

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 shows the ServiceNow User - New Record interface. The page title is "User - New Record". The URL in the address bar is "dev323762.service-now.com/nav/uiclassic/params/target/sys_user.do?sys_id=1%26sys_is_list%3Dtrue%26sys_target%3Dsys_user%26sysparam...". The main form contains the following fields:

- User ID: alice
- Email: alice@gmail.com
- First name: alice
- Last name: P
- Title: (empty)
- Department: (empty)
- Language: -- None --
- Calendar integration: Outlook
- Time zone: System (America/Los_Angeles)
- Date format: System (yyyy-MM-dd)
- Business phone: (empty)
- Mobile phone: (empty)
- Password needs reset:
- Locked out:
- Active:
- Identity type: Human
- Web service access only: (with a note: "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:

At the bottom right is a "Submit" button.

New Record | User | ServiceNow

User - New Record

User ID: bob
First name: Bob
Last name: P
Title:
Department:

Email: bob@gmail.com
Language: -- None --
Calendar integration: Outlook
Time zone: System (America/Los_Angeles)
Date format: System (yyyy-MM-dd)
Business phone:
Mobile phone:

Password needs reset:
Locked out:
Active:
Identity type: Human

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:

- Groups Creation

Project Team | Group | ServiceNow

Group - Project Team

Name: Project Team
Manager:

Description:

Roles Group Members (2) Groups

Created Search Edit...

Created	Role	Granted by	Inherits
			

- Roles Creation

Role - Project Member

Name: Project Member Application: Global

Description:

Contains Roles Applications with Role Modules with Role Custom Tables

No records to display

Role - Team Member

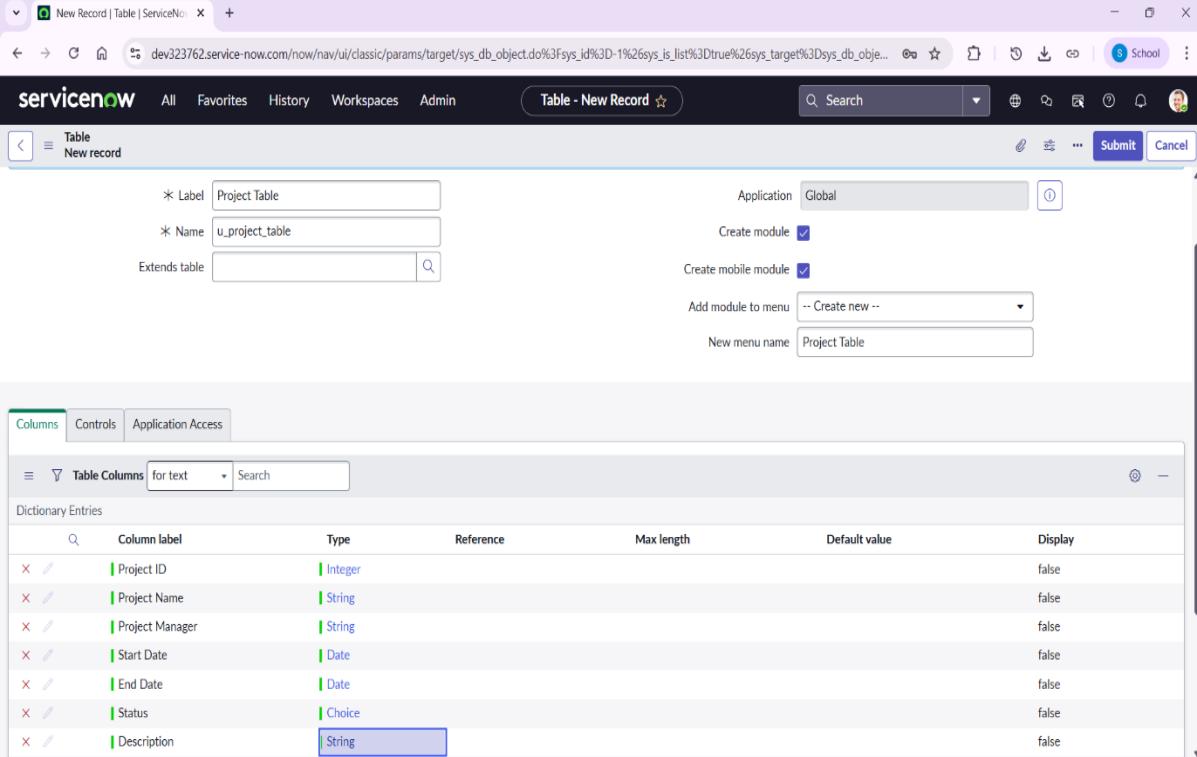
Name: Team Member Application: Global

Description:

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

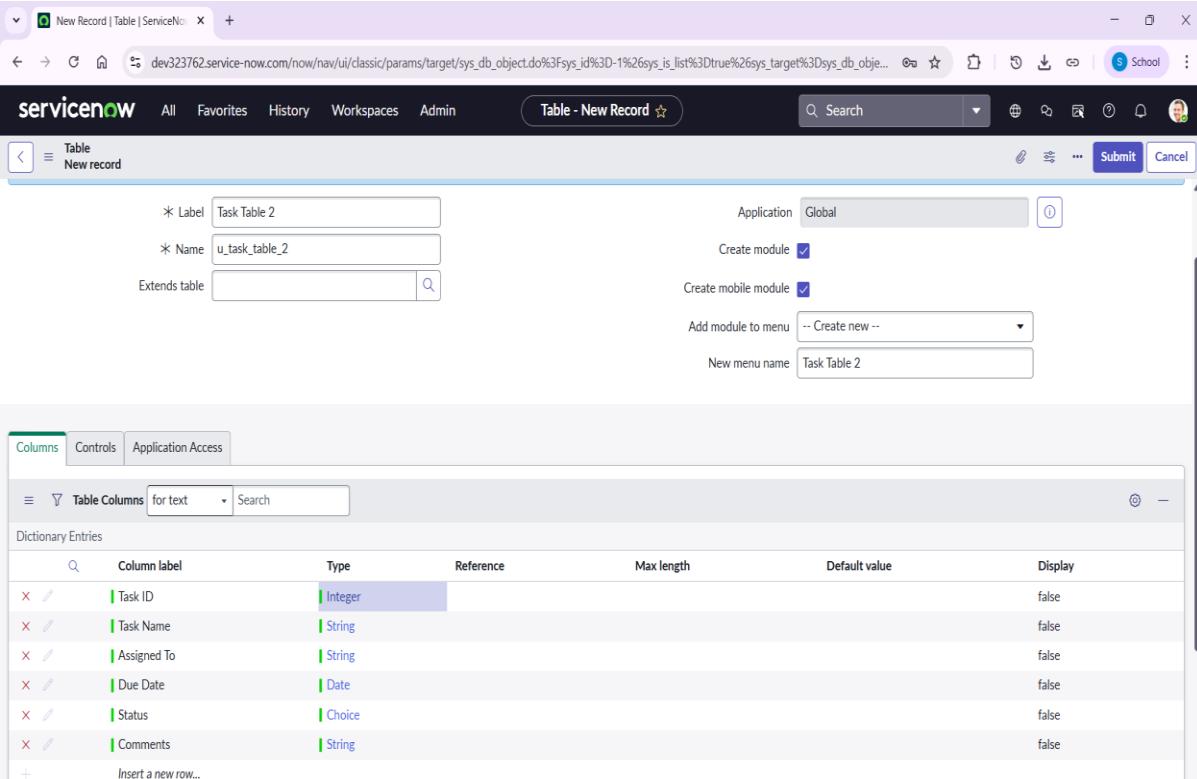
No records to display

- Table Creation



The screenshot shows the 'Table - New Record' page in ServiceNow. The top section contains fields for 'Label' (Project Table), 'Name' (u_project_table), 'Application' (Global), and checkboxes for 'Create module' and 'Create mobile module'. Below this is a table for 'Dictionary Entries' with columns: Column label, Type, Reference, Max length, Default value, and Display. The table includes rows for Project ID (Integer), Project Name (String), Project Manager (String), Start Date (Date), End Date (Date), Status (Choice), and Description (String). The 'Description' row has a blue border.

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



The screenshot shows the 'Table - New Record' page for 'Task Table 2'. The configuration is identical to the first table, with 'Label' set to Task Table 2 and 'Name' set to u_task_table_2. The 'Dictionary Entries' table below also has the same structure and data as the first one, with the 'Task ID' column highlighted in purple.

Column label	Type	Reference	Max length	Default value	Display
Task ID	Integer			false	false
Task Name	String			false	false
Assigned To	String			false	false
Due Date	Date			false	false
Status	Choice			false	false
Comments	String			false	false

- Assigning users to groups

The screenshot shows the ServiceNow interface for managing groups. At the top, the title bar says "Project Team | Group | ServiceNow". The main header "Group - Project Team" has a star icon. Below the header, there are fields for "Name" (Project Team), "Manager" (empty), "Group email" (empty), and "Parent" (empty). A "Description" field is also present. At the bottom of this section are "Update" and "Delete" buttons.

Below this, a section titled "Group Members (2)" is shown. It includes a search bar with dropdown filters for "User" and "Search". The results table shows two users: "alice P" and "Bob P". The table includes standard CRUD buttons ("Update", "Delete") and a "New" button. The footer of the page shows a navigation bar with links like "All", "Favorites", "History", "Workspaces", "Admin", and "Logout".

- Assigning roles to users

The screenshot shows the ServiceNow interface for managing users. The title bar says "alice P | User | ServiceNow". The main header "User - alice P" has a star icon. Below the header, there is a note: "service access only". Under "Related Links", there are links to "View linked accounts", "View Subscriptions", and "Reset a password".

A tab bar at the top of the main content area includes "Entitled Custom Tables", "Roles (4)", "Groups (2)", "Delegates", "Subscriptions", and "User Client Certificates". The "Roles (4)" tab is selected. Below it is a search bar with filters for "Role" and "Search". The results table lists four roles: "Project Member", "u_project_table_user", "snc_required_script_writer_permission", and "u_task_table_2_user". The "Inherited" column for the third role is highlighted in blue. The table includes standard CRUD buttons ("Update", "Set Password", "Delete") and a "New" button. The footer of the page shows a navigation bar with links like "All", "Favorites", "History", "Workspaces", "Admin", and "Logout".

The screenshot shows the ServiceNow User interface for a user named Bob P. The top navigation bar includes links for All, Favorites, History, Workspaces, and Admin. The main content area displays the 'User - Bob P' record. A tooltip message is visible: 'Identity' option in Identity type dropdown field if you want to mark this account as 'Web service access only'. Below this, there is a section for 'Internal Integration User' with checkboxes for Update, Set Password, and Delete. A 'Related Links' section includes links for View linked accounts, View Subscriptions, and Reset a password. A tabs section shows Entitled Custom Tables, Roles (3), Groups (2), Delegates, Subscriptions, and User Client Certificates. The 'Roles' tab is selected, displaying a table with three rows:

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

Pagination at the bottom indicates 1 to 3 of 3.

- Application access

The screenshot shows the ServiceNow Application Menu interface for a menu named 'project table'. The top navigation bar includes links for All, Favorites, History, Workspaces, and Admin. The main content area displays the 'Application Menu - project table' record. A tooltip message is visible: '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.' Below this, there is a section for 'Title' (project table), 'Application' (Global), and 'Active' (checkbox checked). A note states: 'Restricts access to the specified roles. Otherwise, all users can view the application menu when it is active.' A 'Roles' section lists 'Project Member'. A 'Category' section is set to 'Custom Applications'. A 'Hint' field is empty. A 'Description' field is also empty. At the bottom, there are 'Update' and 'Delete' buttons, and a 'Modules' tab is selected.

The screenshot shows the 'Task Table 2 | Application Menu' configuration screen. At the top, there's a title bar with the application name and a back button. Below it is the 'Application Menu - Task Table 2' header with a search bar and various navigation icons. The main content area has a form with the following fields:

- Title:** Task Table 2
- Application:** Global
- Active:** checked
- Roles:** u_task_table_2_user, Project Member, Team Member
- Category:** Custom Applications
- Hint:** (empty)
- Description:** (empty)

At the bottom are 'Update' and 'Delete' buttons, and a toolbar with 'Modules', 'Order', 'Search', and other actions.

- Access control list

The screenshot shows the 'Access Control - u_task_table_2_u_status' configuration screen. At the top, there's a title bar with the application name and a back button. Below it is the 'Access Control' header with a search bar and various navigation icons. The main content area has a form with the following fields:

- Admin overrides:** checked
- Protection policy:** None
- Name:** Task Table 2 [u_task_table_2]
- Status:** (empty dropdown)
- Description:** (empty)
- Applies To:** No. of records matching the condition: 0
 - Add Filter Condition
 - Add OR Clause

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

Below this is a 'Conditions' section with a detailed description of access control rules and two decision types: Allow Access and Deny Access. It also includes a 'More Info' link.

At the bottom, there's a 'Requires role' section listing 'Role' and two entries: 'Task Table' and 'Team Member'. A pagination bar at the bottom right shows '1 to 2 of 2'.

Screenshot of the ServiceNow Access Controls page:

Access Controls

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

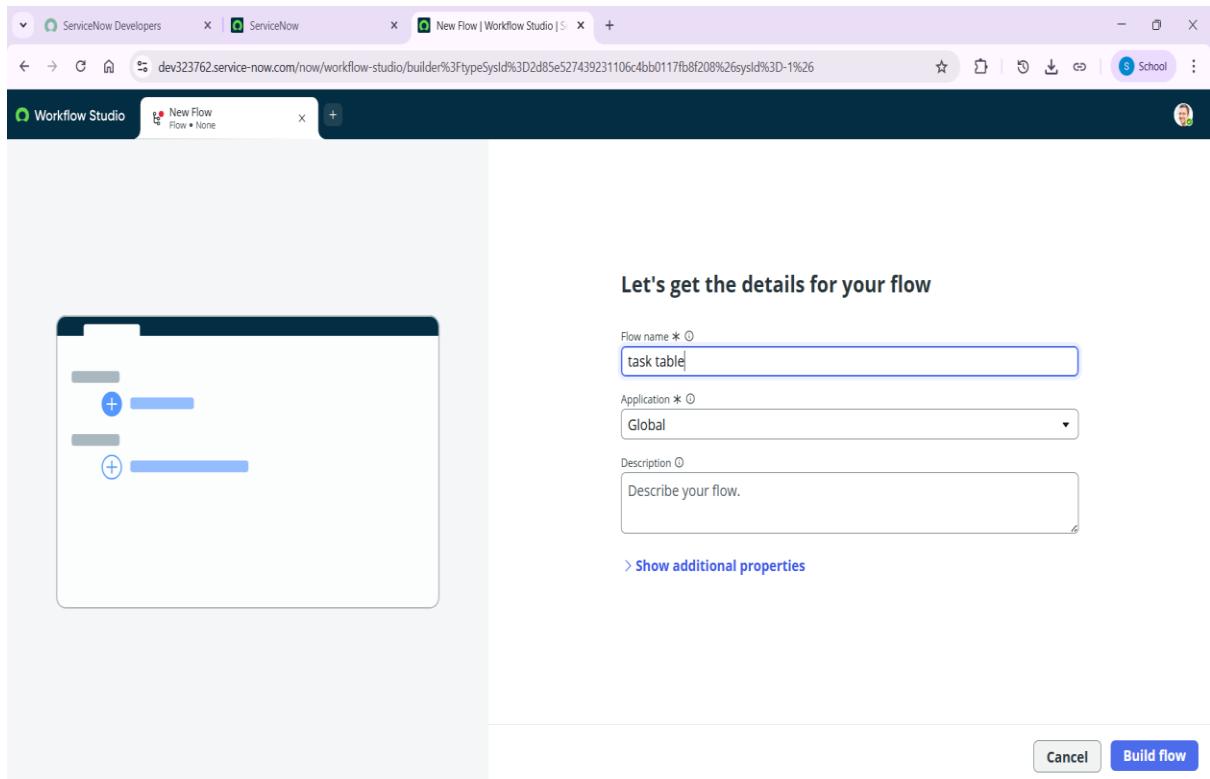
Screenshot of the Task Table 2 - Create Created page:

Task Table 2 - Create Created

Assigned To	Task Name
Task ID	Status
Due Date	Comments

Submit button

- Create a Flow to Assign operations ticket to group



The screenshot shows the ServiceNow Workflow Studio interface with a specific trigger configuration. The title bar indicates the application is "Task Table | Workflow Studio". The main area is titled "Task Table" and shows a "Trigger" configuration. The trigger is set to "Created" for "Task Table 2 [u_task_table_2]". The condition for the trigger is defined as "All of these conditions must be met" and includes three criteria connected by AND operators:

- Status is in progress
- Comments is feedback
- Assigned To is bob

Below the trigger configuration is a sidebar titled "Data" which lists various flow variables and actions. The sidebar includes sections for "Trigger - Record Created", "1 - Update Record", and "2 - Ask For Approval". At the bottom of the screen, there is a status bar with "Status: Modified" and "Application: Global".

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

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

Workflow Studio Task Table Flow • Global

Task Table

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

Done

Add an Action, Flow Logic, or Subflow

javascript:void(0) ed Application: Global

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

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

Workflow Studio Task Table Flow • Global

Task Table

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
- When: alice P

Add another OR rule set

Remove rule set

OR

Status: Draft Application: Global

The screenshot shows the 'Task Table 2 - Create Created' form in ServiceNow. The form includes fields for 'Assigned To' (bob), 'Task Name', 'Task ID', 'Status' (completed), 'Due Date', and 'Comments'. A 'Submit' button is visible at the bottom left.

The screenshot shows the 'Approvals' list view in ServiceNow. It displays a grid of approval requests with the following columns: State (Approved, Requested), Approver (alice P, Bernard Laboy), Comments (empty, CHG0000058, CHG0000007, CHG0000089, CHG0000076, CHG0000096, CHG0000043, CHG0000087, CHG0000042, CHG0000084, CHG0000037, CHG0000057, CHG0000093, CHG0000092, CHG0000083, CHG0000065), Approval for (CHG00000058, CHG00000007, CHG00000089, CHG00000076, CHG00000096, CHG00000043, CHG00000087, CHG00000042, CHG00000084, CHG00000037, CHG00000057, CHG00000093, CHG00000092, CHG00000083, CHG00000065), and Created (2026-02-17 01:18:07, 2024-08-30 06:35:13, 2024-08-27 10:52:40, 2024-08-30 06:33:43, 2024-08-29 07:58:17, 2024-08-29 08:04:38, 2024-08-29 08:02:56, 2024-08-29 08:03:25, 2024-08-29 07:58:59, 2024-08-29 08:04:47, 2024-08-29 07:55:02, 2024-08-29 08:03:06, 2024-08-29 07:59:49, 2024-08-29 08:03:30, 2024-08-29 07:57:06, 2024-08-29 07:59:25). The current row being viewed has a blue background.

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