System and Software Architecture Description (SSAD)

We Are Trojans

Team01

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Version History

Date	Author	Version	Changes made	Rationale
10/13/14	PP, SP	0.5	• Create initial SSAD document for Fundamental Commitment Package	• Used in Fundamental Commitment Package
10/19/14	PP	0.6	• Update system context, artifact and information, and use-case diagrams	• Further understandings regarding the project and documents are acquired
10/19/14	PP	0.7	• Update wording to have consistency across documents	• There is inconsistency in terminologies used in each document

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1. Introduction

1.1 Purpose of the SSAD

- The report demonstrates the whole picture of the project, which includes a synopsis of the key features and people who will be involved in the “WAT” Network.
- The report summarizes the architectures, both software and hardware, used in the project.
- The report presents essential details about the system to be developed, and avoids the generic introduction relating to our project.
- The SSAD presents the system structure independent of the implementation technology, and provides a clear picture of what needs to be done rather than how things need to be done.

1.2 Status of the SSAD

Currently we have updated the SSAD report to include the System Context diagram and Use Case diagram i.e. Section 2 in accordance with to our project “WAT” Network. This is the initial version of SSAD.

2. System Analysis

2.1 System Analysis Overview

The primary purpose of "We Are Trojans" Network is to provide a platform where students can interact with fellow Trojans. The system provides users with an online forum, where users can interact via posting on the forum. The forum allows the users to comment on threads, like posts, and dislike posts. To encourage more and more people to join the forum, the system uses a WAT Points. The WAT Points are awarded to a particular user when other users like his post on the forum. The points can be earned to gain recognition on the leaderboard as well as can be used to redeem USC items/ USC Bookstore gift cards via the website.

2.1.1 System Context

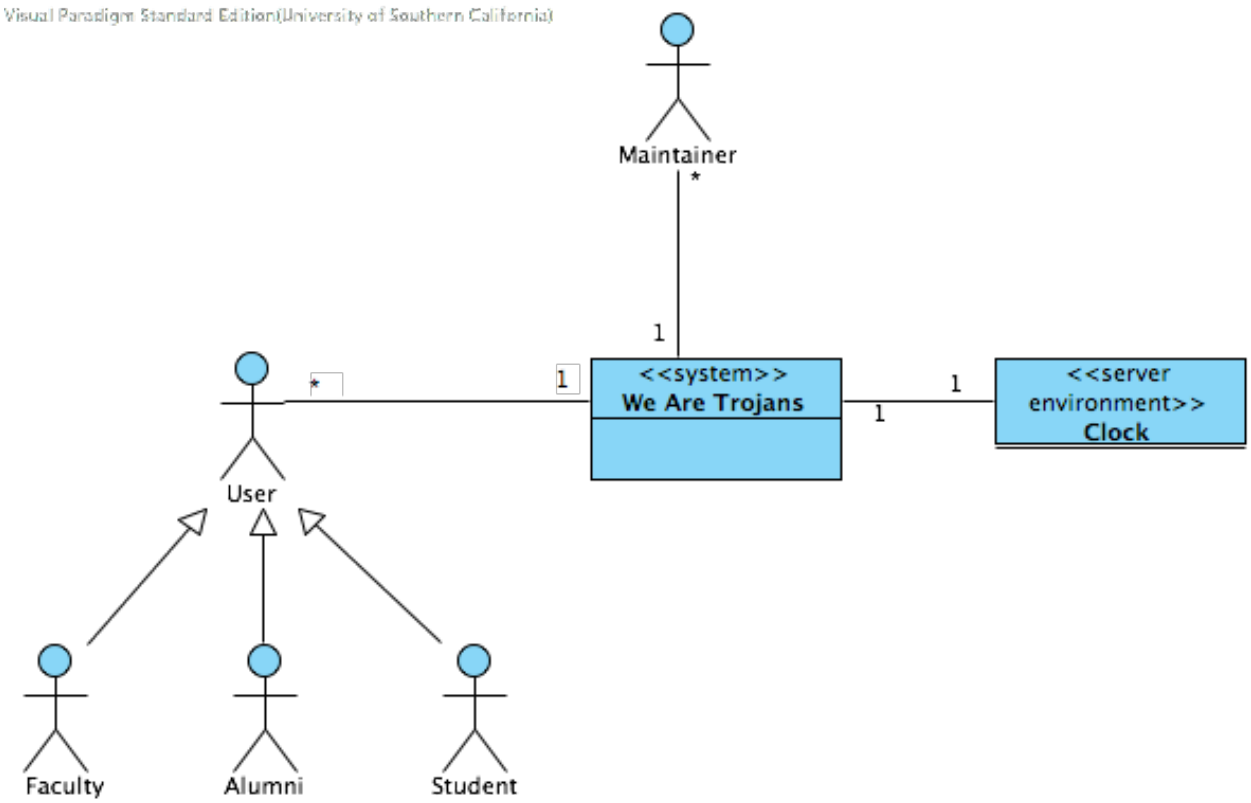

Figure 1: System Context Diagram

Table 1: Actors Summary

Actor	Description	Responsibilities
User (Student, Faculty, Alumni)	USC students, faculty, and alumni who participate in the Trojan network	• Start a thread and post on a thread. • Like, dislike a post/thread in the system to give credibility of both posts and threads • Redeem a gift card, items from points earned in the system • Update their own profiles reflecting their personal information
Maintainer	Selected personnel to maintain the system	• Review and delete rule-violating posts • Pin important posts • Create categories for the posts • Arrange posts to a categories • Manage users' accounts
Clock	System Clock	Provide the system time

2.1.2 Artifacts & Information

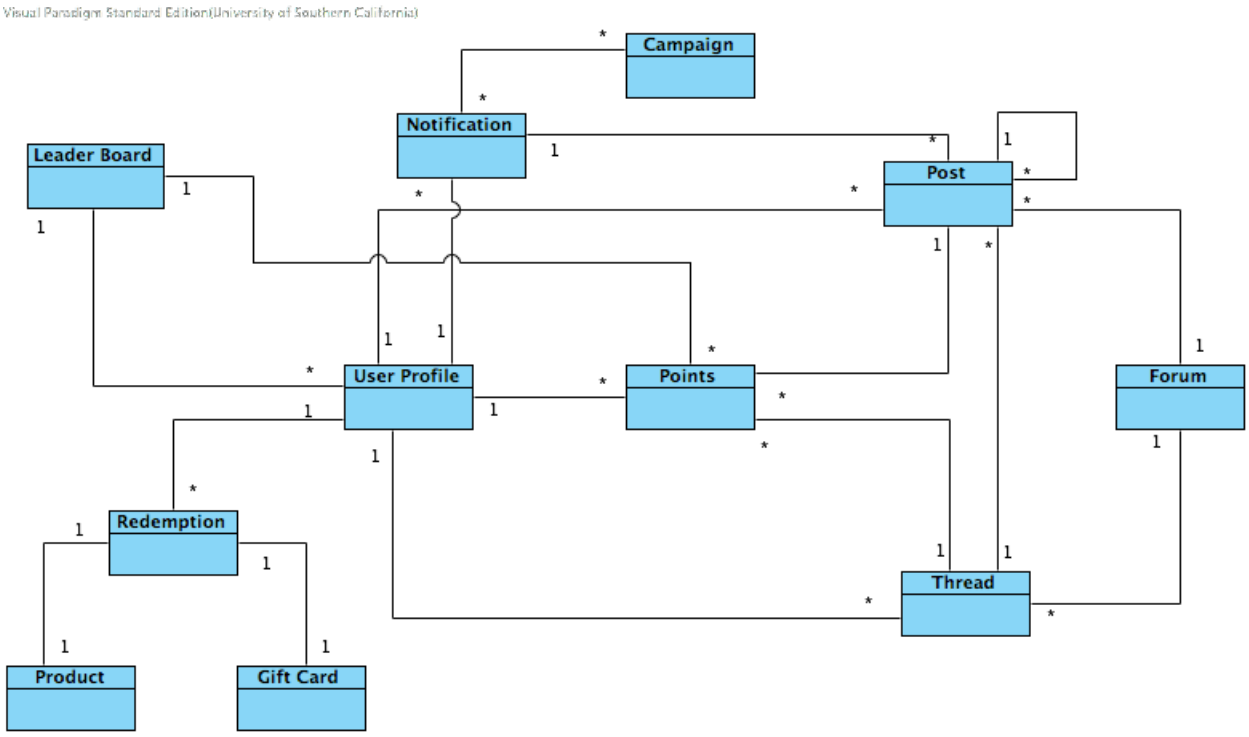

Figure 2: Artifacts and Information Diagram

Table 2: Artifacts and Information Summary

Artifact	Purpose
Leaderboard	Contain all information, personal profile, classes and points, about the user
Redemption	Contain all information regarding redemption for users
Product	Contain all information about items to be redeemed. This could include a list of available items and points for a particular item.
Gift Card	Contain all information about gift cards to be redeemed. This could include a list of available gift cards and points for a particular card.
User Profile	Contain all details about users. There is both prerequisite information set by a system and user-created fields for their special information.
Points	Contain all points in each system of a user.
Thread	Contain all thread posted by users. This includes a posting time, a title, and details of a particular thread.
Post	Contain all post created by users. This includes a posting time, a title, and details of a particular post.
Notification	This includes notification form threads, special events, and other possible notifications.

2.1.3 Behavior

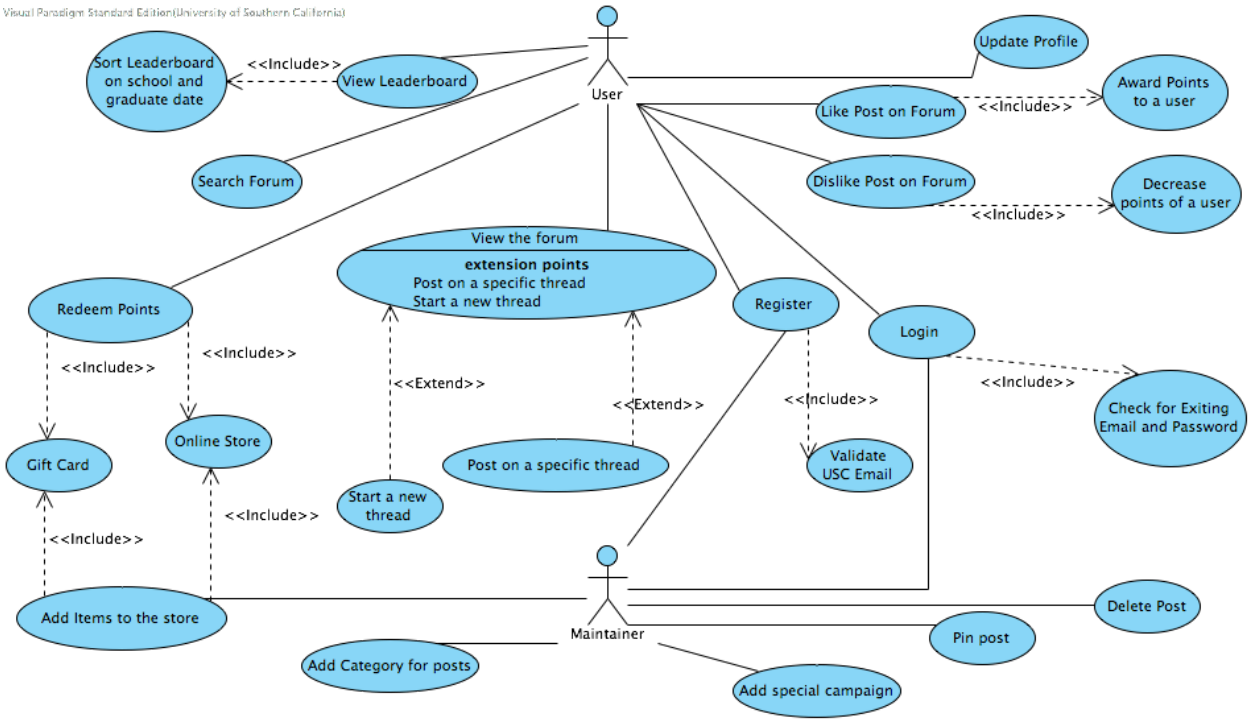

Figure 3: Use-Case Diagram for "We Are Trojans" Network System

2.1.3.1 Capability x

2.1.3.1.1 Process y

Table 3: Process Description

Identifier	User and Maintainer
Purpose	To illustrate all the functionalities that a user and a maintainer can do with the system
Requirements	1. User/Maintainer can create his profile on forum. 2. User/Maintainer can post on the forum and receive likes and dislikes. 3. User can earn points and redeem them in online store or get gift cards using the system. 4. Maintainer can delete post violating forum ethics. 5. Maintainer can add categories for the posts on the forum 6. Maintainer can add new items or gift cards for user to redeem points. 7. Maintainer can add campaigns to the system. 8. Maintainer can pin a post on the forum.

	9. User can Login using his username and password. 10. User can search the forum, the post based on his search is founded will be loaded.
Development Risks	Risk with the User System Implementation: 1. The users might not like the graphical user interface for the systems 2. The point system might not be enough to encourage users to join the system 3. Changes in requirements Risk Associated with Maintainer: 1. Deciding the criteria to be used by the maintainer to validate his action of deleting a post.
Pre-conditions	1. The user joins the system and would like to interact with peers by posting on the forum. 2. The maintainer joins the system.
Post-conditions	1. The users are able to post on the forum, comment and like/dislike specific posts. they earn points and also give points to other users by liking their posts. 2. The maintainer deletes specific posts from the forum to avoid damage to the point system. Update the leaderboard and the usable points on monthly basis.

Table 4: Typical Course of Action

Seq#	Actor's Action	System's Response
1	Joins the System by creating Profile/Register.	The system validate user by USC email and create a user profile.
2	User/Maintainer Login to the system	The Password and Username validated via database and homepage is loaded.
3	User/Maintainer write a post on the system and click Post.	The Post is posted on the Forum for other users to read and assess the user post.
4	User Likes (or) Dislikes a particular post.	The system searches for the person who wrote that post. Award points (or) Deduct Points to that user and update his usable points and send notification to both the current user and the user whose post was liked.
5	User used points to redeem items at the online store	The system subtracts specific number of points from the users usable points.
6	Maintainer add items on the online store/ Campaign Events in the system	• The item is visible on the online store page and ready for the users to redeem points via

		purchasing that item. • The campaign event is added and a notification is sent to users.
7	Users can view leaderboard and search based on schools or graduation date.	The leaderboard displays the result specific to user search.
8	User can search the forum and view posts specific to his search.	The system loads the posts specific to users' search. If the posts specific to the search are not found the system displays a message saying no posts found for the particular search.
9	Users can view other users profile and see their "WAT" Points	The users' were able to view other users profile.
10	The users can view the leaderboard and can make selection to view the board	The leaderboard display the sorted results based on user selection in the leaderboard.

Table 5: Alternate Course of Action

Seq#	Actor's Action	System's Response
1	Joins the System by creating Profile/Register.	The system rejects the user as USC email could not be validated.
2	User/Maintainer Login in the system	The Username or Password Invalid message displayed, as the entries were not found in database
3	User/Maintainer write a post on the system and click Post.	The post is not visible on the forum page.
4	User Likes (or) Dislikes a particular post.	The points were not awarded for the post.
5	User used points to redeem items at the online store	The usable points remain did not change even after redemption.
6	Maintainer add items on the online store/ Campaign Events in the system	• The item did not show up on the online store page. • The campaign event notification was not sent to all users.
7	Users can view leaderboard and search based on schools or graduation date.	Users' actions do not result in any change in to the Leaderboard.
8	User can search the forum and view posts specific to his search.	The system loads all the posts it did not perform the search operation.

9	Users can view other users profile and see their "WAT" Points	The system did not direct the page to other users profile when users made selection to view their profile via the "WAT" Network.
10	The users can view the leaderboard and can make selection to view the board based on graduation year or schools.	When user selected to view leaderboard based on criteria, the user board did not reload to display the specific result. The sorting functionality was not being implemented.

Table 6: Exceptional Course of Action

Seq#	Actor's Action	System's Response
1	Joins the System by creating Profile/Register.	The user was able to create profile without a valid USC email.

2.1.4 Modes of Operation

The system will not have multiple modes. Therefore, no description could be stated in this section.

2.2 System Analysis Rationale

The major operational stakeholders of the system are the USC students, USC faculty and USC alumni. These are the users who will become the members of the system. The users will be authenticated by the system via USC email. The "WAT" Network profile would be created once the user is validated.
The points system is a critical feature of the system. It serves as the base for the development of other features of the system such as the leaderboard and the like/dislike functionality for a post. The users actions in our system are associated with earning points. The more the users participate with the system the more points they can earn and gain recognition on leaderboard or redeem items for store or redeem a gift card.

3. Technology-Independent Model

3.1 Design Overview

3.1.1 System Structure

<< This section should contain

- a UML hardware component class diagram
- a UML software component class diagram
- a UML deployment diagram
- If necessary, a class diagram for the system's supporting software infrastructure
- and descriptions of the hardware components, software components, and, if necessary, the supporting software infrastructure components of the technology/platform-independent system architecture

More information and example can be found in **ICM EPG> Task: Define Technology-Independent Architecture >>**

<<Hardware Component Class Diagram>>

Figure 4: Hardware Component Class Diagram

<<Software Component Class Diagram>>

Figure 5: Software Component Class Diagram

<<Deployment Diagram>>

Figure 6: Deployment Diagram

<<Optional: Supporting Software Infrastructure Diagram>>

Figure 7: Supporting Software Component Class Diagram

Table 7: Hardware Component Description

Hardware Component	Description

Table 8: Software Component Description

Software Component	Description

Table 9: Supporting Software Component Description

Support Software Component	Description

3.1.2 Design Classes

This section should contain:

- UML class diagrams showing all the boundary, entity, and control classes in the design of the system being developed
- and a description of each class in the diagram

More information and example can be found in **ICM EPG> Task: Define Technology-Independent Architecture >>**

3.1.2.1 <Classes n>

<<Design Classes Class Diagram>>

Figure 8: Design Class Diagram

Table 10: Design Class Description

Class	Type	Description

3.1.3 Process Realization

<< This section shows how the proposed architecture can be realized by constructing sequence diagrams. More information and example can be found in **ICM EPG> Task: Define Technology-Independent Architecture >>**

<<Process Realization Diagram>>

Figure 9: Process Realization Diagram

3.2 Design Rationale

<< This section should contain an explanation of how/why the architecture/design described in previous sections was chosen. More information and example can be found in **ICM EPG> Task: Define Technology-Independent Architecture >>**

4. Technology-Specific System Design

<< Once you know specific technology that you team is going to use, design the system and software architecture and document them in this section. >>

4.1 Design Overview

4.1.1 System Structure

<<Hardware Component Class Diagram>>

Figure 10: Hardware Component Class Diagram

<<Software Component Class Diagram>>

Figure 11: Software Component Class Diagram

<<Deployment Diagram>>

Figure 12: Deployment Diagram

<<Optional: Supporting Software Infrastructure Diagram>>

Figure 13: Supporting Software Component Class Diagram

Table 11: Hardware Component Description

Hardware Component	Description

Table 12: Software Component Description

Software Component	Description

Table 13: Supporting Software Component Description

Support Software Component	Description

4.1.2 Design Classes

4.1.2.1 <Classes n>

<<Design Classes Class Diagram>>

Figure 14: Design Class Diagram

Table 14: Design Class Description

Class	Type	Description

4.1.3 Process Realization

<<Process Realization Diagram>>

Figure 15: Process Realization Diagram

4.2 Design Rationale

5. Architectural Styles, Patterns and Frameworks

<< Describe any implementation architecture styles (e.g. the Prism style and 3-tier architecture), patterns (e.g. pipe-and-filter and client-server), or frameworks (e.g. Java and CORBA) used to describe the system architecture. >>

Table 15: Architectural Styles, Patterns, and Frameworks

Name	Description	Benefits, Costs, and Limitations