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Department of Computer Science And Engineering

Completed the project named as

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

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Team Size : 4

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Team member 3 : Subashini G

ABSTRACT

This project aims to optimize user, group, and role management using ServiceNow by implementing Role-Based Access Control (RBAC) and automating workflows. The purpose of the project is to create a structured environment where user permissions are clearly defined, tasks are automatically assigned, and data security is maintained. Through ServiceNow's platform capabilities, the project demonstrates how automation, access control, and dashboards improve transparency and efficiency. The findings reveal that a well-configured RBAC system can significantly reduce manual work, prevent unauthorized actions, and improve collaboration among users.

INTRODUCTION

In organizations that handle multiple users, roles, and departments, maintaining a clear structure of responsibilities and permissions is essential for productivity and security. Without a centralized management system, users may face confusion about task ownership, leading to redundant work and data inconsistencies. ServiceNow provides a low-code platform that simplifies the creation of workflows, role-based access control, and process automation. This project focuses on using these capabilities to create a streamlined environment where each role has specific access and where workflows automatically update task statuses.

The implementation of this system benefits both managers and employees by ensuring that only authorized users perform certain operations. For instance, project managers can create and assign tasks, while team members can only view or update tasks assigned to them. This separation of duties not only enhances security but also improves accountability. The integration of dashboards and reports provides real-time insights into task completion and performance trends, ensuring that teams stay aligned with project objectives.

PROBLEM STATEMENT

Organizations often face challenges when managing users and roles manually. Without automated access control and workflows, there is a high risk of unauthorized actions, duplicated efforts, and poor visibility into project progress. Traditional management systems require manual updates, which can lead to errors and wasted time. Furthermore, without role-based restrictions, sensitive data can be exposed to unintended users.

The absence of workflow automation also affects team coordination. For instance, when a project manager assigns a task to a team member, the lack of an automated system means that the manager has to manually track progress. This can delay project execution. To overcome these limitations, this project proposes a solution built on ServiceNow that combines role-based access control with automated workflows to provide a transparent, efficient, and secure environment.

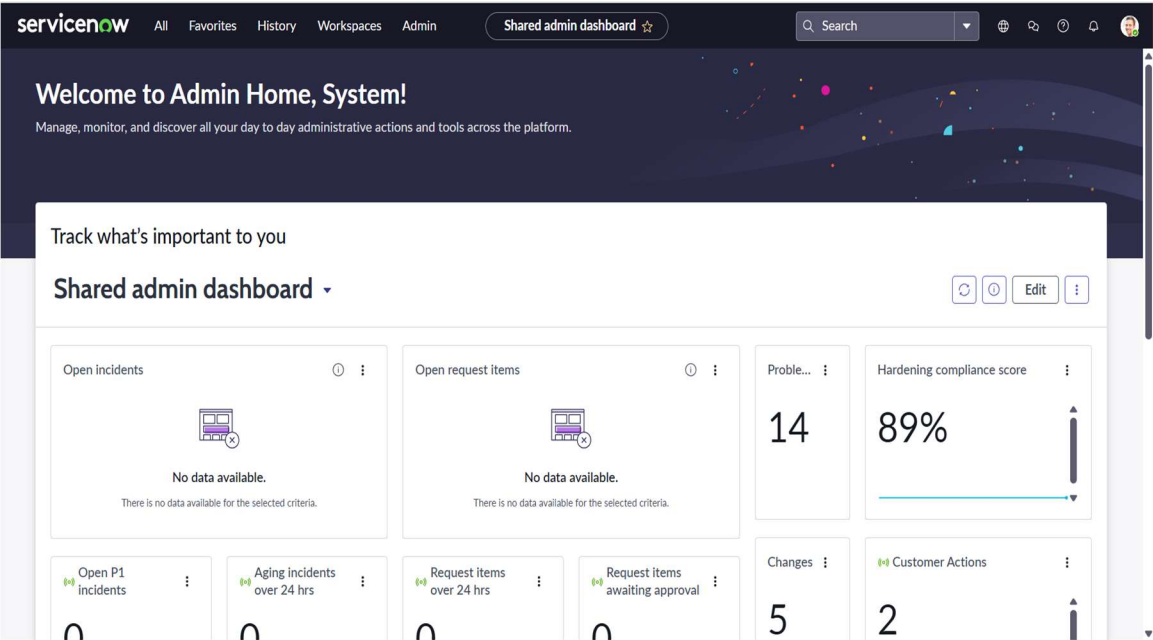
METHODOLOGY / SYSTEM DESIGN

The project follows a structured design and implementation approach using ServiceNow Studio, Flow Designer, and Platform Analytics. The methodology includes user creation, role definition, group setup, workflow automation, and dashboard reporting. Each step is integrated to form a comprehensive role-based system that automates task management.

- **Design Approach:** The system uses ServiceNow's modular structure, where each function—user creation, access control, workflow automation, and analytics—is handled separately. ServiceNow Studio is used to build a custom scoped application called Project Task Tracker, which serves as the main workspace for managing project tasks.
- **System Architecture:** The architecture is divided into three layers: User Layer, Application Layer, and Workflow Layer. The User Layer handles roles and permissions, the Application Layer manages task data using custom tables, and the Workflow Layer automates updates and notifications. Together, these layers ensure secure and smooth operations.
- **User Interface (UI) and User Experience (UX):** The application's forms and list layouts are designed for simplicity. The Project Manager view includes all tasks, while team members see only their assigned tasks. The interface includes dashboards that summarize ongoing work, pending tasks, and completed items using visual charts.

IMPLEMENTATION DETAILS

- Platform Setup: A ServiceNow instance is initialized, and users are created.



The screenshot shows the ServiceNow user profile page for "User - alice p". The page includes a header with the ServiceNow logo, navigation links, and a search bar. The main content area contains a form for user details. The form is divided into two columns. The left column contains fields for User ID (alice), First name (alice), Last name (p), Title, Department, and Password. The right column contains fields for Email (alice@gmail.com), Language (-- None --), Calendar integration (Outlook), Time zone (System (Etc/UTC)), Date format (System (yyyy-MM-dd)), Business phone, and Mobile phone. Below the form, there are checkboxes for "Password needs reset", "Locked out", "Active" (checked), "Web service access only", and "Internal Integration User". At the bottom, there are buttons for "Update", "Set Password", and "Delete".

servicenow All Favorites History Workspaces Admin User - bob p ☆

User bob p Update Set Password Delete

User ID
First name
Last name
Title
Department
Password
Password needs reset ☐
Locked out ☐
Active ☒
Web service access only ☐
Internal Integration User ☐

Email
Language -- None --
Calendar integration Outlook
Time zone System (Etc/UTC)
Date format System (yyyy-MM-dd)
Business phone
Mobile phone
Photo [Click to add...](#)

Update Set Password Delete

Alice acts as the Project Member and Bob as the Team Member. Custom groups Project Members and Team Members are formed, and roles are assigned. This establishes the foundation for RBAC.

servicenow All Favorites History Workspaces Admin Group - project team ☆

Group project team Update Delete

Name
Manager
Description
Group email
Parent

Update Delete

Roles Group Members (2) Groups

User

Group = project team

<input type="checkbox"/>	User
<input type="checkbox"/>	bob p
<input type="checkbox"/>	alice p

« 1 to 2 of 2 »

servicenow

AllFavoritesHistoryWorkspaces

User - alice p

Search

User

alice p

UpdateSet PasswordDelete

Internal Integration User

UpdateSet PasswordDelete

Related Links

[View linked accounts](#)[View Subscriptions](#)[Reset a password](#)

Entitled Custom TablesRoles (3)Groups (1)DelegatesSubscriptionsUser Client Certificates

RoleSearch

Actions on selected rows...Edit...

User = alice p

Role	State	Inherited	Inheritance Count
u_project_table_user	Active	false	
u_task_table_user	Active	false	
project member	Active	false	

1 to 3 of 3

servicenow

AllFavoritesHistoryWorkspaces

User - bob p

Search

User

bob p

UpdateSet PasswordDelete

Web service access only

Internal Integration User

UpdateSet PasswordDelete

Related Links

[View linked accounts](#)[View Subscriptions](#)[Reset a password](#)

Entitled Custom TablesRoles (2)Groups (1)DelegatesSubscriptionsUser Client Certificates

RoleSearch

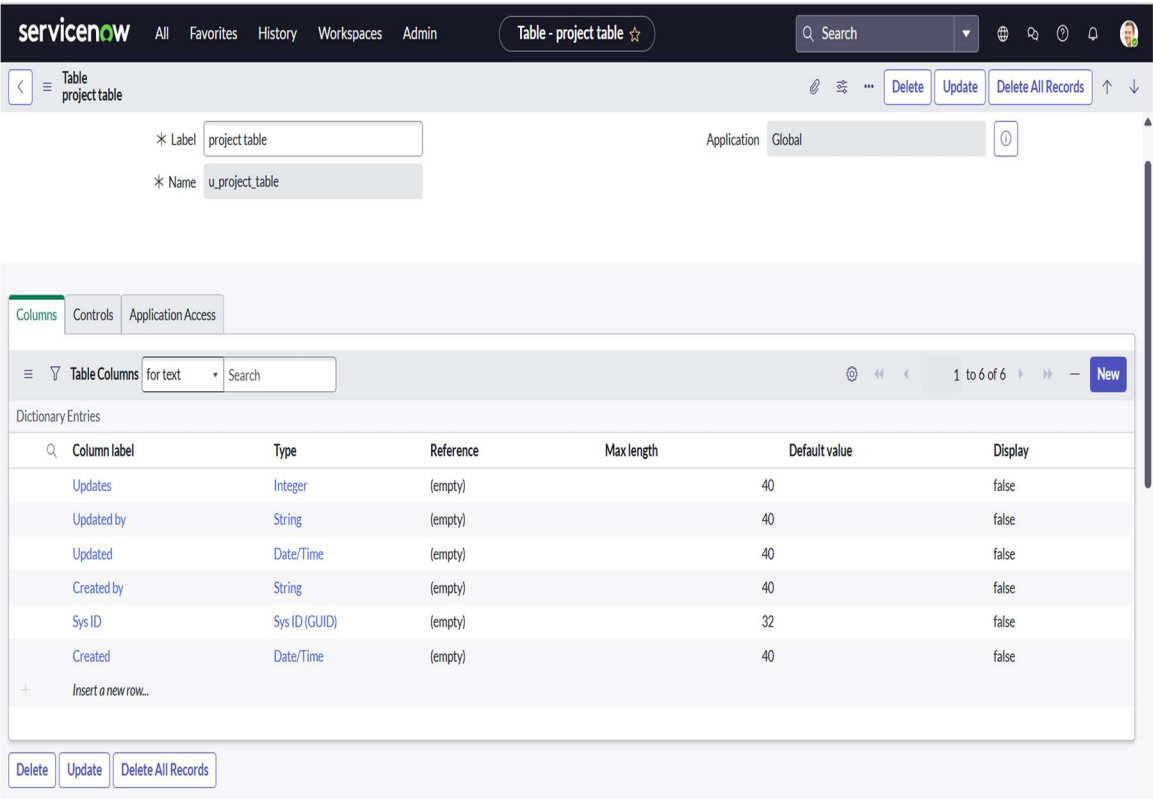
Actions on selected rows...Edit...

User = bob p

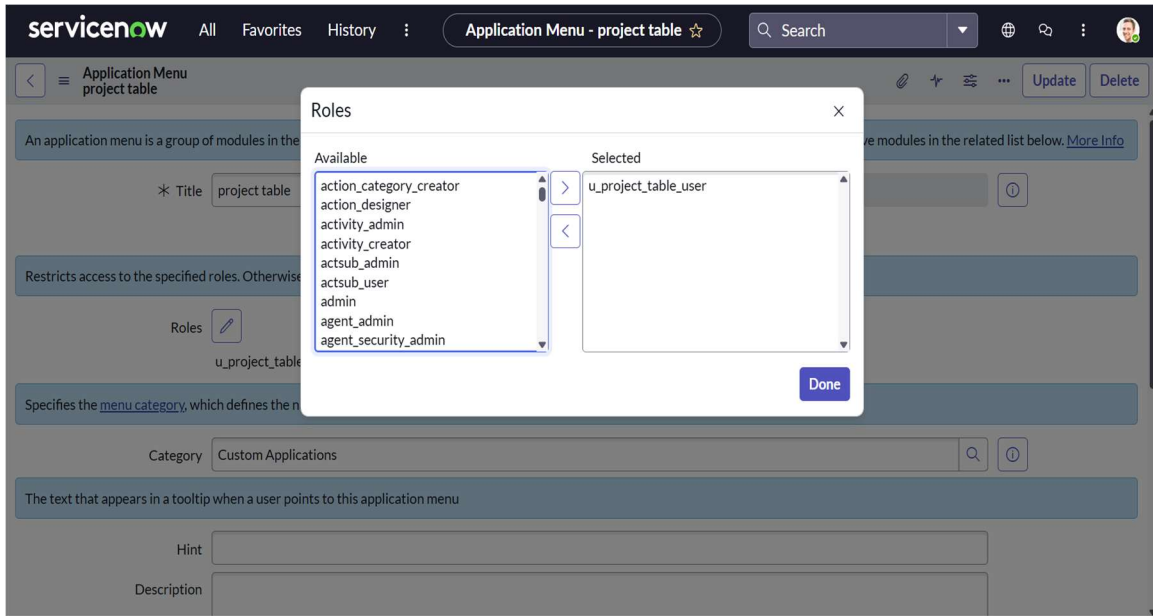
Role	State	Inherited	Inheritance Count
team member	Active	false	
u_task_table_user	Active	false	

1 to 2 of 2

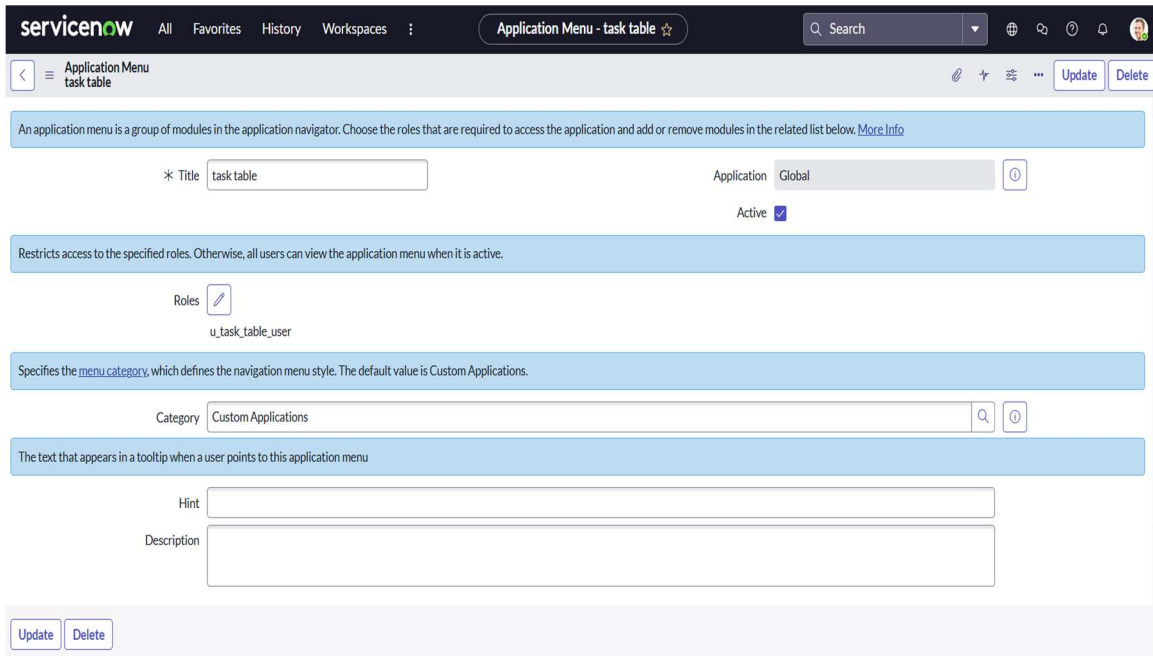
- **Development and Customization:** In ServiceNow Studio, the Project Task Tracker application is created to manage and monitor project tasks efficiently. A custom table named Project Table is designed with fields such as Task Name, Description, Status, Assigned To, Due Date, and Created By to store main project details.

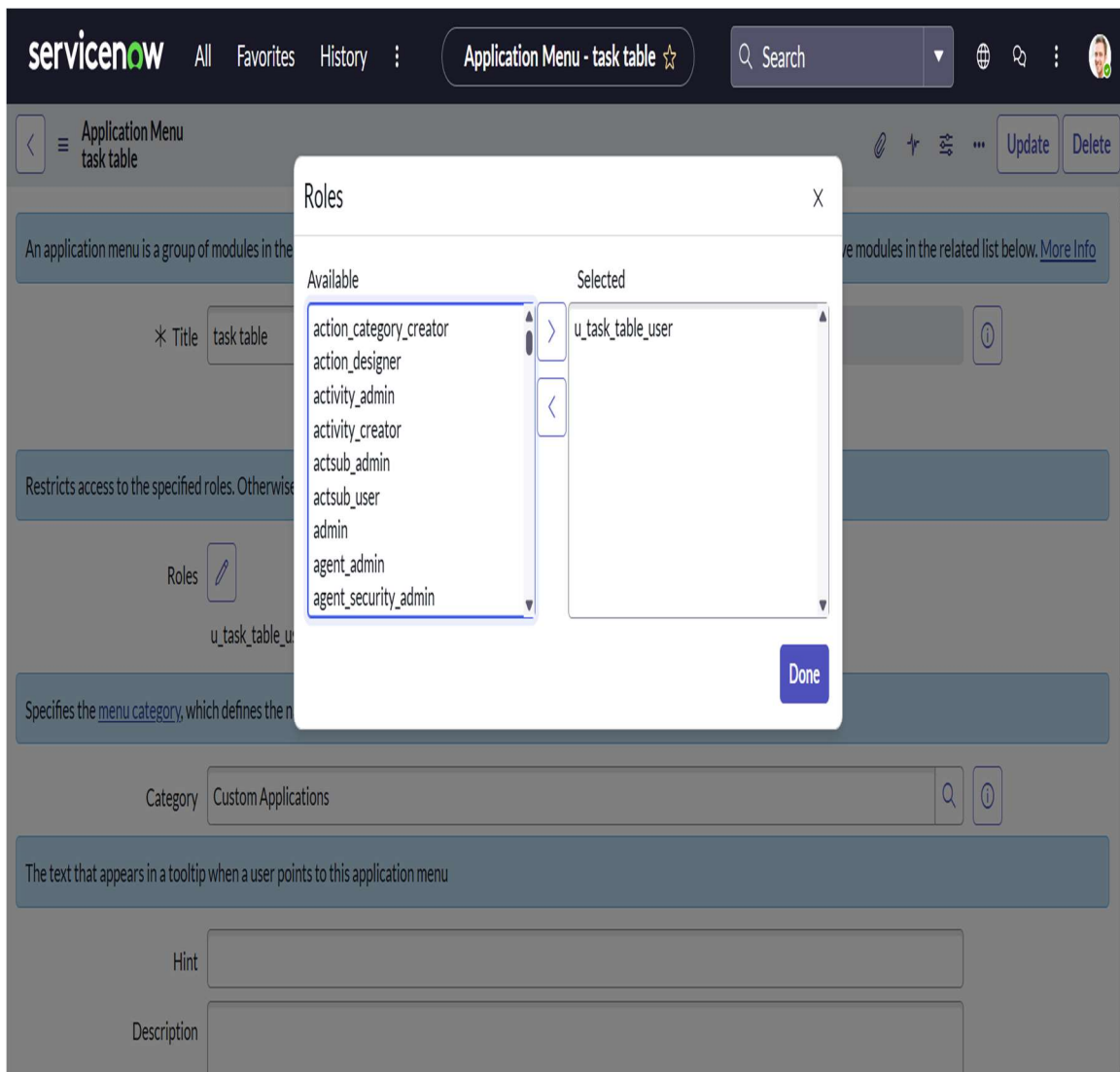


Another custom table named **Task Table** is also created to handle individual tasks related to each project. It includes fields like Task ID, Task Name, Project Name (reference to Project Table), Assigned To, Priority, Start Date, End Date, and Task Status. These tables help in organizing project data and tracking task progress effectively within the application.



Similarly, the **Task Table** application was customized by editing its application settings and assigning both **Project Member** and **Team Member** roles. This allows project members and team members to access, update, and track task details efficiently, ensuring proper role-based access within the application.





Custom forms were created for task entry, and Access Control Lists (ACLs) were configured to ensure secure and role-based access to data. The **Task Table** was assigned the **Team Member** role, allowing members to view and update only their assigned tasks, while the **Project Manager** role was given full access to create, modify, and delete tasks. Four ACLs were created for key fields such as **Task Name**, **Due Date**, **Assigned To**, **Status**, and **Comments** to control edit permissions. This configuration ensures that only authorized users can make changes, maintaining data integrity and proper access control within the Project Task Tracker application.

servicenow

AllFavoritesHistory

Access Controls

Search

Access ControlsUpdatedSearch

Actions on selected rows...

All

	Name	Decision Type	Operation	Type	Active	Updated by	Updated
<input type="checkbox"/>	u_task_table.u_assigned_to	Allow If	write	record	true	admin	2025-10-25 06:09:05
<input type="checkbox"/>	u_task_table.u_task_name	Allow If	write	record	true	admin	2025-10-25 06:08:51
<input type="checkbox"/>	u_task_table.u_task_id	Allow If	write	record	true	admin	2025-10-25 06:08:15
<input type="checkbox"/>	u_task_table.u_due_date	Allow If	write	record	true	admin	2025-10-25 06:05:43
<input type="checkbox"/>	u_task_table.u_status	Allow If	write	record	true	admin	2025-10-25 05:53:15
<input type="checkbox"/>	u_task_table	Allow If	delete	record	true	admin	2025-10-24 16:41:46
<input type="checkbox"/>	u_task_table	Allow If	write	record	true	admin	2025-10-24 16:41:46
<input type="checkbox"/>	u_task_table	Allow If	read	record	true	admin	2025-10-24 16:41:46
<input type="checkbox"/>	u_task_table	Allow If	create	record	true	admin	2025-10-24 16:41:45
<input type="checkbox"/>	u_project_table	Allow If	write	record	true	admin	2025-10-24 16:41:11
<input type="checkbox"/>	u_project_table	Allow If	read	record	true	admin	2025-10-24 16:41:11
<input type="checkbox"/>	u_project_table	Allow If	delete	record	true	admin	2025-10-24 16:41:11

1 to 20 of 21,166

servicenow

AllFavoritesHistoryWorkspacesAdmin

Access Control - u_task_table.u_task_name

Search

Access Controlu_task_table.u_task_name

Type:record

Operation:write

Decision Type:Allow If

Admin overrides☒

Protection policy:-- None --

Name:u_task_table.u_task_name

Description:Allow write for u_task_name in u_task_table, for users with roles (team member, task table).

Applies To:

No. of records matching the condition: 1

(empty)

Application:Global

Active☒

Advanced☐

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.
2. Deny Access: Denies access to a resource unless all conditions are met.
[More Info](#)

Requires role

1 to 2 of 2

Role

team member

task table

servicenow

AllFavoritesHistoryWorkspacesAdmin

Access Control - u_task_table.u_task_id

Search

<

≡

Access Control

u_task_table.u_task_id

Type

record

Application

Global

0

Operation

write

Active

☒

Decision Type

Allow If

Advanced

☐

Admin overrides

☒

Protection policy

-- None --

Name

u_task_table.u_task_id

Description

Applies To

No. of records matching the condition: 1

(empty)

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.

2. Deny Access: Denies access to a resource unless all conditions are met.

[More Info](#)

Requires role

⊖ << < 1 to 2 of 2 >> >> ⊕

Role

team member

task table

servicenow

AllFavoritesHistoryWorkspacesAdmin

Access Control - u_task_table.u_due_date

Search

<

≡

Access Control

u_task_table.u_due_date

Type

record

Application

Global

0

Operation

write

Active

☒

Decision Type

Allow If

Advanced

☐

Admin overrides

☒

Protection policy

-- None --

Name

u_task_table.u_due_date

Description

Applies To

No. of records matching the condition: 1

(empty)

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.

2. Deny Access: Denies access to a resource unless all conditions are met.

[More Info](#)

Requires role

⊖ << < 1 to 2 of 2 >> >> ⊕

Role

task table

team member

servicenow

AllFavoritesHistoryWorkspacesAdmin

Access Control - u_task_table.u_assigned_to

Search

Access Controlu_task_table.u_assigned_to

Type

record

Application

Global

Operation

write

Active

☒

Decision Type

Allow If

Advanced

☐

Admin overrides

☒

Protection policy

-- None --

Name

u_task_table.u_assigned_to

Description

Allow write for u_assigned_to in u_task_table, for users with roles (task table, team member).

Applies To

No. of records matching the condition: 1 (empty)

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.
2. Deny Access: Denies access to a resource unless all conditions are met.
[More Info](#)

Requires role

1 to 2 of 2

Role

task table

team member

← → ↺

nowlearning-nlinst03409483-1h6hj-0001.lab.service-now.com/now/nav/ui/classic/params/target/sys_security_acl.do%3Fsys_id%3D46d632ad453032107f44ebddeda21339%26sysparm_record_...

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AllFavoritesHistoryWorkspacesAdmin

Access Control - u_task_table.u_status

Search

Access Controlu_task_table.u_status

Type

record

Application

Global

Operation

write

Active

☒

Decision Type

Allow If

Advanced

☐

Admin overrides

☒

Protection policy

-- None --

Name

u_task_table.u_status

Description

Allow write for u_status in u_task_table, for users with roles (team member, task table).

Applies To

No. of records matching the condition: 1 (empty)

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.
2. Deny Access: Denies access to a resource unless all conditions are met.
[More Info](#)

Requires role

1 to 2 of 2

Role

team member

task table

Type	record	Application	Global	0
Operation	write	Active	<input checked="" type="checkbox"/>	
Decision Type	Allow If	Advanced	<input type="checkbox"/>	
Admin overrides	<input checked="" type="checkbox"/>			
Protection policy	-- None --			
Name	u_task_table.u_status			
Description	Allow write for u_status in u_task_table, for users with roles (team member, task table).			
Applies To	No. of records matching the condition: 1 (empty)			

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.
2. Deny Access: Denies access to a resource unless all conditions are met.

[More Info](#)

Requires role

🔍 ⏪ ⏩ 1 to 2 of 2 ⏴ ⏵

Role

[team member](#)

[task table](#)

flow designer implementation:

Flow Designer in ServiceNow is used to automate processes and enhance workflow efficiency without the need for coding. In the Project Task Tracker application, Flow Designer was utilized to automate task updates and approvals. A new flow was created with the **Task Table** as the trigger, which activates whenever a task is assigned or updated.

The screenshot displays the ServiceNow Flow Designer interface. At the top, the 'Workflow Studio' header includes a breadcrumb for 'task table' and a 'Flow' tab. Navigation links for 'Homepage', 'Operations', and 'Integrations' are visible. Below the header, a filter bar shows 'Flows' selected, with a 'New' button and a 'Delete' button. A table lists various flows, including 'Inbound Email Flow Example: logging a problem', 'Inbound Email Flow Example: handling email replies', 'Service Catalog item request', 'SLA notification and escalation flow', 'Default SLA flow', 'Register Business Application', 'KPI Signals Configuration Update Flow', 'Change - Normal - Implement', 'Change - Emergency - Implement', and 'Change - Standard'. The table columns are Name, Application, Status, Active, Updated, and Upd. On the right side, a sidebar titled 'Pick up where you left off' lists recent flows: 'task table', 'Create Flow Data', and 'Steps'. Below this, a 'Latest updates' section shows recent modifications by the System Administrator.

Name	Application	Status	Active	Updated	Upd
Inbound Email Flow Example: logging a problem	Global	Draft	false	2019-02-19 18:17:24	adm
Inbound Email Flow Example: handling email replies	Global	Draft	false	2019-02-22 17:51:54	adm
Service Catalog item request	Global	Published	true	2020-01-31 04:12:14	adm
SLA notification and escalation flow	Global	Published	true	2020-04-23 12:42:08	adm
Default SLA flow	Global	Published	true	2020-04-23 12:42:24	adm
Register Business Application	Global	Published	true	2020-06-15 02:47:35	adm
KPI Signals Configuration Update Flow	Global	Published	true	2020-09-18 13:13:51	adm
Change - Normal - Implement	Global	Published	true	2020-09-23 11:23:59	adm
Change - Emergency - Implement	Global	Published	true	2020-09-23 12:06:26	adm
Change - Standard	Global	Published	true	2020-09-23 12:09:01	adm

Workflow Studio

task table
Flow

X

task table

Active

View: [Diagram] [Code]

Test

Deactivate

Activate

Save

...

TRIGGER

task table Created where (Status is In Progress, and Comments is feedback, and Assigned To is bob)

ACTIONS

Select multiple

1

Update u_task_table Record

2

Ask For Approval

+

Add an Action, Flow Logic, or Subflow

ERROR HANDLER

☐

If an error occurs in your flow, the actions you add here will run.

Data

Collapse All

>

Flow Variables

Trigger - Record Created

task table Record

Record

task table Table

Table

Run Start Time UTC

Date/Time

Run Start Date/Time

Date/Time

1 - Update Record

u_task_table Record

Record

u_task_table Table

Table

Action Status

Object

2 - Ask For Approval

Approval State

Choice

Action Status

Object

Workflow Studio

task table
Flow

X

task table

Active

View: [Diagram] [Code]

Test

Deactivate

Activate

Save

...

TRIGGER

task table Created where (Status is In Progress, and Comments is feedback, and Assigned To is bob)

Trigger

Created

* Table

task table [u_task_table]

X

Condition

All of these conditions must be met

AND

Status

is

In Progress

OR

AND

Comments

is

feedback

OR

AND

Assigned To

is

bob

OR

AND

or

New Criteria

Advanced Options

Delete

Cancel

Done

Data

Collapse All

>

Flow Variables

Trigger - Record Created

task table Record

Record

task table Table

Table

Run Start Time UTC

Date/Time

Run Start Date/Time

Date/Time

1 - Update Record

u_task_table Record

Record

u_task_table Table

Table

Action Status

Object

2 - Ask For Approval

Approval State

Choice

Action Status

Object

The flow includes several **actions** to define the automation steps. The first action checks if the **Assigned To** field is not empty. If true, the next **Update Record** action automatically changes the **Status** field to *In Progress*. Following this, an **Ask for Approval** action is added to request approval from the **Project Manager** once the task reaches completion. This ensures that every task is reviewed and approved before being marked as completed.

The screenshot shows the Workflow Studio interface for a flow named 'task table'. The flow is currently 'Active'. The first action, 'Update u_task_table Record', is selected. The configuration for this action is as follows:

- Action:** Update Record
- * Record:** Trigger - Rec... > task table Re...
- * Table:** task table [u_task_table]
- * Fields:** Status (set to Completed)

The right-hand 'Data' panel shows the following variables:

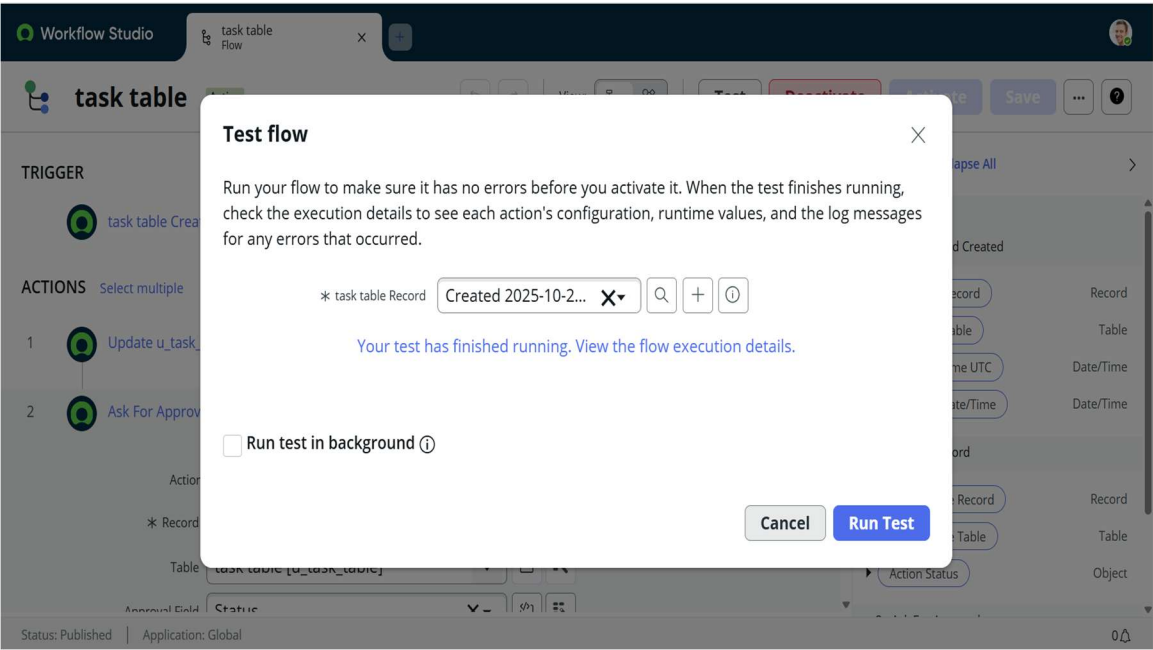
- Flow Variables:**
 - Trigger - Record Created
 - task table Record (Record)
 - task table Table (Table)
 - Run Start Time UTC (Date/Time)
 - Run Start Date/Time (Date/Time)
 - 1 - Update Record
 - u_task_table Record (Record)
 - u_task_table Table (Table)
 - Action Status (Object)
 - 2 - Ask For Approval
 - Approval State (Choice)
 - Action Status (Object)

The screenshot shows the Workflow Studio interface for the same 'task table' flow. The second action, 'Ask For Approval', is selected. The configuration for this action is as follows:

- Action:** Ask For Approval
- * Record:** Trigger - Rec... > task table Re...
- Table:** task table [u_task_table]
- Approval Field:** Status
- Journal Field:** Select a field
- * Rules:**
 - Approve:** When: All users approve (with a condition 'alice p X')
- Due Date:** None

The right-hand 'Data' panel shows the same variables as the previous screenshot, but with the 'Ask For Approval' action added to the list.

The **Test** feature in Flow Designer was used to validate the workflow. A sample record was selected from the **Task Table** to confirm that the flow triggered correctly, updated the record automatically, and sent the approval request as expected. This automation improves accuracy, ensures timely approvals, and reduces manual intervention in the task management process.



Workflow Studio

task table Flow

task table Flow execution

EXECUTION DETAILS task table

Test Run - Waiting Cancel flow Open flow Open context record

Show Action Details	State	Start time	
FLOW STATISTICS	Run as: System Administrator	Open flow logs	Waiting 2025-10-28 15:55:36 47ms
TRIGGER			task table Created Open current record
ACTIONS			
1	Update Record	Core Action Completed	2025-10-28 15:55:36 16ms
2	Ask For Approval	Core Action Waiting	2025-10-28 15:55:36 31ms
ERROR HANDLER			

- **Dashboard and Reporting:** The Platform Analytics module in ServiceNow provides visual dashboards showing project performance. Reports such as pie charts by task status, bar graphs of user workloads, and pivot tables for project distribution are created. Managers use these insights to allocate resources efficiently and track progress.

servicenow

AllFavoritesHistoryWorkspaces

Platform Analytics

Search

Task Management Dashboard

+ Add a tab

SaveExit editing modeAdd new element

Task Status Report

Task Name	(empty)	Total Count (task ...
Assigned To	bob	
Status	requested	
Task Name → Assigned To → Status		
(empty)		1
bob		1
requested		1
Total		1

Configuration

You are editing an element that is saved to the library.

Visualization type

Pivot Table

Header and border

Data

Data sources

task table

+ Add data source

Metric

COUNT task table

servicenow

AllFavoritesHistory

Task Status Report

Search

Edit report

SaveRun

Data > Type > Configure > Style

Report Title : Task Status Report

Type a question about your data

What do you want to see? Ask

To modify the current report, use the left panel or Edit Condition.

Table: task table [u_task_table]

All

Task Status Report

Task Name	Assigned To	Status	Count
(empty)	bob	requested	1
Count			1

GeneralTitle

Edit coloring rules

Display zero

Default expanded

Display row lines

Display column lines

Drilldown view

BackShare

CONCLUSION AND FUTURE SCOPE

The ServiceNow-based role management system successfully demonstrates how access control and workflow automation can transform traditional project management practices. The system ensures that tasks are securely assigned, monitored, and updated without manual intervention. Managers benefit from real-time analytics and dashboards that provide visibility into project performance, while team members gain clarity in their assigned responsibilities.

In the future, this system can be expanded to include integrations with collaboration tools such as Microsoft Teams, Slack, and Jira. Machine learning features can be added to predict task delays and recommend workload balancing. The automation logic can be further improved to include escalations and approvals. By continuously refining the workflows, organizations can achieve even greater productivity and security through the ServiceNow platform.