System and Software Architecture Description (SSAD)

Transportation Grant Fund Database

Team #14

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Version History

Date	Author	Version	Changes made	Rationale
10/10/11	KK	1.0	• SSAD for CoreFCD	• Initial version of the SSAD
10/14/11	KK	1.1	• Projects Log attributes are added in Figure 2: Artifacts and Information Diagram • The associations from Project Log, Project Schedule, and Project document to Project Profile were changed in Figure 2: Artifacts and Information Diagram • User management related Use-Cases in Figure 3: Process Diagram	• Changes according to feedback from TAs and evaluators are done
10/19/11	KK	1.2	• E-mail Send and Export Projects Information Use-Cases are added in Figure 3: Process Diagram • New Actor External Website is added to the System Context diagram	• Changes according to feedback from TAs, Clients and evaluators are done
10/24/11	KK	1.3	• Stereotype <<evolutionary>> added for External Website in the System Context diagram • Pre-condition page added for the Login Use-Case	• Changes made based on the ARB comments
11/07/11	KK	1.4	• Project management Use-Cases changed in Figure 3: Process Diagram	• Changes made based on the ARB comments
11/21/11	KK	2.0	• Pages deleted from Use-Case Preconditions • Use-Cases in Figure 3: Process Diagram updated • Status of the SSAD updated • NDI/NCS Interoperability Analysis added	• Changes made based on the TA's feedback, prototyping results and information obtained during exploring SharePoint
11/29/11	KK	2.1	• Figure 2: Artifacts and Information Diagram updated • System Analysis Rational updated	• Changes made based on a feedback from prototyping
12/04/11	KK	2.2	• User specification added in Use-Case preconditions • COTS added in section 3.1.1	• DCR ARB Comments

Date	Author	Version	Changes made	Rationale
02/04/12	KK	3.0	• Milestone artifact added to Figure 2: Artifacts and Information Diagram • Create Project Use-Case assigned to Administrator in Figure 3: Process Diagram • PM Central NDI added in 3.2 System Structure • System Analysis Rational updated	• Changes made based on the Rebaselining activities
02/14/12	KK	3.1	• Milestone artifact renamed to Task in Figure 2: Artifacts and Information Diagram • Add/Edit/Remove Task Use-Case added	• Changes made based on the preparation to ARB
02/17/12	KK	3.2	• Project Coordinator added at Figure 1: System Context Diagram • View users and Create project Use-Cases assigned to Project Coordinator in Figure 3: Process Diagram	• RDCP ARB Comments
03/26/12	KK	3.3	• Minor updates to match IOC1	• Preparation to IOC1
04/12/12	KK	4.0	• Diagrams are updated according to changes in the project during the development in order to reflect current status of the system	• Preparation to TRR
04/17/12	KK	5.0	• Diagrams and use-cases are updated to match final version of the system • Administrator role has been removed from architecture because it is outside of the system scope	• Design-Code review

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1. Introduction

1.1 Purpose of the SSAD

The purpose of the SSAD document is to provide the analysis of the operational concept, design the architecture, and design the implementation of the Transportation Grant Fund Database (TGFD) System. It serves as a bridge linking between the inception and the construction phases by providing the in-depth architectural design and implementation of the proposed system.

This version of the SSAD document consists of the description of system analysis, behavior, and NDI/ NCS Interoperability Analysis of the TGFD system.

1.2 Status of the SSAD

The current version of the SSAD is 5.0 and it is at the end of the Development phase. At this point, all sections of the document are filled out with relevant information and Context Diagrams, Use Case Diagrams & Class Diagrams is consistent with the system. Team is done with development of the product based on Microsoft SharePoint 2010 and PM Central. Currently team is finishing testing, fixing bugs and preparing for the transition. The document is in agreement with current status of the developed system, SharePoint and PM Central features.

2. System Analysis

2.1 System Analysis Overview

The TGFD system to be built is a web based Content and Document Management System. Users who will be using the system are LADOT employees who are responsible for Transportation Grant Fund process. The system to be delivered intends to automate the transportation grant fund project reporting process. This will centralize the information and documents of all the projects in one database, help to create various reports related to the projects, help to enforce data integrity rules, provide easy access to all the projects' data and documents through the web browser interface and finally enhance the productivity of the employees. The system will improve communication between project participants through the both manual and automated messages.

2.1.1 System Context

Figure 1 shows the operational context of the TGFD system.

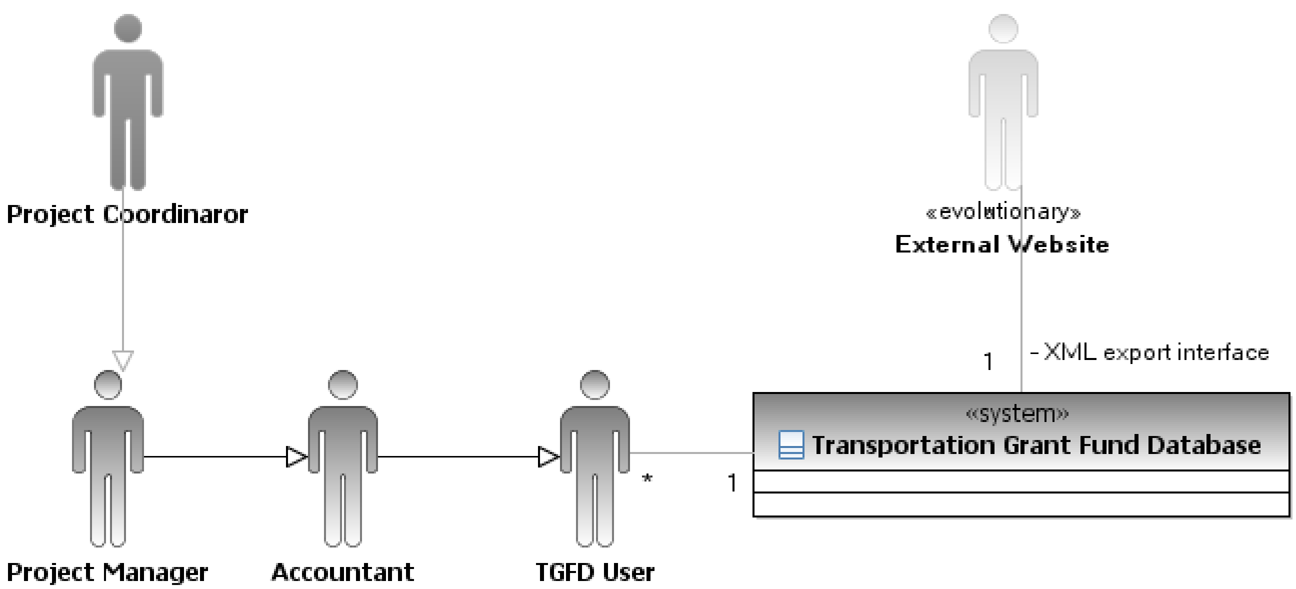

Figure 1: System Context Diagram

Table 1: Actors Summary

Actor	Description	Responsibilities
TGFD User	General type of the system user	• Browse through the projects • Retrieve required projects information • View reports • Download project documents • Send emails
Project Coordinator	A superior user able to create new projects and assign project managers to them	• Create and delete projects • Assign users roles and permissions
Project Manager	A project manager of the certain projects in the system	• Manage own projects: edit all the data • Manage tasks
Accountant	LADOT Accountant	• Edit project financial (accounting) information • Attach documents • Delete project documents • Manage reports
External Website	External website that requests projects information in XML format from the TGFD system and shows it to the public. “External” means that this site is not the part of the system.	• Request projects information through the XML interface

2.1.2 Artifacts & Information

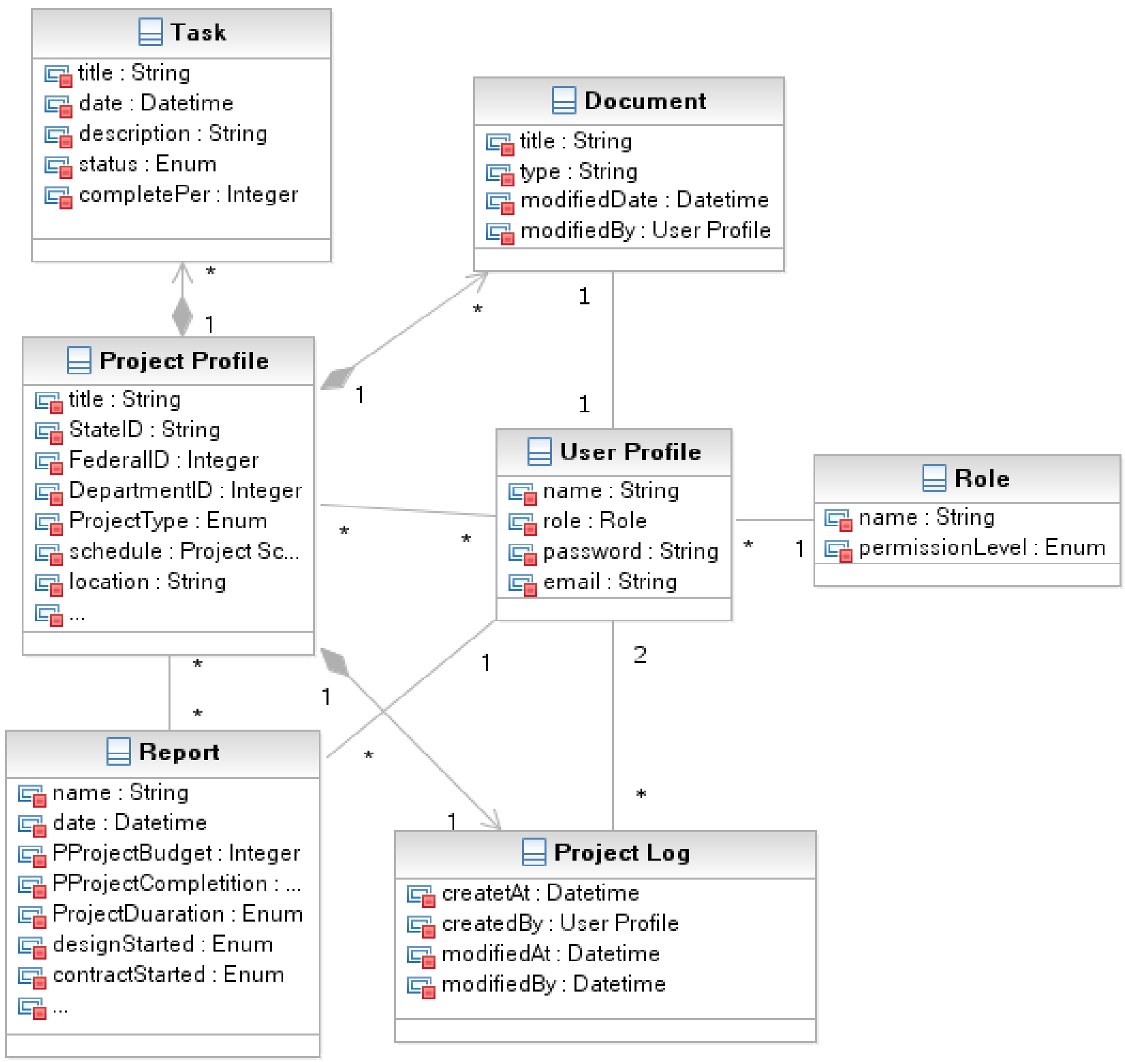

Figure 2: Artifacts and Information Diagram

Table 2: Artifacts and Information Summary

Artifact	Purpose
ATF-1: Role	Role is assigned by administrator to every user and determines the permissions of the user. System has fixed number of roles with fixed permissions.
ATF-2: User Profile	User Profile contains all the information about user: name, password, Role, e-mail, etc.
ATF-3: Project Profile	Project Profile contains all the information about the project: title, owners of the project, schedule, and attached documents. Can be edited by the owners with appropriate permissions.

ATF-4: Report	Report contains determined information about selected projects with fixed formatting. Report is generated by certain user from the information retrieved from projects profiles. There are several fixed report types in the system.
ATF-5: Document	Document is a document of any type attached to a certain project.
ATF-6: Project Log	Project Log contains information about project creation and last changes.
ATF-7:Task	Tasks, such as Quarterly Report due date, contains the name and date of the Task.

2.1.3 Behavior

The following Use-Case Diagram shows the 25 processes that were identified when analyzed the capabilities described in the OCD were analyzed.

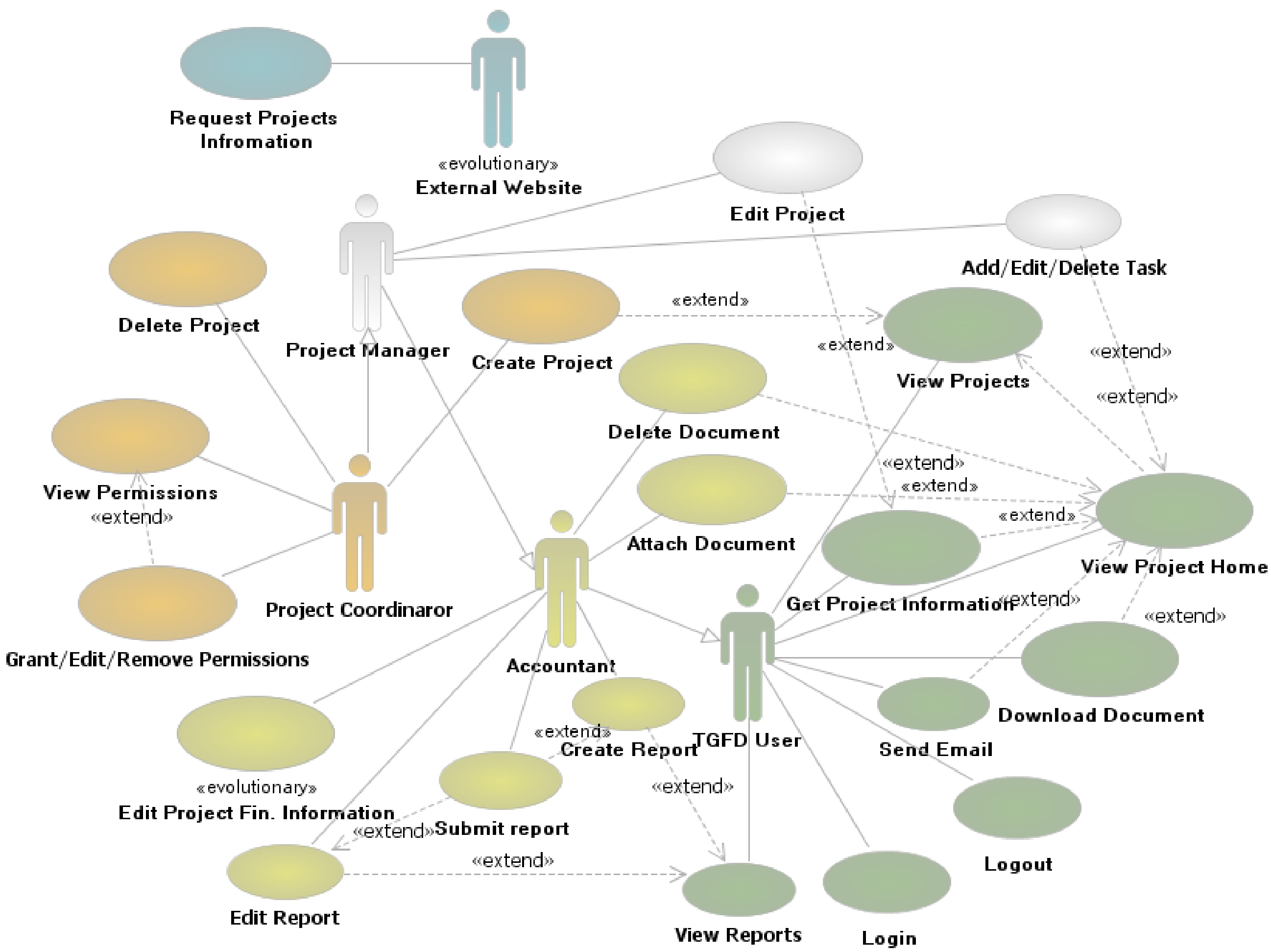

Figure 3: Process Diagram

2.1.3.1 Authentication

2.1.3.1.1 Login

Table 3: Process Description (Login)

Identifier	UC-1: Login
Purpose	Authorize the user to log into the system, and, if so, assign role and privileges.
Requirements	WC_978: Implement user authentication method WC_397: Role Based (RBAC) and Data Level Security
Development Risks	None
Pre-conditions	System database is properly initialized. User is connected from LADOT intranet.
Post-conditions	If user is successfully authorized he is redirected to the Projects View page. He can use the system according to his role. Otherwise access is denied and Login window showed again.

Table 4: Typical Course of Action (Login)

Seq#	Actor's Action	System's Response
1	Enter username and password	
2	Clicks OK button	
3		Verify username and password
4		Redirect the user to the Projects View page.

Table 5: Alternate Course of Action (Login)

Seq#	Actor's Action	System's Response
1	Enter username and password	
2	Clicks the Login button	
3		Verify username and password
4		Show the Login window again

2.1.3.1.2 Logout

Table 6: Process Description (Logout)

Identifier	UC-2: Logout
Purpose	Logout user from the system
Requirements	WC_978: Implement user authentication method WC_397: Role Based (RBAC) and Data Level Security
Development	None

Risks	
Pre-conditions	User logged into the system
Post-conditions	User is logged out from the system and session is terminated

Table 7: Typical Course of Action (Logout)

Seq#	Actor's Action	System's Response
1	User clicks Log Out button	
2		Log user out and delete user's session
4		Show the message "Sign Out: Close Browser To Complete Sign Out"

Alternate Course of Action for User Logout is not applicable

2.1.3.2 Permissions Management

2.1.3.2.1 Grant Permissions

Table 8: Process Description (Grant Permissions)

Identifier	UC-3: Grant Permissions
Purpose	Add new user (group) to the system (site) and specifies its role.
Requirements	WC_398: user registration to the system must be approved by administrator WC_397: Role Based (RBAC) and Data Level Security WC_977: administrator has a capability to assign fixed roles
Development Risks	Manually assigning roles to users can be difficult and time-consuming for Project Coordinator
Pre-conditions	System database is properly initialized. User is logged in as Project Coordinator.
Post-conditions	New permissions are granted

Table 9: Typical Course of Action (Grant Permissions)

Seq#	Actor's Action	System's Response
1	Click Grant Permissions button	
2		Redirect to the empty Grant Permissions Form
3	Fill in Grant Permissions Form with new user (group) information and click OK	
4		Check input information for correctness

5		If information is correct, add new permissions
6		Redirect to the permission management page

Table 10: Alternate Course of Action (Grant Permissions)

Seq#	Actor's Action	System's Response
1-4	Refer to typical course of action	
2		If data is incorrect, redirect back to the Grant Permissions Form with corresponding message (e.g. "No exact match was found.")

2.1.3.2.2 Edit Permissions

Table 11: Process Description (Edit Permissions)

Identifier	UC-4: Edit Permissions
Purpose	Edit Permissions information including assignment of a new role
Requirements	WC_398: user registration to the system must be approved by administrator WC_397: Role Based (RBAC) and Data Level Security WC_977: administrator has a capability to assign fixed roles
Development Risks	Editing permissions can be confusing for Project Coordinator
Pre-conditions	System database is properly initialized. User is logged in as Project Coordinator.
Post-conditions	User(group) permissions has been changed

Table 12: Typical Course of Action (Edit Permissions)

Seq#	Actor's Action	System's Response
1	Click Edit User Permissions button	
2		Redirect to the Edit Permissions Form filled in with permissions data
3	Change permissions and click OK	
4		Save new permissions in the database
5		Redirect to the permissions management page

Table 13: Alternate Course of Action (Remove Permissions)

Seq#	Actor's Action	System's Response
1-2	Refer to typical course of action	
3	Click Cancel	
4		Return to the user management page

2.1.3.2.3 Remove Permissions

Table 14: Process Description (Remove Permissions)

Identifier	UC-5: Remove Permissions
Purpose	Delete existing user permissions from the system
Requirements	WC_397: Role Based (RBAC) and Data Level Security
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as Project Coordinator.
Post-conditions	User deleted from the system

Table 15: Typical Course of Action (Remove Permissions)

Seq#	Actor's Action	System's Response
1	Click Remove Permissions button	
2		Ask for conformation
3	Click confirm	
4		Remove Permissions from the database
5		Redirect to the user management page

Table 16: Alternate Course of Action (Remove Permissions)

Seq#	Actor's Action	System's Response
1-2	Refer to typical course of action	
3	Click Cancel	
4		Return to the user management page

2.1.3.2.4 View Permissions

Table 17: Process Description (View Permissions)

Identifier	UC-18: View Permissions
Purpose	View list of users
Requirements	WC_398: user registration to the system must be approved by

	administrator WC_397: Role Based (RBAC) and Data Level Security WC_977: administrator has a capability to assign fixed roles
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as Project Coordinator.
Post-conditions	List of permissions displayed to Project Coordinator

Table 18: Typical Course of Action (View Permissions)

Seq#	Actor's Action	System's Response
1	Click Site Permissions link	
2		Select permissions data from database
3		Redirect to the Permission Management Page and show list of permissions

Alternate Course of Action for View Permissions is not applicable

2.1.3.3 Project Management

2.1.3.3.1 Create Project

Table 19: Process Description (Create Project)

Identifier	UC-6: Create project
Purpose	Create new project in the system
Requirements	WC_366: Grant information can be tracked by the system. WC_357: all projects should be manageable - budget, schedule, project docs, general project reports generation, individual project and summary of project status
Development Risks	none
Pre-conditions	System database is properly initialized. User is logged in as Project Coordinator.
Post-conditions	New project created in the system

Table 20: Typical Course of Action (Create Project)

Seq#	Actor's Action	System's Response
1	Click Add New Project button	
2		Redirect to the empty Project Form

3	Fill in Project Form with new project information and click Submit	
4		Check input information for correctness and absence of duplicate project names in the database
5		If information is correct, create new project and add project information to the database
6		Redirect to the Project Home page

Table 21: Alternate Course of Action (Create Project)

Seq#	Actor's Action	System's Response
1-4	Refer to typical course of action	
2		If data is incorrect, redirect back to the Project Form with corresponding message (e.g. "Please input Title of the New Site")

2.1.3.3.2 Edit Project

Table 22: Process Description (Edit Project)

Identifier	UC-7: Edit project
Purpose	Change project information (except financial information)
Requirements	WC_366: Grant information can be tracked by the system. WC_357: all projects should be manageable - budget, schedule, project docs, general project reports generation, individual project and summary of project status
Development Risks	none
Pre-conditions	System database is properly initialized. User is logged in as a Project Manager or Project Coordinator.
Post-conditions	Project information was changed

Table 23: Typical Course of Action (Edit Project)

Seq#	Actor's Action	System's Response
1	Click Edit Item button	
2		Redirect to the empty Project Form filled in with project information
3	Change project information in Project Form and click Save	
4		Check input information for correctness

		and absence of duplicate project names in the database
5		If information is correct, save new project information to the database
6		Redirect to the Projects View page

Table 24: Alternate Course of Action (Edit Project)

Seq#	Actor's Action	System's Response
1-4	Refer to typical course of action	
5		If data is incorrect, redirect back to the Project Form with corresponding message

2.1.3.3.3 Delete Project

Table 25: Process Description (Delete Project)

Identifier	UC-8: Delete Project
Purpose	Delete existing project from the system
Requirements	WC_366: Grant information can be tracked by the system. WC_357: all projects should be manageable - budget, schedule, project docs, general project reports generation, individual project and summary of project status
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as a Project Coordinator.
Post-conditions	Project deleted from the database

Table 26: Typical Course of Action (Delete Project)

Seq#	Actor's Action	System's Response
1	Click Site Actions -> Site Settings -> Delete this site link	
2		Show warning message
3	Click Delete	
4		Ask for conformation
5	Click OK	
6		Delete project from the database
7		Show the message "Your Web site has been deleted" and redirect to the Projects View page

Table 27: Alternate Course of Action (Delete Project)

Seq#	Actor's Action	System's Response
1-5	Refer to typical course of action	
6	Click Cancel	
7		Return to the Project Settings page

2.1.3.3.4 Get Project Information

Table 28: Process Description (Get Project Information)

Identifier	UC-9: Get Project information
Purpose	Get project information from the database and show it to the user
Requirements	WC_366: Grant information can be tracked by the system. WC_357: all projects should be manageable - budget, schedule, project docs, general project reports generation, individual project and summary of project status
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as any registered user.
Post-conditions	Project information showed to the user

Table 29: Typical Course of Action (Get Project Information)

Seq#	Actor's Action	System's Response
1	Click on a project name in Project Info table	
2		Find project information in the database
3		If information found redirect user to the Project Home page with project information

Table 30: Alternate Course of Action (Get Project Information)

Seq#	Actor's Action	System's Response
1-2	Refer to typical course of action	
3		If project information not found, redirect to the Projects View page and show message "Project was not found in the database"

2.1.3.3.5 View Projects

Table 31: Process Description (View Projects)

Identifier	UC-10: View Projects
Purpose	View list of all projects
Requirements	WC_366: Grant information can be tracked by the system. WC_357: all projects should be manageable - budget, schedule, project docs, general project reports generation, individual project and summary of project status
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as any registered user.
Post-conditions	Projects list showed to the user

Table 32: Typical Course of Action (View Projects)

Seq#	Actor's Action	System's Response
1	Open View Projects page	
2		Find projects information in the database
3		If information found redirect user to the View Projects page with a list of selected projects

Table 33: Alternate Course of Action (View Projects)

Seq#	Actor's Action	System's Response
1-2	Refer to typical course of action	
3		If projects information not found, redirect to the Projects View page and show a message "No records to display"

2.1.3.3.6 View Project Home

Table 34: Process Description (View Project Home)

Identifier	UC-25: View Project Home
Purpose	View list of all projects
Requirements	WC_366: Grant information can be tracked by the system. WC_357: all projects should be manageable - budget, schedule, project docs, general project reports generation, individual project and summary of project status

Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as any registered user.
Post-conditions	Projects Home Page showed to the user

Table 35: Typical Course of Action (View Project Home)

Seq#	Actor's Action	System's Response
1	Click on a project site path	
2		Find project home page and select project information from the database
3		If information found redirect user to the View Project Home page with project information

Table 36: Alternate Course of Action (View Project Home)

Seq#	Actor's Action	System's Response
1-2	Refer to typical course of action	
3		If projects information not found, show an error message "Page not found"

2.1.3.3.7 Edit Project Financial Information

Table 37: Process Description (Edit Project Financial Information)

Identifier	UC-11: Edit Project Financial Information
Purpose	Change project financial information
Requirements	WC_366: Grant information can be tracked by the system. WC_357: all projects should be manageable - budget, schedule, project docs, general project reports generation, individual project and summary of project status
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as an Accountant.
Post-conditions	Project financial information was changed

Table 38: Typical Course of Action (Edit Project Financial Information)

Seq#	Actor's Action	System's Response
1	Click Edit Fin. Information button	

2		Redirect to the empty Project Accountant Form filled in with project financial information
3	Change project financial information in Project Accountant Form and click Submit	
4		Check input information for correctness
5		If information is correct, save new project financial information to the database
6		Redirect to the Project Home page

Table 39: Alternate Course of Action (Edit Project Financial Information)

Seq#	Actor's Action	System's Response
1-4	Refer to typical course of action	
5		If data is incorrect, redirect back to the Project Accountant Form with corresponding message (e.g. "Data in the field [Field Name] is incorrect")

2.1.3.4 Report Generator

2.1.3.4.1 Create Report

Table 40: Process Description (Create Report)

Identifier	UC-12: Create Report
Purpose	Create Report of the selected type filled with selected project information
Requirements	WC_370: System can create progress reports
Development Risks	none
Pre-conditions	System database is properly initialized. User is logged in as any registered user.
Post-conditions	Projects report created and saved in the database

Table 41: Typical Course of Action (Create Report)

Seq#	Actor's Action	System's Response
1	Click Add Document button	
2		Find corresponding project information in the database and fill corresponding

		fields
3	Fill in remaining information	
4	Click the button Save	
5		If information is correct save the report

Table 42: Alternate Course of Action (Create Report)

Seq#	Actor's Action	System's Response
1-4	Refer to typical course of action	
5		If information is incorrect show the error message

2.1.3.4.2 View Reports

Table 43: Process Description (View Reports)

Identifier	UC-19: View reports
Purpose	Show saved reports
Requirements	WC_370: System can create progress reports
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as any registered user.
Post-conditions	Projects reports showed to the user

Table 44: Typical Course of Action (View Reports)

Seq#	Actor's Action	System's Response
1	Click Quarterly Report tab	
2		Find reports in the database and show them to the user

Alternate Course of Action for View Reports is not applicable

2.1.3.4.3 Edit Report

Table 45: Process Description (Edit Report)

Identifier	UC-20: Edit report
Purpose	Edit report information
Requirements	WC_370: System can create progress reports
Development Risks	none

Pre-conditions	System database is properly initialized. Report exist in the database. User is logged in as any registered user.
Post-conditions	Edited report information saved in the database

Table 46: Typical Course of Action (Edit Report)

Seq#	Actor's Action	System's Response
1	Click on the report	
2		Find corresponding projects information in the database and fill corresponding fields
4	Fill in remaining information	
5	Click the button Save	
6		If information is correct save the report

Table 47: Alternate Course of Action (Edit Report)

Seq#	Actor's Action	System's Response
1-5	Refer to typical course of action	
6		If information is incorrect show the error message

2.1.3.4.4 Submit Report

Table 48: Process Description (Submit Report)

Identifier	UC-24: Submit Report
Purpose	Submit Report information
Requirements	WC_370: System can create progress reports
Development Risks	none
Pre-conditions	System database is properly initialized. User is logged in as any registered user.
Post-conditions	Update report information in the database and generate a report in pdf format

Table 49: Typical Course of Action (Submit Report)

Seq#	Actor's Action	System's Response
1	Click on the report or click Add	

	document button	
2		Find corresponding projects information in the database and fill corresponding fields
3	Fill in or change information	
4	Click the Submit button	
5		If information is correct save the report, generate and save pdf version of the report

Table 50: Alternate Course of Action (Submit Report)

Seq#	Actor's Action	System's Response
1-4	Refer to typical course of action	
5		If information is incorrect show the error message

2.1.3.5 Project Document Management

2.1.3.5.1 Attach Document

Table 51: Process Description (Attach Document)

Identifier	UC-13: Attach Document
Purpose	Upload and attach a new document to the project
Requirements	WC_392: Ability to upload (attach) any files to the project
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as a Project Manager.
Post-conditions	New document uploaded to the server and attached to the project

Table 52: Typical Course of Action (Attach Document)

Seq#	Actor's Action	System's Response
1	Click Add Document button	
2		Show "Upload Document" dialog
3	Choose a file to be attached and click OK	
4		Upload file to a server and link to the project in the database
6		Show Project Home page with attached file

Alternate Course of Action for Attach Document is not applicable

2.1.3.5.2 Download Document

Table 53: Process Description (Download Document)

Identifier	UC-14: Download Document
Purpose	Download selected document form server to the user workstation
Requirements	WC_392: Ability to upload (attach) any files to the project
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as any registered user. Link to the document shown on the Project Home page
Post-conditions	Document downloaded to the user workstation

Table 54: Typical Course of Action (Download Document)

Seq#	Actor's Action	System's Response
1	Click on the link of the desired document	
2		Show Save File dialog
3	Choose location and name and click Save File button	
4		Save File on a user workstation

Alternate Course of Action for Download Document is not applicable

2.1.3.5.3 Delete Document

Table 55: Process Description (Delete Document)

Identifier	UC-15: Delete Document
Purpose	Delete existing document from the system
Requirements	WC_392: Ability to upload (attach) any files to the project
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as a Project Manager.
Post-conditions	Deleted deleted from the system

Table 56: Typical Course of Action (Delete Document)

Seq#	Actor's Action	System's Response
1	Click Delete Document button in a drop-down menu in front of the corresponding document	
2		Ask for conformation
3	Click OK	
4		Delete document from the file system and information about it from the database
5		Redirect to the renewed Project Home page without deleted document

Table 57: Alternate Course of Action (Delete Document)

Seq#	Actor's Action	System's Response
1-2	Refer to typical course of action	
3	Click Cancel	
4		Return to the Project Home page

2.1.3.6 Projects Information Export

2.1.3.6.1 Request Projects Information

Table 58: Process Description (Request Projects Information)

Identifier	UC-17: Request Projects Information
Purpose	External website can request projects information through the HTTP protocol and receive it in XML format
Requirements	WC_382: Ability to export information for the general public (for example xml)
Development Risks	None
Pre-conditions	System database is properly initialized. External Website has access to the LADOT intranet.
Post-conditions	XML information provided to the External Website

Table 59: Typical Course of Action (Request Projects Information)

Seq#	Actor's Action	System's Response
1	Send an HTTP request with specified parameters to the System	
2		Check the correctness of the request

3		Select requested projects data from the database
4		Form XML with projects data and return it to the External Website

Table 60: Alternate Course of Action (Request Projects Information)

Seq#	Actor's Action	System's Response
1-2	Refer to typical course of action	
2		If request is incorrect return a response "Incorrect request"

2.1.3.7 Email System

2.1.3.7.1 Send Email

Table 61: Process Description (Send E-mail)

Identifier	UC-16: Send E-mail
Purpose	Send E-mail to selected users
Requirements	WC_376: System has the capability to send out emails through the system
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as any registered user.
Post-conditions	E-mail sent to the selected users

Table 62: Typical Course of Action (Send E-mail)

Seq#	Actor's Action	System's Response
1	Click Send E-mail button	
2		Show empty E-mail form
3	Fill in the form	
4	Click Send button	
5		Check correctness of data
6		Send E-mail to the selected users

Table 63: Alternate Course of Action (Send E-mail)

Seq#	Actor's Action	System's Response
1-5	Refer to typical course of action	
6		If data is incorrect, show corresponding message (e.g. "Please enter valid e-mail.") and redirect back to the E-mail

		Form

2.1.3.8 Tasks

2.1.3.8.1 Add Task

Table 64: Process Description (Add Task)

Identifier	UC-21: Add Task
Purpose	Add a new task to selected project
Requirements	WC_379: Scheduling functions (ability to set deadlines and send reminders (ex: quarterly reports by email))
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as Project Manager.
Post-conditions	New task is added to the project

Table 65: Typical Course of Action (Add Task)

Seq#	Actor's Action	System's Response
1	Click Add new item button in the Tasks table	
2		Redirect to the empty Task form
3	Fill in the form	
4	Click Save button	
5		Check correctness of data
6		Add Task to the project

Table 66: Alternate Course of Action (Add Task)

Seq#	Actor's Action	System's Response
1-5	Refer to typical course of action	
6		If data is incorrect, redirect back to the Task Form with corresponding message (e.g. "You must specify a value for this required field.")

2.1.3.8.2 Edit Task

Table 67: Process Description (Edit Task)

Identifier	UC-22: Edit Task
Purpose	Edit existing task
Requirements	WC_379: Scheduling functions (ability to set deadlines and send

	reminders (ex: quarterly reports by email))
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as Project Manager.
Post-conditions	Task information is updated

Table 68: Typical Course of Action (Edit Task)

Seq#	Actor's Action	System's Response
1	Click Edit Item button	
2		Redirect to the Task form filled with the tasks information
3	Change the information	
4	Click Save button	
5		Check correctness of data
6		Update tasks information

Table 69: Alternate Course of Action (Edit Task)

Seq#	Actor's Action	System's Response
1-5	Refer to typical course of action	
6		If data is incorrect, redirect back to the Task Form with corresponding message (e.g. "You must specify a value for this required field.")

2.1.3.8.3 Delete Task

Table 70: Process Description (Delete Task)

Identifier	UC-23: Delete Task
Purpose	Delete existing task
Requirements	WC_379: Scheduling functions (ability to set deadlines and send reminders (ex: quarterly reports by email))
Development Risks	None
Pre-conditions	System database is properly initialized. User is logged in as Project Manager.
Post-conditions	Task deleted from the project

Table 71: Typical Course of Action (Delete Task)

Seq#	Actor's Action	System's Response

1	Click Delete Item button	
2		Ask confirmation for deleting
3	Click OK button	
4		Delete Task from the project

Table 72: Alternate Course of Action (Edit Task)

Seq#	Actor's Action	System's Response
1-2	Refer to typical course of action	
3	Click Cancel button	
4		Return to the Project Home page

2.1.4 Modes of Operation

The TGFD System is intended to operate in only one mode. Thus, no further information is giving in this section.

2.2 System Analysis Rationale

Based on the clients' description, the following information about External Website Actor is given:

In future clients want to be able to build a website for the general public which will contain information about LADOT projects. In order for this site to be able to pull data from TGFD System that we develop there will be an HTTP interface which will allow retrieving projects information in XML format. This can be done with SharePoint with minimal efforts.

Note about Users Profile:

User Profile will contain only basic information about the system user (e.g. name, e-mail address) and will be populated and managed by admin. Users will not have ability to change their profiles.

Note about accounting information:

As for now clients requested for accountants only the ability to attach files with financial information and manage reports. In the future separate project fields can be dedicated to accountants.

Note about SharePoint and PM Central capabilities:

After prototyping with SharePoint and PM Central team determined that SharePoint and PM Central provide all the required capabilities with very minor coding (only small script was used).

Note about Administrator: as for now the IT department will perform administrative functions for the system: manage users and add new projects. Later on a special position called Project Coordinator can be created to perform these functions. This should not affect system architecture.

3. NDI/NCS Interoperability Analysis

3.1 Introduction

We are currently planning to use two NDIs in our project: Microsoft SharePoint 2010 Enterprise and PM Central from Bamboo Solutions.

3.1.1 COTS / GOTS / ROTS / Open Source / NCS

Table 45: NDI Products Listing

NDI/NCS Products	Purposes
Microsoft SharePoint 2010 Enterprise	Web application platform for the project
Microsoft SQL Server 2008	Relational database management system
Active Directory service of Windows Server 2008 R2	Directory service (responsible for authenticating and authorizing)
PM Central	Web-based workspace solution for Microsoft SharePoint
Muhimbi PDF Converter (Sharepoint Add-in)	This product allows us to convert Microsoft documents to pdf

3.1.2 Connectors

Two NDIs are used in this project: Microsoft SharePoint 2010 Enterprise and PM Central. PM Central is just a plug in (collection of templates and web applications) to Microsoft SharePoint 2010. Microsoft SharePoint 2010 NDI uses Microsoft SQL Server 2008 R2. However, communication with the database is hidden from the users and in our case from developers as well. Thus no connectors are required for the TGFD system.

3.1.3 Legacy System

At this point there are no requirements for interoperability with other systems.

3.2 System Structure

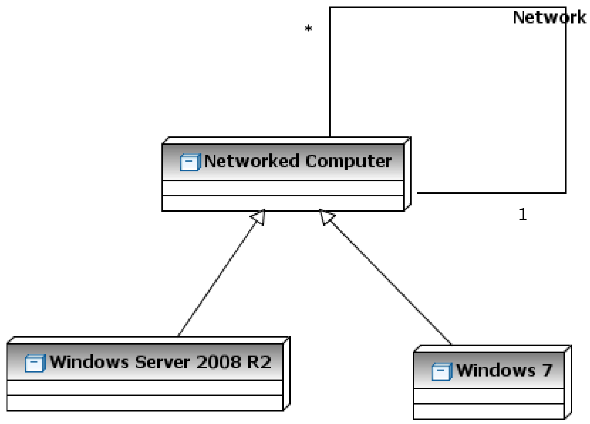

Figure 4: **Hardware Component Diagram**

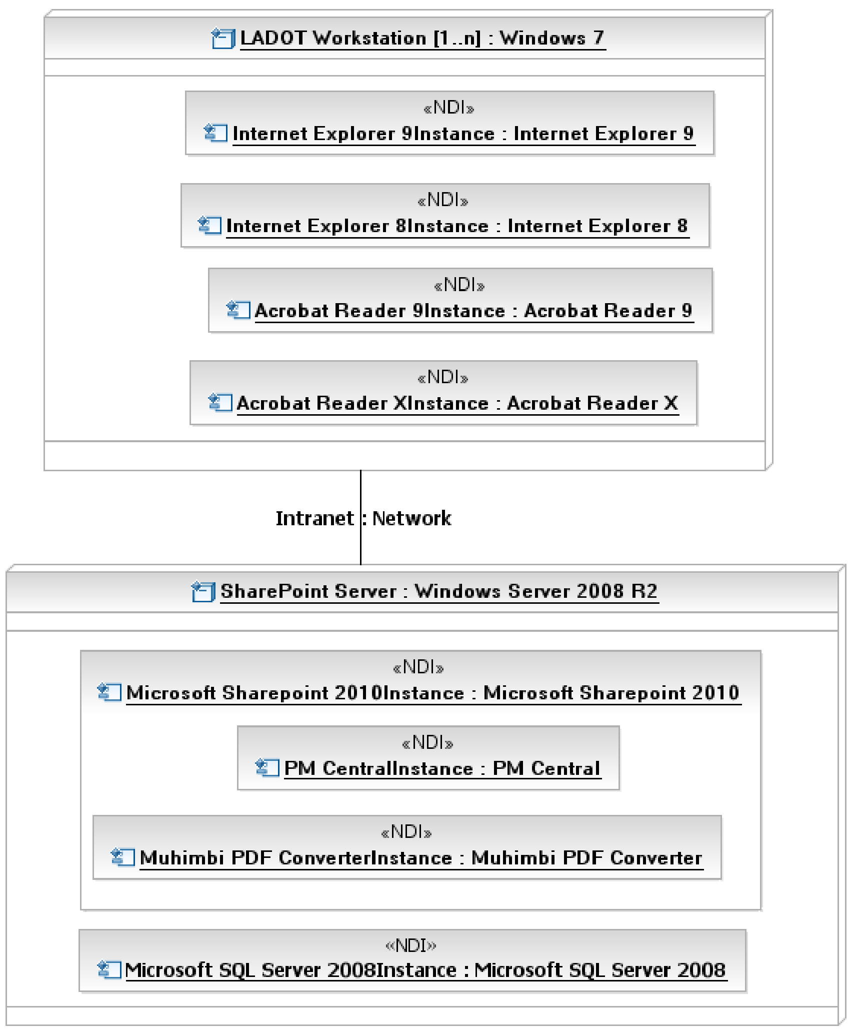

Figure 5: **Deployment Diagram**

3.3 Evaluation Summary

Table 46: NDI Evaluation

NDI	Usages	Comments
Microsoft SharePoint 2010 Enterprise	Web application platform for the project	The project is planned to be developed using SharePoint with minor coding. Thus all the functionality will be developed using SharePoint tools and will use build in SharePoint functionality.
PM Central	Web-based workspace solution for Microsoft SharePoint	PM Central provides a collection of site templates and web-applications for project management. Its functionality will be used in the project.
Muhimbi PDF Converter (Sharepoint Add-in)	Converter of Microsoft documents to pdf	This product allows us to convert our report forms to pdf which is one of the main system purposes