

Optimizing User, Group, and Role Management with Access Control and Workflows

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Project Name	Optimizing User, Group, and Role Management with Access Control and Workflows
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1. INTRODUCTION

1.1 Project Overview

Modern organizations rely on structured digital platforms to manage users, data access, and workflow processes efficiently. Improper handling of user roles, permissions, and task tracking can lead to confusion, security vulnerabilities, and operational inefficiencies. This project focuses on optimizing user, group, and role management using access control and workflow automation within the ServiceNow platform.

The system is designed to simulate a small project team environment consisting of a Project Manager and Team Member. It demonstrates how structured identity management, secure access permissions, and automated task flows can improve collaboration and accountability. The project implements user creation, group organization, role assignment, table configuration, access control enforcement, and workflow automation to showcase effective platform utilization.

1.2 Purpose

The purpose of this project is to design and implement a controlled and automated system for managing users and project tasks. The project aims to:

- Improve access management through role-based permissions
- Enhance accountability via structured task tracking
- Automate workflow processes to reduce manual effort
- Ensure secure handling of project data

This system provides practical experience with enterprise service management concepts while demonstrating how automation and security mechanisms enhance operational efficiency.

2. IDEATION PHASE

2.1 Problem Statement

In small project environments, manual task handling and loosely defined permissions often result in unclear responsibility distribution and unauthorized data access. The absence of structured workflows causes delays in approvals and progress tracking. Therefore, there is a need to develop a centralized solution capable of organizing users, controlling access, and automating operations within a unified platform.

2.2 Empathy Map Canvas

From the perspective of users involved:

Project Manager

- Needs visibility of project progress
- Wants secure approval control
- Expects reliable task updates

Team Member

- Needs clear task assignments
- Wants simple data access
- Expects role-based permissions

Understanding these needs guided system development toward usability, security, and automation.

2.3 Brainstorming

Different solution approaches were evaluated, including manual tracking, spreadsheet management, and standalone databases. These approaches lacked scalability and automation. ServiceNow was selected as the implementation platform due to its integrated tools for identity management, access control, and workflow automation. The brainstorming process led to the conceptual solution integrating structured data storage, security enforcement, and automated flows.

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

Users interact with the system by logging in, accessing assigned modules, performing tasks, and updating records. Managers review progress and approve workflows. The journey highlights interaction points where usability and responsiveness are essential for satisfaction.

3.2 Solution Requirements

Functional Requirements

- Create users, groups, and roles
- Assign permissions
- Design project/task tables
- Implement ACL security rules
- Automate status updates and approvals

Non-Functional Requirements

- System responsiveness
- Secure data handling
- Ease of use
- Scalability

3.3 Data Flow Diagram (Explanation)

Data flows from user input into structured tables where records are stored. Access control rules validate permissions before allowing viewing or modification. Workflow triggers monitor record changes and initiate automated actions such as updates or approvals. This ensures continuous system interaction between user interface, database, and automation engine.

3.4 Technology Stack

- Platform: ServiceNow
- Tools: Flow Designer, ACL Module, Table Designer
- Interface: Web Browser
- Database: ServiceNow Internal Tables

4. PROJECT DESIGN

4.1 Problem Solution Fit

The designed system aligns with identified issues by introducing role hierarchy, structured data management, and automated workflow handling. It directly addresses access confusion, manual tracking inefficiencies, and approval delays.

4.2 Proposed Solution

The solution integrates:

- User identity configuration
- Group collaboration structure
- Role-based permission enforcement
- Custom data tables
- Workflow automation

This integrated approach improves productivity and ensures operational security.

4.3 Solution Architecture

The architecture consists of:

- User Interface Layer
- Application Logic Layer
- Database Tables
- Security Control Layer
- Workflow Automation Engine

These layers interact to provide secure and efficient system functionality.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

The project was executed in sequential phases:

1. Environment Setup
2. User/Role Configuration
3. Table Creation
4. Access Control Implementation
5. Workflow Development
6. Testing

7. Documentation

Progress monitoring ensured timely completion and minimized risks.

6. FUNCTIONAL & PERFORMANCE TESTING

6.1 Performance Testing

Testing evaluated system responsiveness during user operations, data retrieval, and workflow execution. Multiple record updates and permission validations were performed. Results confirmed stable execution and efficient response time under normal usage conditions, demonstrating system reliability.

7. RESULTS

7.1 Output Screenshots

The system successfully demonstrated:

- User creation

The screenshot displays the 'User - New Record' form in the ServiceNow interface. The form is titled 'User - New Record' and includes a 'Submit' button. A blue banner at the top states: 'To set up the User's password, save the record and then click Set Password.' The form fields are organized into two columns. The left column contains: 'User ID' (alice), 'First name' (alice), 'Last name' (P), 'Title' (empty), 'Department' (empty), 'Password needs reset' (checkbox), 'Locked out' (checkbox), 'Active' (checkbox, checked), 'Identity type' (Human), 'Web service access only' (checkbox), and 'Internal Integration User' (checkbox). The right column contains: 'Email' (alice@gmail.com), 'Language' (None), 'Calendar integration' (Outlook), 'Time zone' (System (America/Los Angeles)), 'Date format' (System (yyyy-MM-dd)), 'Business phone' (empty), 'Mobile phone' (empty), and 'Photo' (Click to add...). A blue tooltip is visible over the 'Web service access only' checkbox, stating: 'This field is read-only. Please select 'Machine Identity' option in Identity type dropdown field if you want to mark this account as 'Web service access only'.' The 'Submit' button is located at the bottom left of the form.

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_user.do%3Fsys_id%3D-1%26sys_list%3Dtrue%26sys_target%3Dsys_user%26syspa...

servicenow All Favorites History Workspaces Admin User - New Record Search

User New record Submit

To set up the User's password, save the record and then click Set Password.

User ID bob Email bob@gmail.com

First name Bob Language -- None --

Last name P Calendar integration Outlook

Title Department ? Time zone System (America/Los Angeles)

Password needs reset Locked out Date format System (yyyy-MM-dd)

Active Identity type Human Business phone Mobile phone Photo Click to add..

Web service access only

This field is read-only. Please select 'Machine Identity' option in Identity type dropdown field if you want to mark this account as 'Web service access only'.

Internal Integration User

Submit

• Groups Creation

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_user_group.do%3Fsys_id%3De20c9856477632100aa044c0806d4327%26sysparm_re...

servicenow All Favorites History Workspaces Admin Group - Project Team Search

Group Project Team Update Delete

Job to add or remove role(s) from user(s) of group has been queued

Name Project Team Group email

Manager Parent


Description

Update Delete

Roles Group Members (2) Groups

Created Search Edit...

Group = Project Team

Created	Role	Granted by	Inherits
			

- Roles Creation

Project Member | Role | ServiceNow

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_user_role.do%3Fsys_id%3D829e509a477632100aa044c0806d43be%26sysparm_reco...

servicenow All Favorites History Workspaces Admin Role - Project Member

Role Project Member

Name Project Member Application Global

Elevated privilege ☐

Description

Update Delete

Contains Roles Applications with Role Modules with Role Custom Tables

for text Search

Role = Project Member

Contains

No records to display

Team Member | Role | ServiceNow

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_user_role.do%3Fsys_id%3D66628dd647ba32100aa044c0806d4389%26syspar...

servicenow All Favorites History Workspaces Admin Role - Team Member

Role Team Member

Name Team Member Application Global

Elevated privilege ☐

Description

Update Delete

Contains Roles Applications with Role (1) Modules with Role Custom Tables

for text Search

Role = Team Member

Contains

No records to display

- Table Creation

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_db_object.do%3Fsys_id%3D-1%26sys_is_list%3Dtrue%26sys_target%3Dsys_db_obje... School

servicenow All Favorites History Workspaces Admin Table - New Record Search

Table New record Submit Cancel

* Label Project Table Application Global ⓘ

* Name u_project_table Create module ☒

Extends table Create mobile module ☒

Add module to menu -- Create new --

New menu name Project Table

Columns Controls Application Access

Table Columns for text Search

Dictionary Entries

	Column label	Type	Reference	Max length	Default value	Display
X /	Project ID	Integer				false
X /	Project Name	String				false
X /	Project Manager	String				false
X /	Start Date	Date				false
X /	End Date	Date				false
X /	Status	Choice				false
X /	Description	String				false

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_db_object.do%3Fsys_id%3D-1%26sys_is_list%3Dtrue%26sys_target%3Dsys_db_obje... School

servicenow All Favorites History Workspaces Admin Table - New Record Search

Table New record Submit Cancel

* Label Task Table 2 Application Global ⓘ

* Name u_task_table_2 Create module ☒

Extends table Create mobile module ☒

Add module to menu -- Create new --

New menu name Task Table 2

Columns Controls Application Access

Table Columns for text Search

Dictionary Entries

	Column label	Type	Reference	Max length	Default value	Display
X /	Task ID	Integer				false
X /	Task Name	String				false
X /	Assigned To	String				false
X /	Due Date	Date				false
X /	Status	Choice				false
X /	Comments	String				false
+	Insert a new row...					

- Assigning users to groups

Project Team | Group | ServiceNow

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_user_group.do%3Fsys_id%3De28c9856477632100aa044c0806d4327%26sysparm_re...

Group - Project Team

Update Delete

Name Project Team Group email

Manager Parent

Description

Update Delete

Roles Group Members (2) Groups

User Search

Group = Project Team

User
alice P
Bob P

1 to 2 of 2

- Assigning roles to users

alice P | User | ServiceNow

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_user.do%3Fsys_id%3D2ac1109a471232100aa044c0806d43f7%26sysparm_record_ro...

User - alice P

Update Set Password Delete

service access only.

Internal Integration User

Update Set Password Delete

Related Links

[View linked accounts](#)

[View Subscriptions](#)

[Reset a password](#)

Entitled Custom Tables Roles (4) Groups (2) Delegates Subscriptions User Client Certificates

Role Search

User = alice P

Role	State	Inherited	Inheritance Count
Project Member	Active	false	
u_project_table_user	Active	false	
snc_required_script_writer_permission	Active	true	
u_task_table_2_user	Active	false	

1 to 4 of 4

Bob P | User | ServiceNow

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_user.do%3Fsys_id%3D76a3d492473632100aa044c0806d43b4%26sysparm_rec...

servicenow All Favorites History Workspaces Admin User - Bob P

Search

User Bob P

Update Set Password Delete

Identity* option in Identity type dropdown field if you want to mark this account as 'Web service access only'.

Internal Integration User ☐

Update Set Password Delete

Related Links

[View linked accounts](#)

[View Subscriptions](#)

[Reset a password](#)

Entitled Custom Tables Roles (3) Groups (2) Delegates Subscriptions User Client Certificates

Role Search

Actions on selected rows... Edit...

User = Bob P

Role	State	Inherited	Inheritance Count
u_task_table_2_user	Active	false	
Project Member	Active	false	
snc_required_script_writer_permission	Active	true	

1 to 3 of 3

- Application access

project table | Application Menu

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_app_application.do%3Fsys_id%3D3f52289247b632100aa044c0806d4397%26s...

servicenow All Favorites History Workspaces Application Menu - project table

Search

Application Menu project table

Update Delete

An application menu is a group of modules in the application navigator. Choose the roles that are required to access the application and add or remove modules in the related list below. [More Info](#)

* Title project table

Application Global

Active ☒

Restricts access to the specified roles. Otherwise, all users can view the application menu when it is active.

Roles Project Member

Specifies the menu.category, which defines the navigation menu style. The default value is Custom Applications.

Category Custom Applications

The text that appears in a tooltip when a user points to this application menu

Hint

Description

Update Delete

Modules Order Search

Actions on selected rows... New

Task Table 2 | Application Menu

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_app_application.do%3Fsys_id%3Dd27314d6473a32100aa044c0806d434b%26s...

Application Menu - Task Table 2

Search

Application Menu Task Table 2

Update Delete

An application menu is a group of modules in the application navigator. Choose the roles that are required to access the application and add or remove modules in the related list below. [More Info](#)

* Title Task Table 2

Application Global

Active ☒

Restricts access to the specified roles. Otherwise, all users can view the application menu when it is active.

Roles

u_task_table_2_user, Project Member, Team Member

Specifies the [menu category](#), which defines the navigation menu style. The default value is Custom Applications.

Category Custom Applications

The text that appears in a tooltip when a user points to this application menu

Hint

Description

Update Delete

Modules Order Search

Actions on selected rows... New

- Access control list

u_task_table_2u_status | Access

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_security_acl.do%3Fsys_id%3D50eb891e47fa32100aa044c0806d43e0%26sysparm_record...

Access Control - u_task_table_2u_status

Search

Access Control u_task_table_2u_status

Update Delete

Admin overrides ☒

Protection policy -- None --

* Name Task Table 2 [u_task_table_2] Status

Description

Applies To [No. of records matching the condition: 0](#)

Add Filter Condition Add OR Clause

-- choose field -- -- oper -- -- value --

Conditions

Access Control Rules have two decision types, and these types will behave differently depending on conditions.

1. Allow Access: Allows access to a resource if all conditions are met. Additional ACLs may grant access to records where this ACL has not granted access.
2. Deny Access: Denies access to a resource unless all conditions are met. Additional ACLs may not grant access to records where this ACL has denied access.

[More Info](#)

Requires role

1 to 2 of 2

Role
X Task Table
X Team Member

Access Controls | ServiceNow

dev323762.service-now.com/now/nav/ui/classic/params/target/sys_security_ad_list.do%3Fsysparm_first_row%3D1%26sysparm_query%3Dsys_created_onON...

servicenow All Favorites History Workspaces Admin Access Controls Search

Access Controls Updated by Search Actions on selected rows... New

All > Created on Today

<input type="checkbox"/>	Name	Decision Type	Operation	Type	Active	Updated by	Updated
<input type="checkbox"/>	u_project_table	Allow If	write	record	true	admin	2026-02-03 04:10:19
<input type="checkbox"/>	u_task_table_2	Allow If	read	record	true	admin	2026-02-03 05:25:01
<input type="checkbox"/>	u_task_table_2	Allow If	delete	record	true	admin	2026-02-03 05:25:01
<input type="checkbox"/>	u_task_table_2.u_assigned_to	Allow If	write	record	true	admin	2026-02-03 07:37:20
<input type="checkbox"/>	u_task_table_2	Allow If	write	record	true	admin	2026-02-03 05:25:01
<input type="checkbox"/>	u_task_table_2.u_task_name	Allow If	write	record	true	admin	2026-02-03 07:41:21
<input type="checkbox"/>	u_project_table	Allow If	delete	record	true	admin	2026-02-03 04:10:19
<input type="checkbox"/>	u_task_table_2.u_status	Allow If	write	record	true	admin	2026-02-03 07:17:04
<input type="checkbox"/>	u_task_table_2.u_task_id	Allow If	write	record	true	admin	2026-02-03 07:40:16
<input type="checkbox"/>	u_project_table	Allow If	create	record	true	admin	2026-02-03 04:10:19
<input type="checkbox"/>	u_task_table_2	Allow If	create	record	true	admin	2026-02-03 05:25:01
<input type="checkbox"/>	u_task_table_2.u_due_date	Allow If	write	record	true	admin	2026-02-03 07:38:49
<input type="checkbox"/>	u_project_table	Allow If	read	record	true	admin	2026-02-03 04:10:19

1 to 13 of 13

Create Created | Task Table 2

dev323762.service-now.com/now/nav/ui/classic/params/target/u_task_table_2.do%3Fsys_id%3D-1%26sys_is_list%3Dtrue%26sys_target%3Du_task_table_2%2...

servicenow All Favorites History Task Table 2 - Create Created

Task Table 2 New record Submit

Assigned To Task ID Due Date Task Name Status -- None -- Comments

Submit

- Create a Flow to Assign operations ticket to group

ServiceNow Developers x Task Table 2 | Table | ServiceNow x Task Table | Workflow Studio | 5 x +

dev323762.service-now.com/now/workflow-studio/builder%3Ftable%3Dsys_hub_flow%26sysid%3D7129999a477e32100aa044c0806d43b7%26

Workflow Studio Task Table Flow Global

Task Table

Inactive

View: [Diagram] [Code] [Test] [Activate] [More]

1 Update Task Table 2 Record

Action Properties

Action: Update Record

Action Inputs

* Record: Trigger - R... Task Table 2 R... X

* Table: Task Table 2 [u_task_table_2] X

* Fields: Status X completed

+ Add field value

Delete Cancel Done

+ Add an Action, Flow Logic, or Subflow

javascriptvoid() | Application: Global

Data Collapse All

- Flow Variables
- Trigger - Record Created
 - Task Table 2 Record: Record
 - Task Table 2 Table: Table
 - Run Start Time UTC: DateTime
 - Run Start Date/Time: DateTime
- 1 - Update Record
 - Task Table 2 Record: Record
 - Task Table 2 Table: Table
 - Action Status: Object

ServiceNow Developers x Approvals | ServiceNow x Task Table | Workflow Studio | 5 x +

dev323762.service-now.com/now/workflow-studio/builder%3Ftable%3Dsys_hub_flow%26sysid%3D7129999a477e32100aa044c0806d43b7%26

Workflow Studio Task Table Flow Global

Task Table

Inactive

View: [Diagram] [Code] [Test] [Activate] [More]

2 Ask For Approval on Task Table 2

Action Properties

Action: Ask For Approval

Action Inputs

* Record: 1 - Updat... Task Table 2 Re... X

Table: Task Table 2 [u_task_table_2]

Approval Reason:

Approval Field: Status X

Journal Field: Select a field

* Rules

Approve When: All users approve X

alice P X

OR

Add another OR rule set Remove rule set

OR AND

Status: Draft | Application: Global

Data Collapse All

- Flow Variables
- Trigger - Record Created
 - Task Table 2 Record: Record
 - Task Table 2 Table: Table
 - Run Start Time UTC: DateTime
 - Run Start Date/Time: DateTime
- 1 - Update Record
 - Task Table 2 Record: Record
 - Task Table 2 Table: Table
 - Action Status: Object
- 2 - Ask For Approval
 - Approval State: Choice
 - Action Status: Object

ServiceNow Developers | Create Created | Task Table 2 | Task Table | Workflow Studio

dev323762.service-now.com/now/nav/ui/classic/params/target/u_task_table_2.do%3Fsys_id%3D-1%26sys_is_list%3Dtrue%26sys_target%3Du_task_table_2%26...

Task Table 2 - Create Created

Assigned To: bob

Task ID:

Due Date:

Task Name:

Status: completed

Comments:

Submit

Approvals | ServiceNow | Task Table | Workflow Studio

dev323762.service-now.com/now/nav/ui/classic/params/target/sysapproval_approver_list.do%3Fsysparm_first_row%3D1%26sysparm_query%3D%26sys...

Approvals

Approver: Search

Actions on selected rows...

State	Approver	Comments	Approval for	Created
Approved	alice P		(empty)	2026-02-17 01:18:07
Requested	Bernard Laboy		CHG0000058	2024-08-30 06:35:13
Requested	Bernard Laboy		CHG0000007	2024-08-27 10:52:40
Requested	Bernard Laboy		CHG0000089	2024-08-30 06:33:43
Requested	Bernard Laboy		CHG0000076	2024-08-29 07:58:17
Requested	Bernard Laboy		CHG0000096	2024-08-29 08:04:38
Requested	Bernard Laboy		CHG0000043	2024-08-29 08:02:56
Requested	Bernard Laboy		CHG0000087	2024-08-29 08:03:25
Requested	Bernard Laboy		CHG0000042	2024-08-29 07:58:59
Requested	Bernard Laboy		CHG0000084	2024-08-29 08:04:47
Requested	Bernard Laboy		CHG0000037	2024-08-29 07:55:02
Requested	Bernard Laboy		CHG0000057	2024-08-29 08:03:06
Requested	Bernard Laboy		CHG0000093	2024-08-29 07:59:49
Requested	Bernard Laboy		CHG0000092	2024-08-29 08:03:30
Requested	Bernard Laboy		CHG0000083	2024-08-29 07:57:06
Requested	Bernard Laboy		CHG0000065	2024-08-29 07:59:25

1 to 20 of 740

Screenshots document each implemented functionality.

8. ADVANTAGES & DISADVANTAGES

Advantages

- Improved security
- Automation reduces workload
- Structured data management
- Enhanced accountability

Disadvantages

- Requires platform knowledge
- Configuration complexity
- Limited scope without enterprise integration

9. CONCLUSION

The project successfully implemented a structured system for managing users, permissions, and workflows using ServiceNow tools. It demonstrated how role-based security and automation enhance collaboration, accountability, and operational efficiency. The solution met defined objectives and provided valuable exposure to enterprise system configuration practices.

10. FUTURE SCOPE

- Integration with external enterprise tools
- Advanced analytics dashboards
- AI-based task recommendations
- Multi-team scalability

11. APPENDIX

- Source Code: No external code; used ServiceNow platform
- Dataset Link: Not applicable
- GitHub & Project Demo Link

Drive Link:

https://drive.google.com/drive/folders/151pfVo8D08Be8_cKS-N7-vruo8UbH4p3?usp=drive_link

GitHub Link:

<https://github.com/Poojasri31/Optimizing-User-Group-and-Role-Management-with-Access-Control-and-Workflows>

Video Link:

https://drive.google.com/file/d/1LoP7EM4rE44Qw_vXLtZJrvpi8mnGj0f3/view?usp=drive_link