Smart Library Request Workflow in ServiceNow

Problem Statement

- In many academic institutions, managing a library system manually creates challenges such as lack of real-time updates on book availability, inefficient approval processes, and limited visibility into borrowing patterns. Students often face issues in knowing which books are available, while librarians struggle with tracking requests, approving or rejecting them, and maintaining accurate records of issued or returned books.
- To address these challenges, a role-based Library Management System needs to be implemented on the ServiceNow platform. This system should allow students to request books, while librarians manage the book inventory and approve borrow requests. Automated workflows, role-based access controls, and reports will ensure a streamlined process for both parties.

Objective

The objective of this project is to implement a role-based Library Management System in ServiceNow that simplifies the process of borrowing and managing books. The system allows students to submit borrow requests and track their status, while librarians manage the book catalog and approve or reject requests. Through automated workflows, book availability is updated in real time, role-based access ensures proper security, and reporting features like "Most Borrowed Books" provide insights for better resource management.

Phase 1: Requirement Analysis & Planning

The system requires two roles: student and librarian. Students can request and track books, while librarians manage the catalog and approve requests. Two tables are needed: **Book** (details, status) and Borrow Request (transactions). Workflows will automate approvals and status updates, ACLs will control access, and reports like "Most Borrowed Books" will give insights. Planning covers defining tables, roles, workflows, and test cases to ensure smooth implementation.

Business Objectives

The main business objective of this project is to create a digital library system in ServiceNow that reduces manual effort, improves accuracy in book tracking, and enhances user experience for both students and librarians. By automating borrow requests, approvals, and book status updates, the system ensures efficient operations, transparency, and faster access to resources.

Additionally, role-based controls and reporting features support better decision-making and effective management of library resources.

Functional Scope

The Library Management System on ServiceNow will provide the following key functions:

- **Book Management** – Librarians can add, update, and maintain book details with status tracking (Available, Issued, Lost, Returned).

- **Borrow Requests** – Students can create and track requests; librarians can approve, reject, or close them.

- **Workflow Automation** – Approval of requests will automatically update the book status.

- **Role-Based Access** – Students have limited access to requests, while librarians manage the entire system.

- **Reporting** – Generate insights such as “Most Borrowed Books” for library usage analysis.

Stakeholder Mapping

- **Students** – Request and track books; expect easy access and quick approvals.

- **Librarians** – Manage catalog, approve/reject requests, generate reports; need efficiency and accuracy.

- **System Administrators** – Configure tables, workflows, and roles; ensure secure and stable systems.

- **Management/Faculty** – Use reports for planning and resource allocation.

- **IT Support Team** – Provide technical support, upgrades, and system reliability.

Execution Roadmap

1. **Role Setup** – Create student and librarian roles.
2. **Table Design** – Build *Book* and *Borrow Request* tables with required fields.
3. **Form Configuration** – Add fields, set default values, and establish related lists.
4. **Workflow Automation** – Configure Flow Designer for approval and book status updates.
5. **Access Control** – Define ACLs for role-based permissions.
6. **UI Enhancements** – Apply UI Policies for form restrictions and usability.
7. **Reporting** – Create dashboards/reports like *Most Borrowed Books*.
8. **Testing & Validation** – Use sample data, impersonation, and debug tools to verify end-to-end flow.

Milestone 1: Create Roles

- Define roles: **student** and **librarian**.
- Ensure role separation for access control (students = request, librarians = manage).

Milestone 2: Create Tables

- Create a Book table (u_book).
- Create a Borrow Request table (u_borrow_request).
- Link Borrow Request → Book.

Milestone 3: Add Fields to Book

- Add fields: Title, Author, ISBN, Status.
- Configure Status choices: Available (default), Issued, Lost.

Milestone 4: Add Fields to Borrow Request

- Add fields: Requested By, Book (Reference), Request Date, Status.

- Configure Status choices: Requested (default), Approved, Rejected, Returned.

Milestone 5: Show Borrow Requests on Book (Related List)

- Add Borrow Request related list on Book form.
- Verify relationship: Book → Borrow Request.

Milestone 6: Prevent Requesting Already-Issued Books (Reference Qualifier)

- Configure Reference Qualifier on Borrow Request → Book field.
- Condition: Show only books where Status = Available.

Milestone 7: Flow Designer – Approve → Issue Book

- Create Flow: Trigger when Borrow Request → Status changes to Approved.
- Action: Update Book → Status = Issued.
- Optional: Send email notification to requester.

Milestone 8: UI Policy

- Apply UI Policy: When Borrow Request Status = Approved → lock fields (Book, Requested By, etc.).
- Improves form usability and prevents accidental edits.

Milestone 9: Access Control (ACLs)

- Define ACLs for **Book table**:
    - Librarians = Create/Write/Delete.
    - Students & Librarians = Read.
- Define ACLs for **Borrow Request table**:
    - Students = Create/Read (own records).

    - Librarians = Approve/Write/Delete.

Milestone 10: Report – "Most Borrowed Books"

- Build Report from Borrow Request table.
- Group by **Book**, Count requests.
- Display the top 5 most borrowed books as a chart or list.

Phase 2: Backend Development & Configurations

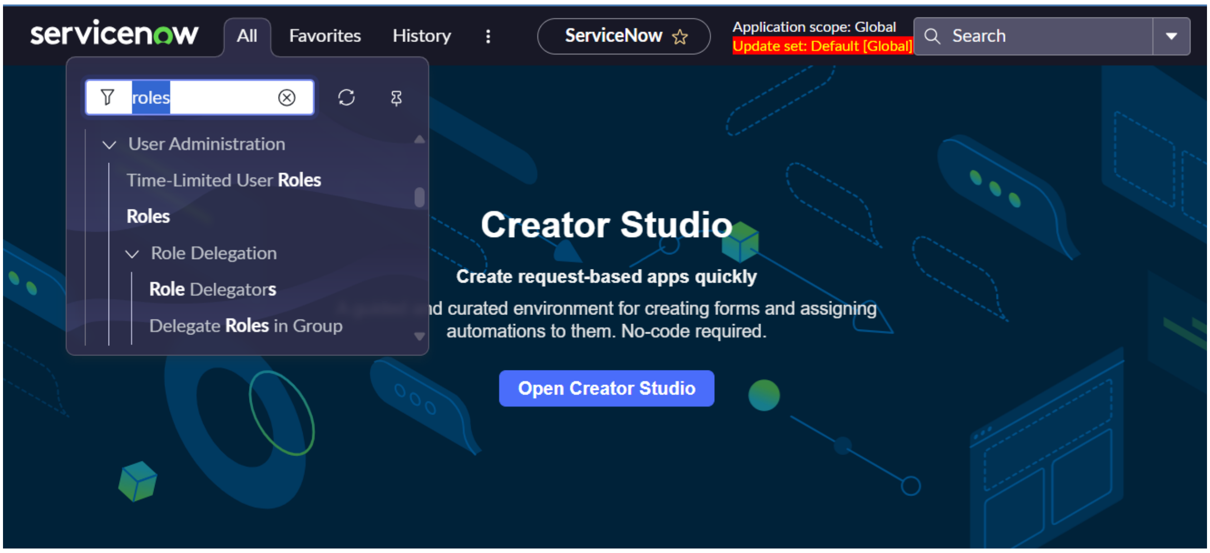
The backend setup focuses on creating roles, tables, and automation to manage the library process efficiently. Roles such as *student* and *librarian* are defined to control access, while custom tables (*Book* and *Borrow Request*) are configured with fields and relationships to store catalog and transaction data. A reference qualifier ensures only available books can be requested, and Flow Designer automates approvals by updating book status to *Issued*. To maintain consistency, UI Policies lock fields after approval, and Access Control Rules (ACLs) enforce role-based permissions. Finally, reports like *Most Borrowed Books* are configured to provide administrators with useful insights.

Data Architecture

Creation of roles

Steps to Create Roles

- Open ServiceNow
- Click on All → search for Roles.
- Select User Administration → Roles.
- Click on New.
- Enter Role Name as librarian → click Submit.
- Again, click on New.
- Enter Role Name as student → click Submit.
- Verify that both roles (*librarian* and *student*) are listed in the Roles module.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All
Favorites
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ServiceNow
Application scope: Global
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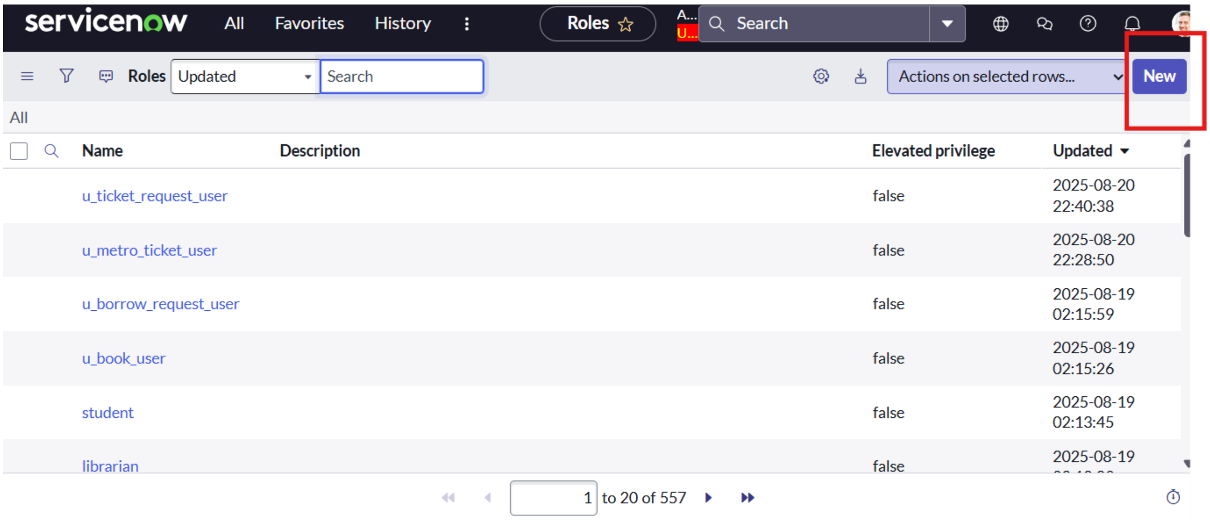
User Administration
Time-Limited User Roles
Roles
Role Delegation
Role Delegators
Delegate Roles in Group
Creator Studio
Create request-based apps quickly
d curated environment for creating forms and assigning
automations to them. No-code required.
Open Creator Studio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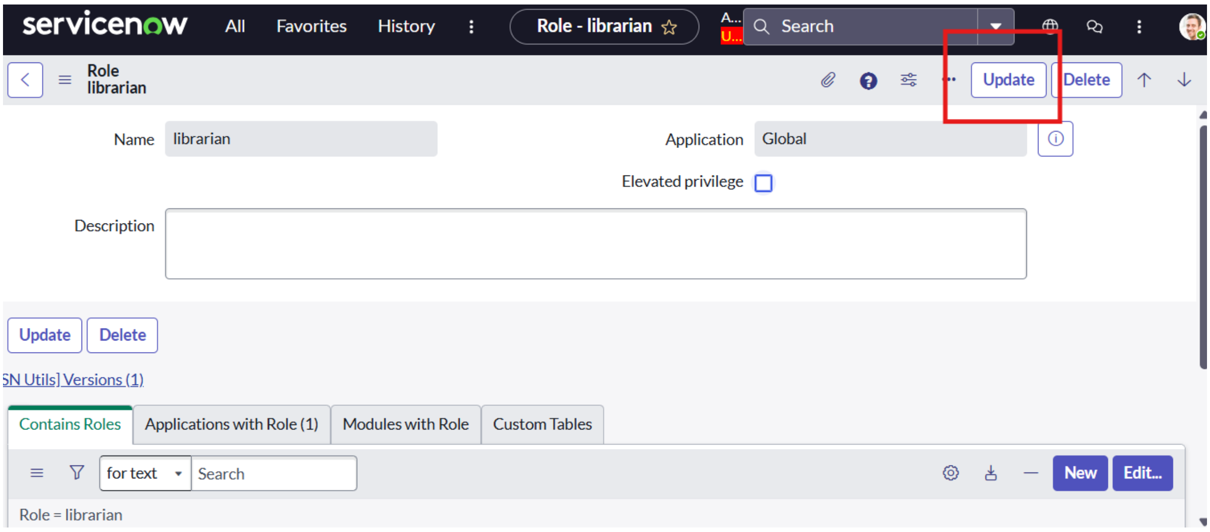
1 to 20 of 557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Search
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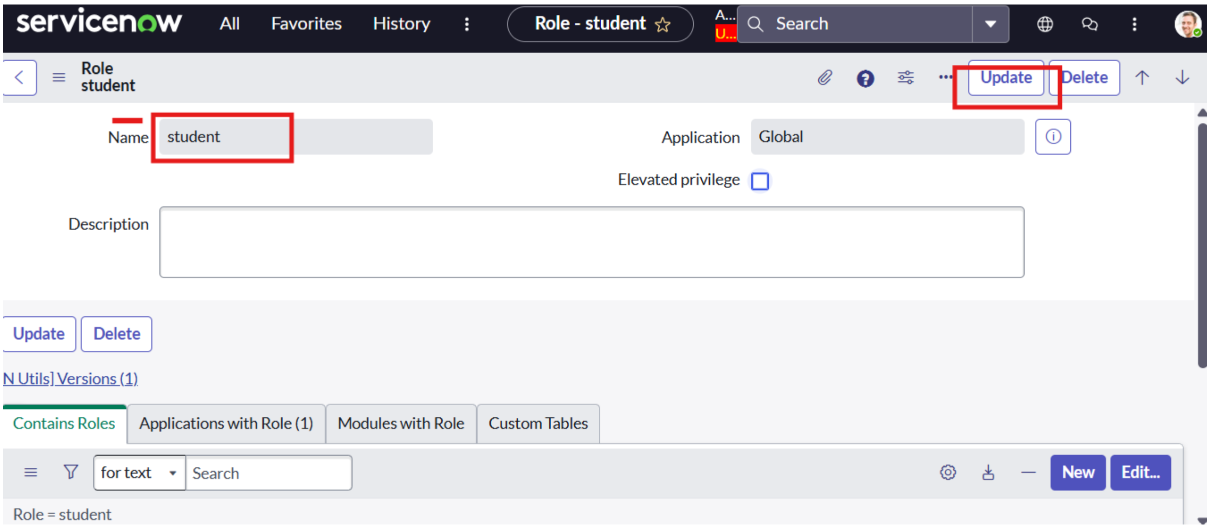
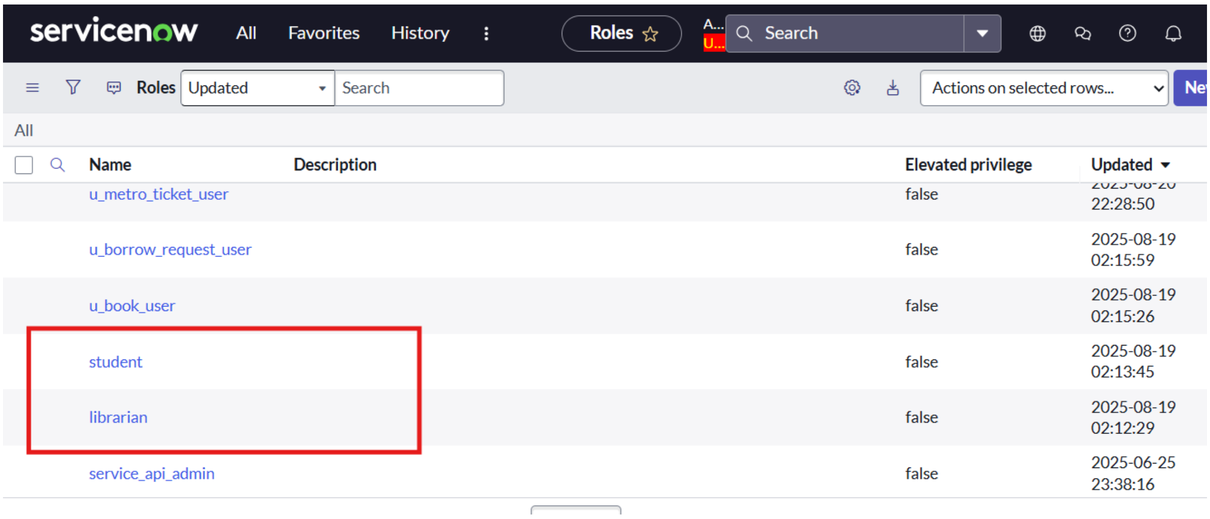
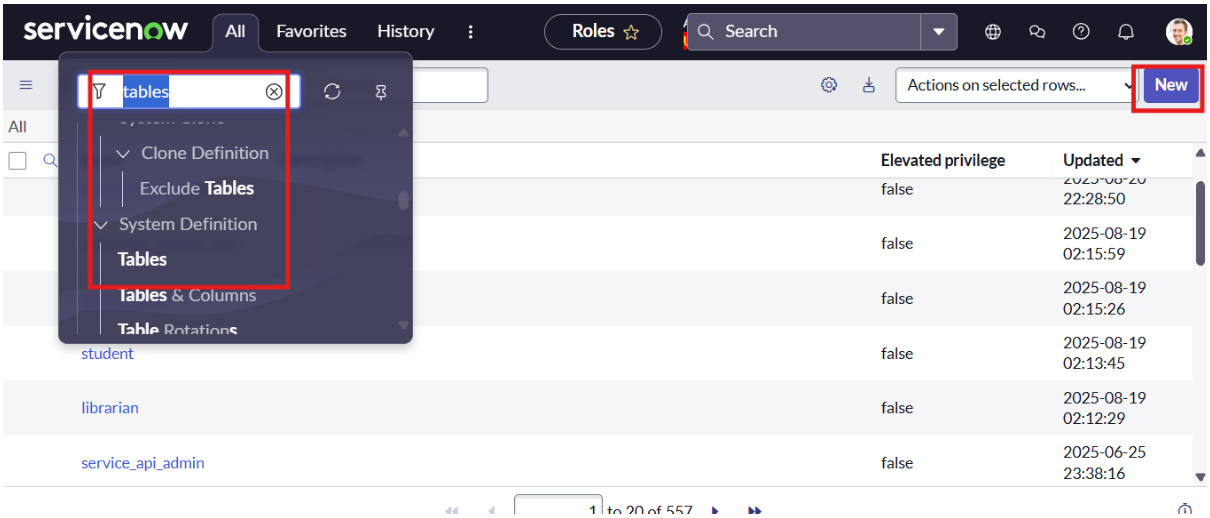
Role = librarian





Steps to Create Tables

1. Open ServiceNow.
2. Click on All → search for Tables.
3. Select System Definition → Tables.
4. Click on New.
5. Enter Label as *Book* → click Submit (this creates the table u_book).
6. Again, click on New.
7. Enter Label as *Borrow Request* → click Submit (this creates the table u_borrow_request).
8. Verify that both tables (*Book* and *Borrow Request*) are listed under the Tables module.


servicenow
All
Favorites
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Search
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Clone Definition
Exclude Tables
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Tables & Columns
Actions on selected rows...
New
All
Elevated privilege
Updated
false
22:28:50
false
2025-08-19
02:15:59
false
2025-08-19
02:15:26
student
false
2025-08-19
02:13:45
librarian
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02:12:29
service_api_admin
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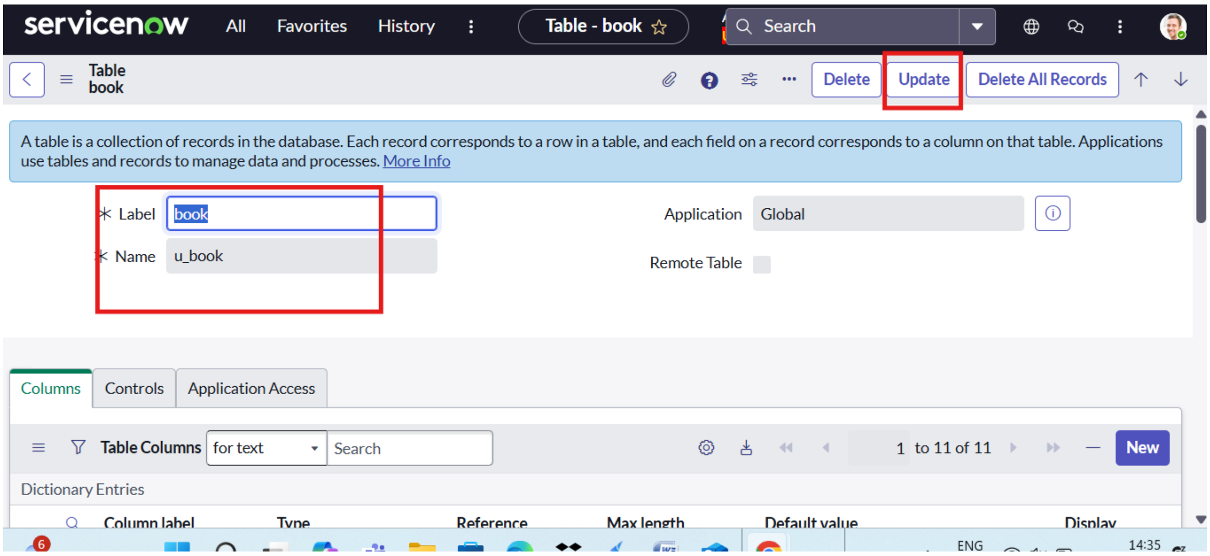
23:38:16


servicenow
All
Favorites
History
Table - book
Search
Table
book
Delete
Update
Delete All Records
A table is a collection of records in the database. Each record corresponds to a row in a table, and each field on a record corresponds to a column on that table. Applications use tables and records to manage data and processes. More Info
Label
book
Name
u_book
Application
Global
Remote Table
Columns
Controls
Application Access
Table Columns
for text
Search
1 to 11 of 11
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Column label
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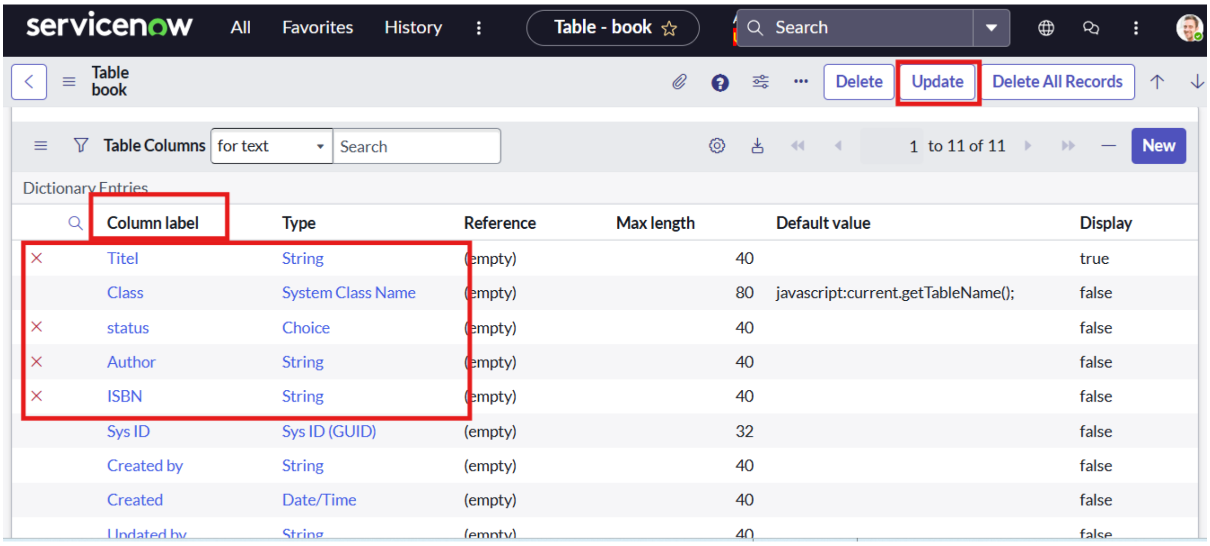
servicenow
All
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Delete
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Table Columns
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New
Dictionary Entries
Column label
Type
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Default value
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Class
System Class Name
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80
javascript:current.getTableName();
false
status
Choice
(empty)
40
false
Author
String
(empty)
40
false
ISBN
String
(empty)
40
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Sys ID
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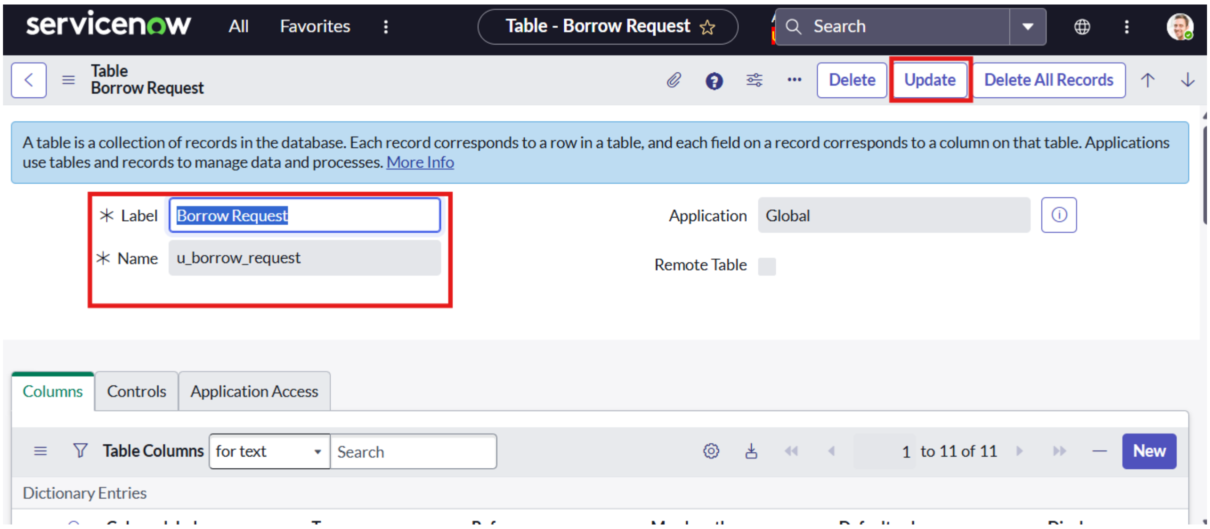
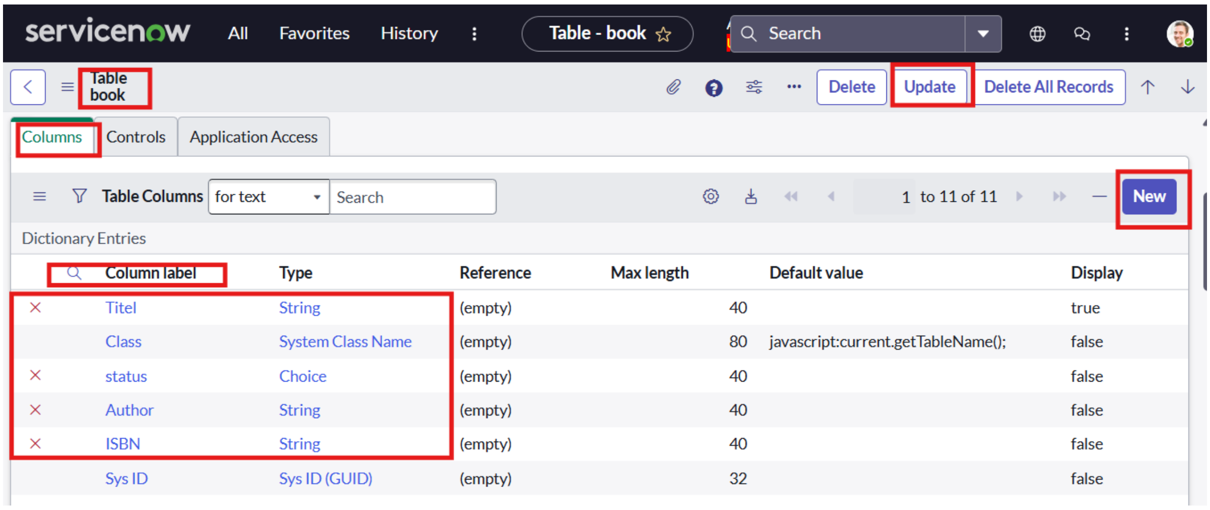
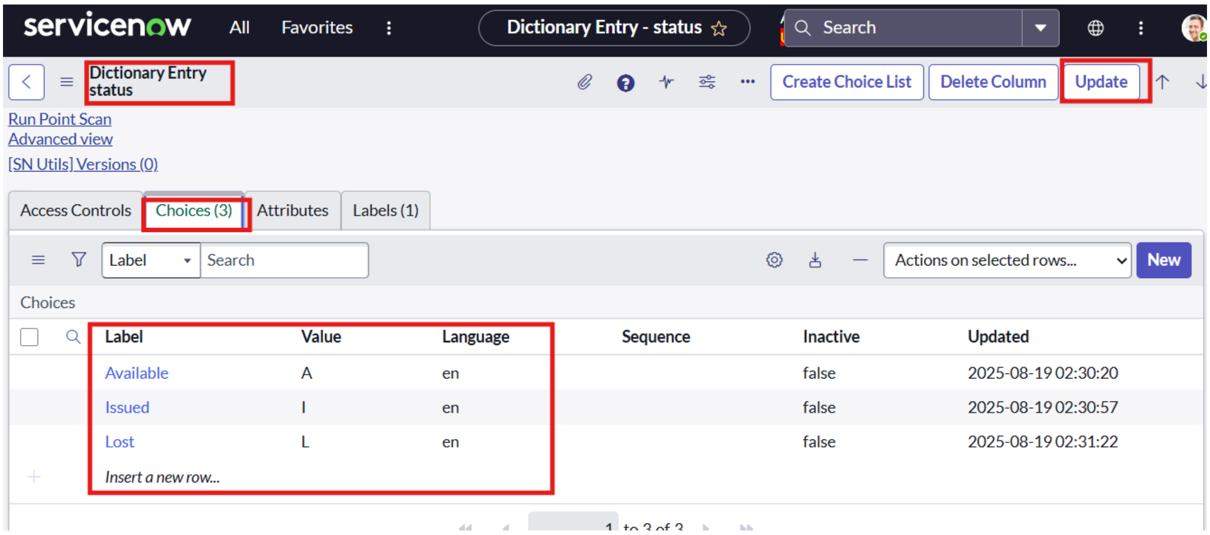
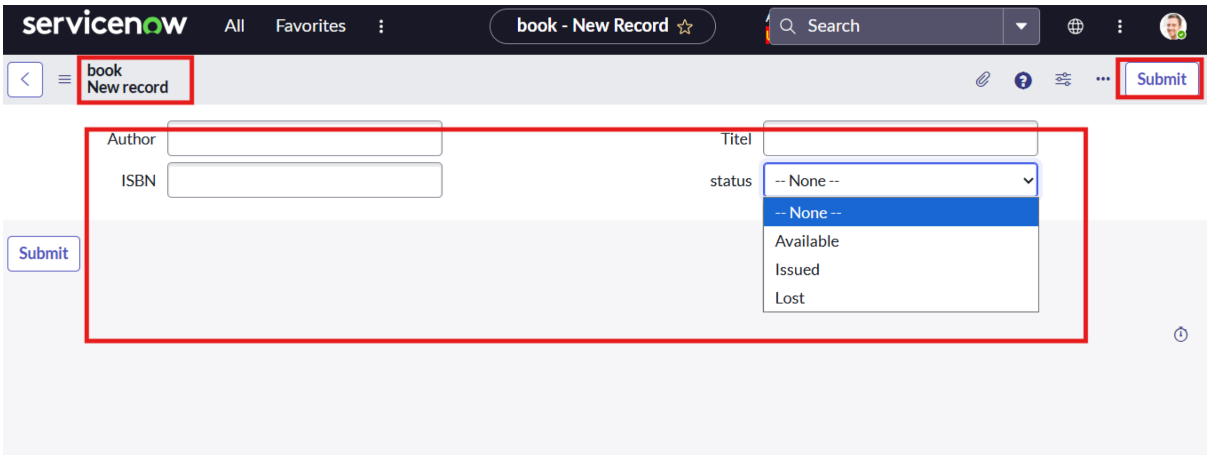


Steps to Add Fields to Book

1. Open ServiceNow.
2. Click on All → search for Tables.
3. Select System Definition → Tables.
4. From the list, open the table Book (u_book).
5. Scroll down to the Columns (Dictionary) related list.
6. Click on New to add a new field.
7. Enter Column Label as *Title*, select **Type = String* → click Submit.
8. Again, click on New. Enter Column Label as *Author*, select **Type = String* → click Submit.
9. Again, click on New. Enter Column Label as *ISBN*, select **Type = String* → click Submit.
10. Again, click on New. Enter Column Label as *Status*, select **Type = Choice* → click Submit.
11. Open the Status field you just created.
12. In the Choices related list, click New and add values: *Available*, *Issued*, *Lost*.
13. Set the Default Value of Status = *Available*.
14. Click Update to save.
15. Verify that the Book form now has fields: *Title, Author, ISBN, Status*.





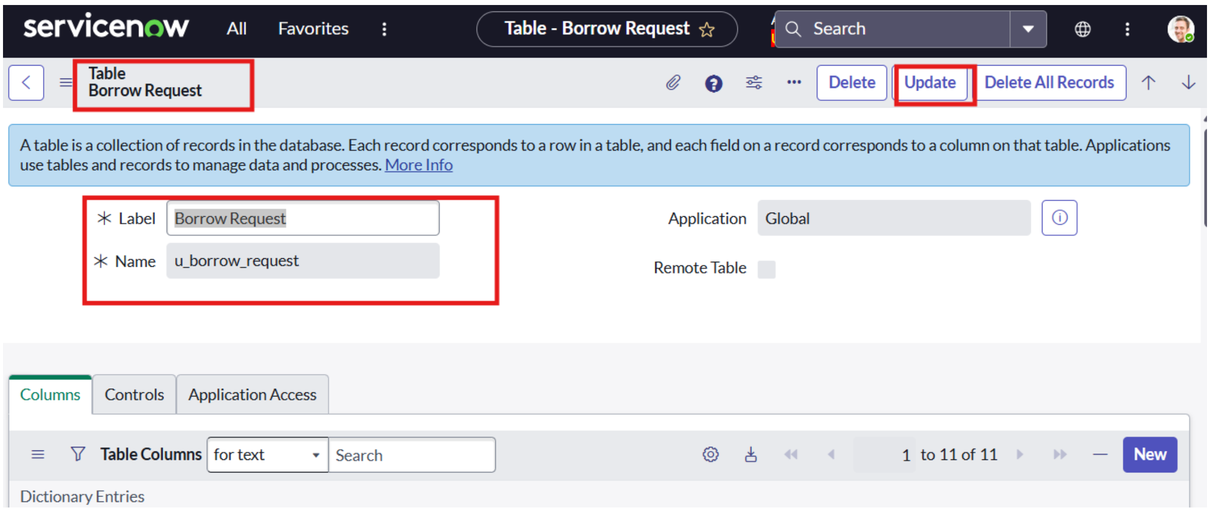


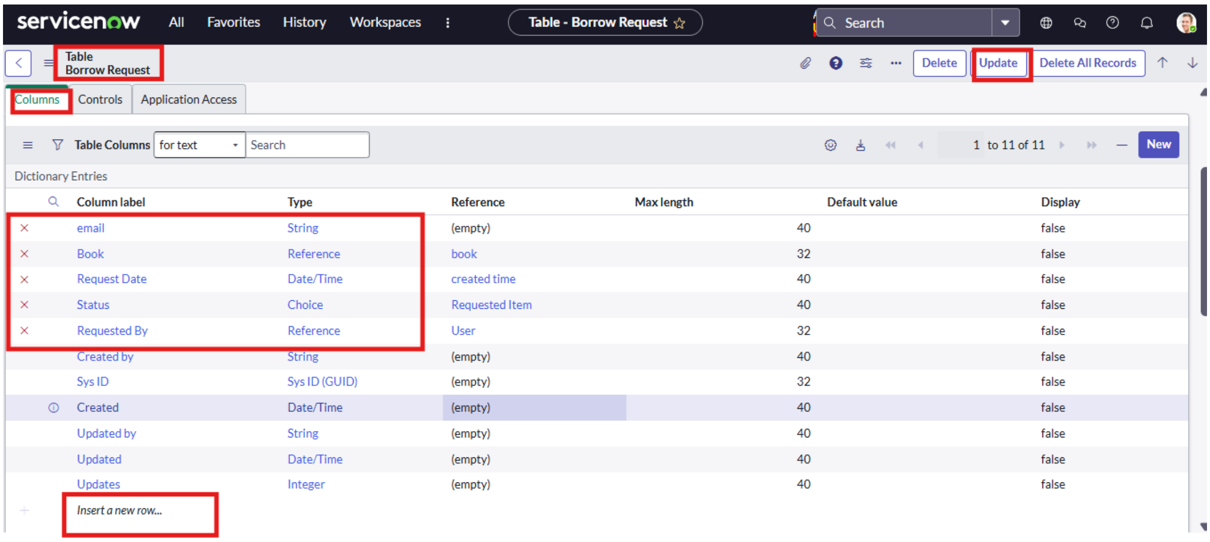
Steps to Add Fields to Borrow Request

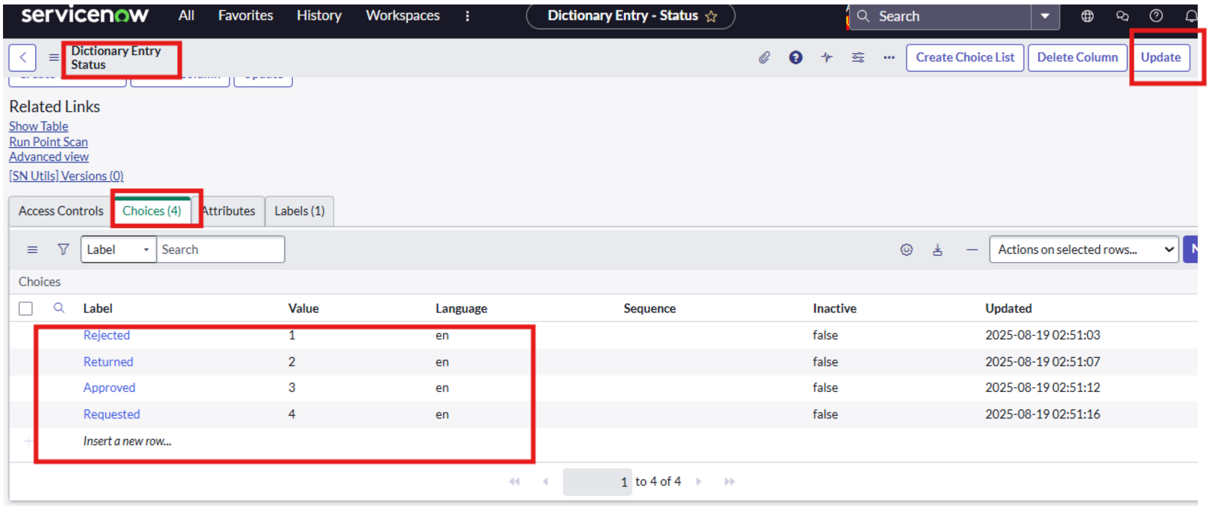
1. Open ServiceNow.
2. Click on All → search for Tables.

3. Select System Definition → Tables.
4. From the list, open the table Borrow Request (u_borrow_request).
5. Scroll down to the Columns (Dictionary) related list.
6. Click on New to add a new field.

7. Enter Column Label as *Requested By*, select Type = Reference, set Reference = User [sys_user] → click Submit.
8. Again, click on New. Enter Column Label as *Book*, select Type = Reference, set Reference = Book [u_book] → click Submit.
9. Again, click on New. Enter Column Label as *Request Date*, select **Type = Date/Time* → click Submit.
10. Again, click on New. Enter Column Label as *Status*, select **Type = Choice* → click Submit.
11. Open the Status field you just created.
12. In the Choices related list, click New and add values: *Requested*, *Approved*, *Rejected*, *Returned*.
13. Set the Default Value of Status = *Requested*.
14. Click Update to save.
15. Verify that the Borrow Request form now has fields: *Requested By, Book, Request Date, Status*.

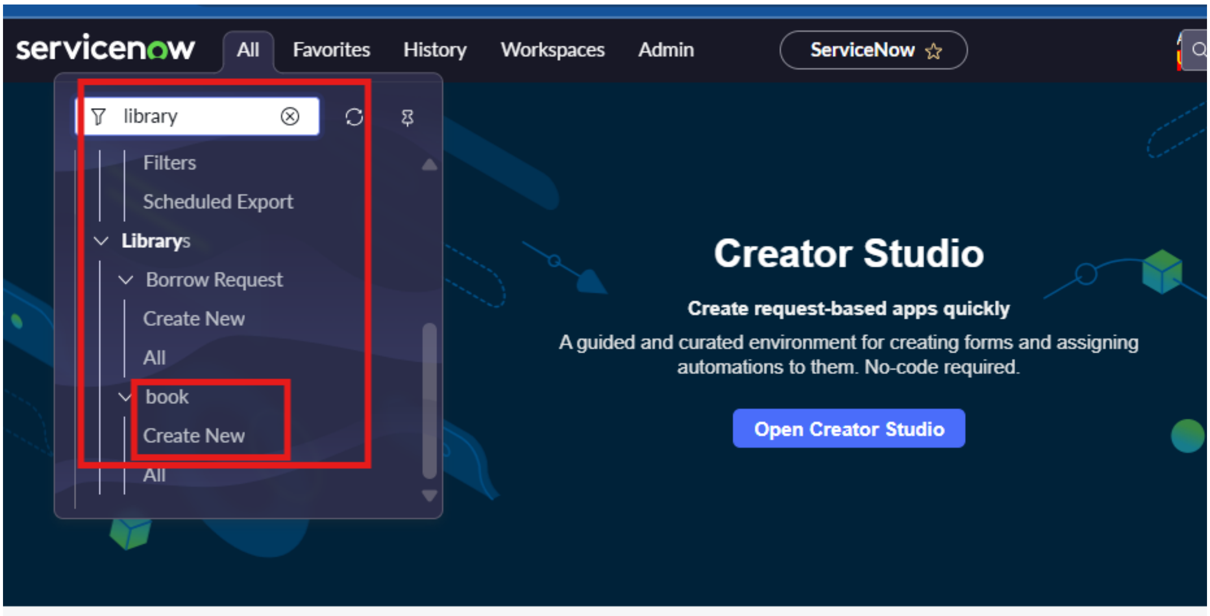






Steps to Configure Reference Qualifier (Prevent Requesting Already-Issued Books)

1. Open ServiceNow.
2. Click on All → search for Tables.
3. Select System Definition → Tables.
4. From the list, open the table Borrow Request (u_borrow_request).
5. Scroll down to the Columns (Dictionary) related list.
6. Open the field Book (Reference field to *Book [u_book]*).
7. In the field form, scroll to the Advanced View (click the gear ⚙️ if needed).
8. Locate the Reference Qualifier section.
9. Select Simple type.
10. In the Reference Qualifier Condition, set: Status is Available
11. Click Update to save the field.


servicenow
All
Favorites
History
Workspaces
Admin
ServiceNow
library
Filters
Scheduled Export
Librarys
Borrow Request
Create New
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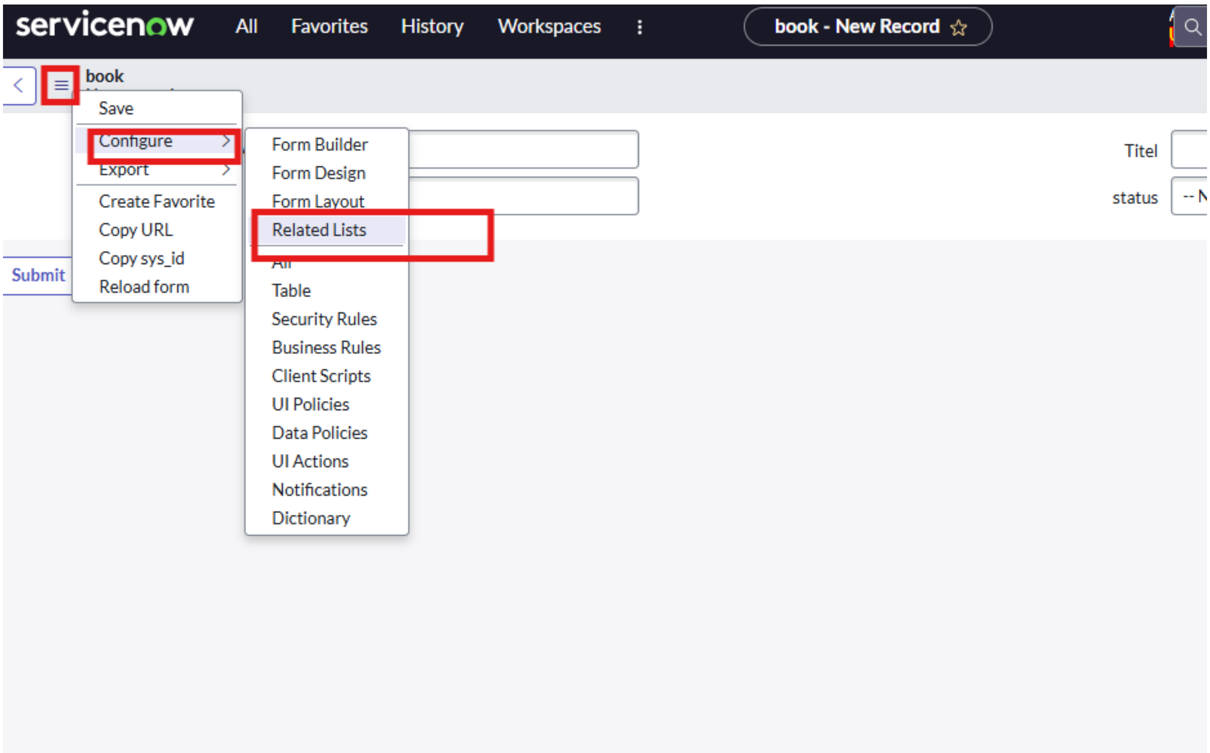
book
Create New
All
Creator Studio
Create request-based apps quickly
A guided and curated environment for creating forms and assigning automations to them. No-code required.
Open Creator Studio


servicenow
All
Favorites
History
Workspaces
book - New Record
book
Save
Configure
Export
Create Favorite
Copy URL
Copy sys_id
Reload form
Form Builder
Form Design
Form Layout
Related Lists
Table
Security Rules
Business Rules
Client Scripts
UI Policies
Data Policies
UI Actions
Notifications
Dictionary
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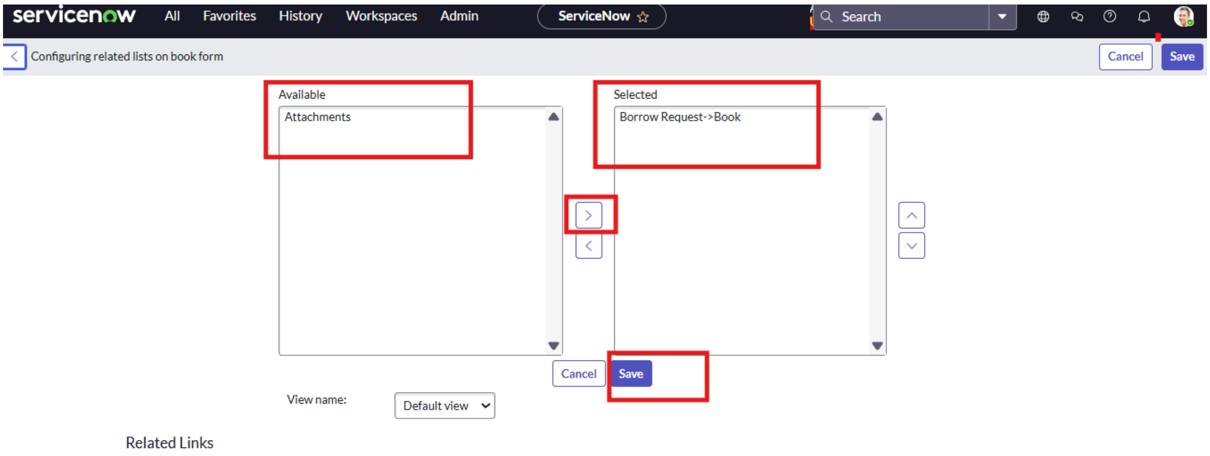
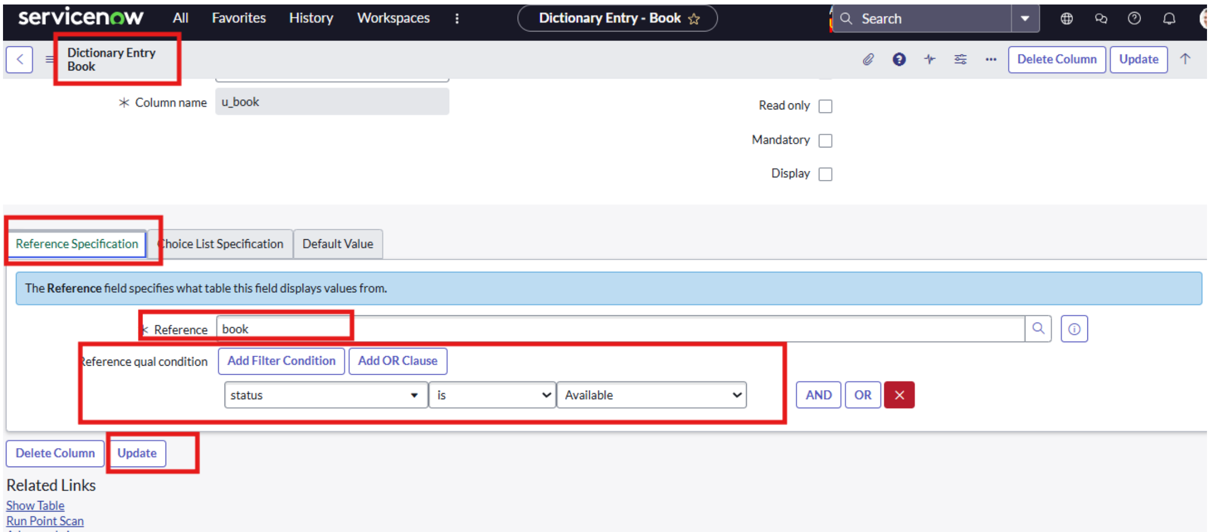
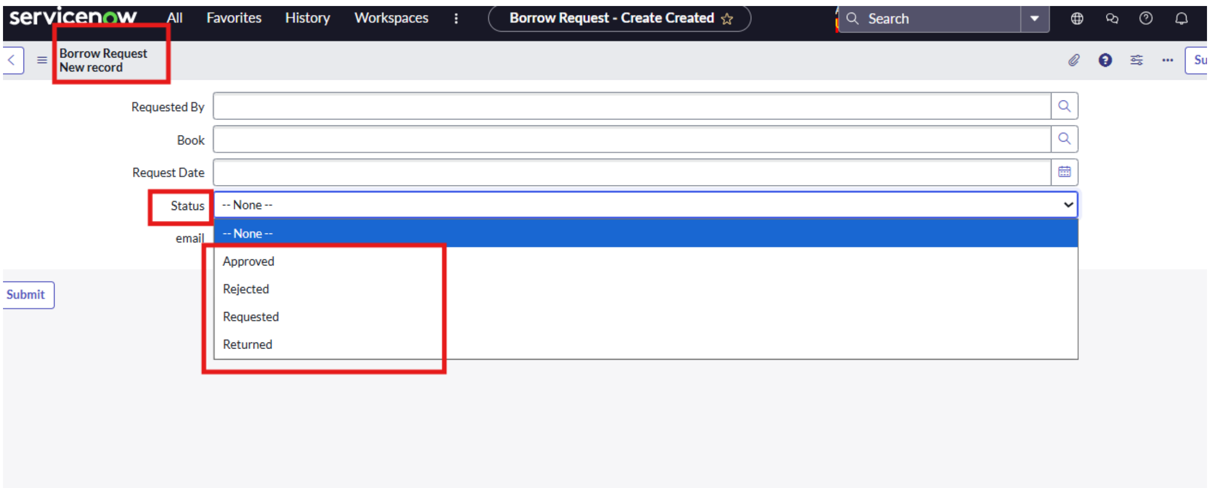
status
Submit





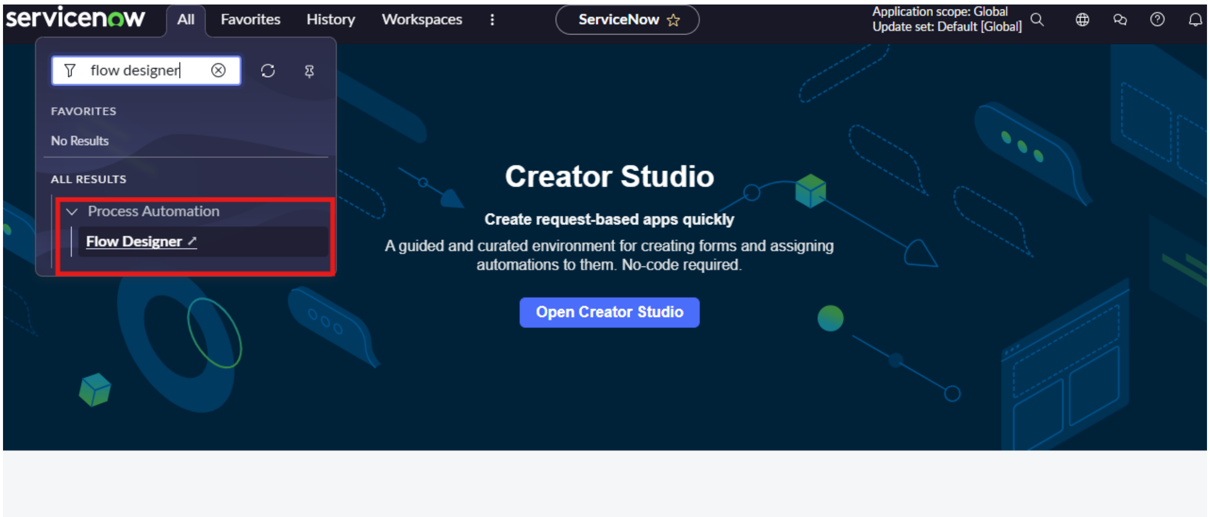


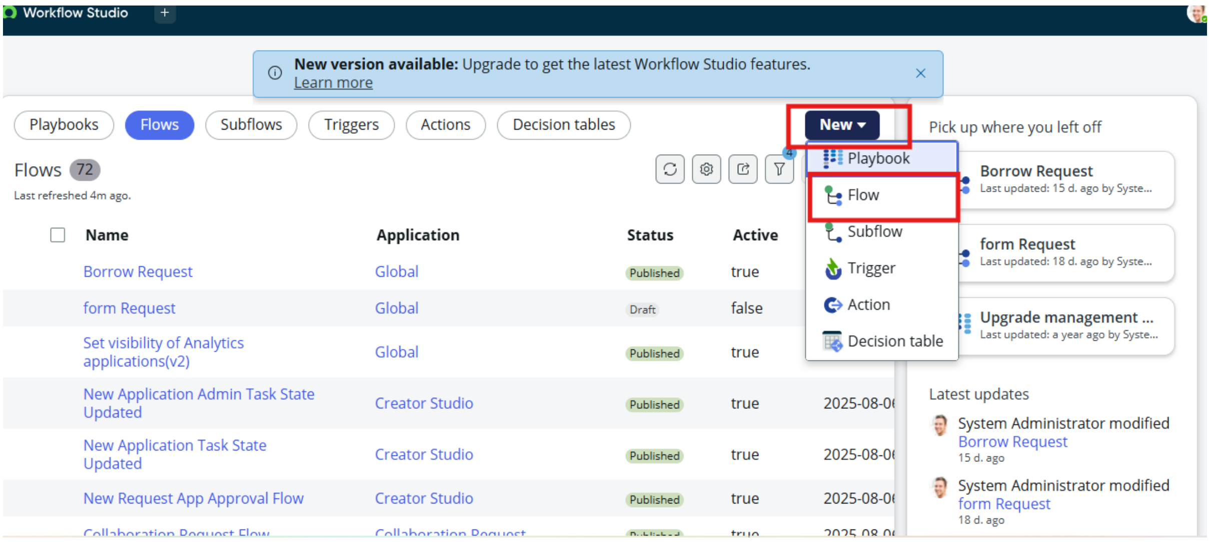
Phase 3: Development

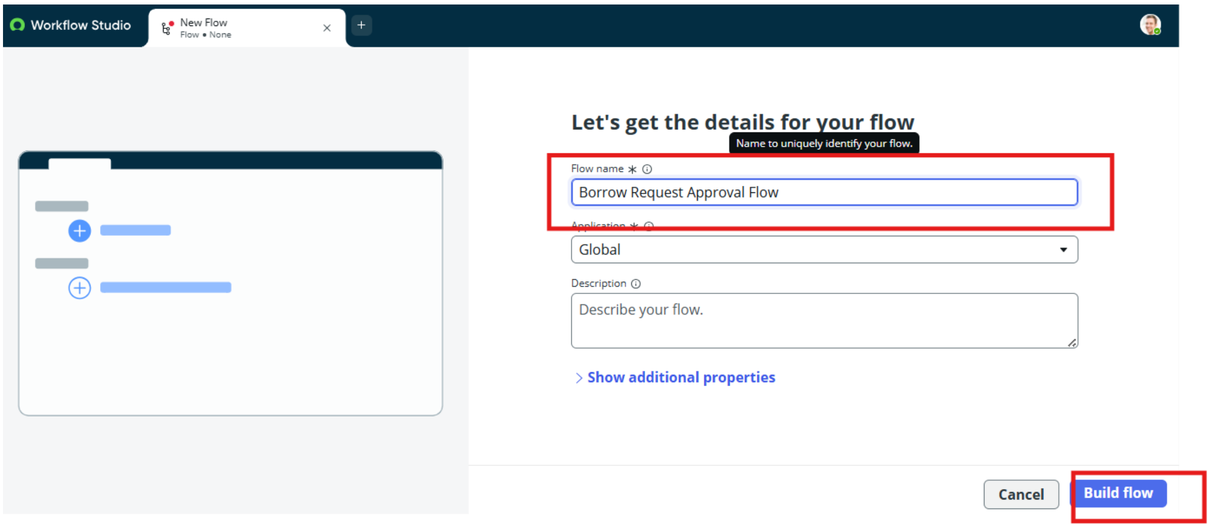
Steps to Create Flow in Flow Designer (Approve → Issue Book)

1. Open Flow Designer

1. Open ServiceNow.
2. Click on All → search for Flow Designer.
3. Select Flow Designer and click New → Flow.
4. Enter Name as Borrow Request Approval Flow → click Submit.

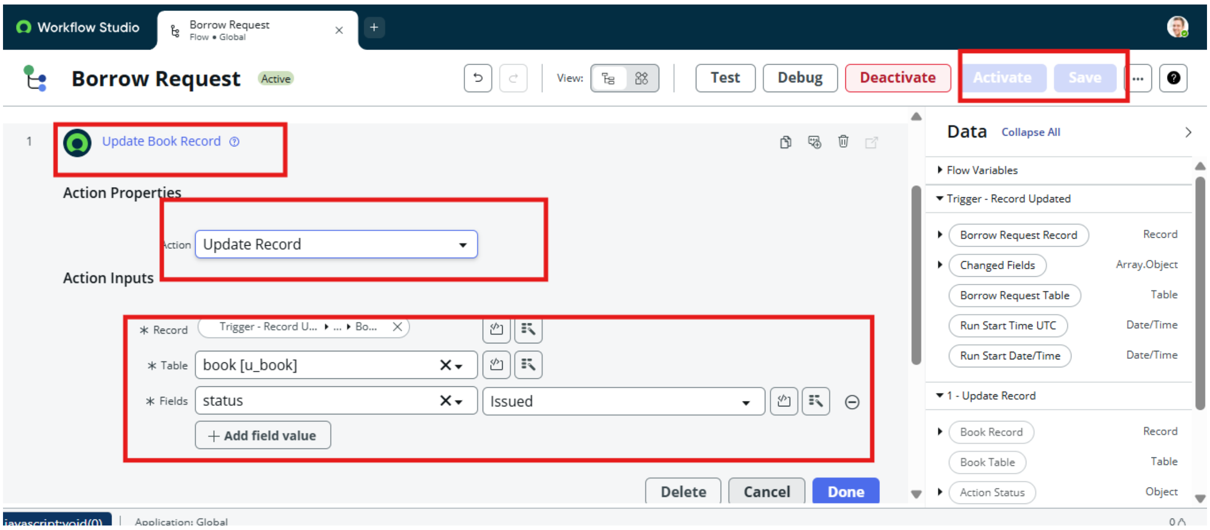






2. Add Trigger (When to Run the Flow)

1. In the Flow Designer canvas, click + Add Trigger.
2. Select Created or Updated.
3. Choose Table = Borrow Request [u_borrow_request].
4. Add condition: Status = Requested.
5. Click Done.



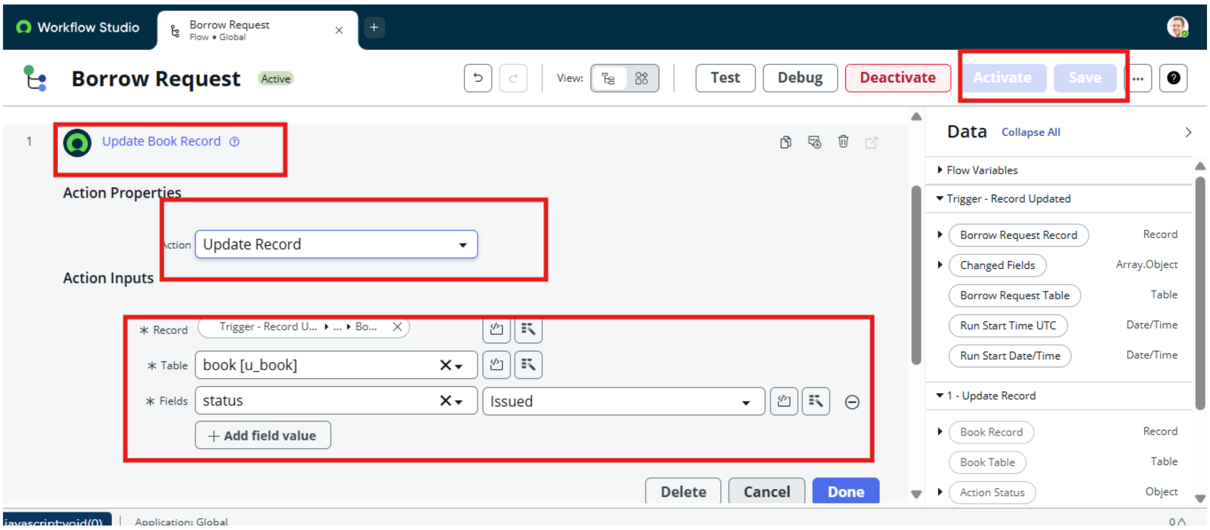
3. Add Action – Approval

1. Click on + Add Action.
2. Search for Ask for Approval.
3. Set Approvers = Role: librarian.

4. Approval conditions:
   On Approve → continue flow.
   On Reject → set Status = Rejected.
5. Click Done.

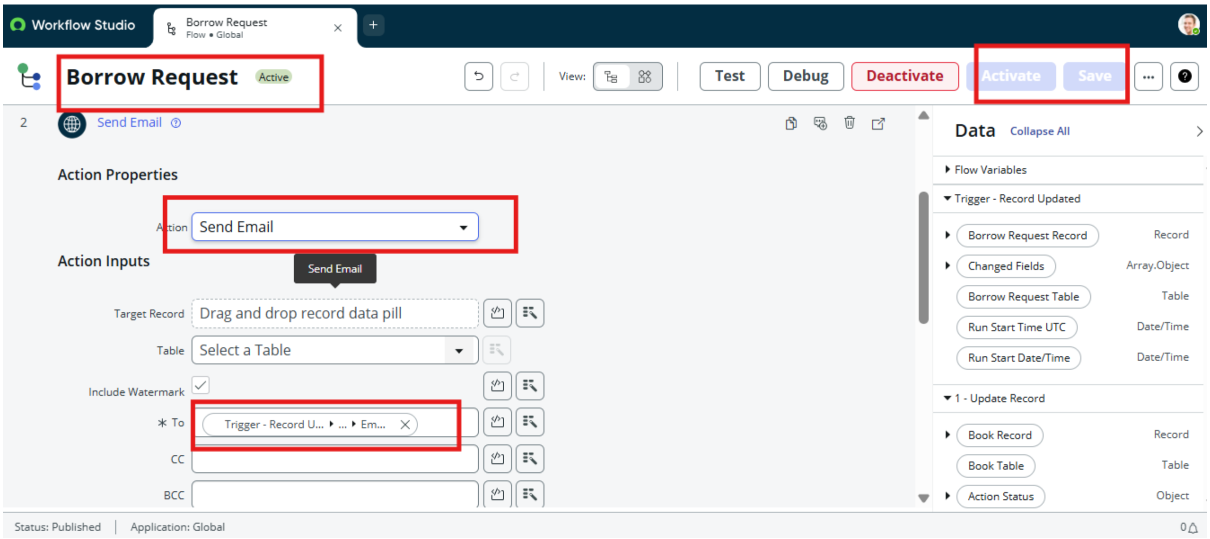
4. Add Action – Update Record (Issue Book)

1. Click on + Add Action.
2. Search for an Update Record.
3. Choose Table = Book [u_book].
4. Condition: Sys ID = Current.Book (the one from Borrow Request).
5. Set Status = Issued.
6. Click Done.



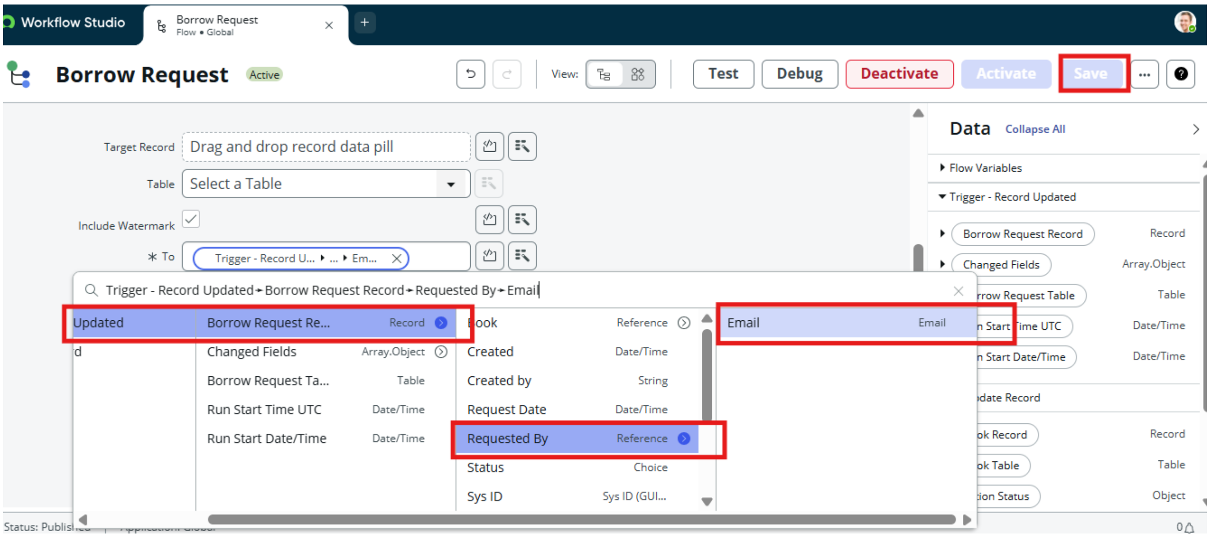
5. Add Action – Update Borrow Request Record

1. Click on + Add Action.
2. Search for an Update Record.
3. Choose Table = Borrow Request [u_borrow_request].
4. Condition: Sys ID = Current.
5. Set Status = Approved.
6. Click Done.



6. Add Action – Send Email (Notification)

1. Click on + Add Action.
2. Search for Send Email.
3. Set To = Requested By (Borrow Request → Requested By field).
4. Subject: Your Borrow Request has been Approved.
5. Body: The book [Book.Title] has been issued to you. Please collect it from the library.
6. Click Done



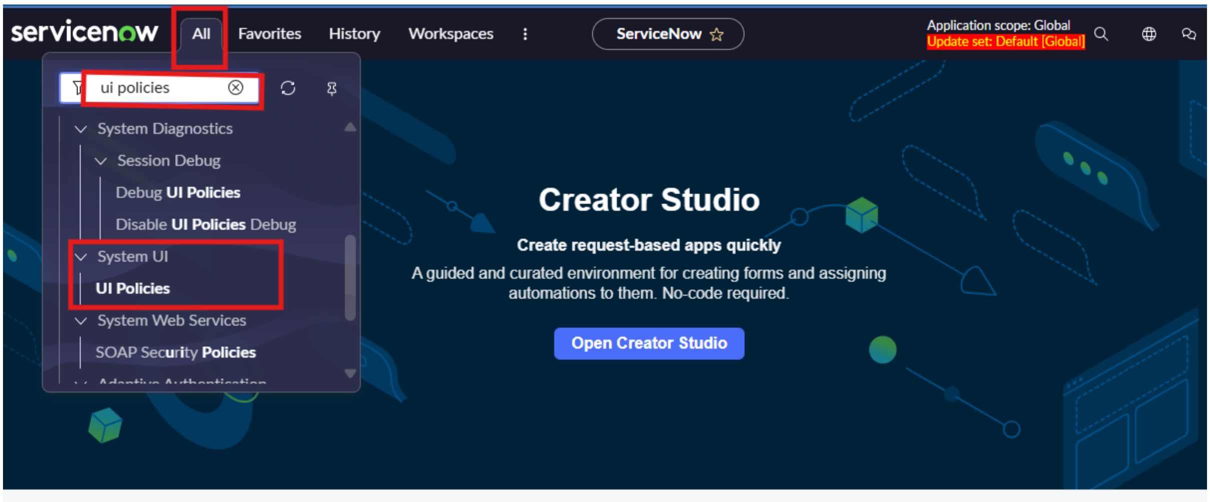
7. Save and Test Flow

1. Click Save → Activate.
2. Create a test Borrow Request with Status = Requested.

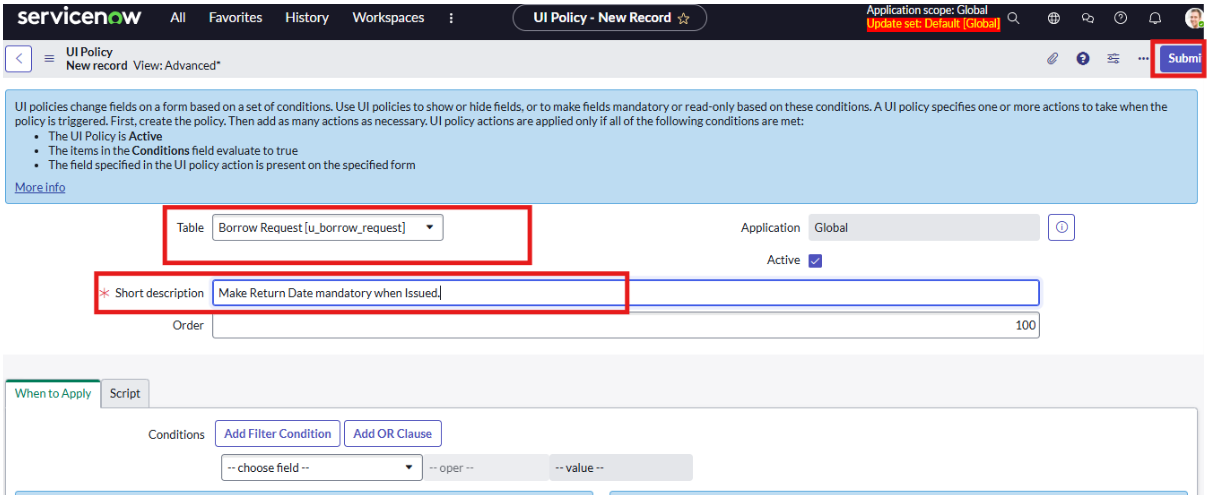
3. Verify: Librarian gets approval → On approve, Book.Status = Issued, Borrow Request.Status = Approved, and student receives an email.

Steps to Create UI Policy

1. Open ServiceNow.
2. Click on All → search for UI Policies.
3. Select System UI → UI Policies.

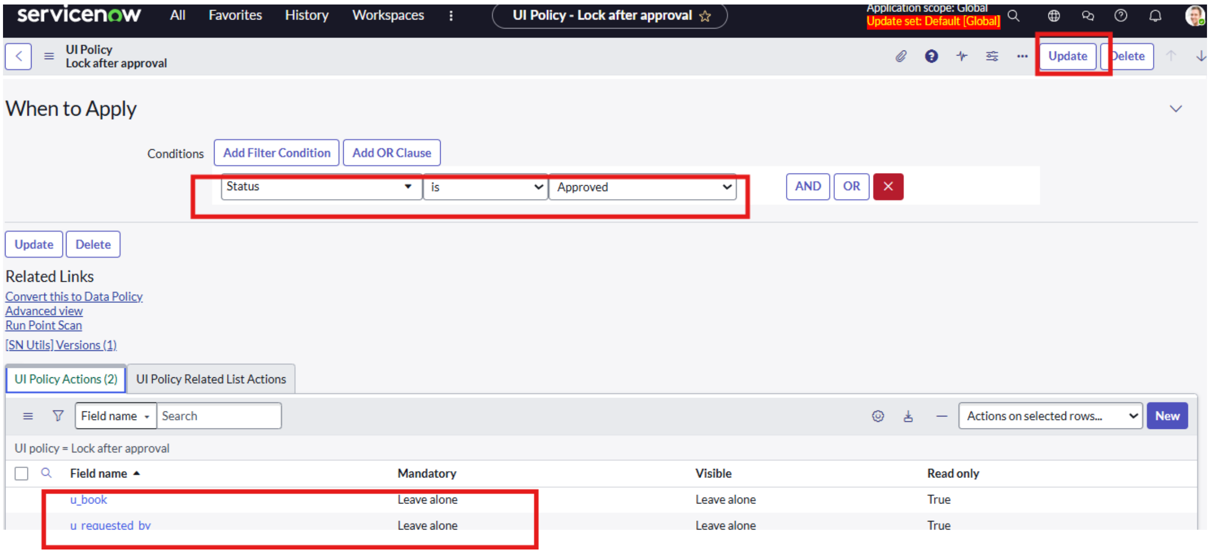


4. Click on New.
5. Enter Table = Borrow Request [u_borrow_request].
6. Enter Short Description = Make Return Date mandatory when Issued.
7. Submit the record.



8. Reopen the created UI Policy record.
9. In the Conditions section, set: Status = Issued.

10. In the UI Policy Actions related list, click New.



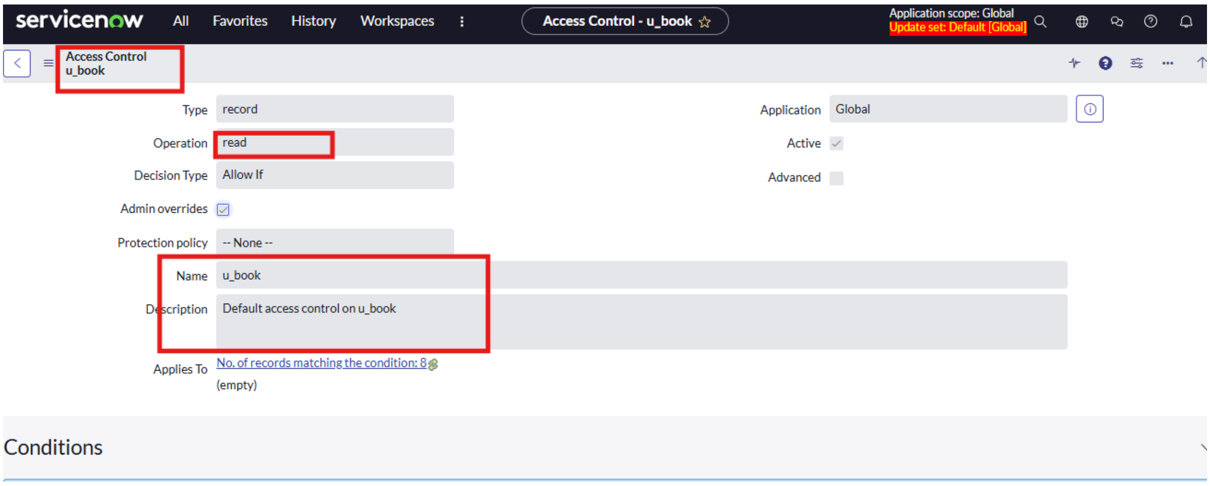
11. Select Field = Return Date.
12. Set Mandatory = True.
13. Set Visible = True.
14. Submit the UI Policy Action.

Phase 4: Data Migration,Testing & Security

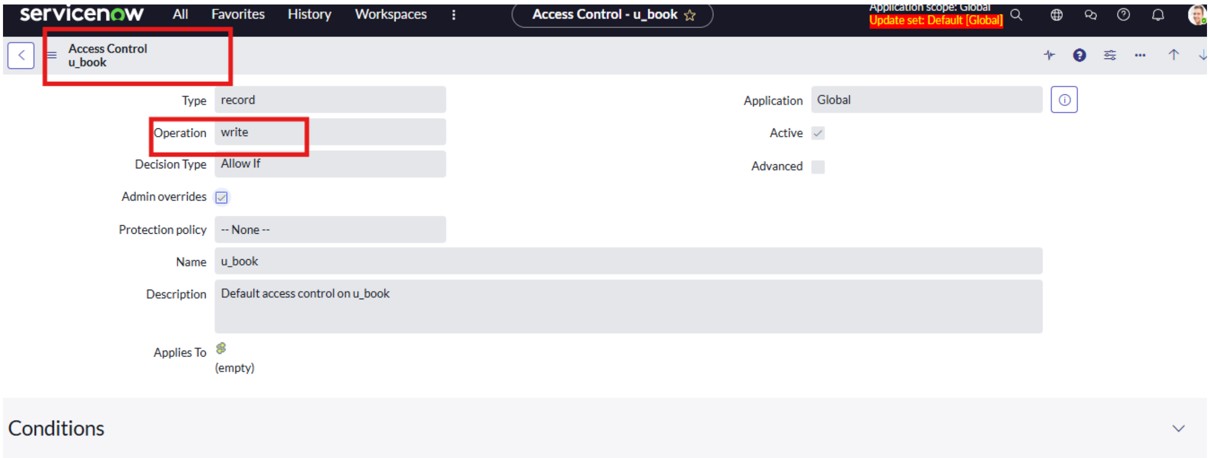
Access Control

Access Control for Book Table

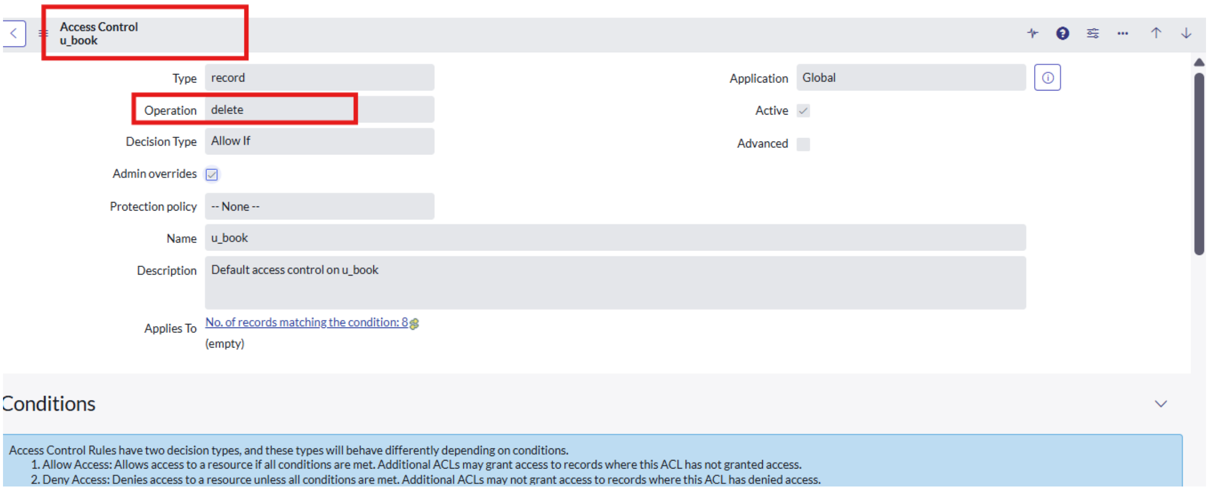
1. Open ServiceNow.
2. Click on All → search for Access Control.
3. Select System Security → Access Control (ACL).
4. Click New.
5. Select Table = Book [u_book].
6. Choose Operation = read.
7. Set Requires role = student, librarian.



8. Submit.
9. Again, click New.
10. Select Table = Book [u_book].
11. Choose Operation = write.
12. Set Requires role = librarian.



13. Submit.
14. Again, click New.
15. Select Table = Book [u_book].
16. Choose Operation = delete.

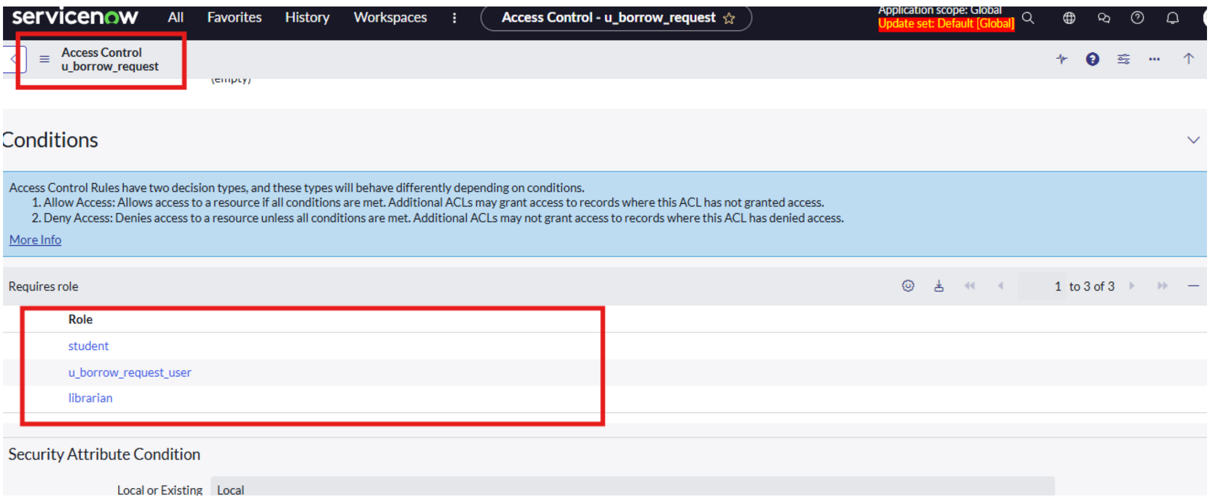


17. Set Requires role = librarian.
18. Submit.

Result: Students can only read books, librarians can read, write, and delete.

Access Control for Borrow Request Table

1. Open ServiceNow.
2. Click on All → search for Access Control.
3. Select System Security → Access Control (ACL).
4. Click New.
5. Select Table = Borrow Request [u_borrow_request].
6. Choose Operation = create.
7. Set Requires role = student.
8. Submit.
9. Again, click New.
10. Select Table = Borrow Request [u_borrow_request].
11. Choose Operation = read.
12. Set Requires role = student, librarian.



13. Submit.
14. Again, click New.
15. Select Table = Borrow Request [u_borrow_request].
16. Choose Operation = write.
17. Set Requires role = librarian.
18. Submit.
19. Again, click New.
20. Select Table = Borrow Request [u_borrow_request].
21. Choose Operation = delete.
22. Set Requires role = librarian.
23. Submit

Result: Students can create and read their borrow requests, librarians can read, update, and delete requests.

Steps to Create Report:

1. Open ServiceNow.
2. Click on All → search for Reports.
3. Select Reports → View / Run.
4. Click on New.
5. Enter Name = Most Borrowed Books.
6. Select Source Type = Table.
7. Select Table = Borrow Request [u_borrow_request].
8. Choose Type = Bar Chart (or Pie Chart as needed).
9. In the Group by field, select Book.
10. In the Aggregate field, select Count.
11. Add a filter: Status = Approved (to count only issued books).
12. Click Run to preview the report.
13. Adjust chart options (Title, Labels, Legend) as required.
14. Click Save.
15. To publish, click Sharing → Add roles (student, librarian).

Phase 5: Deployment, Documentation & Final Presentation

Troubleshooting

Flow Execution & Logs
Verified end-to-end execution of the Borrow Request Approval Flow using Flow Designer Execution Details. Checked trigger conditions, approvals, and book issuance updates.

Reference Qualifier Issues
Debugged cases where already-issued books were still showing in the Borrow Request form. Corrected reference qualifier conditions to filter only available books.

UI Policy Behavior
Tested Borrow Request form to ensure Return Date became mandatory when Status = Issued. Verified field visibility and mandatory settings across portal and platform views.

Access Control Validation
Checked that students could only create/read their own Borrow Requests while librarians had full access. Adjusted ACL conditions to restrict unauthorized access.

Report Accuracy
Validated the “Most Borrowed Books” report to ensure only approved/issued requests were counted. Fixed grouping to display correct book titles.

Adherence to Timelines

Executed project based on the defined milestones:

- Creation of Roles
- Creation of Tables
- Adding Fields (Book & Borrow Request)
- Reference Qualifier Implementation
- Flow Designer Setup (Approval & Issuance)
- UI Policy Configuration
- Access Control Setup
- Report Creation (“Most Borrowed Books”)
- Testing & Validation

Innovation

End-to-End Automation: Automated the book borrowing process by integrating custom tables, Flow Designer, and approvals, eliminating manual tracking of borrow requests.

Optimized Request Handling: Implemented reference qualifiers to ensure only available books can be requested, reducing errors and duplicate borrow entries.

Maintainability & Scalability: Designed the solution using out-of-the-box ServiceNow features like Flow Designer, UI Policies, and ACLs, ensuring easy maintenance and future scalability.

User Experience Enhancements: Applied UI policies to make Return Date mandatory only when a book is issued, keeping forms clean and user-friendly for both students and librarians.

Document Technical Blueprint

Variables:

- Book Title and Author
- Borrower (auto-populated with current user, editable if borrowing for others)
- Borrow Date (auto-filled with current date)
- Return Date (mandatory only when book is issued)

Approval Use Cases:

- Librarian Approval required automatically when a student raises a borrow request.
- Auto-approval for requests made by librarian role (for testing or internal usage).

Fulfillment Task Use Cases:

- Catalog tasks created for the Librarian group to issue the book.
- Automatic update of Borrow Request status to “Issued” once approved.
- Automatic update of Borrow Request status to “Returned” when the book is marked as returned.

Document Setup Manual

· Provided step-by-step manual for recreating the solution in a new Personal Developer Instance (PDI):

- Role creation (Librarian, Student)
- Table creation (Book, Borrow Request)
- Field configuration for each table
- Reference qualifier setup for available books
- Flow Designer configuration (Approval → Issue → Return)

- UI Policy setup for mandatory Return Date
- Access Control rules for students and librarians
- Report creation (“Most Borrowed Books”)
  · Test data submission performed to validate borrow/return flow
  · Screenshots and order of operations included for clarity

Project Demo Video Planning

· Demo includes:
· Portal walkthrough: Home → Library Services → Submit Borrow Request
· Live book borrow request submission by a student
· Dynamic approval flow handled by librarian
· Email notification triggers for request approval and issuance
· Request and book status tracking (Requested → Approved → Issued → Returned)
· Includes narration for each step and role-based perspectives (Student, Librarian)

Visual Demonstration

Captured:
o Form UI behaviour (e.g., Return Date becomes mandatory only when a book is issued)
o Approval records in the Borrow Request timeline (Student request → Librarian approval → Issued)
o Flow logs showing the end-to-end execution path (Request submitted → Approved → Issued → Returned)
o Annotated visuals with labels and highlights to explain each stage clearly

Explanation Clarity

· Documentation and presentation follow logical, sequential structure:
· What → Why → How → Outcome
· Each step includes:
· Clear headings for every configuration (Roles, Tables, Flow, UI Policy, etc.)
· Labelled screenshots of ServiceNow setup and execution
· Explanatory notes for easy replication in a new PDI

Realism & Quality

· Workflow mimics real-world library operations, including:
o Role-based approvals (Student requests → Librarian approves)
o Data validations (book availability check, mandatory return date)
· Solution tested with realistic use cases and sample data (multiple students requesting the same book, overdue returns).

Scalability & Future Plan

Future enhancements considered:
· Auto-notifications for overdue books and reminders via email/SMS
· Integration with external library systems or digital catalog APIs
· Enhanced reporting dashboards (borrow frequency, student activity, overdue analysis)
· Expansion to other academic services (lab equipment requests, study room booking, digital resource access)

Conclusion

The Library Management Project successfully streamlined the process of borrowing and managing books within ServiceNow by integrating role-based access, automated approvals, and dynamic workflows. Students can easily submit barrow requests, while librarians efficiently review, approve, and issue books with proper validations. The solution ensures transparency through status tracking, notifications, and reporting features. By combining automation with usability, the project delivers a scalable foundation that can be extended to broader academic services in the future.