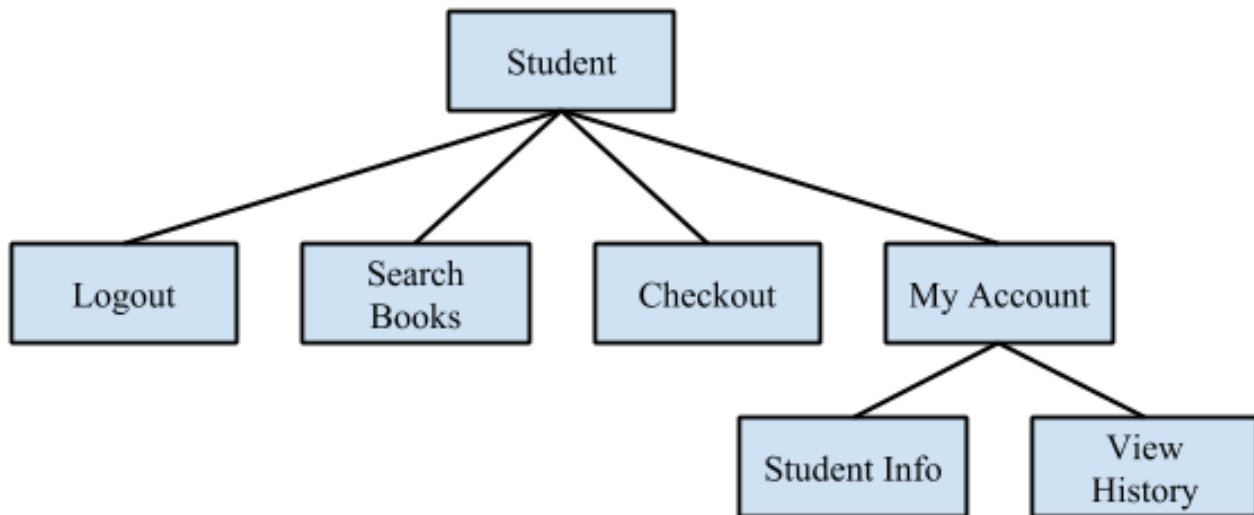
Structure Diagram

Each Structure diagram displays a tree hierarchy with each of the user types and the appropriate components of the E.A.S.I. system.

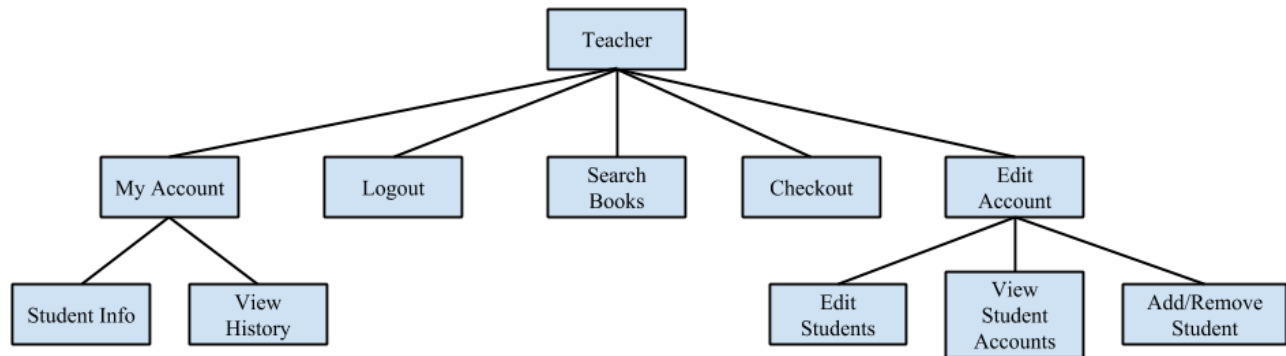
Overview Structure



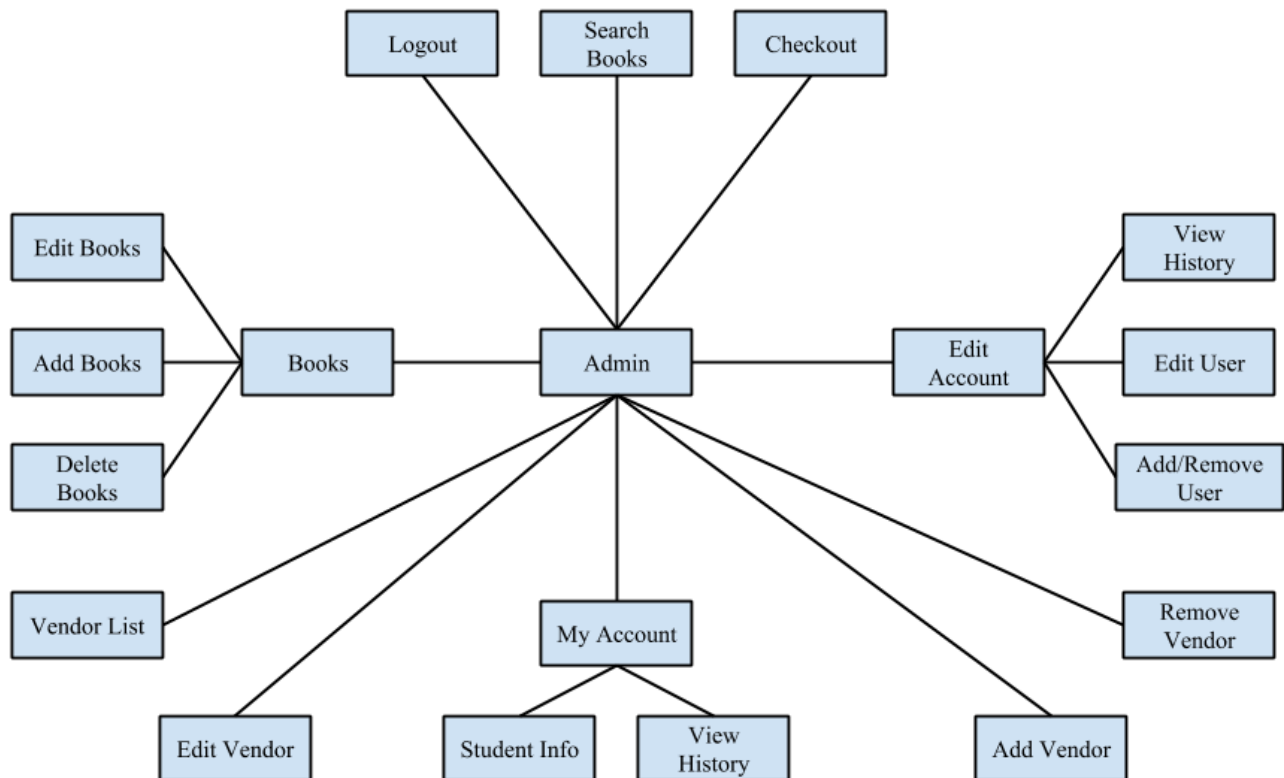
Student Structure



Teacher Structure



Administrator Structure



Requirements Inventory

The Functional Requirements Inventory are the list of features that E.A.S.I. is expected to perform, and defines the behavior of the system. The Non-Functional Requirements will specify E.A.S.I. properties, those that are not necessarily specific functions of the system but rather what the system is intended to present to the user. Each of the inventories is subject to change as Seraphim progresses further into the design of E.A.S.I.

Functional Requirements

E.A.S.I. has three types of users: Students, Teachers and Administrators, each with their own functions when interacting with the system. The following list details the requirements of each human user that will interact with E.A.S.I.: Student, Teacher and Administrator.

Student

- Will use the main login screen to access the system
 - The credentials will include the district, username, and password of the user
 - Any failed login attempt (ex. wrong username & password combination) will display the appropriate error message
- Access to e-books' information, such as the e-book cover, description, title, author, ISBN-13, publisher
- Ability to download e-books in the available formats (view, e-book or audiobook)
- Ability to organize and search e-books
 - Able to organize by Genre, Subject or Level
 - Able to search across categories or for specific e-books
- Will be able to log out of E.A.S.I.

Teacher

- Will inherit all functional requirements specified for the Student
- Ability to change student account information
 - Ability to view and change username or password
 - Ability to view and change user's level access
 - Ability to get a Student access to specific e-books
 - Change how many books they can "check out"
- Access to special level of books for teachers only
- Ability to add/remove Student accounts
 - Add district, username, password and level

Administrator

- Will inherit all functional requirements specified for the Teacher
- Ability to change the district for Student accounts
- Ability to add or remove Student accounts
 - Add student accounts for each vendor site
 - An "import" system will be in place so that the administrators can import a document containing all the username and password information for all the students
- Ability to add or remove Teacher accounts
- Ability to add or remove Administrator accounts
- Ability to add or remove vendors (e-books)
- Ability to adjust details for e-books
 - Genre, Subject or Level
 - Descriptions

Non-Functional Requirements

The following list contains those items that are not specific features in the software, but rather what E.A.S.I. is expected to accomplish overall. These features cannot be objectively measured. E.A.S.I. will have the following features:

- The system will be responsive, which is the ability of the system to respond to queries within a reasonable amount of time
- The system will be scalable, with the ability to control access about 85,000+ students
- The system will be secure, allowing users to transverse the system without accessing protected data
- The system will be viewable and functional on multiple platforms and browsers (including: Android Mobile Browser, iPhone Mobile Browser, Safari, Firefox, Chrome, Opera, Internet Explorer)
- The system will be intuitive for all users
- The system will be able to be maintained by the administrators of the system

Data Dictionary

The Data Dictionary describes what information will be stored within the system. The data dictionary will describe the data types, names, and the purpose of each data piece within E.A.S.I.

Data Dictionary Legend

User Type: Which user type(s) the data will apply to.

Data Name: The name of the data entity.

Applicable To: What Use Case in E.A.S.I. the data entity relates to.

Data Type: The type of data this entity is.

Data Size: The size of the data entity.

Description: A brief description of what the data entity is.

Acceptable Input: The types of input allowed for the data entity.

Good Example(s): List(s) of proper constructed input.

Bad Example(s): List(s) of improper constructed input.

Notes: Any additional information.

Data Dictionary

Data Name	Applicable To	Data Type	Data Size	Description	Acceptable Input	Good Example(s)	Bad Example(s)	Notes
firstName	My Account, Add users to system	Varchar	1-30 characters	First name of a user	ASCII char 32 (space), -, A-Z, a-z, ' , , , ASCII char 128 to ASCII char 165	John, Mary Beth Jo Anne Elizabeth, José	John, [0/4y]3e+4, Alexander{Alex}	
lastName	My Account, Add users to system	Varchar	1-50 characters	Last name of a user	ASCII char 32 (space), -, A-Z, a-z, ' , , , ASCII char 128 to ASCII char 165	Smith, Wolczak, Aldren Phippen, Hammond-Wood	Smith, Aldren Phippen	
userName	Login, My Account, Add users to system	Varchar	6-30 characters	Username of a user	A-Z,0-9	dw01stre, cd040fde	12monkeys!	Names are unique Must include at least three of the following four characters: lowercase letter, uppercase letter, number, special character, will be encrypted
password	Login, My Account	Varchar	8-10 characters	Password of a user	a-z, A-Z, 0-9, ASCII Special Characters (,./>?;:[]{}'\"@#\$%&*!(-_+)	AwesomeT-rex19!	gonnagetbacked	
schoolDistrict	Login, My Account	Varchar	1-50 characters	School District a user is currently enrolled in	a-z, A-Z, ' &, _ , -	Shenandoah School District, Christian Brothers Academy	District 9	
dateOfBirth	Add users to system	Date	10 characters	Date of Birth of a user	0-9,-	*2014-11-09*	ATG-5-1992	
readingLevel	My Account, Book	Number	1-2 characters	Reading Level of a user/book	0-9	2,3,12	0,15,3,7	

Data Name	Applicable To	Data Type	Data Size	Description	Acceptable Input	Good Example(s)	Bad Example(s)	Notes
author	Book	Varchar	1-60 characters	Author of a book	ASCII char 32 (space), -, A-Z, a-z, ' , , , ASCII char 128 to ASCII char 165	Stephen King, Veronica Roth, Dr. Seuss	steffe	
title	Book	Varchar	1-100 characters	Title of a book	ASCII char 32 (space), -, A-Z, a-z, ' , , , ASCII char 128 to ASCII char 165	Cell, Divergent, The Life and Times of Dr. Lim	%*#\$%&-%	
description	Book	Varchar	1-1000 characters	Description of a book	ASCII char 32 (space), -, A-Z, a-z, ' , , , ASCII char 128 to ASCII char 165	(Short narrative describing book)	Thrilling, twist, 3/5 stars	
genre	Book	Varchar	1-20 characters	Genre of a Book	a-z, A-Z, space	Fantasy	Blue	
subject	Book	Varchar	characters	Subject of a Book	a-z, A-Z, space	Science, Math	Red	
ISBN	Book	Number	13 digits	International Standard Book Number of a book	0-9, -	978-0-123456-47-2	1234567898765, onethree-fourteen	

Prototype Screens

The following images and explanations are visual representations of the first prototypes that will be created as E.A.S.I. The prototypes presented here do not represent the final design of E.A.S.I. and are subject to change, but they do represent some of the core functions and processes that E.A.S.I. is guaranteed to have.

Access Screen

This access screen, as shown on the next few pages, represents the login screen for E.A.S.I. All users will be presented with this screen, and must enter correct credentials in order to access the system.

The login screen (http://oraserv.cs.siena.edu/~perm_seraphim/prototypes/) will have the following features:

- A drop down listing every district that is available for the system
- A username and password to access the system
- A "Sign In" button
- A "Need Help?" link, which provides a small pop-up explaining how to contact someone in charge (most likely the administrator in charge of maintaining the system)
- Any login attempts that fail will be represented with an error message that displays what goes wrong next to the correct field of choice
- Each of the representations of the images will have links to their main websites (in order): <http://www.questar.org/>, http://oraserv.cs.siena.edu/~perm_seraphim/, and <http://www.capitalregionboces.org/>

Questar III and Capital Region BOCES - Digital School Library System

E.A.S.I.

Please Sign In:


Please Choose Your School District:
Burnt Hills-Ballston Lake


Username: Enter Username


Password: Enter Password

Sign In

Need Help?

QUEST  R.I.I.I.
Questar III and Capital Region BOCES





Questar III and Capital Region BOCES
Digital School Library System
© 2010 Questar III and Capital Region BOCES

30 | Page

Questar III and Capital Region BOCES - Digital School Library System

E.A.S.I.

Please Sign In:

Please Choose Your School District:

Burnt Hills-Ballston Lake

Username:




Enter Username

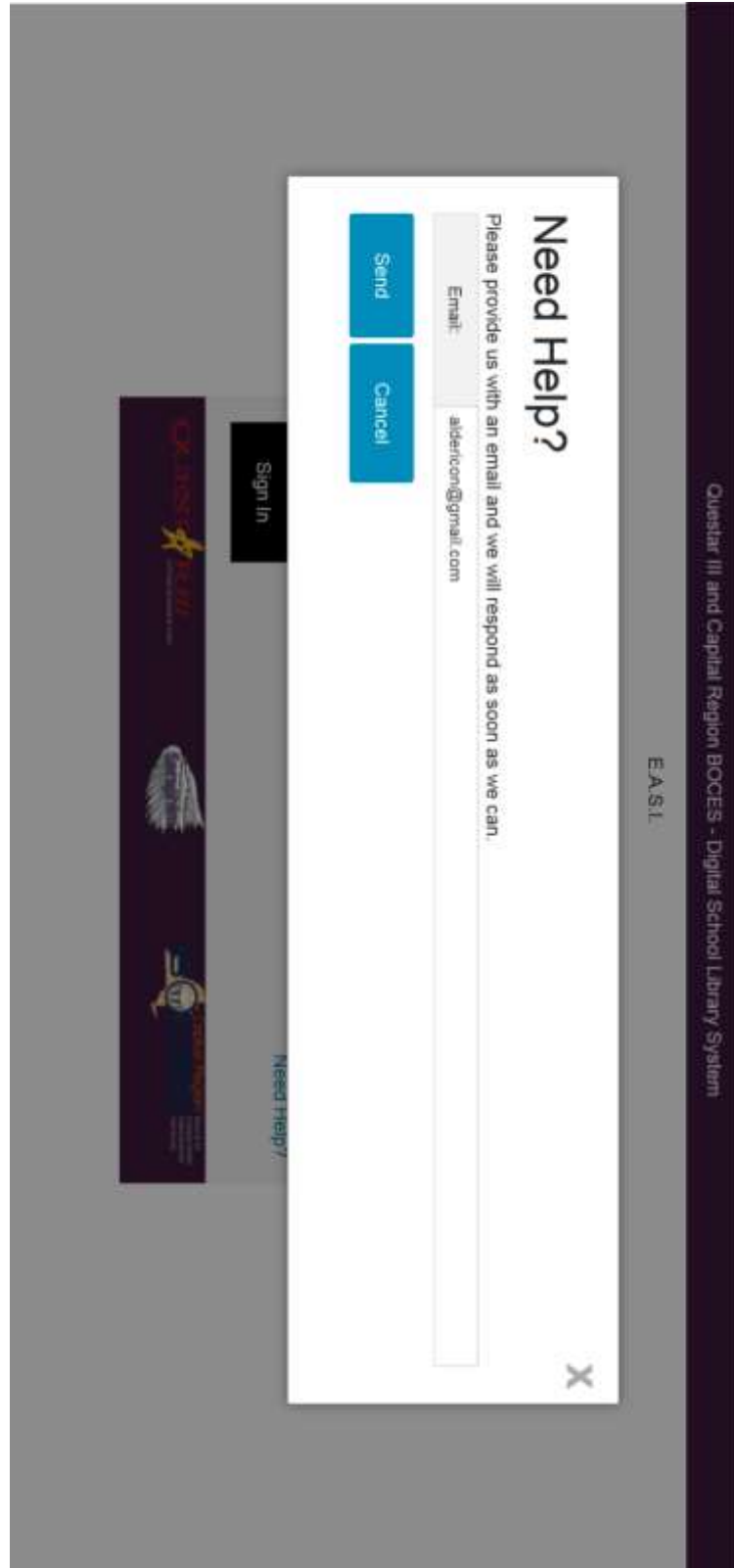
Password:

This is where you type in your username for logging in.

Sign In

Need Help?





Main Page

The main page of the website, as shown on the next page, is what all users will first encounter when correctly entering into the system (as long as the user provides the right district, username and password credentials).

Capital Region BOCES - School Library System
Digital Library

Logged In as: USERNAME Type: Administrator District: Academy of the Holy Names	My Account 	Games 	Subjects 	Level 	<input type="text"/> Advanced Search
---	--------------------------------	---------------------------	------------------------------	---------------------------	---

 Download	 Download	 Download	 Download
 Download	 Download	 Download	 Download

© 2014 Seraphim

The website will have the following pages:

- The main page, as shown above
- "My Account", a page to organize their account settings (or, for administrators, to organize other user type account settings or book settings)
- "Genres" and "Subjects" will be a drop-down that leads to pages that have all the Fantasy books, Science Fiction, etc
- "Subjects" will be a drop-down that leads to pages that have all Science, Math, History, etc, books
- "Levels" will be a drop-down that leads to pages that have only books for certain levels.
- Searching in the search box will lead to the "search" page, which shows all the books found for the inputted text
- Clicking "Advanced Search" will lead to a separate page to search using advanced settings
- Clicking on any book cover will lead to a single page with that book's information

All pages of the website will have:

- The "header" (the top of the page; everything along the menu, such as the "Genres" and Search bar, and above)
 - Clients request that message header should be: "Capital Region BOCES and Questar III – School Library System"
- (Optional) The "footer" (the bottom of the page, where the images for Questar III, Capital Region BOCES, and Seraphim, are)
- A logout button/link (not shown in pictures above); the user will be automatically logged out after five minutes of inactivity
- Whenever books are displayed (such as on the main page, searching, or in Genres/Subjects/Levels), they will show:
 - The book cover
 - Whether the book is available as viewing (default), downloadable as an e-book, or downloadable as an audiobook
 - When scrolling over the book image, a small, transparent, "block" will pop up over the book cover, displaying the title and author
 - Clicking on the book cover leads to a page that displays more information about that book
 - A download button, with an arrow, below the book; clicking the download button allows you to download the book as an e-book (default), while clicking the arrow allows you to choose to view or choose a download option (if the book is available in multiple formats, such as e-book and audiobook)
 - Books will only appear depending on the user's level
 - Books will display in rows/columns, and will only have so many rows; there will be a "Next Page" and "Previous Page" options at the bottom

SERAPHIM

The main page will have the following features:

- A set number of books, in rows/columns
- All books will be randomly selected, from the database, of available books from the district for that user's level
- The books display method (as discussed in the above section)

The "My Account" page will have the following features:

- The ability to see their first and last name (that's connected to the account)
- The ability to view their username, user account type (either student, teacher or administrator), and their district (students + teachers will not be able to change any of these)
- Individual abilities as dictated by their user account type (for example, administrators adding/removing vendors)
- History: See what e-books the user has checked out

The "Genres" will include:

- The following genres: Biography & Autobiography, Comic & Graphic Novels, Drama & Literature, Historical Fiction, History, Humor, Mystery & Thriller, Romance, Science & Nature, Sci-Fi & Fantasy, Fiction, Non-Fiction, Arts, Business & Finance, Education, Law, Medicine, Multicultural Studies, Religion, Social Science, Technology, Adventure, Audiobooks, Classics, Film, Horror, Music, Philosophy, Picture Books, Sport, Thrillers
- Genres will appear in alphabetical order
- These Genres will only show in the drop down menu if the topic is available (if there are 1+ books in the category)

The "Subjects" will include:

- The following subjects: Language Arts, Mathematics, Science, Health, Physical Education, Art, Music, Foreign Languages, English, Social Science, Technology
- Subjects will appear in alphabetical order
- These Subjects will only show in the drop down menu if the topic is available (if there are 1+ books in the category)

The "Levels" options:

- Levels will be: K-5, 6-8, and 9-12
 - Teachers and Administrators will have access to an Education level
- When choosing a level, one will see all books found for that level
- Students in higher levels have access to books in lower levels
- Students can have access to specific books, as directed by Teachers or Administrators

Searching/Advanced Search options:

- Any search part will lead to a page that shows all book options. If none are found, it will show the message "No books found!"
- Searching involves entering in book title, author or ISBN-13
- Advanced Search will at least be able to:
 - search parts available in normal searching
 - search in any number of categories from Subjects, Genres, or Levels
 - search for viewing, e-books or audiobooks

Book Descriptions pages will have:

- A bigger version of the book cover
- Full description of the book
- Title, Author, ISBN-13, Publisher information
- The ability to view/download it

What E.A.S.I. will be doing:

1. As administrators add the credentials for a vendor site, the system will automatically "grab" the e-books from the site, along with the information, and incorporate it into our database.
2. The system will check for new e-books bought on the vendor site every 24 hours.
3. As users download/view an e-book, the system will automatically "inform" the vendor site, corresponding to the user and the user account on the vendor site.
4. The system will only contact the vendor site when the user goes to view/download an e-book.
5. The system will handle all internal requests, such as search, clicking, logging in, etc.

Testing Plan

Overview

The strategy for testing the system is to ensure that the system meets its design specifications, as well as both the functional and non-functional requirements. E.A.S.I. will be vigorously tested on both mobile and desktop machines, using Windows, Linux and Mac Operating Systems as well as the popular browsers: Mozilla Firefox, Internet Explorer, Google Chrome, Opera, and Safari. The testing will use a multi-step process that goes through each of the activities that are in the system: unit testing, integration testing, system testing, performance testing, and acceptance testing.

Exception Handling

The goal of Seraphim is to create a system that accomplishes the functions provided in the Software Plan as well as listed above. As part of these goals, E.A.S.I. will be able to handle all software exceptions as they arise; in the event of an exception error, the system will be able to handle it without the entire system failing. All the input into the system will be validated before

the input is stored or made available to the users. At this stage of the project, the potential errors to the system are still unknown, but do include validation of user credentials and vendor information. Exceptions might be made possible either through user interaction or by the system itself, but in either case, E.A.S.I. will be designed to recover from any such events.

Acceptance Test

The accepted criteria for E.A.S.I. will include all previously stated requirements and functions listed in this document as well as the Software Plan. If the final product is unable to meet the specified requirements or functions, a reasonable explanation must be provided, which will be measured by the supervisors, Dr. Meg Fryling and Dr. Darren Lim. Each portion of E.A.S.I. will be tested in each stage to ensure that the individual components function before having the system integrated as a whole. At the end of the project, an acceptance test will take place to ensure Seraphim has met the system and client needs. Once the acceptance test has taken place, Seraphim and the clients will measure the requirements that have been successful.

Unit Tests and Test Cases

Each unit test is a test run to ensure that the system is running properly and that it has all the fore-mentioned functions. Each unit test is a step-by-step process for input and what to expect when certain functions are set in motion. Some tests will be performed separately, while others will be performed together. Once all unit tests have been approved, a full system test will be run to ensure that all the functions work together.

Each unit test has a series of test cases, which are directions for input and the order in which the system will receive them. It will contain details on what to expect for each input, and what the system should do if incorrect input is received.

39 | Page

Login

To log the user into the system, and determine what type of login account type it is

Test Cases										
Pass/Fail Status	Test Number	Description	Action to perform test (input)	Steps to be Executed	State Before Test	Expected result	Observed result	Comments	Tested By	Test Date
	1.001	Log in as Student	Submit student account credentials	Press submit	Empty form	Logged in as student				
	1.002	Log in as Teacher	Submit teacher account credentials	Press submit	Empty form	Logged in as Teacher				
	1.003	Log in as Administrator	Submit administrator account credentials	Press submit	Empty form	Logged in as Admin				
	1.004	Empty username	Leave username blank	Press submit	Empty username	Error message				
	1.005	Empty password	Leave password blank	Press submit	Empty password	Error message				
	1.006	Unselected district	Leave district unselected	Press submit	Empty district	Error message				
	1.007	Empty username/password	Leave username/password blank	Press submit	Empty username/password	Error message				
	1.008	Empty username/district	Leave username/district blank	Press submit	Empty username/district	Error message				
	1.009	Empty password/district	Leave password/district blank	Press submit	Empty password/district	Error message				
	1.010	All fields empty	Leave all fields empty	Press submit	Empty fields	Error message				
	1.011	Non-existent username	Type in a non-existing username	Press submit	Filled form, wrong username	Error message				
	1.012	Wrong password	Type in right username but wrong password	Press submit	Filled form, wrong password	Error message				
	1.013	Wrong district	Type in right username and password but have the wrong district	Press submit	Filled form, wrong district	Error message				
F	= Unit Summary			0% passing	0 passed 0 failed		Date of last test =		1/0/00	
	13	tests								

Login

Add Book

Add Book
To add a book to the E.A.S.I. system and verify that its vendor is in the database

Pass/Fail Status	Test Number	Test Cases Description	Action to perform test (input)	Steps to be Executed	State Before Test	Expected result	Observed result	Comments	Tested By	Test Date
	1.001	Add Book Appropriately	Submit Book Information	Press submit	Empty Form	Addition and Confirmation Error message and user prompted for title				
	1.002	Empty Title	Leave title field blank	Press submit	Empty Form	Error message and user prompted for title				
	1.003	Empty Author	Leave author field blank	Press submit	Empty Form	Error message and user prompted for author				
	1.004	Empty ISBN	Leave ISBN field blank	Press submit	Empty Form	Error message and user prompted for ISBN				
	1.005	Empty Publisher	Leave publisher field blank	Press submit	Empty Form	Allow submission, inform user that field is blank				
	1.006	Empty Reading Level	Leave reading level field blank	Press submit	Empty Form	Error message and user prompted for reading level				
	1.007	Empty Description	Leave description field blank	Press submit	Empty Form	Allow submission, inform user that field is blank				
	1.008	Empty Genre with empty Subject	Leave genre field blank	Press submit	Empty Form	Error message and prompt user for genre				
	1.009	Empty Genre with filled Subject	Leave genre field blank	Press submit	Empty Form	Allow submission, inform user that field is blank				
	1.010	Empty Subject with filled Genre	Leave subject field blank	Press submit	Empty Form	Allow submission, inform user that field is blank				
	1.011	Empty Vendor	Leave vendor field blank	Press submit	Empty Form	Error message and user prompted for vendor				
	1.012	Empty Teacher Edition Status	Leave teacher edition status field blank	Press submit	Empty Form	Error message and user prompted for teacher edition status				
	1.013	All Fields Empty	Leave all fields blank	Press submit	Empty Form	Error message				
	1.014	Invalid characters in field	Input a string with an invalid character	Press submit	Empty Form	Error message and prompt user for corrected input				
	1.015	Invalid ISBN format	Input a string with an invalid character	Press submit	Empty Form	Error message and prompt user for corrected ISBN format				
	1.016	Vendor not in Database	Input a vendor with no match in database	Press submit	Empty Form	Error message and prompt user to add vendor				
F	= Unit Summary 16 tests		0% passing		0 passed 0 failed		Date of last test = 1/0/00			

Appendices

Glossary of Terms

E.A.S.I.: E-Book Application System Integration, the name of the e-book digital library being created for Capital Region BOCES and Questar III.

Prototype: An early sample of the product to project what the designers anticipate the system to look like.

UML: Unified Modeling Language, a standardized modeling language to present a graphical overview of the functionality of the system.

Spiral Model: A software development process combining which elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts.

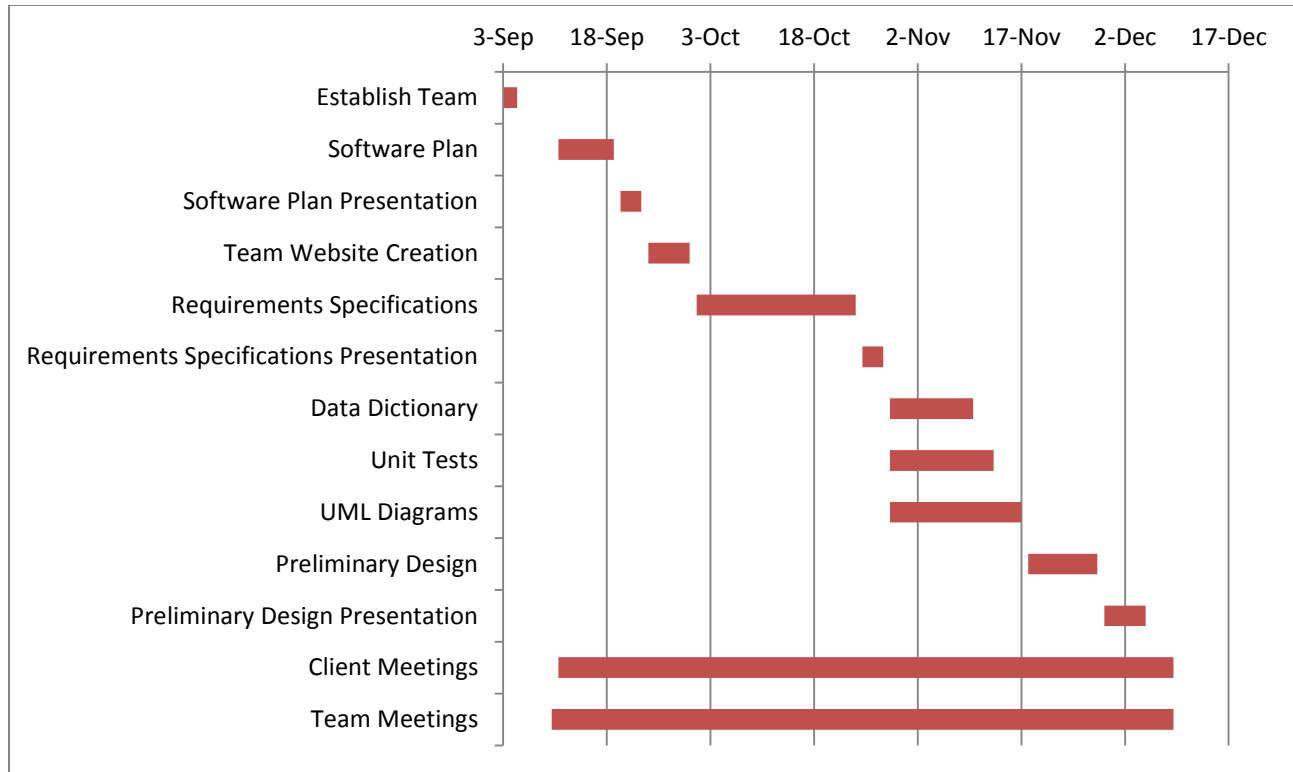
Waterfall Model: Software development process where each phase flows down into the next. This process makes it difficult to go back up to a previous phase.

Project Timeline

The following is the list of tasks to be completed throughout this year for the E.A.S.I. system:

Task	Duration (Days)	Start	Finish
Establish Team	2	9/3	9/4
Software Plan	8	9/11	9/19
Software Plan Presentation	3	9/20	9/23
Team Website Creation	6	9/24	9/30
Requirements Specification	23	10/1	10/24
Requirements Specification Presentation	3	10/25	10/28
Data Dictionary	12	10/29	11/10
Unit Tests	15	10/29	11/13
UML Diagrams	19	10/29	11/17
Preliminary Design	10	11/18	11/28
Preliminary Design Presentation	6	11/29	12/4
Client Meetings	~ 20	9/11	12/2
Team Meetings	~ 20	9/10	12/4

SERAPHIM



Bibliography

The following sources were used when creating the Requirements Specifications document:

- Pfohl, Shannon, Paul Cherrier, Ryan Egan, Jordan Holoboski, Kathleen O'Hara, and Julian Thomas. "Requirements Specifications." *Quantum Technologies*, 25 Oct. 2013. Web. 5 Oct. 2014. <http://oraserv.cs.siena.edu/~perm_quantum_tech/>.
- Greiner, Luke, Denis Kalic, Abigail McCarthy, Robert Tateo, Nguyen Truong, and Patrick White. "Requirements Specifications." *DeltaTech*, 28 Oct. 2013. Web. 5 Oct. 2014. <http://oraserv.cs.siena.edu/~perm_deltatech/#tab1>.
- Purcell, David, Paul Amodeo, Stephanie Del Belso, Marco Samaritoni, and Tom Delaney. "Requirements Specifications." *ExoNET*, 29 Oct. 2011. Web. 5 Oct. 2014. <http://oraserv.cs.siena.edu/~perm_exonet/>.