

The Design and Implementation of a Workshop Reservation System

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ABSTRACT: *In this paper, we present the design, implementation, and testing of a workshop reservation system. It was developed for the Academic Technology Department at St. Mary's University to handle workshop registration and history recording of attendance information. After going through strict software engineering processes of specification, design, coding, and testing, we successfully developed the workshop reservation system, as will be shown in the paper. Our subsequent testing indicated that the proposed workshop reservation system met all the requirements set forth by the Academic Technology Department.*

Keywords -MySQL,PHP, software development, software engineering,web application

I. INTRODUCTION

The Academic Technology Department (ATS) at St. Mary's University needs a simple, fast, and reliable workshop reservation system to handle workshop registration and history recording of attendance information. The goal of the workshop reservation system is to allow workshop attendees to easily register for workshops, add or modify their sign-ups by selecting or canceling a workshop according to different available time and dates. The proposed workshop reservation system will be used for self-registration online. A well-run workshop needs to have an efficient and reliable way of handling attendance and registration. An automated system reduces the amount of paperwork, time, and effort spent by an attendee on registration. It can also reduce the errors resulted from the manual registration process. The workshop reservation system, therefore, provides benefits to both workshop attendees and workshop organizers.

After several meetings with the management team at ATS, we underwent detailed system analysis, system design, physical design, and application design procedures to design and implement the workshop reservation system [1-3]. A number of use cases were created by analyzing information offered in the requirement document. Detailed use cases were then developed to understand how some of these use cases might operate in more details. Use case diagrams were created to illustrate how these use cases might be utilized by certain actors which serve as the direct means of interaction with the system. Using the detailed use cases as a basis, sequence diagrams were developed to understand how sequential events might occur in the typical success scenario of these use cases. The deployment diagram was created to identify which physical tools and software protocols would be necessary to get the system up and running. Finally, screen flow diagrams were created to sketch out how the system's different interfaces would flow and intercommunicate with one another.

II. SYSTEM FEATURES

Below is a list of features that are currently available in the proposed workshop reservation system, for regular user and a super administrator, respectively.

List of Features available for a regular user (Student/Staff/Faculty):

- View Workshop Information
- Register
- Login
- Add workshops to the cart
- Edit the cart
- Check attended workshops
- Print attended workshops.

List of Features available for a Super Administrator:

- View Workshop Information
- Register
- Login
- Add workshops to the cart
- Edit the cart
- Check attended workshops
- Print attended workshops
- Add, Edit and Delete workshops to the system
- Add, Edit and Delete schools to the system
- Add, Edit and Delete departments to the system
- Add, Edit and Delete major programs to the system
- Add users to the system from admin side
- Edit and Delete the user from the system
- Assign roles like Super Administrator, Administrator, Dean, and Chair to selected users
- Assign authorities to those particular users to whom the roles were assigned
- Generate Reports

The aforementioned features will be discussed in more details when we present use cases later.

III. FUNCTIONAL AND DATA REQUIREMENTS

The proposed workshop reservation system will be able to process transactions for multiple workshops. Each workshop will be defined by the following:

- Workshop ID (Event ID)
- Workshop Title (Event Title)
- Workshop Description (Event Description)
- Workshop Category (Event Category)
- Workshop Subcategory (Event Subcategory)
- User ID (people registered for workshop)
- Workshop Date and Time
- Workshop Location

The offerings for a workshop will be defined by the following data requirements:

- Workshop ID
- Workshop Title
- Workshop Instructor (Moderator)
- Workshop Description
- Workshop Category
- Workshop Subcategory
- Workshop Start Date and Time
- Workshop Duration
- Workshop Location
- Workshop Access Type (Student/Staff/Faculty)
- Workshop Last Registration Time

The workshop reservation system will track an individual's registration information. The following general registration information will be collected:

- First Name
- Last Name
- User Name (a St. Mary's email address required)
- Password (minimum 6 characters with a combination of alphabets, digits, and special characters)
- Confirm Password

- Mother's Maiden Name (for password reset)
- School (for Student or Faculty)
- Major Program (for Student)
- Department (for faculty)
- Captcha code
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The workshop reservation system will allow a user to add a workshop to his/her cart, check history, and see workshop details along with other regular activities that a content management system usually offers to its registered users. The following features will be provided to a regular user.

- A user can sign up or login from any computing devices with a standard web browser.
- A user can cancel a workshop that he has recently signed up any time before the workshop starts. Once the workshop starts, the user cannot cancel it.
- As soon as the user signs up the workshop, that event will go to his *recently signed up* tab with the attended flag set to "NO". When an instructor or a Super Administrator marks his attendance, the flag will set to "YES" and the workshop information will be moved from recently signed up to the Past sessions tab.
- A user can print his records from the *past session* tab where the workshops attended by him will be shown.
- A user can edit his profile from the edit profile tab. A user can also change his password by going to the *change password* tab.

A super administrator will be able to do all the functionalities without any restrictions. The following are some of the actions a super administrator can perform:

- A super administrator can Add, Edit and Delete Workshops.
- A super administrator can Add, Edit and Delete the School, the Department, and the Student Major information.
- A super administrator can Add, Edit and Delete the location for a workshop.
- A super administrator can Add, Edit and Delete the existing users as well as new users.
- A super administrator can assign roles, i.e., Super Administrator, Administrator, Dean, Chair, and Director of HR to registered users, if needed.
- A super administrator can assign responsibilities, i.e., Workshop management, School, Department and Program management, and Instructor responsibility.
- A super administrator can generate a report for any workshop.
A super administrator can mark the attendance for any workshop.

IV. SYSTEM ANALYSIS AND DESIGN

The system analysis of the proposed workshop reservation system involved the formulation of fundamental principles of the system. To properly understand and explicate out these principles, we developed a number of textual and extended use cases. All of these techniques allowed us to better articulate the demands of the system in terms of objects, classes, attributes, relationships, scenarios, and actors. A sample use case for a regular user and a super administrator is shown below.

A sample use case for a regular user (Student/Staff/Faculty):

Use Case Name	Workshop Details
Actor	User
Purpose	To see details about the workshops available.
Overview	A user can see the details regarding the various workshops from any category. The user does not need to register/login with the system for those information.

A sample use case for a super administrator:

Use Case Name	Add/Edit/Delete Workshop
Actor	Super Administrator
Purpose	To allow a super administrator to add, edit, and delete workshops
Overview	A super administrator will have the sole permissions, unless he assigns the responsibility of a super administrator to anybody else, to add, edit and delete workshops from the database.

Regarding the use cases written above, each will serve as a particular scenario or function that will fulfill the need of having a workshop reservation system. A detailed use case provides information such as preconditions, post conditions, description, exception, and frequency. A use case diagram reflects the functions performed by various actors of the system through its many modes of action.

The analysis class diagram brings the information of the use case diagram, the use case description, and extended use cases into consideration by modeling the classes of the system. These classes, though not software components, will influence later software development. The features of the analysis class diagrams are the classes and their cardinality. A sample use case diagram is shown below.

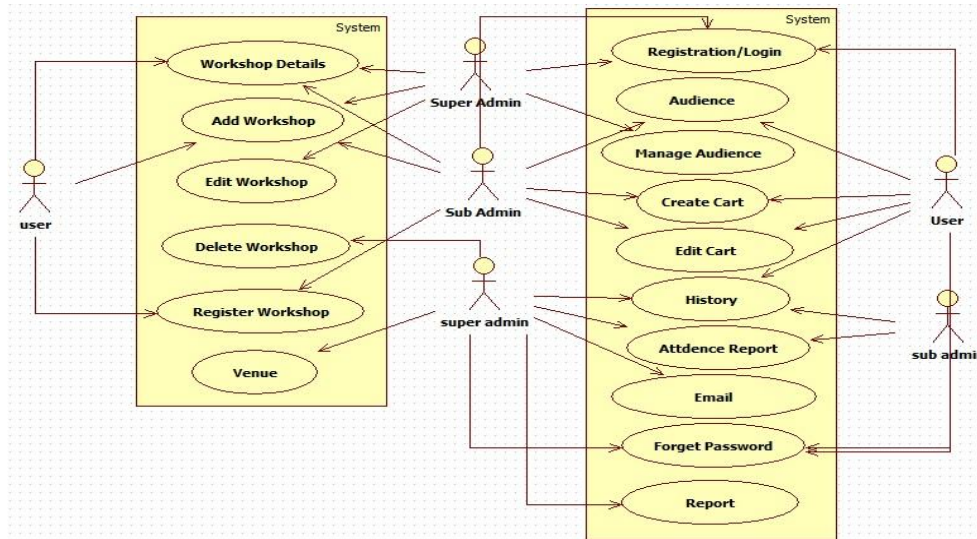


Fig. 1 use case diagram

Sequence diagrams are the interaction diagrams that show how processes operate with one another and in what order. Here, we have displayed four different sequence diagrams. The first sequence diagram is for a regular user. The sequence diagram displays the number of processes a regular user can perform within the system and the order in which a user can conduct those processes.

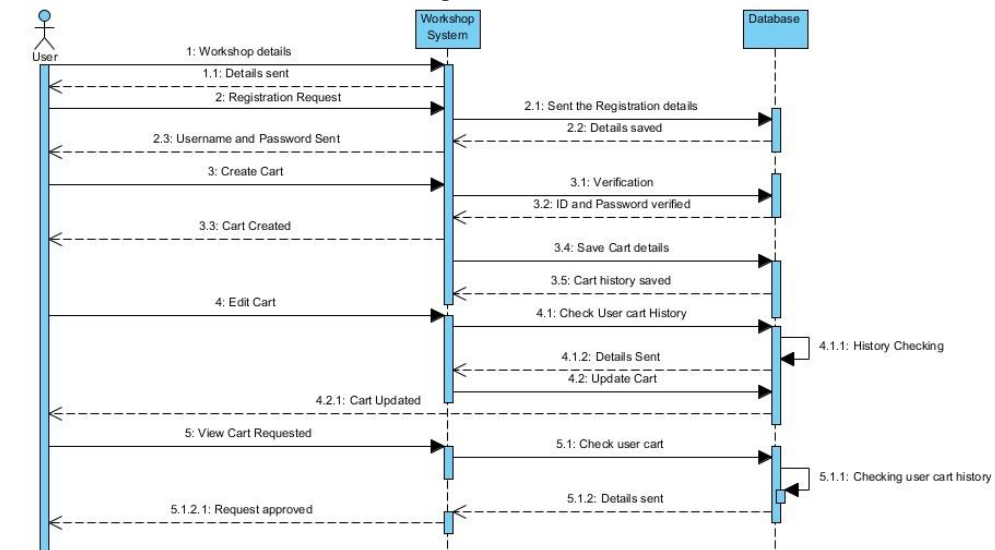


Fig. 2a sequence diagram for a regular user (User/Faculty/Staff)

Similar sequence diagrams were drawn for 1) a super administrator's workshop activity, 2) a super administrator's system activities, and 3) a super administrator's report function activity. The following state diagram shows the decision tree that is followed during the completion of a process from start to finish for a regular user.

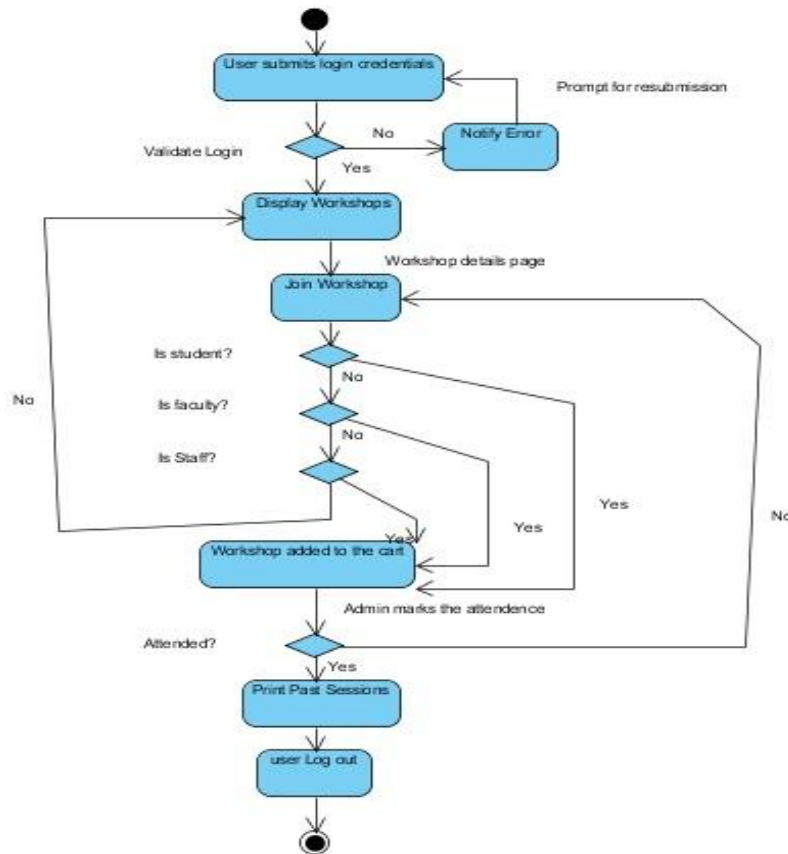


Fig. 3 a state diagram for a regular user

A second state diagram was drawn for a super administrator. A super administrator has the sole rights to conduct all activities, including all functionalities available to a regular user. Notes are provided in the state diagram to clarify the functionalities available to a super administrator.

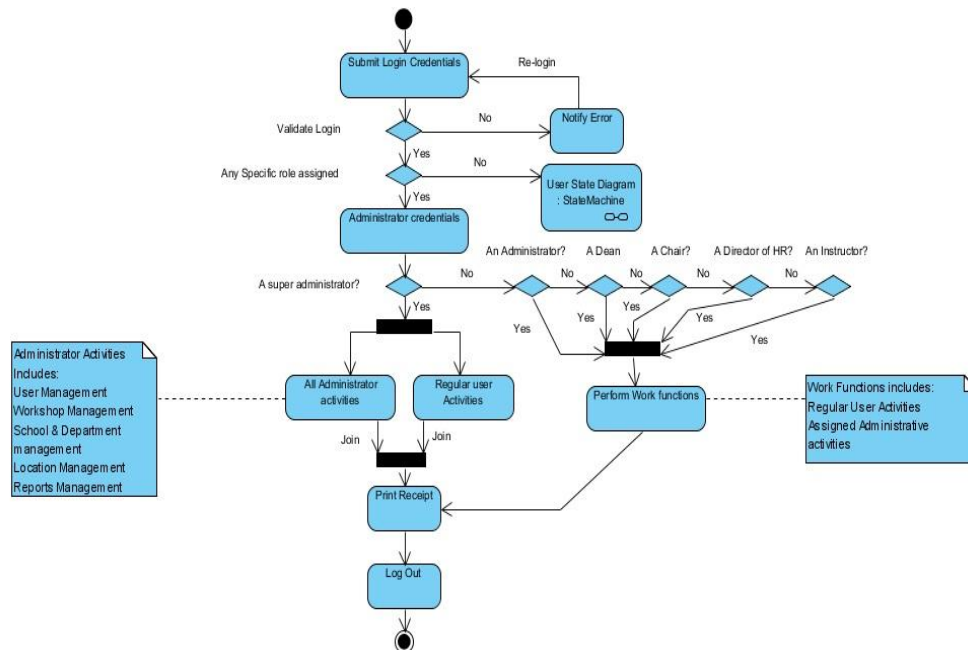


Fig. 4 state diagram for a super administrator

V. PHYSICAL AND APPLICATIONS DESIGN

The deployment diagram shows the overall system and software architecture, The workshop reservation system was designed as a web application, which can be accessed from any standard web browser available on personal computers or mobile devices. The system is hosted by an Apache web server that understands PHP scripting language [4-6] and is connected to a MySQL database.

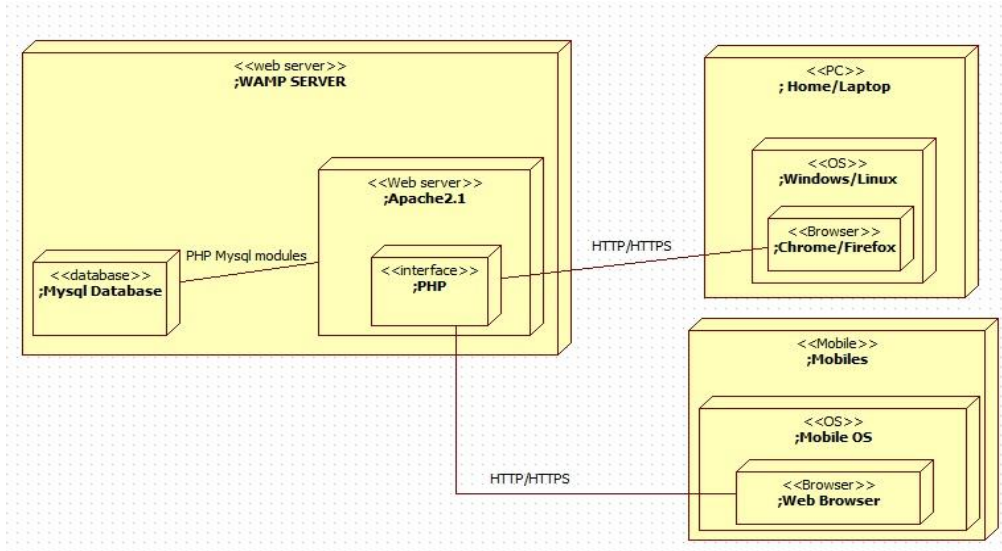


Fig. 5 deployment diagram

A screen flow diagram provides the navigation path between screens based on user actions. The home page is workshop homepage which will display all the workshops available in the system. If a user clicks on any workshop it will take him to the workshop details page. If a user wants to join the workshop, he either creates a new account or logs in using the existing account. As soon as the user logs in, he will again see the workshop home page. From there, he will be able to select the workshops according to his preferred time.

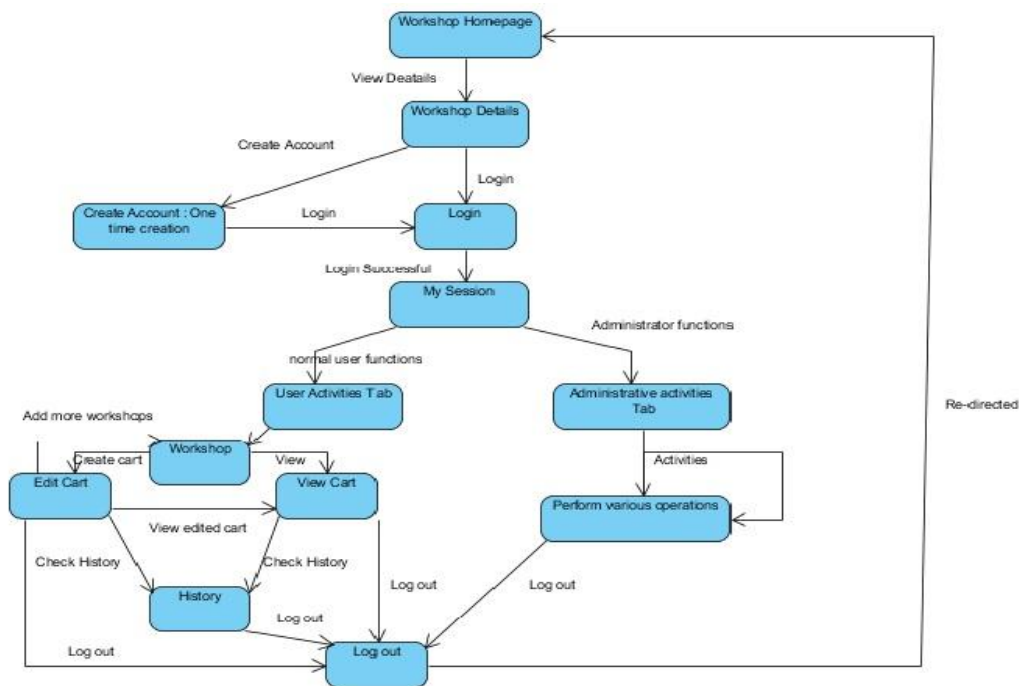


Fig. 6 screen flow diagram for super administrator

VI. CONCLUSION

In this paper, we presented a workshop reservation system that we have successfully designed and implemented for the Academic Technology Department at St. Mary's University. With the workshop reservation system, St. Mary's community can register for the different technological workshops offered by the Academic Technology Department. The workshop reservation system is a dynamic web application. As a result, a super administrator of the workshop reservation system can change its contents at any time.

Solid software engineering principles were utilized in the design and implementation of the proposed workshop reservation system. In addition, we performed extensive testing to validate different functionalities available in the system. Our testing indicated that the aforementioned workshop reservation system met all the requirements proposed by the Academic Technology Department.

REFERENCES

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- [3] R. Pressman, *Software Engineering* (New York City, NY: McGraw-Hill, 2005).
- [4] <http://www.php.net>
- [5] <http://www.phphunt.com>
- [6] <http://www.github.com>

APPENDIX

A screenshot of the workshop reservation system:

