

System and Software Architecture Description (SSAD)

LA Commons upgrade of website

Team 1

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11/27/2013

Version History

Date	Author	Version	Changes made	Rationale
10/19/13	Yueheng Li	1.0	<ul style="list-style-type: none"> • Original SSAD template • Constructed system context diagrams, use-case diagrams, deployment diagrams, behavior diagrams • Embedded description in each Tab 	<ul style="list-style-type: none"> • Initial version of the SSAD, ver 1.0 • To fulfill the exit conditions of Draft FC package
11/21/13	Yueheng Li	2.0	<ul style="list-style-type: none"> • Changed the Use-case diagrams according the requirement changing • Changed the system context diagrams 	<ul style="list-style-type: none"> • To meet on response to Evaluation of Core FC Package
11/27/13	Taizhi Li, Yueheng Li	3.0	<ul style="list-style-type: none"> • Add the section 1, 2 and 3 • Constructed the Artifact and Information diagram • Modified all of the diagrams according the lecture of “SSAD IN DC” 	<ul style="list-style-type: none"> • To be consistent with ICM EPG SSAD template • To identify the document for NDI and NCS Project

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1. Introduction

1.1 Purpose of the SSAD

The purpose of the SSAD is to record the results of the object-oriented analysis and upgrade the LA Commons website. This document is critical in transition from foundation phase to development phase by providing architectural design of the proposed system. Later, the programmers and developers of our team can use this SSAD as reference to the architecture of the system that we are developing. During the development of this system, our team will be faithful to the structure of the system described in SSAD.

1.2 Status of the SSAD

This SSAD is the version 3.0. This version we correct some mistakes mentioned by TA, and add the content in section 1, 2 and 3.

This SSAD is the version 3.4. This version we correct some mistakes mentioned by TA.

2. System Analysis

2.1 System Analysis Overview

The primary purpose of LA Commons Website, which is developing now, is to market and promote LA Commons events, and to showcase arts work properly on the website. On the other hand, the website will help to increased the visibility of art projects of LA Commons, to increase acknowledgement of neighborhood's arts and culture. Through displaying galleries, more funds will be raised, and popularity and reputation of LA Commons events should be increased.

2.1.1 System Context

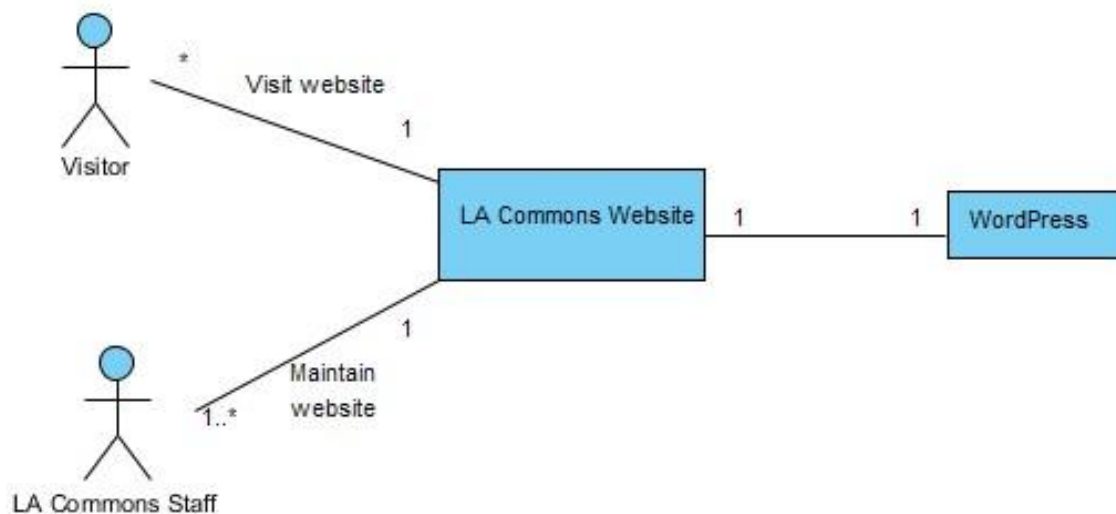


Figure 1: System Context Diagram

Table 1: Actors Summary

Actor	Description	Responsibilities
Visitor	Visitor is a user who views the contents of the website and finds information about the neighborhoods and projects. The visitor can be a funder, youth artist, artist, community member, tourist	View gallery images on Project Page and Gallery Page View the Project/Neighborhoods Pages View the Trekking LA Visit interactive map Share events to Facebook
LA_Commons_Staff	An executive/managerial staff of this website.	Post new projects Add new events to interactive map Share projects to Facebook Add pictures to Gallery of art works

2.1.2 Artifacts & Information

Visual Paradigm for UML Standard Edition(University of Southern California)

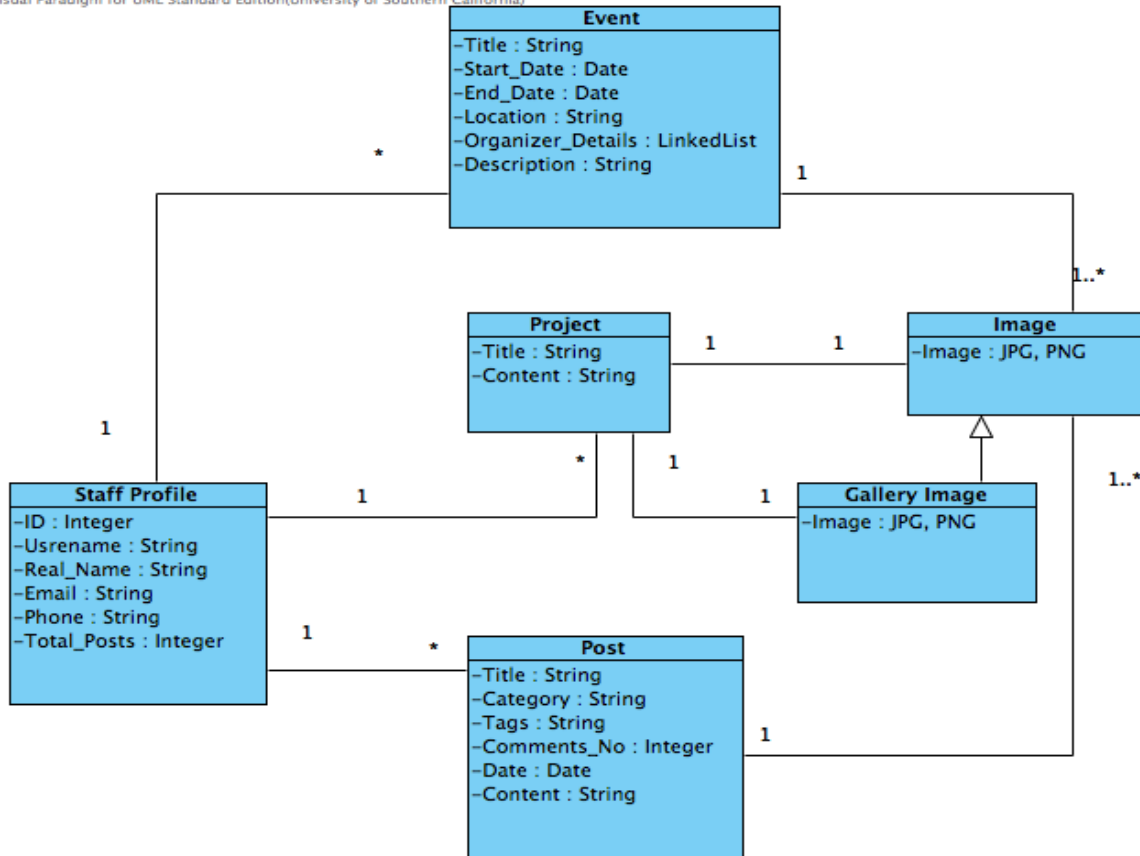
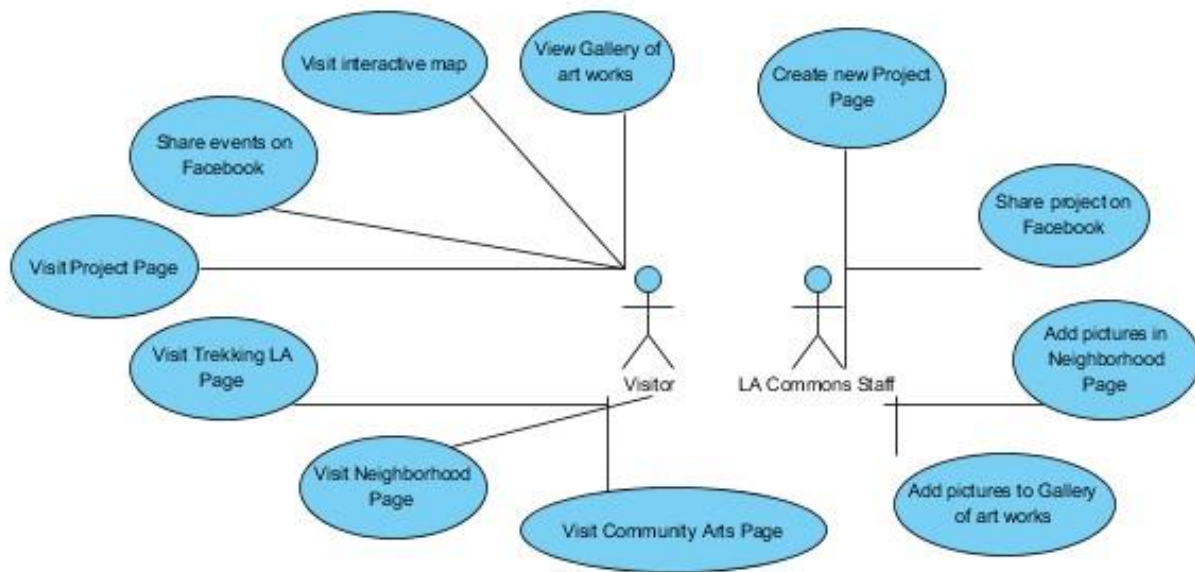


Figure 2: Artifacts and Information Diagram

Table 2: Artifacts and Information Summary

Artifact	Purpose
Image	To show all the images uploaded by the website administrators. The formats of images are JPG and PNG.
Gallery Image	To show all the images displayed in galleries of Project Pages and Gallery Page.
Post	To store all the blogs edited by the LA Commons staffs, including blogs' titles, categories, tags, total comments number, published date and blog contents.
Project	To give a brief description of neighborhoods' projects, including the projects' titles and text descriptions.
Event	To give the detailed information of the upcoming events held by LA Commons, including the events' titles, start-dates, end-dates, locations, organizers' details and descriptions.
Staff Profile	To store the information of LA Commons staffs, including the staff ID, username, real name, email address, phone number and total posts number.

2.1.3 Behavior



<<Use-Case Diagram>>

Figure 3: Process Diagram

2.1.3.1 Interactive Map

2.1.3.1.1 Visit interactive map

Main			
Identifier	UC02 - Visit interactive map		
Purpose	By checking the interactive map, visitor could have a brief introduction about recent tours and community arts		
Requirements	WC_2700 : As a visitor, I can see by the interactive map how many different neighbourhoods in Los Angeles area LA Commons has partnered with and created programs for, and upcoming tours and community arts of the neighbourhoods in the interactive map.		
Development Risks	High		
Pre-conditions	Visitor is visiting the homepage of LA Commons		
Post-conditions	The page of Interactive Map is shown or Error page is displayed		
Flow of Events		Actor Input	System Response
	1	Click Neighbourhoods on homepage	
	2		Display a dropdown list which contain the whole list of neighbourhoods
	3	Choose map	
	4		Display a interactive map
	5	Hover mouse over a neighbourhood point	
	6		Show a box containing Community Arts Program and Tours
	7	Click the link in the box	
	8		Check the validation of the link and display corresponding page
Exception		Actor Input	System Response
	1	Click Neighbourhoods on homepage	
	2		Display a dropdown list which contain the whole list of neighbourhoods
	3	Choose map	
	4		Display a interactive map

	5	Hover mouse over a neighbourhood point	
	6		Show a box containing Community Arts Program and Tours
	7	Click the link in the box	
	8		Check the validation of the link, find the link is invalid and display 404 or 500 error page

2.1.3.2 Community Arts project page

2.1.3.2.1 Visit project page

Main			
Identifier	UC04 - Visit project page		
Purpose	By visiting project pages, knows more about previous and current projects		
Requirements	<p>WC_2561 : As a visitor, I can see the Community Arts Programming related documents on the website so that I know more about this program. Funders can see where their money going. Youth artists can use their art works in resume for college. Artists can use these projects as in their resume. Community members can see what's going on in their neighbourhoods. Tourists can see what's going on in LA.</p> <p>WC_2817: As a visitor, I can access specific neighbourhood community arts program information from both the "Programs" tab (dropdown - Community Arts) and the "Neighbourhood" tab (dropdown - specific neighbourhoods)</p>		
Development Risks	Medium		
Pre-conditions	Visitor is visiting the Neighbourhood Page of LA Commons		
Post-conditions	The page of a project is shown or Error page is displayed		
Flow of Events		Actor Input	System Response
	1	Click the right bottom of the page	
	2		Read image and gallery from plugin, display the corresponding project page, which has a image and a gallery and description of the project.
	3	Click thumbnail of the gallery	
	4		Display the corresponding image of the thumbnail
	5	Click left or right arrow of the gallery	
	6		Display previous or next image
Exception		Actor Input	System Response
	1	Click the right bottom of the page	
	2		Read image and gallery from

			plugin, fail in reading, display 404 or 500 error page
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2.1.3.2.2 Visit Community Arts Page

Main			
Identifier	UC07 - Visit Community Arts Page		
Purpose	Visitor could access community arts program from the Community Arts page		
Requirements	WC_2817: As a visitor, I can access specific neighbourhood community arts program information from both the "Programs" tab (dropdown - Community Arts) and the "Neighbourhood" tab (dropdown - specific neighbourhoods)		
Development Risks	Low		
Pre-conditions	Visitor is visiting the homepage of LA Commons		
Post-conditions	The page of a project is shown or Error page is displayed		
Flow of Events		Actor Input	System Response
	1	Click Programs on homepage	
	2		Display a dropdown list
	3	Click Community Arts from the dropdown list	
	4		Display the Community Arts page, which contains links to project pages
	5	Click the link	
	6		Check the validation of the link, display the corresponding project page
Exception		Actor Input	System Response
	1	Click Programs on homepage	
	2		Display a dropdown list
	3	Click Community Arts from the dropdown list	
	4		Display the Community Arts page, which contains links to project pages
	5	Click the link	
	6		Check the validation of the link, find link is invalid, display 404 or 500 error page

2.1.3.2.3 Create new project Page

Main			
Identifier	UC08 - Create new project Page		
Purpose	Add information about Youth Artist or Neighbourhood Project		
Requirements	<p>WC_2558 : As a worker at LA Commons, I can maintain the website of LA Commons so that it will let the users visit the website more safely and stably</p> <p>WC_2562 : As LA Commons staff, I can use the template to enter and save the past ten-year project documents after accepting Wordpress training provided by developers</p>		
Development Risks	Medium		
Pre-conditions	LA Commons staff has logined to Wordpress; the gallery file has been created		
Post-conditions	Create a new page about the project with a gallery or not		
Flow of Events		Actor Input	System Response
	1	Click Page, Add new from the left side of the dashboard	
	2		Display a new section on the right side of the dashboard
	3	Add image, gallery and description of the project, and Click Publish	
	4		Read gallery from plugin, create new project page which has gallery on LA Commons website
Exception		Actor Input	System Response
	1	Click Page, Add new from the left side of the dashboard	
	2		Display a new section on the right side of the dashboard
	3	Add image, gallery and description of the project, and Click Publish	
	4		Read gallery from plugin, fail in reading, create new project page which has no gallery on LA Commons website

2.1.3.2.4 Visit Trekking LA Page

Main			
Identifier	UC05 - Visit Trekking LA Page		
Purpose	Visitor could visit Trekking LA on LA Commons website which has a better layout		
Requirements	WC_2699 : As a visitor, I can see a better layout of LA Commons website so that I can be more attracted by programs and spend more time on the website.(For example, condense the "upcoming tour" section in "trekking LA" page)		
Development Risks	Low		
Pre-conditions	Visitor is visiting the homepage of LA Commons		
Post-conditions	The page of Trekking LA is shown or Error page is displayed		
Flow of Events		Actor Input	System Response
	1	Click Programs on homepage	
	2		Display a dropdown list
	3	Click Trekking LA from the dropdown list	
	4		Read images and texts, display the Trekking LA page, which contains a description of upcoming tours that has a better layout
Exception		Actor Input	System Response
	1	Click Programs on homepage	
	2		Display a dropdown list
	3	Click Trekking LA from the dropdown list	
	4		Read images and texts, fail in reading, display 404 or 500 error page

2.1.3.3 Neighborhood Page Upgrade

2.1.3.3.1 Visit Neighborhood Page

Main			
Identifier	UC06 - Visit Neighbourhood Page		
Purpose	Visitor will know more about what's happening between neighbourhood		
Requirements	WC_2557 : As a visitor, I can view a gallery of art works of community arts program WC_2697 : As a visitor, I can clearly identify the various Community Arts Programming on the "Neighbourhood" web page, along with the most current applicable Tour information		
Development Risks	Medium		
Pre-conditions	Visitor is visiting the homepage of LA Commons		
Post-conditions	The page of neighbourhood is shown or Error page is displayed		
Flow of Events		Actor Input	System Response
	1	Click Neighbourhoods on homepage	
	2		Display a dropdown list which contain the whole list of neighbourhoods
	3	Click on a particular neighbourhood	
	4		Read gallery from plugin, display the corresponding neighbourhood page, which has a small gallery of Community Art Program on the right bottom of the page.
Exception		Actor Input	System Response
	1	Click Neighbourhoods on homepage	
	2		Display a dropdown list which contain the whole list of neighbourhoods
	3	Click on a particular neighbourhood	
	4		Read gallery from plugin, fail in reading, display 404 or 500 error page

2.1.3.3.2 Add pictures in Neighbourhood Page

Main			
Identifier	UC10 - Add pictures in Neighbourhood Page		
Purpose	Post pictures in Neighbourhood Page		
Requirements	WC_2558 : As a worker at LA Commons, I can maintain the website of LA Commons so that it will let the users visit the website more safely and stably		
Development Risks	Medium		
Pre-conditions	LA Commons staff has logged in to Wordpress		
Post-conditions	Post pictures to gallery in the Neighbourhood or not		
Flow of Events		Actor Input	System Response
	1	Click Post, NewPost from the left of the dashboard	
	2		Display a new section on the right side of the dashboard
	3	Click Add File. Choose pictures from computer. Click Upload. Choose categories from neighborhood. Click Publish	
	4		Read pictures, add new pictures to gallery in the Neighborhood section
Exception		Actor Input	System Response
	1	Click Post, NewPost from the left of the dashboard	
	2		Display a new section on the right side of the dashboard
	3	Click Add File. Choose pictures from computer. Click Upload. Choose categories from neighborhood. Click Publish	
	4		Read pictures, fail in reading, can not add new pictures to gallery in the Neighborhood section

2.1.3.4 Social Network Share Function

2.1.3.4.1 Share events on Facebook

Main			
Identifier	UC03 - Share events on Facebook		
Purpose	If visitor likes a specific event, he/she could post project information to Facebook		
Requirements	WC_2563 : As a visitor, I can share my favourite events to the social media so that I can invite more friends to attend the upcoming events and enlarge the social influence of the projects		
Development Risks	Low		
Pre-conditions	Visitor has a Facebook account; Visitor is visiting the event page of LA Commons		
Post-conditions	Visitor shares events on Facebook or error message is displayed		
Flow of Events		Actor Input	System Response
	1	Click Facebook button on website pages	
	2		Display a new window for logging in to Facebook
	3	Enter user name and password of Facebook and click Log in	
	4		Send user name and password to Facebook database and check name and password
	5	Write post on user facebook wall	
	6		Post posts about the project on user's Facebook timeline
Alternate		Actor Input	System Response
	1	Click Facebook button on website pages	
	2		Checked visitor has logged in Facebook, display a new window for writing Facebook post
	3	Write post on visitor's facebook wall	
	4		Post posts about the project on visitor's Facebook timeline

Exception		Actor Input	System Response
	1	Click Facebook button on website pages	
	2		Display a new window for logging in to Facebook
	3	Enter user name and password of Facebook and click Log in	
	4		Send user name and password to Facebook database, check name and password, find invalid name and password match, and show invalid user name or password

2.1.3.4.2 Share project on Facebook

Main			
Identifier	UC09 - Share project on Facebook		
Purpose	If LA Commons Staff likes a specific project, he/she could post project information to Facebook		
Requirements	WC_2556 : As a worker at LA Commons, I can share our project documents to social media so that it will increase our influence on Internet		
Development Risks	Low		
Pre-conditions	LA Commons Staff has a Facebook account and is visiting project page		
Post-conditions	Share project on Facebook or error message is displayed		
Flow of Events		Actor Input	System Response
	1	Click Facebook button on website pages	
	2		Display a new window for logging in to Facebook
	3	Enter user name and password of Facebook and click Log in	
	4		Send user name and password to Facebook database and check name and password
	5	Write post on user Facebook wall	
	6		Post posts about the project on LA Commons Staff's Facebook timeline
Alternate		Actor Input	System Response
	1	Click Facebook button on website pages	
	2		Checked LA Commons staff has logged in Facebook, display a new window for writing Facebook post
	3	Write post on LA Commons staff facebook wall	
	4		Post posts about the project on LA Commons staff's Facebook timeline

Exception		Actor Input	System Response
	1	Click Facebook button on website pages	
	2		Display new window to login in to Facebook
	3	Enter user name and password of Facebook and click Log in	
	4		Send user name and password to Facebook database, check name and password, find invalid name and password match, and show invalid user name or password

2.1.3.5 Gallery of art works

2.1.3.5.1 View Gallery of art works

Main			
Identifier	UC01 - View Gallery of art works		
Purpose	Visitor could visit the gallery of artwork, hence knows more about LA.		
Requirements	WC_2557 : As a visitor, I can view a gallery of art works of youth arts program.		
Development Risks	Low		
Pre-conditions	Visitor is visiting the homepage of LA Commons		
Post-conditions	The page of Gallery of Artwork is shown or Error page is displayed		
Flow of Events		Actor Input	System Response
	1	Click Gallery on homepage	
	2		Read gallery from plugin, display a new page of Gallery of Artwork
	3	Click left or right arrow of the gallery	
	4		Display previous or next image
	5	Click image of the Gallery	
	6		Check the validation of the link of the image, display corresponding Project page
Exception		Actor Input	System Response
	1	Click Gallery on homepage	
	2		Read gallery from plugin, fail in reading, display 404 or 500 error page
Exception		Actor Input	System Response
	1	Click Gallery on homepage	
	2		Read gallery from plugin, display a new page of Gallery of Artwork
	3	Click left or right arrow of the gallery	
	4		Display previous or next image

	5	Click image of the Gallery	
	6		Check the validation of the link of the image, find the link is invalid, display 404 or 500 error page

2.1.3.5.2 Add pictures to Gallery of art works

Main			
Super Use Case	UC11 - Add pictures to Gallery of art works		
Purpose	Add new pictures to Gallery		
Requirements	WC_2558 : As a worker at LA Commons, I can maintain the website of LA Commons so that it will let the users visit the website more safely and stably.		
Development Risks	Low		
Pre-conditions	LA Commons staff has logged in to Wordpress		
Post-conditions	Add new picture to Gallery or display Error page		
Flow of Events		Actor Input	System Response
	1	Click Gallery, Add new from the left side of the dashboard	
	2		Display a new section on the right side of the dashboard
	3	Add images and Click Publish	
	4		Read images, add new pictures to Gallery
Exception		Actor Input	System Response
	1	Click Gallery, Add new from the left side of the dashboard	
	2		Display a new section on the right side of the dashboard
	3	Add images and Click Publish	
	4		Read images, fail in reading, can not add new pictures to Gallery

3. NDI/NCS Interoperability Analysis

3.1 Introduction

Since our project's main responsibility is to upgrade "LA Commons" current website, we need to add features and modify the current website's flow of information using the WordPress and it's plugins. Currently, the whole LA Commons' website is built on WordPress, and there are some useful plugins we can directly use and optimize.

3.1.1 COTS / GOTS / ROTS / Open Source / NCS

Table 7: NDI Products Listing

NDI/NCS Products	Purposes
WordPress	This offers the general solution for the website. And this is what client currently uses.
BlueHost	This provides the hosting solution for the website. And this is what the client currently uses.
WOW Slider NextGen Gallery	An image gallery that will display a set of thumbnails and the corresponding large image attached to the right portion of a project's post or page. An image gallery should also provide a slide show function in Gallery page. This way, we can achieve WC_2561 & WC_2557
MapPress Easy Google Maps Leaflet Maps Marker	It will help the client to create an interactive map to show the neighborhoods in the Los Angeles area that "LA Commons" has partnered with or created programs for. This way, we can achieve WC_2700
Add This Share This	It will enable page past to be shared by visitors. This will increase the engagement from visitors and increase the website's traffic. And this way we can achieve the WC_2563 and WC_2556

3.1.2 Connectors

- In this project, wordpress manages the connection with MySQL database automatically. Type: data access connector.
- In this project, “WordPress Gallery Widget” or “NextGen Gallery” manages the connection with data storage and MySQL automatically. Type: data access connectors and linkage connectors.
- In this project, “MapPress Easy Google Maps” or “Leaflet Maps Marker” uses absolute hypertext link or image’s absolute URL link to connect with detailed neighborhood page. Type: linkage connectors.
- In this project, “Add This” or “Share This” uses Facebook API, Twitter API, LinkedIn API, etc. to connect the blog post with social media. Type: remote procedural calls and linkage connectors.

3.1.3 Legacy System

- In this project, the current website is still be used. And WordPress used to edit the webpage, maintain the website is still used to upgrade the LA Commons website. Bluehost is still used in the development of the website.
- In this project, the “WordPress Gallery Widget” has to be able to interoperate well with “WordPress” version 3.6.1, which is the website solution that the client is currently using.
- In this project, the “Leaflet Maps Marker” has to be able to work well with “WordPress” version 3.6.1.
- In this project, the “Add This” has to be able to work well with “WordPress” version 3.6.1.
- In this project, the “NextGen Gallery” has to be able to work well with “WrodPress” version 3.6.1.

3.2 System Structure

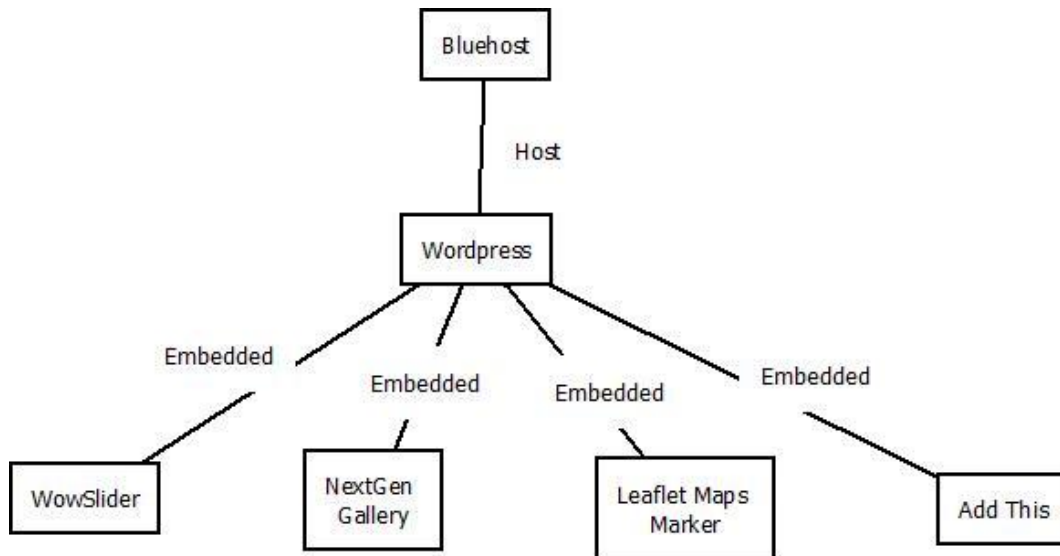


Figure4: System Structure

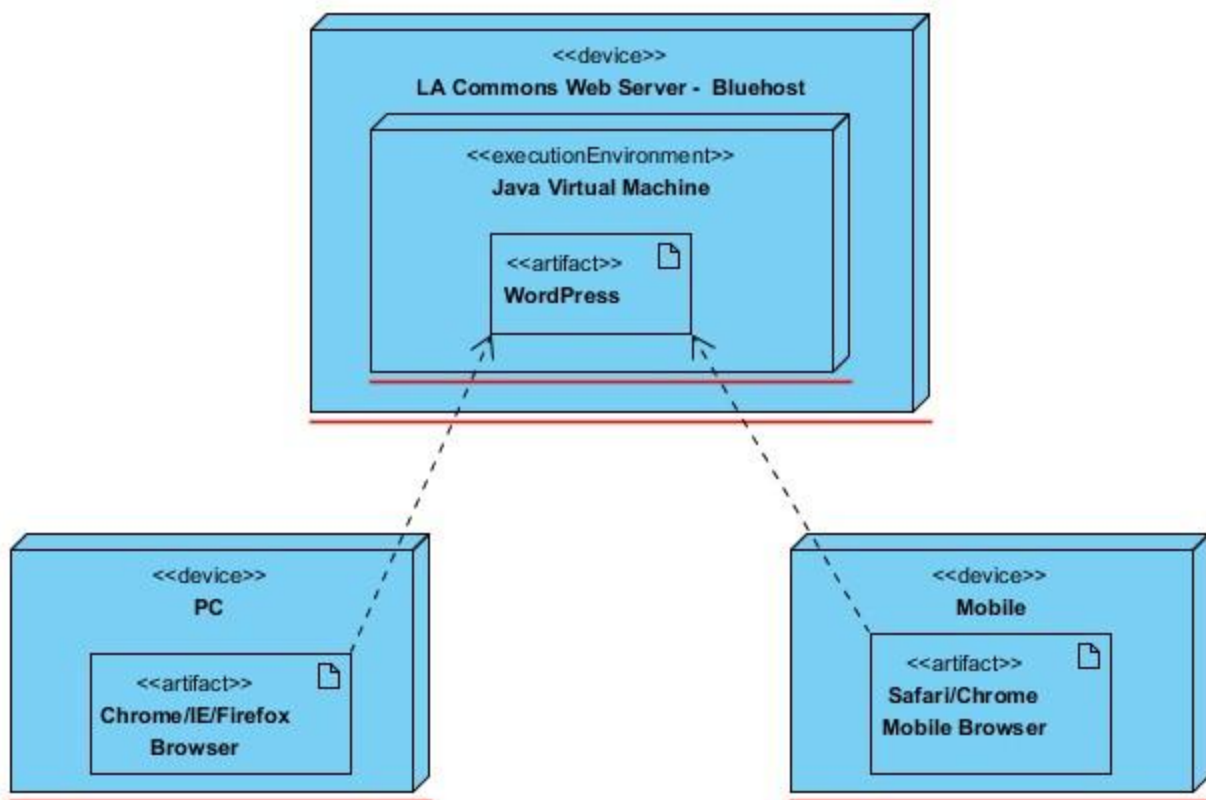


Figure5: Deployment Diagram

3.3 Evaluation Summary

Four persons in our team evaluated the NDIs. After calculation, we found that “WOW Slider” is better to achieve the feature that “Community Arts Project page will have a gallery to show the various arts projects pictures” - WC_2561. “Leaflet Maps Marker” should be used to achieve “interactive map feature” - WC_2700. “Add This” should be used to achieve “sharing functions” including project page sharing and featured event sharing - WC_2563 & WC_2556.

Note that: “NextGen Gallery” should also be used in our implementation even though WOW Slider has a higher score in comparison, because “WOW Slider” cannot perform the function that “Visitor can view a gallery of Community Arts Programming” – WC_2557.

The following table shows the usages of the above selected NDI item, and gave the comments for each feasible NDI item.

Table 10: NDI Evaluation

NDI	Usages	Comments
WordPress	Upgrade and maintain the website. WC_2697 WC_2699 WC_2562	Positive Points: -Currently used -Widely used -Information all over the internet -Client is familiar with Note: There is no comparison between other component with this one
BlueHost	Host the website whole solutions and database	Positive Points: -Currently used -Widely used in the current world -Information all over the internet -Client is familiar with Negative Points: -Not free Note: There is no comparison between other component with this one
WOW Slider	Display the gallery of arts projects pictures under the Community Arts Project page WC_2561	Positive Points: -Reliable vender support -Strong customization tools -Multiple layout and templates options -Fancy displaying effects Negative Points: -Free version has watermark -Relative hard to use for client
NextGen Gallery	Display a slideshow under “Gallery” tab WC_2557	Positive Points: -7.5 million downloads -Update frequently -Currently installed in WordPress with Pro version
Leaflet Maps Marker	Interactive map with neighborhoods WC_2700	Positive Points: -Easy way to add point in the map -Allow to customize pop-up window Negative Points: -Advanced features needs payment -Unknown compatibility with WordPress 3.6.1
Add This	Enable sharing features in blog posts WC_2563 WC_2556	Positive Points: -Over 330 social services -Widely used -Update frequently Negative Points: -No custom button -Limited customizable options