



# Central Workflow System

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## **I. PROJECT PURPOSE**

### **1. Background**

The Central Workflow System is a centralized system designed for faster data gathering, customized queries, and workflow customization.

### **2. Overview**

The aim of this project is to create a flexible centralized workflow system that could host up to 2800 users, solve issues at hand by automating the data gathering process in order to provide more accurate data for detailed analytics, and achieve flexibility by creating a customizable workflow depending on the client's workflow process.

### **3. Purpose**

The purpose of this project is to resolve issues at hand such as the manual gathering of data, inaccurate analysis, slow data gathering due to manual process, and slow production of analysis because of manpower shortage.

### **4. Description**

The development of Central Workflow System addresses the following issues:

1. Data gathering is slow as a result of manual processing.
2. Inconsistent data could lead to inaccurate analytics.
3. Delayed analytics because of lack of manpower to produce results.

Central Workflow System achieves flexibility through customization of different forms and user roles to fit the respective workflow process that the Poseidon IT Solutions needs, it reduces the cost of the company by automating the workflow process, and achieving accurate analytics by producing accurate data.

## II. OBJECTIVES

### 1. GENERAL OBJECTIVES

- To develop a centralized system.
- To automate workflow process that would produce accurate data.
- To create a solution that would lessen the delay of data gathering.
- Automate the client's data gathering process.
- Handle a maximum of 2800 users.
- Customize any workflow process that the client has.

### 2. SPECIFIC OBJECTIVES

The goal of this application is to create a solution through the use of open-source software that would minimize the manpower needed, automate business processes, produce accurate analytics, and improve cost efficiency.

Objectives by priority are:

1. System roles to be created are the following:

a. Super Admin	Creates user roles and Assign user roles
b. Privilege User	Can create form, assign approvers, manage form response, and approve request form or decline.
c. Approver	Can approve or return created form and approve or return submitted form
d. Average User	Can request form and submit filled-out form

2. Privileged users can create forms for a specific department in the organization.
3. The creator of the forms must assign approvers, who will be notified once a form is submitted.
4. Features Include:
  - a. User Management System
  - b. User Access Controls
  - c. Form creation
5. Forms can:
  - a) Be created using drag and drop, where the creator of the form can select fields to be added.
  - b) Only be submitted if it has been filled out.
  - c) Be either approved by the assigned approvers or returned to the creator.

### III. EXPECTED BENEFITS

The advantages of the central workflow system are the following:

- Organize the process by automating the workflow system.
- Cost efficient, the system is cheaper than existing software.
- Flexibility, the system is customizable and can be configured depending on the business process of the clients.

### IV. DETAILED DESCRIPTION OF THE REQUIREMENT

To be able to run the application these are the minimum requirements:

#### Server Requirements

Software Requirements	Hardware Requirements
Debian 5.5.35	6GB HDD Space
Windows 2003 server	1GB RAM
Apache 2.4.17	
PHP 5.5.37	
phpMyAdmin 4.5.1	
OpenSSL 1.0.2	
MariaDB 10.1.13	
XAMPP Control Panel 3.2.2,	
Webalizer 2.23-04	
Mercury Mail Transport System 4.63	
FileZilla FTP Server 0.9.41	
Tomcat 7.0.56 (with mod_proxy_ajp as connector)	

## PC Requirements

Software Requirements	Hardware Requirements
Windows 7/Vista/XP (32 or 64 bit)	Processor: Dual Core 2.0GHz or equivalent processor
	2GB System RAM
	6GB free HDD Space

## V. PROJECT ORGANIZATION - ROLES AND RESPONSIBILITIES

### 1. Project sponsors

- Poseidon IT Solutions – The client company will provide the servers needed for the project.

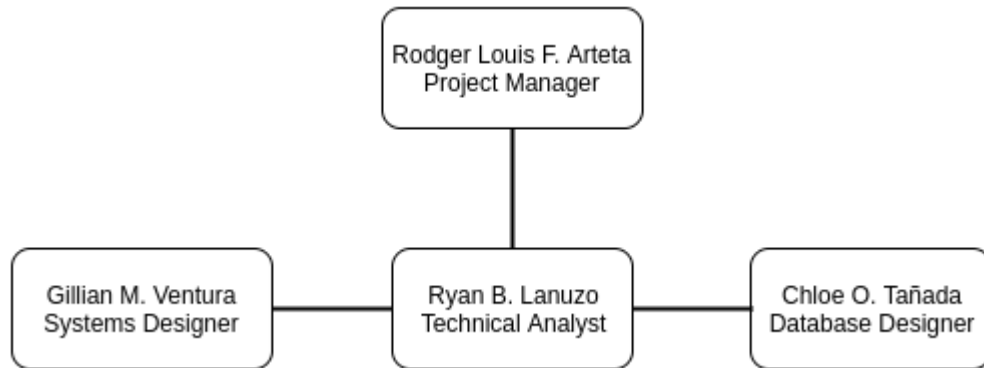
### 2. Project Manager

- Responsible for the initiation, management, planning, and implementation of the project. Keeps the group on track and manages unexpected challenges along the way. Ensures quality control during the course of the project. Makes sure the risks are planned for

### 3. Stakeholders

- Project Manager - Acts as the leader of the team, must be involved with all changes in the project.
- Team Members - Main members of the project, must be able to do all given tasks assigned to each
- Project Adviser - Supervises the team regarding the project, must be given feedback and updates for each change in the project.
- Users - Main beneficiaries of the application, feedbacks that they give will be the basis for the application improvements.

#### 4. Development Team Organizational Chart



ROLES	QUALIFICATIONS	RESPONSIBILITIES
Project Manager	<ul style="list-style-type: none"> <li>• Excellent organizational, planning and time management skills</li> <li>• Logical thinking and creative problem-solving ability</li> <li>• Great attention to detail</li> <li>• Good communication and negotiation skills</li> <li>• Understanding of budget control</li> <li>• The ability to work well with others and lead a team</li> <li>• A good understanding of business</li> <li>• Technical knowledge relevant to the project</li> <li>• Good IT skills</li> </ul>	Responsible for the initiation, management, planning, and implementation of the project. Keeps the group on track and manages unexpected challenges along the way. Ensures quality control during the course of the project. Makes sure the risks are planned for
Database Designer	<ul style="list-style-type: none"> <li>• Ability to design and normalize databases</li> </ul>	Creates the business rules, ERD, and implements them in the actual project.
Systems Designer	<ul style="list-style-type: none"> <li>• Ability to design the system architecture</li> <li>• Ability analyze the process of the system and translate it to diagrams for the developer's reference.</li> </ul>	Responsible for the analysis business process of the company and the system.
Technical Analyst	<ul style="list-style-type: none"> <li>• Analytical Skills</li> <li>• Critical-thinking Skills</li> </ul>	Handles all business documentations, responsible for checking if everything is followed according to the business documentations.

## **VI. KEY POTENTIAL RISKS**

- The system only allows the super admin to escalate privileges of a user.
- If a user forgets his/her account credentials, there should be a facility that would resend their account credentials to their verified email address.
- If the form is incomplete there should be a notification from the system that the form is incomplete.

## **VII. ERROR HANDLING**

### **Operational Level**

- There should be an error handling facility that would reject incomplete forms.
- There should be an error handling facility that would reject the authentication of the user if the password is incorrect.

### **Technical Level**

- There should be an error handling facility that would allow the user to cancel the form for approval.
- There should be an error handling facility that would allow the approver to return the submitted form the user who requested for approval.



## VIII. REVIEW OF RELATED SOFTWARE

Software	Description	Features
KISSFLOW	A Business Process Management (BPM) tool used to automate workflow processes and provide analytics report based on the data from the created workflow process.	<ul style="list-style-type: none"><li>• Workflow Customization</li><li>• Drag and Drop Form Designer</li><li>• Role-based Access Control</li><li>• Mobile Platform Support</li><li>• Notifications</li><li>• Status indicators</li><li>• Integration</li><li>• Dashboard</li></ul>
Zoho Creator	A BPM tool that can create an application that can customize workflow, use schedulers to automate tasks, generate analytics to interpret gathered data, and share data to specific users or user groups.	<ul style="list-style-type: none"><li>• Form Design</li><li>• Automation (Notification, Schedule, Reminders)</li><li>• Data Share</li><li>• Insights</li><li>• Mobile Platform Support</li><li>• Integration</li></ul>
ProcessMaker	An open source BPM & workflow solution that helps companies in improving their processes such as finance, human resource, compliance, and other business functions by automating said processes.	<ul style="list-style-type: none"><li>• BPMN 2.0 Process Designer</li><li>• Dynaform Designer</li><li>• Dashboards</li><li>• User Management</li><li>• Document Builder</li></ul>

The difference between the mentioned software and the proposed software is that the proposed software is cheaper compared to the monthly rates of the mentioned software and can be configured to match the needs of the client.

## IX. COST AND BENEFIT

### Benefits

Tangible	Intangible
Manual labor savings	Accurate data gathering.
	System Flexibility.
	Faster gathering data.

### Cost

Operational Costs
Arvixe linux shared web hosting - \$4.00/month
Google Cloud Storage - \$0.026 per GB/month

The pricing for Google Cloud Storage goes by  $(0.026(\$/\text{GB}/\text{mo.}) * (\text{GB}) * (\text{days}) / 30(\text{days}/\text{mo.}))$ , We estimate the company needs a 20GB storage per month running 24 hours will cost \$0.0173 per month and \$0.208 per year. For a total cost of \$48.208 a year the system can reduce the cost of manual labor needed of the company for their daily operations, reduce the cost of paper through automation of forms, and provide accurate and faster data gathering through automation rather than manual data gathering.

## X. RISK MANAGEMENT

ID	Risk and Consequences	Probability%	Impact (1-5)	Priority(P*I)	Mitigation Response
01	Human Error	80%	4	240	<ul style="list-style-type: none"> <li>• Training</li> <li>• System Documentation</li> <li>• Policies and Procedures</li> <li>• User Manuals</li> <li>• User Access Profiles</li> </ul>
02	System Availability	80%	5	400	<ul style="list-style-type: none"> <li>• Memory and Disk Utilization Monitoring</li> <li>• Network Management</li> <li>• Incident Investigation</li> <li>• Immediate and Permanent Resolution</li> <li>• Capacity Planning</li> <li>• Updating and Upgrading Firmware</li> </ul>
03	System Vulnerability	90%	5	450	<ul style="list-style-type: none"> <li>• System Monitoring</li> <li>• Intrusion Prevention Systems</li> <li>• Incident Documentation</li> <li>• Incident Response</li> <li>• Updating and Upgrading Firmware</li> </ul>

## **XI. CONSTRAINTS & LIMITATIONS**

- The system will be PC based only.
- The system must be implemented within a company domain.
- The system has a maximum limit of 2800 users due to server issues.
- The client will be trained to handle the customization of the system.
- There will be error handling facilities for operational level.
- The team will only focus on the system's flexibility.

## **XII. METRICS / SUCCESS FACTORS**

<b>Metrics / Success Factors</b>	<b>Percentage</b>
Create the User Management System	25%
Create User Database	20%
Set up Webservers and Backup Servers	20%
Set up Load Balancer	15%
Host up maximum of 2800 users.	20%
<b>TOTAL:</b>	100%

### XIII. SWOT ANALYSIS

<b>Strength</b> <ul style="list-style-type: none"><li>• The system is flexible and can be customized to the client's preference depending on the usage.</li><li>• The system can handle an estimated number of 2800 users.</li><li>• The system could lessen the workload of the employees</li><li>• The system could</li></ul>	<b>Weakness</b> <ul style="list-style-type: none"><li>• The system cannot handle bulk submissions of forms for approval.</li></ul>
<b>Opportunity</b> <ul style="list-style-type: none"><li>• Improve notifications of the system</li><li>• Include a load balancer</li><li>• Improve disaster recovery</li></ul>	<b>Threat</b> <ul style="list-style-type: none"><li>• User may exceed the maximum capacity</li></ul>

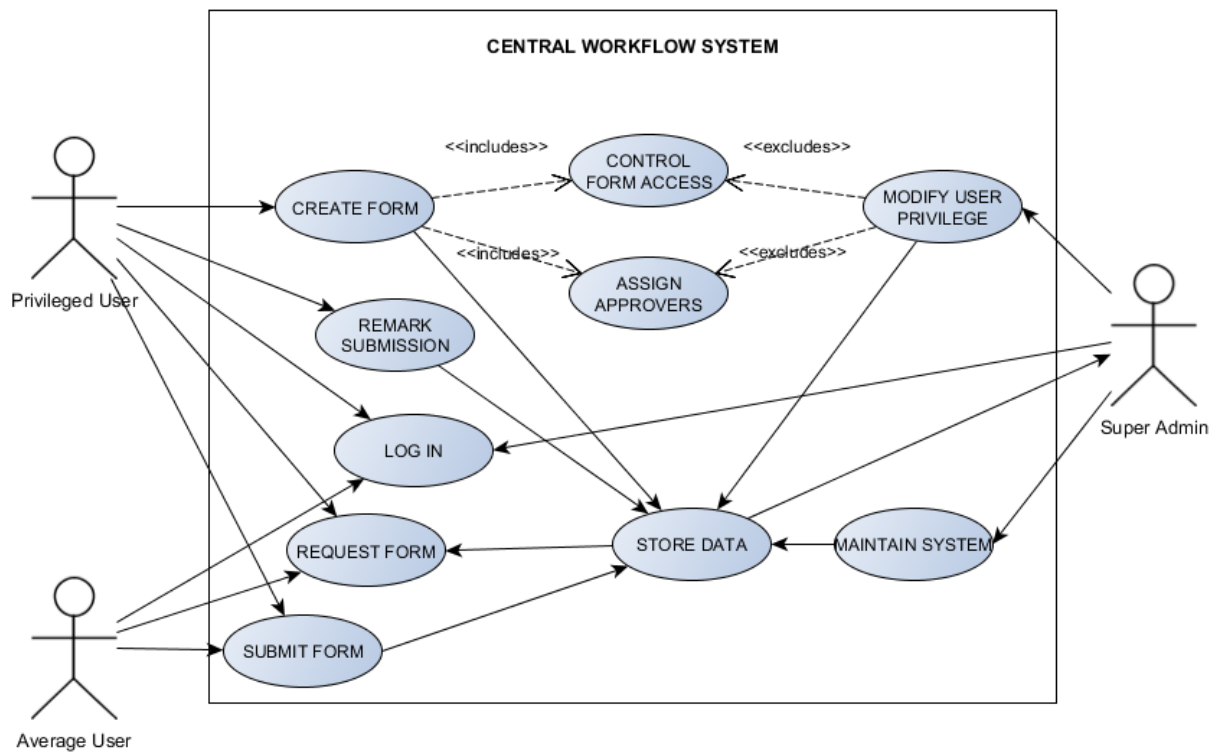
#### XIV. SOFTWARE REQUIREMENTS SPECIFICATION

	ASSIGNED TO	YES	NO	REMARKS
<b>Output</b>  ✓ System Administrator will be notified simultaneously of the request forms being sent for approval.  ✓ The forms created are stored and may be accessed by the average user depending on its department or privilege.  ✓ The system will send a verification email after registration.  ✓ If a user forgot his or her password, the system will send an email to the user to change the password.	System Developer  System Developer  System Developer  System Developer		✓  ✓  ✓  ✓	Project Development is not yet in progress  Project Development is not yet in progress  Project Development is not yet in progress  Project Development is not yet in progress
<b>Input</b>  ✓ Registration form must be completely filled out before submitting.  ✓ Privileged users and the system administrator are the only allowed users to create forms in the form section.  ✓ Request forms must be completely filled out before submitting.  ✓ All users can fill out an approved form.	Project Developer  Technical Analyst  Technical Analyst  System Developer		✓  ✓  ✓  ✓  ✓	Project Development is not yet in progress  Project Development is not yet in progress  Project Development is not yet in progress  Project Development is not yet in progress  Project Development is not yet in progress

<b>Process</b>  ✓ Once a request form is marked as complete, it can no longer be canceled.  ✓ All requested/approved forms is stored in the database.	System Analyst		✓	Project Development is not yet in progress
	Database Developer		✓	Project Development is not yet in progress
<b>Performance</b>  ✓ All logs from the user, new account, forms, status, requests and maintenance are stored in the database.  ✓ The system must support a maximum of 2800 users online.  ✓ The system is operational 24/7  <b>Control</b>  ✓ The System administrator can modify privileges among users to give them access on the available forms on the user's department.  ✓ Only the system administrator can grant features to users notes.  ✓ The system must maintain operational security for all users and the system administrator.  ✓ System administrator retrieves data from the data store and is assigned to maintain the database.	Database Developer		✓	Project Development is not yet in progress
	Server-Side Developer		✓	Project Development is not yet in progress
	Server-Side Developer		✓	Project Development is not yet in progress
	System Developer		✓	Project Development is not yet in progress
	Technical Analyst		✓	Project Development is not yet in progress
	System Developer		✓	Project Development is not yet in progress
	Database Developer		✓	Project Development is not yet in progress

## XV. UNIFIDE MODELING LANGUAGE DIAGRAMS

## XVI. USE-CASE DIAGRAM





## XVII. USE-CASE NARRATIVES

### A. LOG IN Use-case

Name:	LOG IN	
Actor:	Privileged User, Average User and Super Admin	
Description:	Users log in using their registered account.	
Successful Completion:	User Side: 1. User enters user name and password	System Side: 1.1 System verifies the user's account 2. System authenticates the user. 3. System grants access according to the user's role. 4. System creates user log.
Alternatives:	1. System notifies user to re-log in with registered account. 2. System denies access to the Central Workflow System 3. The system will create failed attempt logs. 4. The Super Admin will check and verify the account used by the user to log in.	
Precondition:	Only authenticated users with verified accounts can gain access.	
Post-condition:	User gained access and perform tasks according to their privilege.	
Assumption:	The user has registered account.	

### B. CREATE FORM Use-case

Name:	CREATE FORM	
Actor:	Privileged User	
Description:	Privileged User creates form and includes CONTROL FORM ACCESS and ASSIGN APPROVERS	
Successful Completion:	User Side: 1. Privileged User creates form with the user of drag and drop.	System Side: 1.1 System stores created forms in the database.

Alternatives:	<ol style="list-style-type: none"> <li>1. The System restricts the user if it is not privileged to create forms.</li> <li>2. The Super Admin may modify the user's privilege.</li> </ol>
Precondition:	The system must verify user to create form.
Post-condition:	<ol style="list-style-type: none"> <li>1. The Privileged User will assign approvers of the form.</li> <li>2. Average Users who may access can request forms.</li> </ol>
Assumption:	The user is privileged to create form.

### C. ASSIGN APPROVERS Use-case

Name:	ASSIGN APPROVERS	
Actor:	Privileged User and Super Admin	
Description:	Assignment of Approvers of the created forms	
Successful Completion:	User Side: <ol style="list-style-type: none"> <li>1. Privileged user assigns an approver of the created form.</li> </ol>	System Side: <ol style="list-style-type: none"> <li>1. System records the assigned approvers of each forms.</li> </ol>
Alternatives:	<ol style="list-style-type: none"> <li>1. The System restricts the user if it is not privileged to assign approvers.</li> <li>2. The Super Admin modify the user's privilege.</li> <li>3. Super Admin may modify the assigned approvers.</li> </ol>	
Precondition:	<ol style="list-style-type: none"> <li>1. Submitted forms must be approved by verified Approvers.</li> <li>2. A form must be created before assigning approvers.</li> </ol>	
Post-condition:	Approvers will be notify ones a form to be approved by them is submitted.	
Assumption:		

### D. CONTROL ACCESS Use-case

Name:	CONTROL ACCESS
Actor:	Privileged User and Super Admin
Description:	Privileged User controls who may access the created form and the Super Admin may modify the Control Access in modification of the user privilege

Successful Completion:	User Side: 1. Privileged Users controls the form accessibility.	System Side: 1.1 System record who may access the form.
Alternatives:	1. The System restricts the user if it is not privileged to control access of the created form.  2. The Super Admin may modify the user's privilege.  3. Super Admin may modify access controls of each forms created.	
Precondition:	Accessibility of form should be according to their roles.	
Post-condition:	Average Users who can access may request forms.	
Assumption:		

#### E. REMARK SUBMISSION Use-case

Name:	REMARK SUBMISSION	
Actor:	Privileged User	
Description:	Privileged Users that are assigned to approve a form remarks the submission.	
Successful Completion:	User Side: 1. Approver remarks form as approved.	System Side: 1. System creates form log upon approval of the form.
Alternatives:	1. Approver remarks form as declined.  2. Declined forms will be pushed back until approved.	
Precondition:	Submitted forms must be remarked by any of the approvers.	
Post-condition:	1. System stores remarked as approved forms.  2. Requestor of form will be notified about the form status.	
Assumption:	Filled out form is submitted to the system for Approver's approval.	

## F. REQUEST FORM Use-case

Name:	REQUEST FORM	
Actor:	Average User and Privileged User	
Description:	User request created forms.	
Successful Completion:	User Side: 1. The User request for created forms.	System Side: 1.1 System provides form requested form.
Alternatives:	1. The System restricts the user if the user cannot access the form 2. The Super Admin modifies the form access control	
Precondition:	The Privileged User or the Super Admin grants Average User to request form.	
Post-condition:	Requested form will be filled out and submit for approval.	
Assumption:	The Average User may access the created form.	

## G. SUBMIT FORM Use-case

Name:	SUBMIT FORM	
Actor:	Average User and Privileged User	
Description:	User submits Form	
Successful Completion:	User Side: 1. User fills out and submits form.	System Side: 1. System stores submitted forms. 2. The system notifies the approvers of the submitted forms.
Alternatives:	The system notifies the user if there is an empty field.	
Precondition:	1. Form must be requested. 2. Form must be filled out. 3. Form must be submitted for approval.	
Post-condition:	The form will be remarked by the assigned approvers.	
Assumption:	The User may access and requested the form.	

#### H. MODIFY USER PRIVILEGE Use-case

Name:	MODIFY USER PRIVILEGE	
Actor:	Super Admin	
Description:	Super Admin modifies the user's privileged which rxcludes CONTROL FORM ACCESS and ASSIGN APPROVERS.	
Successful Completion:	User Side: 1. Super Admin escalates the privilege of the users.	System Side: 1.1 System creates system logs for every modification made by the Super Admin.
Alternatives:	Super Admin de-escalates the privilege of the users.	
Precondition:	Modification of the user's privilege must be done.	
Post-condition:	Super Admin overwrites stored data in the system.	
Assumption:	Management requests modification.	

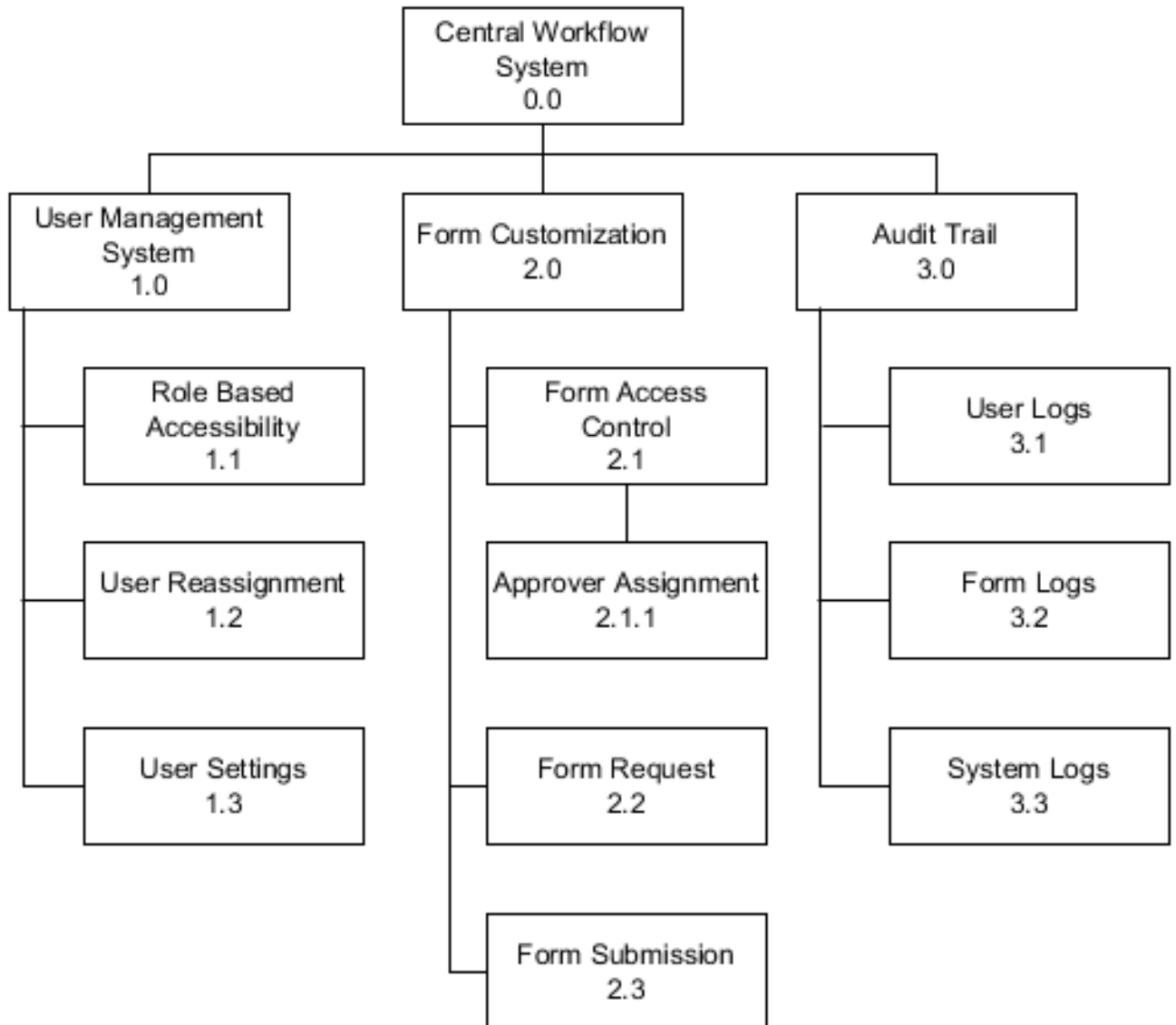
#### I. MAINTAIN SYSTEM Use-case

Name:	MAINTAIN SYSTEM	
Actor:	Super Admin	
Description:	Super Admin maintains the System.	
Successful Completion:	User Side: 1. Super Admin overwrites information in the system.	System Side: 1.1 System creates system logs.
Alternatives:	Management must report data anomalies.	
Precondition:	System must have data to be maintained.	
Post-condition:	System is maintained	
Assumption:		

#### J. STORE DATA Use-case

Name:	STORE DATA
Actor:	System
Description:	System Stores data.
Successful Completion:	<ol style="list-style-type: none"> <li>1. System stores user accounts.</li> <li>2. System stores created forms.</li> <li>3. System stores list of privileged users who can approved forms.</li> <li>4. System stores list of average users who can access created forms.</li> <li>5. System stores submitted forms.</li> <li>6. System stores approved forms.</li> <li>7. System stored overwritten data.</li> </ol>
Alternatives:	<ol style="list-style-type: none"> <li>1. System notifies the Super Admin if data storage fails.</li> <li>2. Super Admin maintain the system.</li> </ol>
Precondition:	Processed data needs to be stored
Post-condition:	<p>Super Admin maintains the system.</p> <p>Users retrieve data according to their roles and privileges.</p>
Assumption:	Process has been made

## XVIII. FUNCTION DECOMPOSITION DIAGRAM



The Central Workflow System (0.0) consists three modules, first, the User Management System (1.0), second, the Form Customization(2.0), and third, the Audit Trail(3.0).

The User Management System(1.0) has Role Based Accessibility(1.1)-the user's access will be according to the privilege; User Reassignment(1.2)- Super Admin can either escalate or de-escalate a user's privilege; and Account Settings(1.3)-the user can modify its own user account, eg. changing password.

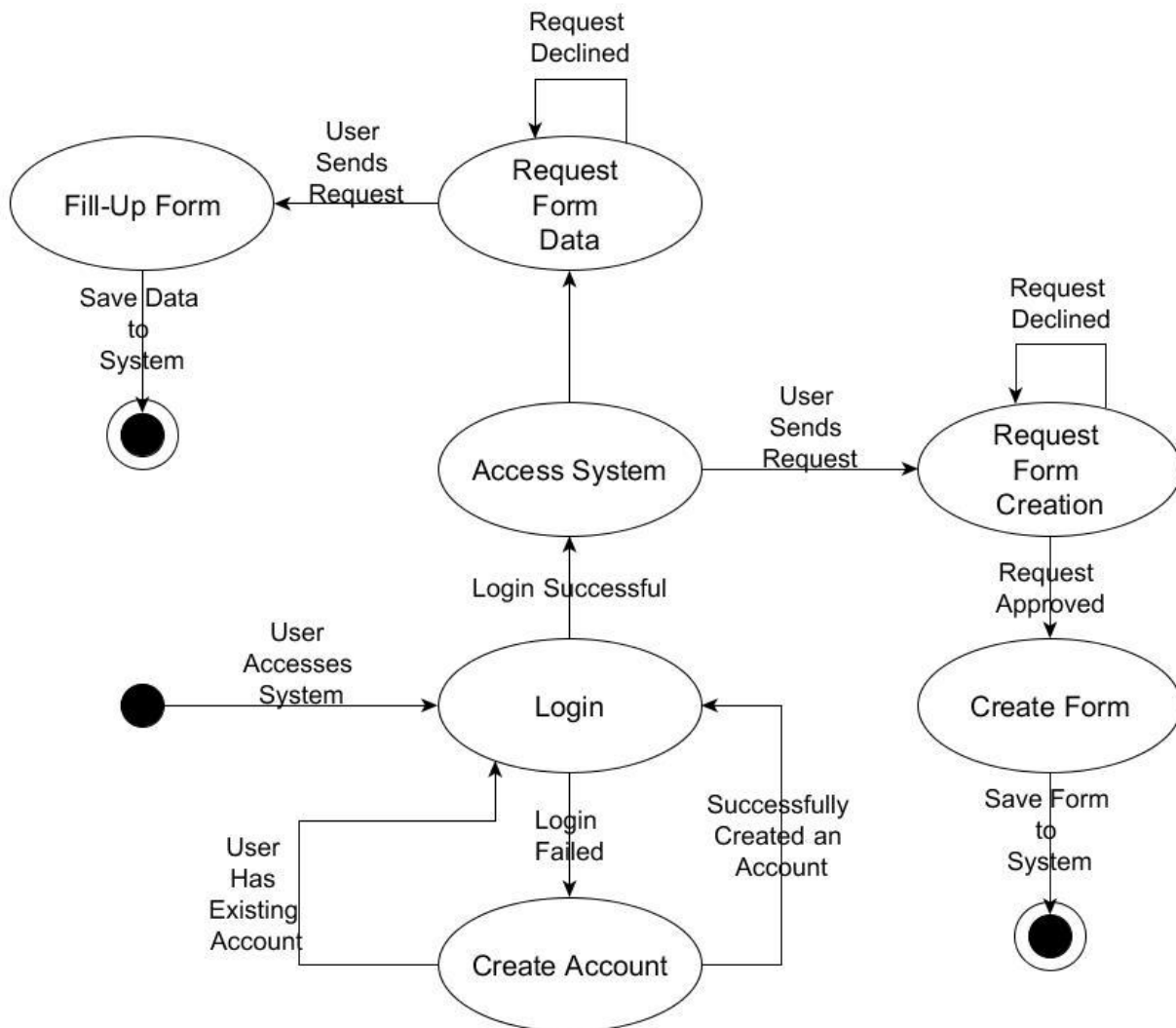
The Form Customization (2.0) has Form Access Control (2.1)- where the creator of the form controls who can access the created form, this module includes Approver Assignment(2.1.1)-where the creator of the form assigns who will remark once the form was submitted, the Form Control Accessibility can be reviewed by the Super Admin and may be modified to overwrite the data. The second submodule is the Form Request(2.2)-the user who may access the form may request; and the Form Submission (2.3)-Where the user who can access may submit a filled out form.

The Audit Trail(3.0) includes User Logs(3.1)-which is generated when a user successfully logs in; Form Logs (3.2)- which is generated when a Form is submitted; and System Log(3:3) which is generated when the Super Admin modifies a data in the system.

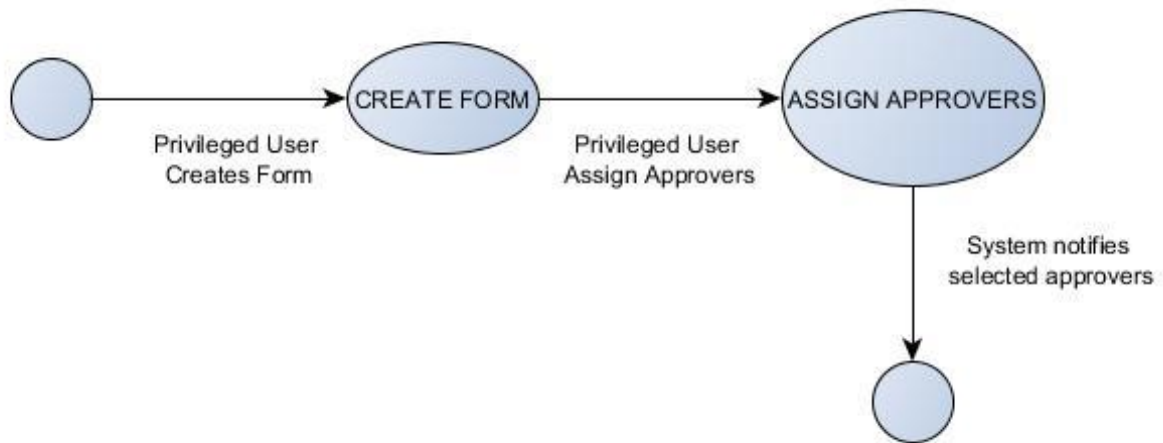


## XIX. STATE TRANSITION DIAGRAM

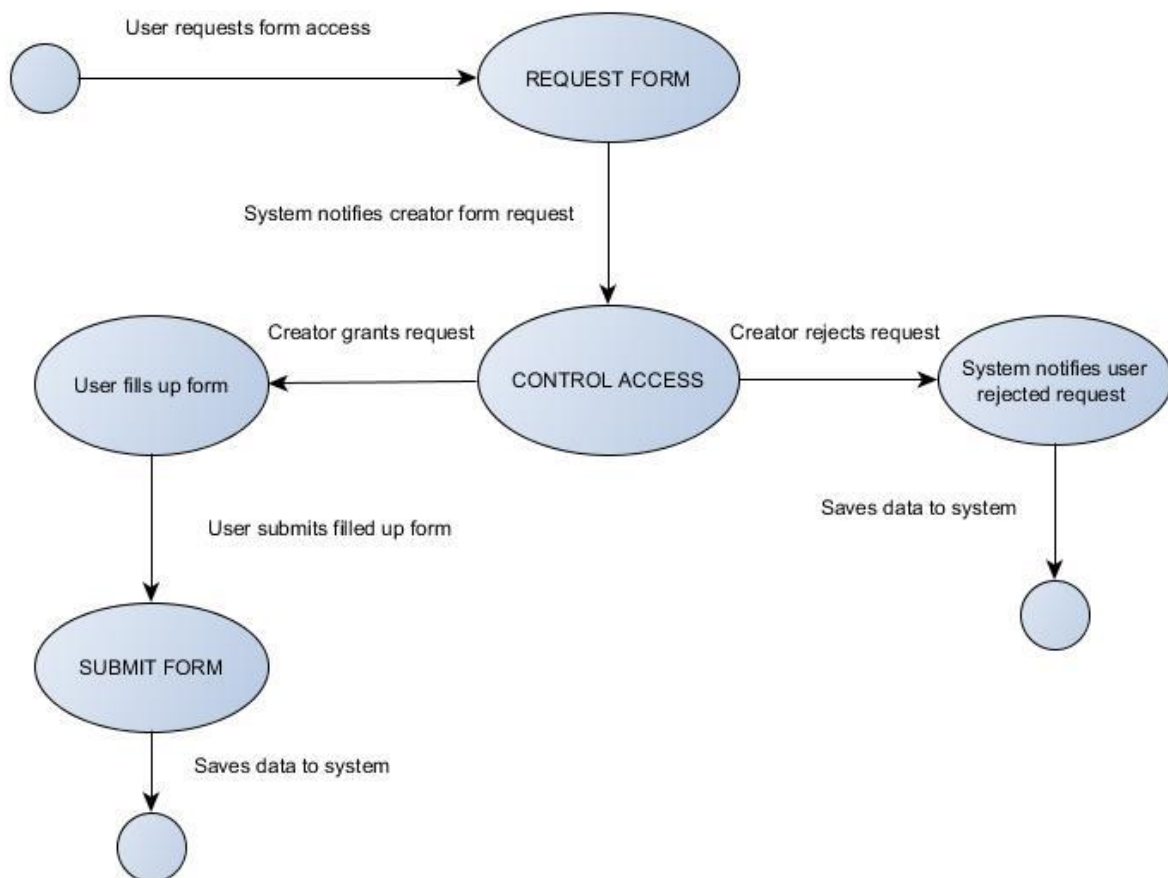
Login, Request Form, Create Form,



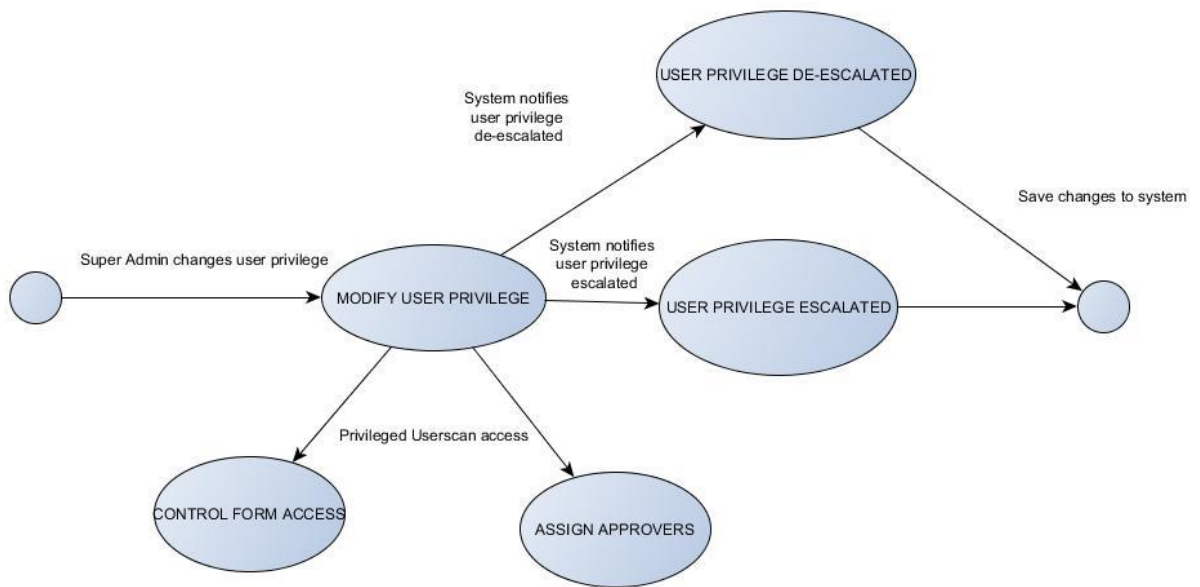
## Assign Approvers



## Control Access



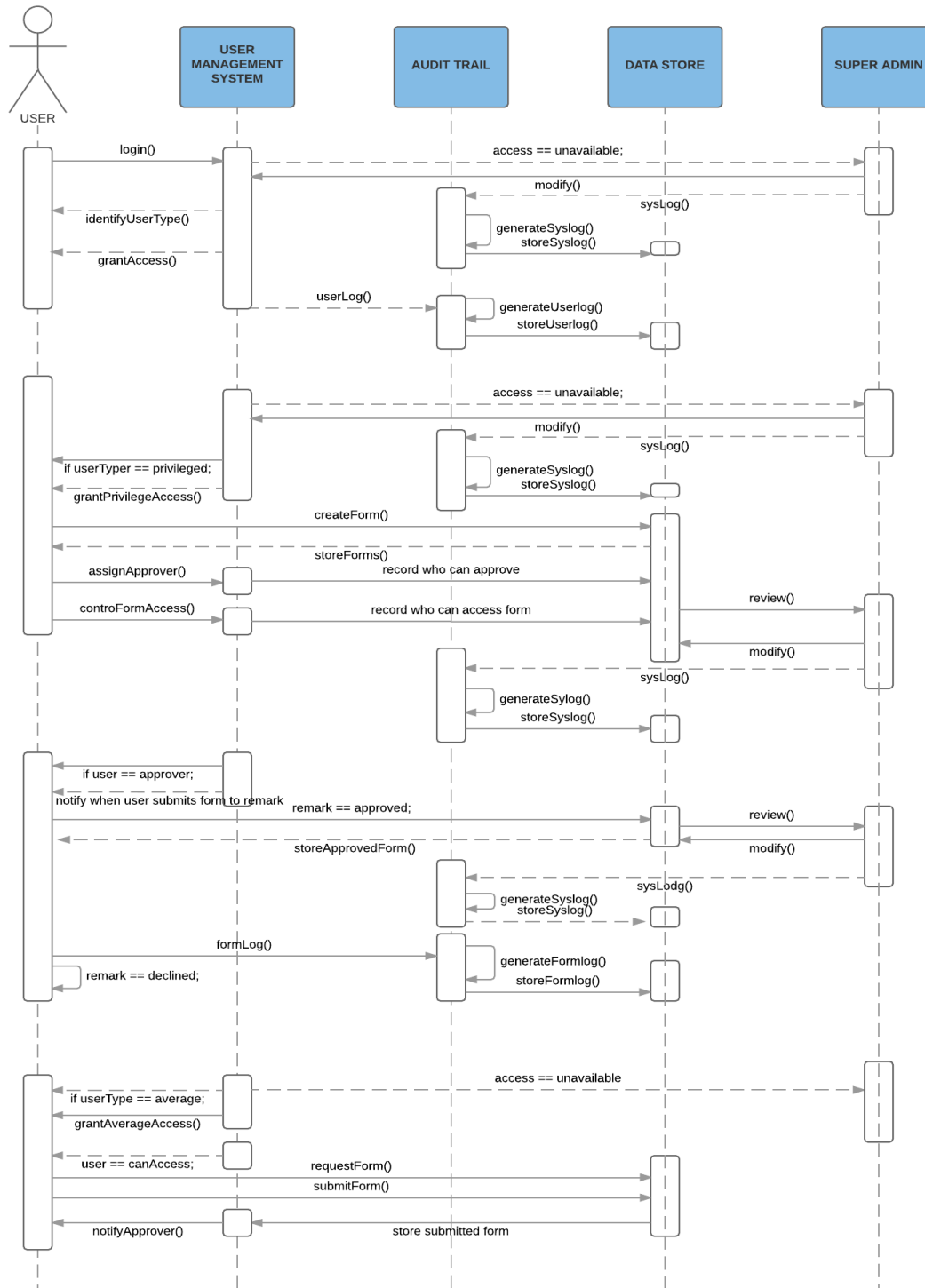
## Modify User Privilege



## XX. SEQUENCE DIAGRAM

### CENTRAL WORKFLOW SYSTEM

yana ventura | November 12, 2016



The user login to the system, if the login was unsuccessful, it will send a trigger to the Super Admin to modify the User management system triggering the audit trail to generate a syslog and storing the syslog to the database. In logging in, the user management system identify the user type(the privilege of the user) and grants access to the user. Successful log in sends trigger to the Audit trail to generate user log which will be stored in the data store.

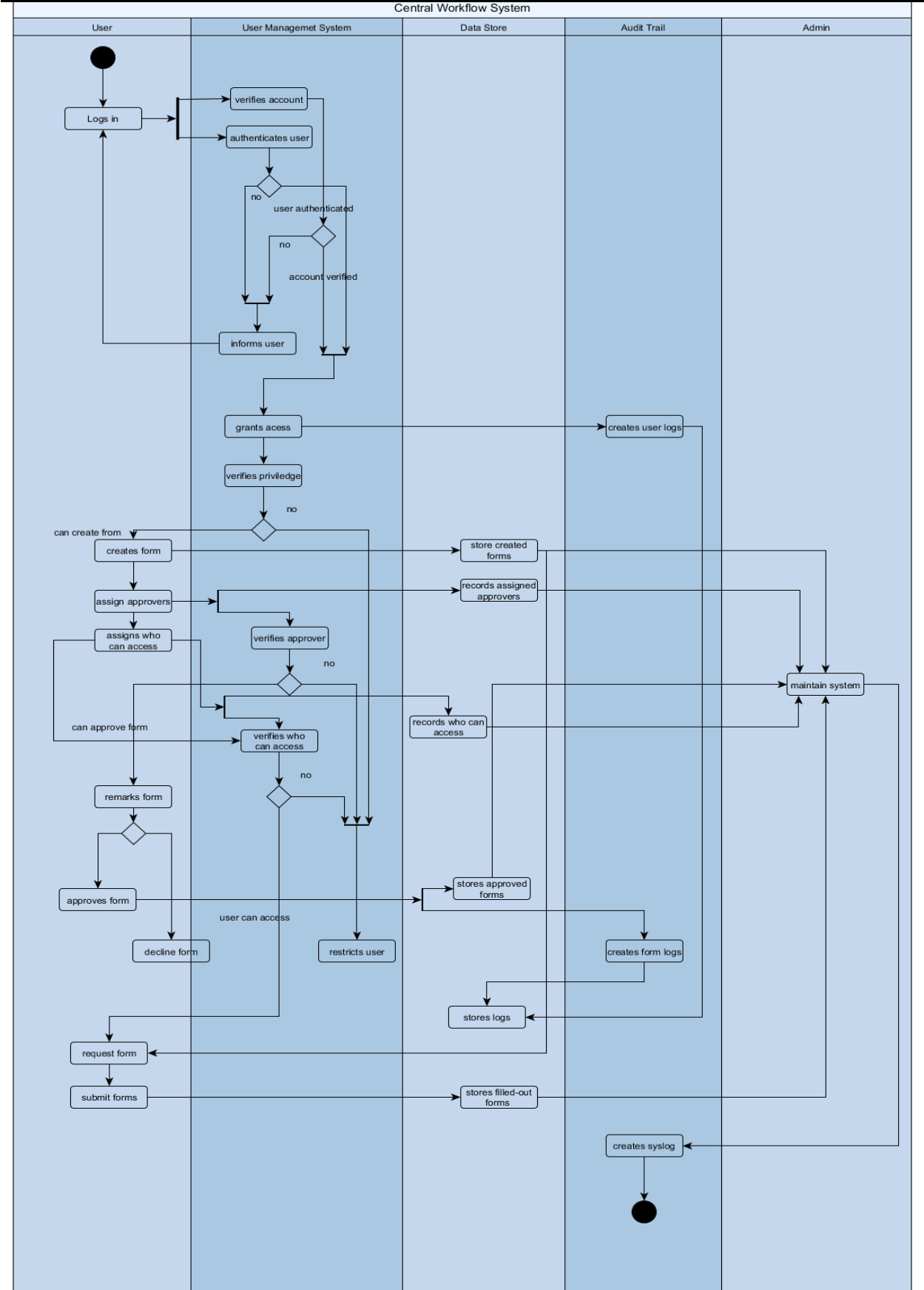
If the user type is privileged, the system will grant privileged access. Otherwise, if the access is unavailable, the Super Admin may modify the data sending a trigger to the audit trail to generate a syslog and store it to the data store.

In privileged access mode, the user may create form and store it in the data store. The form creator will assign approver and the system records who the approvers are, and control form access sends trigger to the system to record the average users who can access the form. These data may be reviewed by the Super admin and modification may be made which will trigger the audit trail to generate syslog and store syslog in the data store.

If the user is assigned as the approver, the system will notify the user if there is a submission of the form that must be remarked. If the approver remarked the form as approved, the form will be stored in the data store. The approval of the form can be reviewed by the Super admin and any modification made will send trigger to the Audit trail to generate syslog that will be stored in the data store. Form approval also sends trigger to the audit trail to generate form log and store form log in the data store. If the form is remarked as declined, the form will be pushed to wait for the other approver to approve the form. There must be at least two 'approved' remarks to set the form as approved forms.

If the user type is average user, the user will be granted average user access. If the access is unavailable, it will send a trigger to the Super admin to modify the system. Any modification made by the Super Admin will trigger the Audit Trail to generate the syslog and store it in the data store. In the average user access mode, the user may request and submit form if the user is available to access the form. The submitted form will be stored in the data store and the system will notify the approver of the submitted form.

## XXI. ACTIVITY DIAGRAM



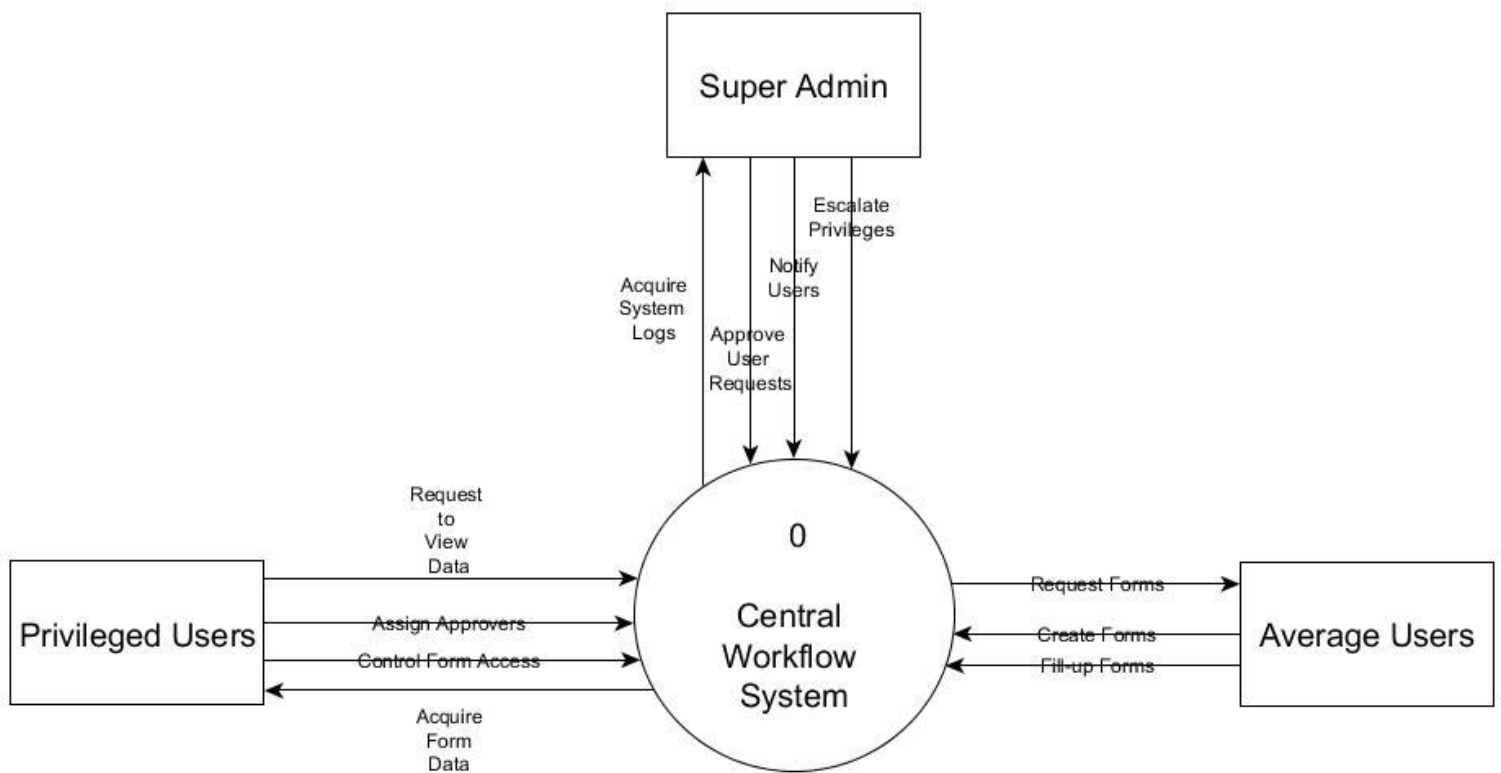
In order to access the Central Workflow System, the user must log in. Once the user Logs in, the User Management System will simultaneously verify the account and authenticate the user. If the account is not verified and the user was not authenticated, the system will notify the user to re-log in. If the verification of account and authentication of the user is successful, the system will grant access to the user which will trigger the Audit Trail to create a User Log and store the logs.

The User Management System will verify the privilege, if the User is not privileged to create form, the User will be restricted to create a form, and otherwise, the user can create form and assign the approvers and who can access. The System records who the approvers of the form are and who may access the form. These data may be modified by the Super Admin which will trigger the Audit trail to create a system log and store logs to the data store.

The User Management System will verify who the approvers are, if the user is the approver of the submitted form, the system will notify the user approver to remark the form. The user will be restricted to remark the form if he is not assigned as an approver. The form can either be remarked as approved or decline. Approval of form will send the form to the data store and the audit trail to create form logs. The form log will be stored in the system. The stored approved form can be reviewed by the Super Admin and may be modified generating a System log which will be stored in the system as well. Declined Form will be pushed back notifying other approver to remark the form. There must be two approvers to approve the form to set the form as approved. The user who submitted the form will be notified with the form status.

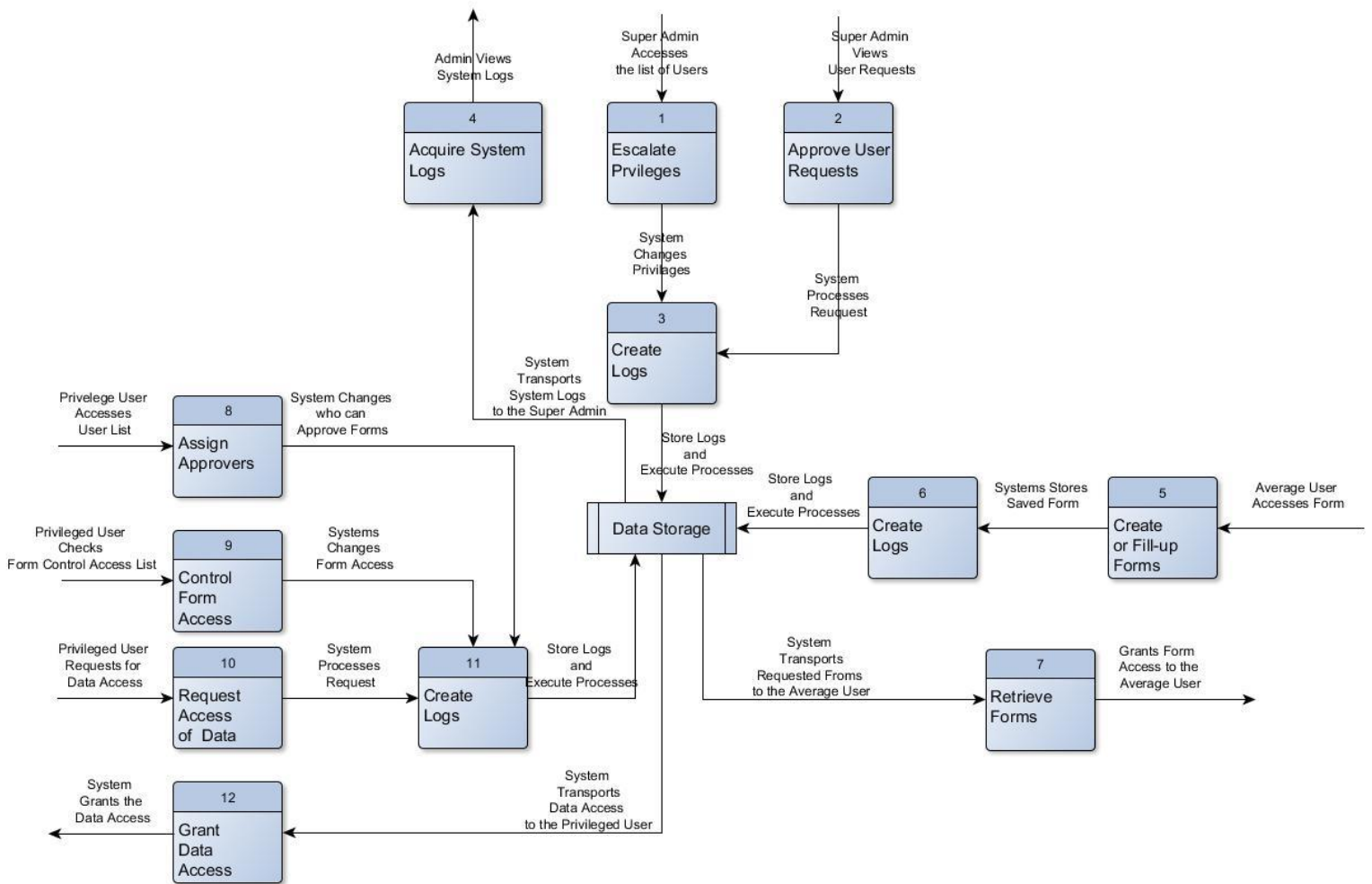
The User Management System will verify if the user can access the created form. Accessibility of the form means the user can request and submit the form. If the user cannot access the form, the user will be restricted. The user request for the form from the system. The user must fill out the form before submission. Once the form is submitted, the approver will be notified by the system. Submitted form will be stored by the system and will be overwritten once it is approved.

## XXII. Context Diagram





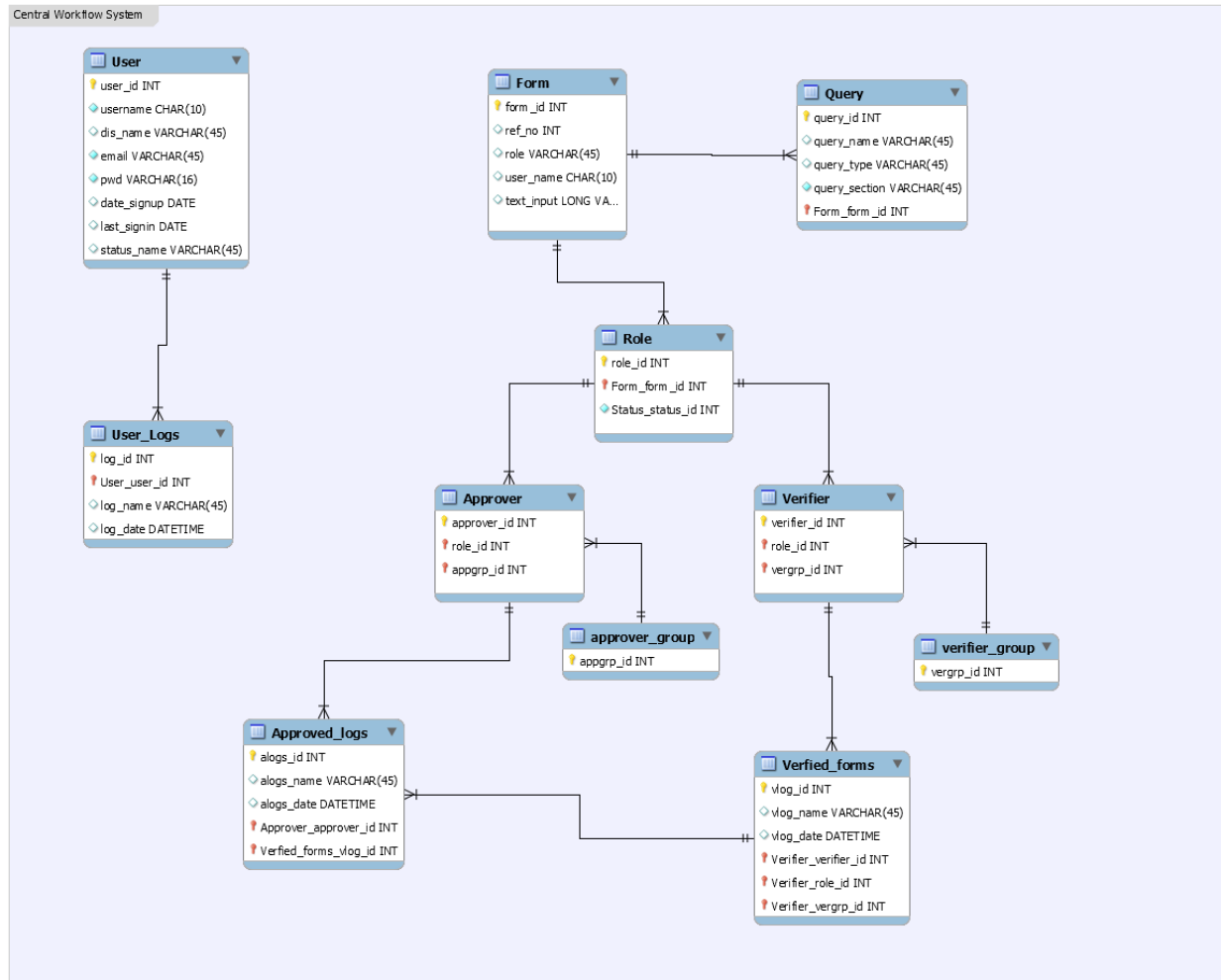
### XXIII. Data Flow Diagram



## **XXIV. BUSINESS RULES**

- Each user can create one or more request forms (one or more request form per year for multiple years). Each certain request form is created by only one user.
- Each user can only have one membership. Each membership is associated by one or more users.
- Each user can only have one title. Each title can be associated with one or more user.
- Each user can create one or more forms. Each created forms is created by one or more user.
- Each forms can choose one or more role. Each role can be associated with one or more forms.
- Each role can choose one or more user. Each user can be associated with one or more role.
- All requested forms is stored in the database.
- Each decline request forms are on return. Each returned request forms is stored in the database.
- All approved request forms is stored in the database.
- (Each user assigned with a specified role by another user/s to associate with the request forms will be notified) Each user with a role receives notification. Each notified request forms are associated with one or more user with specified role/s.
- Each action will be recorded to the audit log.

## XXV. ENTITY RELATIONSHIP DIAGRAM



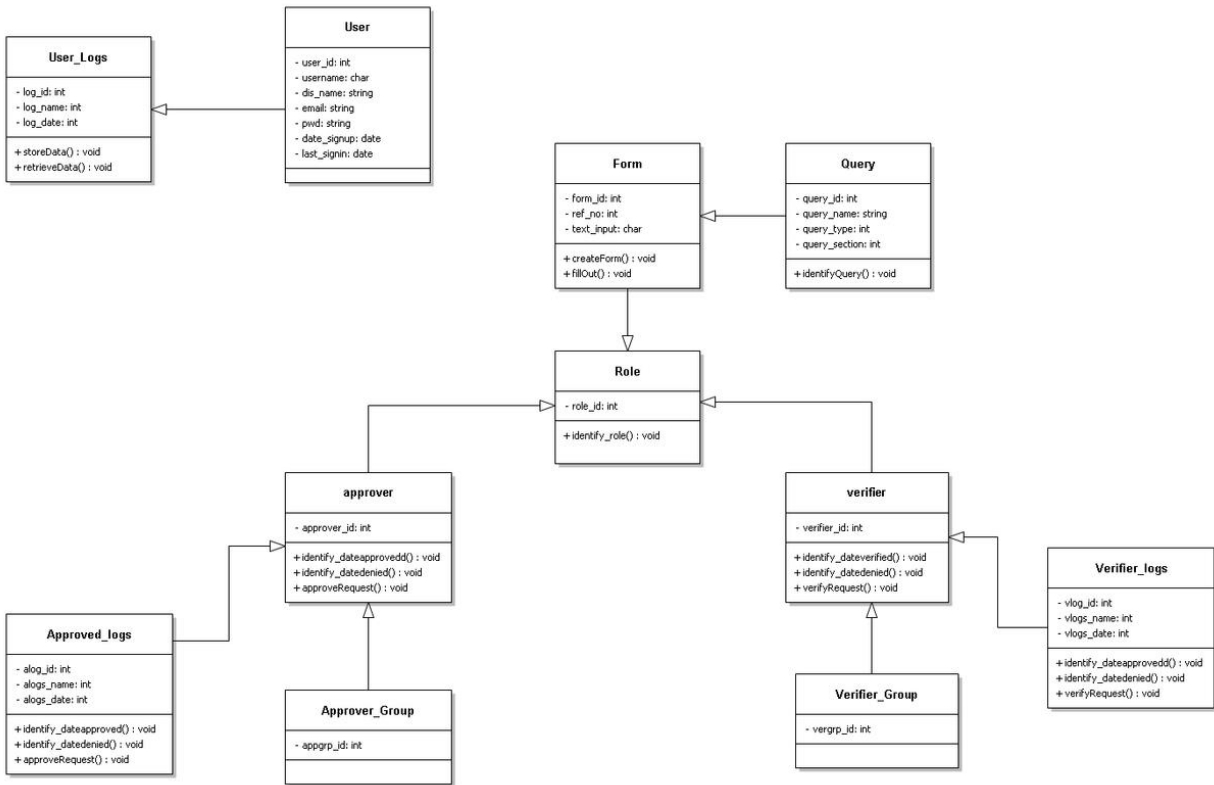
## XXVI. DATA DICTIONARY

Table Name	Attribute Name	Contents	Data Types	Format	Required	PK/FK	FK References Table
User	user_id	User ID	INT	9999999	Y	PK	
	username	User Name	CHAR(10)	xxxxxxxx	Y		
	dis_name	Display Name	VARCHAR (45)	xxxxxxxx	Y		
	email	Email Addresses	VARCHAR (45)	xxxxxxxx	Y		
	pwd	Password	VARCHAR (45)	xxxxxxxx	Y		
	date_signup	Date sign-up	DATE	MM/DD/YYYY	Y		
	last_signin	Last sign-in	DATE	MM/DD/YYYY	Y		
	status_name	Status name	VARCHAR (45)	xxxxxxxx	Y		
User_logs	log_id	Log ID	INT	9999999	Y	PK	
	user_user_id	User ID	INT	9999999	Y	FK	User Table
	log_name	Log name	VARCHAR (15)	xxxxxxxx	Y		
	log_date	Log Date	DATETIME	YYYYMMDDHHMMSS	Y		
Verifier	verifier_id	Verifier ID	INT	9999999	Y	PK	
	role_id	Role ID	INT	9999999	Y	FK	Role Table
	vergrp_id	Verify Group ID	INT	9999999	Y	FK	Verify Group Table
Verifier_group	vergrp_id	Verifier Group ID	INT	9999999	Y	PK	
Verified_forms	vlog_id	Verified Log ID	INT	9999999	Y	PK	
	vlog_name	Verified Log Name	VARCHAR (15)	xxxxxxxx	Y		
	vlog_date	Verified Log Date	DATETIME	YYYYMMDDHHMMSS	Y		

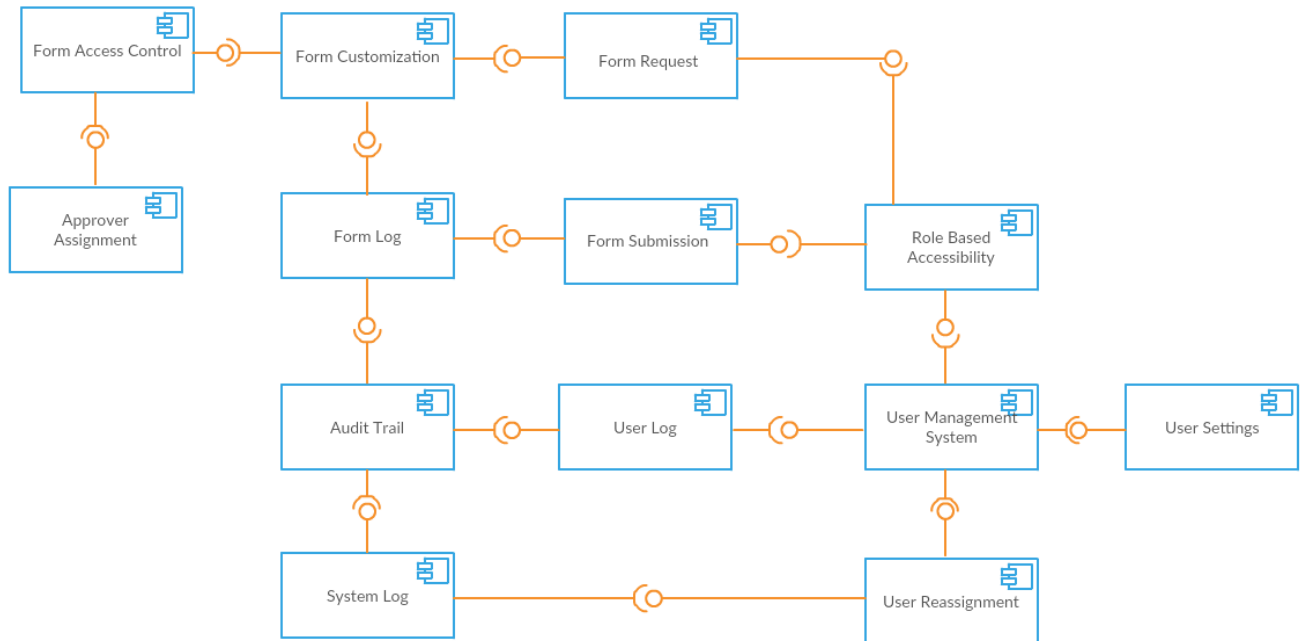
	verifier_verifier_id	Verifier ID	INT	9999999	Y		
	verifier_role_id	Verifier Role ID	INT	9999999	Y	FK	Verifier Table
	verifier_vergrp_id	Verifier Group ID	INT	9999999	Y	FK	Verifier Group Table
Approver	approver_id	Approver ID	INT	9999999	Y	PK	
	role_id	Role ID	INT	9999999	Y	FK	Role Table
	appgrp_id	Approval Group ID	INT	9999999		FK	Approval Group Table
Approver_group	appgrp_id	Approver Group ID	INT	9999999		PK	
Approved_Logs	alog_id	Approved Logs ID	INT	9999999	Y	PK	
	alog_name	Approved Logs Name	VARCHAR (15)	xxxxxxx	Y		
	alog_date	Approved Logs Date	DATETIME	YYYYMMDDHHMMSS	Y		
	approver_approver_id	Approver ID	INT	9999999	Y		
	verified_forms_vlog_id	Verified Forms	INT	9999999	Y	FK	Verified Forms Table
Role	role_id	Role ID	INT	9999999	Y	PK	
	Form_form_id	Form ID	INT	9999999	Y	FK	Form Table
	Status_status_id	Status ID	INT	9999999	Y	FK	Status Table
Form	form_id	Form ID	INT	9999999	Y	PK	
	ref_no	Reference Number	INT	9999999	Y		

	role	Role	VARCHAR (45)	xxxxxxxxxx	Y		
	user_name	User	VARCHAR (45)	xxxxxxxxxx	Y		
	text_input	Text Input	LONGTEX T	xxxxxxxxxx	Y		
Query	Query_id	Query ID	INT	99999999	Y	PK	
	Query_name	Query Name	VARCHAR (45)	xxxxxxxxxx	Y		
	Query_type	Query Type	VARCHAR (45)	xxxxxxxxxx	Y		
	Query_section	Query Section	VARCHAR (45)	xxxxxxxxxx	Y		
	Form_form_id	Form ID	INT	99999999	Y	FK	Form Table

## XXVIII.CENTRAL WORKFLOW SYSTEM ENTITY CLASS DIAGRAM

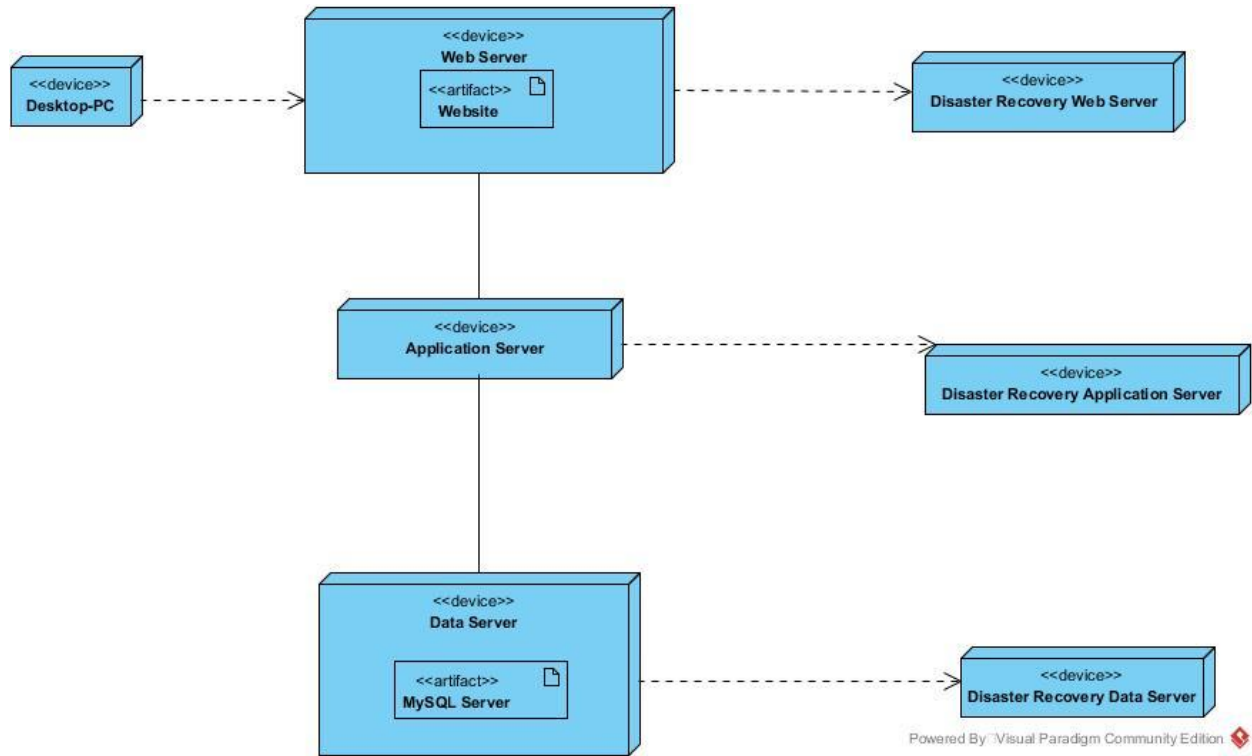


## XXIX. COMPONENT DIAGRAM



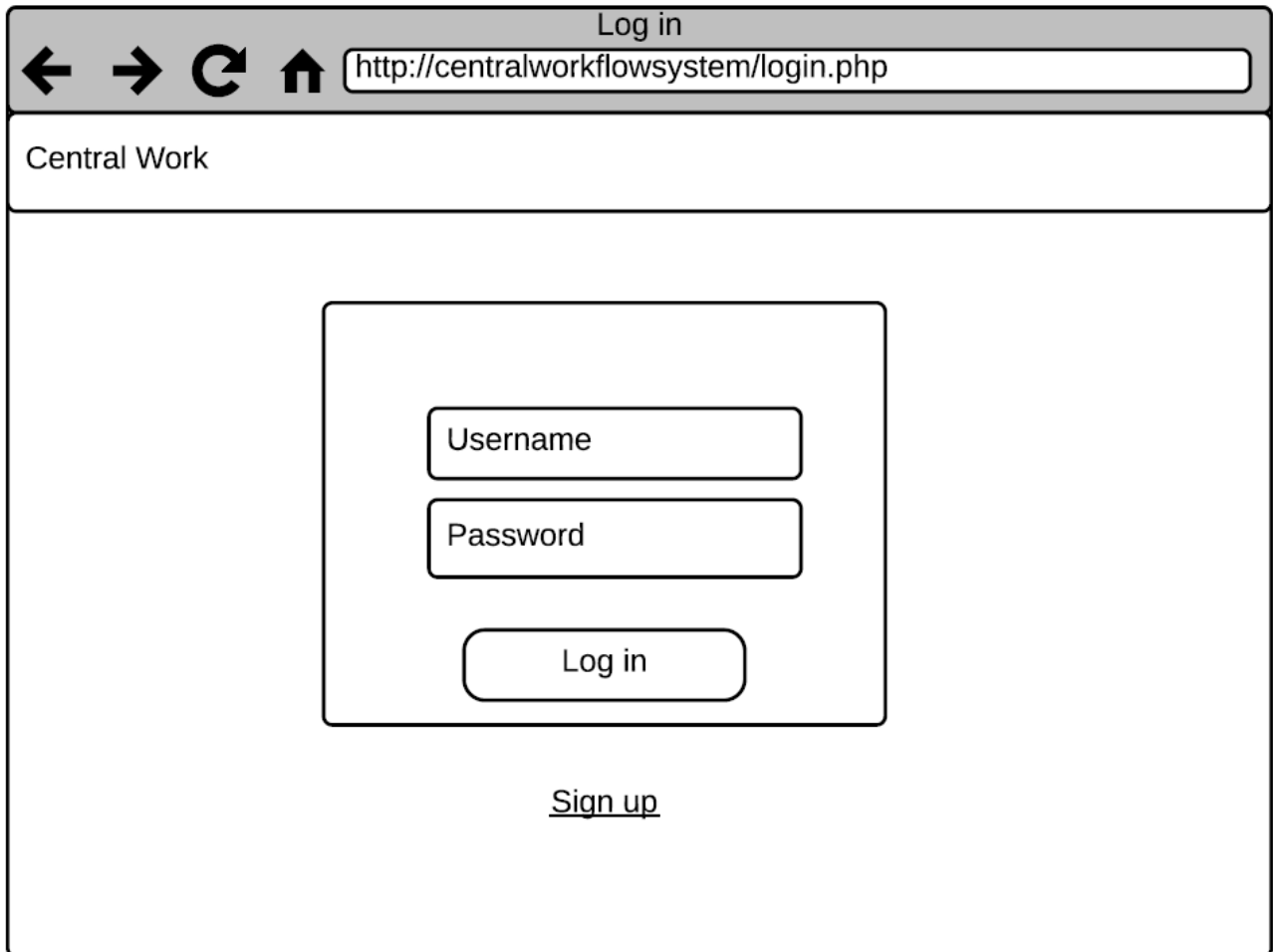


## XXX.DEPLOYMENT DIAGRAM



## XXXI.SCREEN LAYOUTS

Login



The image shows a web browser window with a grey title bar containing the text "Log in". The address bar shows the URL "http://centralworkflowsystem/login.php". The page content area has a white background with a header "Central Work". In the center, there is a white box with a black border containing three input fields: "Username", "Password", and a "Log in" button. Below this box, the text "[Sign up](#)" is displayed.

Log in

http://centralworkflowsystem/login.php

Central Work

Username

Password

Log in

[Sign up](#)

Homepage

CWS

Central Workflow System

Users	Create Form	Request Forms	Reports	Exams	Forms	User Settings	Notifications	Logout
-------	-------------	---------------	---------	-------	-------	---------------	---------------	--------

Account

Hey! This is an example secure page designed some of the basic features of UseCake.

Just so you know, your title at the moment is New Member and that can be changed in the admin panel.

You registered this account on Dec 07, 2016

Create Form

CWS  
Central Workflow System

Users

Create Form

Request Forms

Reports

Exams

Forms

User Settings

Notifications

Logout

Form

Drag & Drop components

InputRadios/CheckboxesSelectButtonsRenderedAbout

Multiple Radios

☒ Option one

☐ Option two

Inline Radios

☒ 1

☐ 2

☐ 3

☐ 4

Multiple Checkboxes

☐ Option one

☐ Option two

Inline Checkboxes

☐ 1

☐ 2

☐ 3

☐ 4

Approver Line

No.	Role	User
1	<div>Empty</div>	<div>Empty</div>
2	<div>Empty</div>	<div>Empty</div>
3	<div>Empty</div>	<div>Empty</div>

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## Request Form

**CWS**  
Central Workflow System

Users

Create Form

**Request Form**

Reports

Exams

Forms

User Settings

Notifications

Logout

### Sample Form


☒ Radiobutton 1

☐ Radiobutton 2

Submit

## Notification

Home



http://centralworkflowsystem/notif.php

Central Work

Log out

Home

Notifications

Create Form

Request Form

Sick Leave Request from User1 for Approval

Sick Leave Request from User2 for Approval

Your Vacation Leave Request has been approved

Your Vacation Leave Request has been declined

Your Vacation Leave Request has been approved

Your Vacation Leave Request has been sent