| **Date** | **31 OCTOBER 2025** |
| --- | --- |
| **Team ID** | **NM2025TMID00034** |
| **Project Name** | **Laptop Request Catalog Items** |
| **Maximum Marks** | **4 Marks** |

|  |  |
| --- | --- |
|  |  |

### Ideation Phase

### Brainstorm & Idea Prioritization

This guided project demonstrates how to design and implement a new service catalog item for employee laptop requests. It begins by defining the business problem: a lack of a standardized process for hardware procurement. The plan involves designing a user-friendly form that captures all necessary information, such as the type of request (new, refresh, repair) and the desired laptop model.

A multi-stage approval workflow will be built to route requests first to the user's manager for financial approval, then to the IT hardware team for fulfillment. This ensures proper tracking, accountability, and management of IT assets. The workflow also includes automated notifications to keep the user informed of their request status.

Finally, test scenarios will be executed to validate the entire process. Tests will confirm that the form logic works, approvals are routed correctly, and notifications are sent as expected, ensuring a smooth rollout to all employees.

### Step-1: Team Gathering, Collaboration and Select the Problem Statement:

* **PROBLEMS**
  + Users request laptops via email or informal chat, leading to missed information.
  + There is no tracking for requests, causing long delays and user frustration.
  + Approval processes are manual and inconsistent.
  + IT asset and procurement teams lack visibility into demand.
* **DISCUSSION**
  + The team decided to create a standardized, automated process using a new service catalog item.
  + This will enforce standards and provide a single source of truth for all laptop requests.
* **IDEAS**
  + Plan to define standard laptop models (e.g., Standard User, Developer, High-Performance).
  + Design an input form to capture user, manager, department, and request type.
  + Map out the approval workflow: Manager -> IT Hardware -> Procurement.
* **SOLUTIONS**
  + Develop and test the catalog item, including its form, workflow logic, and automated notifications for the user and fulfillment teams.
  + Integrate the request with the Asset Management (CMDB) database.

Step-2: Brainstorm, Idea Listing and Grouping:

| 1ST PARTICIPANT'S NAME: ANNA THOMAS | 2ND PARTICIPANT'S NAME: ROHAN MEHTA | 3RD PARTICIPANT'S NAME: CHEN WEI |
| --- | --- | --- |
| **Initial Idea:**  Create a single form for all laptop requests (new, refresh, repair). | **Initial Idea:**  Develop an approval workflow that goes to the user's manager first for cost approval. | **Teammate builds on initial idea:**  Create a report dashboard for managers to track their team's hardware requests. |
| **Teammate builds on initial idea:**  Provide clear descriptions and specs for each laptop model directly on the form. | **Teammate builds on initial idea:**  After manager approval, route the request as a task to the IT Hardware team's fulfillment queue. | **Teammate builds on initial idea:**  Add a confirmation prompt *before* submission summarizing the request and selected model. |

**Brainstorm:** Team members share ideas freely to explore solutions without judgment, encouraging creativity and participation.

**Idea Listing:** All ideas from the session are written down to capture every suggestion and ensure no input is overlooked.

**Grouping:** Similar ideas are organized into categories to identify patterns, highlight priorities, and simplify decision-making.

**Action Planning:** Chosen ideas are turned into clear steps with assigned responsibilities and timelines.

### Step-3: Idea Prioritization:

**7 Steps to Implement a Laptop Request Catalog Item**

* **01: Define Requirements & Laptop Models**
  + Gather requirements from HR, IT, and Finance.
  + Finalize the standard-issue laptop models to be offered.
* **02: Design the Request Form (Variables)**
  + Build the user-facing form.
  + Add fields (variables) for request type, model selection, and business justification.
* **03: Map Approval & Fulfillment Workflows**
  + Design the visual workflow for manager and IT approvals.
  + Create fulfillment tasks for the hardware team.
* **04: Configure Notifications (User & Fulfillers)**
  + Set up automated emails for submission confirmation, approval/rejection, and completion.
* **05: Link to Asset Management (CMDB)**
  + Create logic to link the request to an asset record upon deployment.
* **06: Develop & Test End-to-End**
  + Build the item and conduct rigorous testing of the form, workflow, and notifications.
* **07: Deploy to Production & Gather Feedback**
  + Move the item to the production environment.
  + Announce the new item and collect user feedback for future improvements.

**Idea Prioritization:** Idea prioritization is crucial for managing project scope and delivering value quickly. For this project, the team must decide what features are "Must-Haves" vs. "Nice-to-Haves." For example, the core workflow (form > manager approval > IT fulfillment) and user notifications are high-priority "Must-Haves." Secondary features, like deep integrations with vendor procurement systems or a predictive hardware refresh report, are lower priority "Nice-to-Haves" and can be moved to Phase 2. This approach ensures the team can deliver a functional catalog item quickly, addressing the core problem, while creating a backlog for future enhancements.

Project Planning Phase

Project Planning Template (Product Backlog, Sprint Planning, Stories, Story points)

### Product Backlog, Sprint Schedule, and Estimation

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint-1 | Catalog Item Form Design | USN-1 | As a user, I want to see the available laptop models (Standard, Developer) and their specs on the form. | 3 | High | Anna Thomas |
| Sprint-1 | Catalog Item Form Design | USN-2 | As a user, I want to select my request type (New, Refresh, Repair) and have the form show relevant fields based on my choice. | 4 | High | Anna Thomas |
| Sprint-2 | Approval Workflow | USN-3 | As a manager, I want to receive an approval request when my direct report submits a laptop request. | 5 | High | Rohan Mehta |
| Sprint-2 | Fulfillment & Notifications | USN-4 | As a user, I want to receive an email notification when my request is submitted. | 2 | Medium | Chen Wei |
| Sprint-3 | Fulfillment & Notifications | USN-5 | As an IT Hardware agent, I want a task created in my queue when a request is manager-approved. | 4 | High | Rohan Mehta |
| Sprint-3 | Testing & Deployment | USN-6 | As a tester, I should verify that the end-to-end request (Submit > Approve > Fulfill) works as expected. | 5 | High | Chen Wei |
| Sprint-3 | Documentation | USN-7 | As a developer, I want to document the workflow and form logic for the knowledge base. | 3 | Medium | Anna Thomas |

### Project Tracker, Velocity & Burndown Chart:

| Sprint | Total Story Points (Planned) | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint-1 | 7 | 5 Days | 03 Nov 2025 | 07 Nov 2025 | 7 | 07 Nov 2025 |
| Sprint-2 | 7 | 5 Days | 10 Nov 2025 | 14 Nov 2025 | 7 | 14 Nov 2025 |
| Sprint-3 | 12 | 5 Days | 17 Nov 2025 | 21 Nov 2025 | 12 | 21 Nov 2025 |

**Velocity** Average velocity = (Total Story Points Completed) / (Total Duration in Days) Total: 26 points over 15 days → Velocity = 1.73 points/day

**Burndown Chart:** A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.

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### Project Design Phase

### Proposed Solution

**Proposed Solution Template:**

| S.No. | Parameter | Description |
| --- | --- | --- |
| 1. | **Problem Statement (Problem to be solved)** | Currently, laptop requests are handled via email, chat, or verbal requests. This manual process is inconsistent, difficult to track, and lacks a formal approval chain, leading to significant delays and employee frustration. |
| 2. | **Idea / Solution description** | Implement a new Service Catalog Item for laptop requests. This item will feature a dynamic form to capture all required information (e.g., request type, model choice) and an automated workflow for manager approval and IT fulfillment. |
| 3. | **Novelty/ Uniqueness** | It standardizes and automates a core, high-volume business process. The solution provides a single 'source of truth' for hardware requests, integrating a user-friendly form with back-end fulfillment and asset management. |
| 4. | **Social Impact / Customer Satisfaction** | Drastically improves the new-hire and existing employee experience by providing a simple, transparent, and trackable request process. It reduces employee frustration and downtime spent waiting for essential hardware. |
| 5. | **Business Model (Revenue Model)** | This is a cost-saving model, not a revenue-generating one. It drives savings by reducing manual IT labor, standardizing hardware (enabling bulk purchase discounts), and providing clear data for asset lifecycle management and budget forecasting. |
| 6. | **Scalability of the Solution** | The solution is highly scalable. The same framework (form, workflow, tasks) can be easily replicated for other hardware (monitors, peripherals) and software requests, creating a unified and comprehensive IT service catalog. |

### Conclusion

The "Laptop Request Catalog Item" project addresses a critical gap in IT procurement and service delivery. By centralizing and automating a previously chaotic and manual process, we significantly improve operational efficiency, employee satisfaction, and IT asset control. This solution provides a transparent, auditable trail for all hardware requests, safeguarding against procurement delays and lost assets. The successful implementation of this catalog item sets a foundation for a mature, scalable, and user-friendly IT Service Management program, moving the IT department from a reactive to a proactive service provider.

**Solution Description:**

To standardize hardware requests, a new item will be created in the Service Catalog. This item will present a user-friendly form that dynamically shows fields based on the user's request type (e.g., 'New Hire' vs. 'Hardware Refresh'). Once submitted, an automated workflow triggers, first routing an approval request to the user's manager. Upon approval, the workflow automatically generates a catalog task for the IT Hardware team's queue to provision and deliver the laptop. The user is kept informed via automated email notifications at key stages (Submitted, Approved, Fulfilled), ensuring full transparency throughout the process.

Project Design Phase

Solution Architecture:

Provide a standardized, user-friendly self-service channel for all laptop requests.

Automate the multi-stage approval workflow to enforce consistency and accountability.

Ensure every request is tracked and automatically linked to the IT Asset Management (CMDB) system.

Reduce manual processing time and eliminate email-based requests.

Key Components:

Service Catalog (The user-facing portal and form interface).

Request Item (RITM) and Catalog Tasks (The record types used for tracking and fulfillment).

Workflow Engine (Logic for automated approvals and task generation).

Manager/User Data Tables (Source for routing approval requests and user details).

IT Asset/Configuration Management Database (CMDB) (The final destination for asset tracking).

Development Phases:

Define standard laptop models and specifications.

Build the Service Catalog Item and Request Form (variables).

Design and implement the automated approval workflow (Manager → Fulfillment).

Configure automated email notifications for the user and fulfillment teams.

Integrate the final fulfillment task with asset creation/update logic in the CMDB.

Perform comprehensive end-to-end user acceptance testing (UAT).

Solution Architecture Description:

The solution architecture is centered around creating a transparent and fully automated hardware procurement process. The core component is a new item within the Service Catalog, which provides a single, standardized entry point for employees to request a laptop.

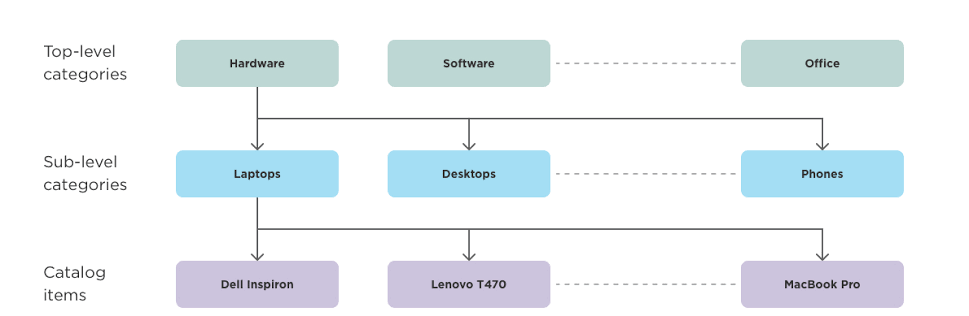
When a user submits the request, a Request Item (RITM) is created, triggering a robust Workflow Engine. This workflow is designed to ensure compliance: it automatically routes an approval request to the user’s Manager for budget sign-off. Once approved, the workflow generates a series of Catalog Tasks for the IT Hardware Fulfillment Team.

Crucially, the final task in the fulfillment process includes an automated step to create a new record or update an existing one in the IT Asset Management/CMDB table. This integration ensures that every laptop procured through this process is instantly and accurately tracked in the system, maintaining data consistency and promoting operational accountability for IT assets.

Solution Architecture Diagram:

This guided project demonstrates how to design and implement a new service catalog item for employee laptop requests. It begins by defining the business problem: a lack of a standardized process for hardware procurement. The plan involves designing a user-friendly form that captures all necessary information, such as the type of request (new, refresh, repair) and the desired laptop model.

A multi-stage approval workflow will be built to route requests first to the user’s manager for financial approval, then to the IT hardware team for fulfillment. This ensures proper tracking, accountability, and management of IT assets. The workflow also includes automated notifications to keep the user informed of their request status.



Data Flow Diagram & User Stories

Data Flow Diagrams:

A Data Flow Diagram (DFD) for the Laptop Request Catalog Item project visually represents the information flow from the user’s initial request to the final provisioning of the asset. [cite\_start]The DFD highlights how data is processed, what systems interact, and where data is stored.

In this project, the DFD illustrates the interaction between the Employee, the Service Catalog system, the Manager, the Fulfillment process, and the IT Asset Database (CMDB). It ensures that data, such as request details, approval status, and asset information, is consistently passed through the system to maintain accuracy and accountability.

DFD Flow Description:

The Employee (External Entity) enters Request Details into the Service Catalog Form (System) and submits the request.

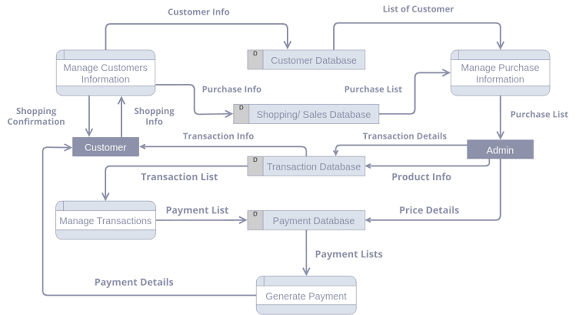
The Service Catalog creates a Request Item (RITM) and passes an Approval Request (Data Flow) to the Manager (Externaltity).

The Manager sends an Approval Status (Data Flow) back to the RITM in the Service Catalog (System).

If approved, the Service Catalog passes a Fulfillment Task (Data Flow) to the IT Hardware Fulfillment (Process).

The IT Hardware Fulfillment process retrieves Asset Information from the CMDB (Data Store) and sends the Product (Data Flow) to the Employee.

Upon completion, the IT Hardware Fulfillment process sends an Asset Update Record (Data Flow) back to the CMDB (Data Store) to finalize asset tracking.

Data Flow Diagrams:

### User Stories:

[cite\_start]User stories define the functionality needed from the system in simple, goal-focused language, ensuring the final product meets the needs of all stakeholders.

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
| --- | --- | --- | --- | --- | --- | --- |
| **Employee (End User)** | Catalog Item Submission | USN-1 | As an **employee**, I want to select my desired laptop model and see the specifications and pricing on the request form. | The form must clearly display model names (e.g., 'Standard' or 'Developer'), specifications, and cost. | High | Sprint-1 |
| **Manager** | Workflow Approval | USN-2 | As a **manager**, I want to receive an approval request via email for my direct report's laptop request with a single-click approve/reject link. | The approval record must contain all request details (user, model, cost); the approval action must update the request status correctly. | High | Sprint-2 |
| **IT Hardware Agent** | Request Fulfillment | USN-3 | As an **IT Hardware Agent**, I want a task created in my fulfillment queue that lists the laptop model, user contact information, and delivery location. | The task must be auto-assigned to the correct fulfillment group and contain all details needed for provisioning. | High | Sprint-2 |
|  |  |  |  |  |  |  |
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Solution Requirements (Functional & Non-functional)

### Functional Requirements:

Following are the functional requirements of the proposed solution.

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
| --- | --- | --- |
| **FR-1** | **Catalog Form Submission** | User can access and submit the "Laptop Request" form. |
|  |  | The form must capture Request Type (New/Refresh/Repair). |
|  |  | The form must capture the required Laptop Model (e.g., Standard or Developer). |
| **FR-2** | **Automated Workflow** | The system must automatically initiate a multi-stage approval workflow upon submission. |
|  |  | The first approval must be routed to the requester's Manager. |
|  |  | The system must automatically create a Fulfillment Task for the IT Hardware team after Manager approval. |
| **FR-3** | **Asset Management Integration** | The system must automatically create a new Asset record (CI) in the CMDB upon completion of the fulfillment task. |
|  |  | The new Asset record must be linked to the requester and include the asset tag and model details. |
| **FR-4** | **Notifications** | The system must send an email notification to the requester upon submission, approval, and completion/fulfillment. |
| **FR-5** | **Form Validation** | The form must enforce mandatory fields (e.g., Manager Name, Business Justification) before submission. |

### Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

| FR No. | Non-Functional Requirement | Description |
| --- | --- | --- |
| **NFR-1** | **Usability (UX)** | The Service Catalog form interface must be simple, clear, and easy for all employees to use, requiring minimal training. |
| **NFR-2** | **Performance** | The workflow must process the request (submission, approval routing) in under 5 seconds to ensure a fluid user experience. |
| **NFR-3** | **Reliability** | The automated approval routing and task creation must function correctly 100% of the time. |
| **NFR-4** | **Security** | Only authorized IT Fulfillment staff should be able to complete the final fulfillment task. |
| **NFR-5** | **Scalability** | The system should handle 500+ requests per month without experiencing performance degradation. |
| **NFR-6** | **Maintainability** | The workflow logic must be modular and well-documented to allow for quick updates to laptop models or approval changes. |

## Technology Stack (Architecture & Stack)

### Technical Architecture:

The solution is architected on the **ServiceNow SaaS platform**, utilizing its native capabilities to provide a seamless and automated hardware request process.

The architecture is driven by the **Service Catalog** as the user interface (UI) layer, providing the self-service form. The **Workflow Engine** is the primary application logic, responsible for:

1. Routing the request to the requester's manager for **approval**.
2. Creating a **Fulfillment Task** for the IT Hardware team.
3. Sending **automated notifications** to stakeholders.

All data, including user details, request records (RITMs), and the final laptop asset information, is stored within the platform's **CMDB** and other internal tables. The use of **Server Scripting** (like GlideRecord) ensures efficient and fast data lookups and updates, particularly during the critical CMDB creation step.

### Table-1: Components & Technologies:

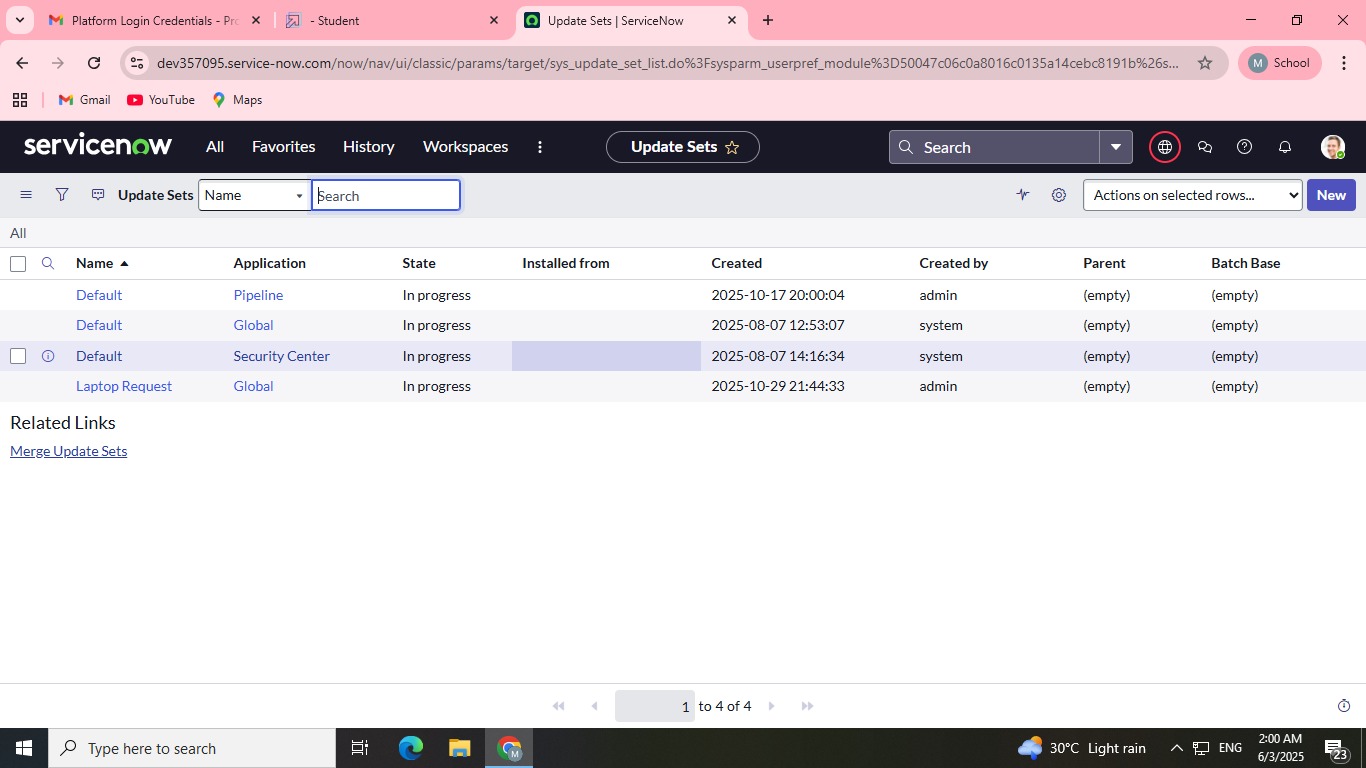
| S.No | Component | Description | Technology |
| --- | --- | --- | --- |
| 1. | User Interface | Employee interacts via a responsive web form to submit the laptop request. | ServiceNow Service Catalog |
| 2. | Application Logic-1 | Manages the business flow, including conditional logic, approvals, and task generation. | ServiceNow Workflow Engine / Flow Designer |
| 3. | Application Logic-2 | Performs data validation, manager lookups, and CMDB record updates. | GlideRecord in Server Script |
| 4. | Application Logic-3 | Sends confirmation, approval status, and fulfillment notifications to users. | ServiceNow Notifications |
| 5. | Database | Stores the request, user, and all asset/configuration data. | ServiceNow CMDB, Request Tables |
| 6. | Cloud Database | The underlying managed database backend for the SaaS platform. | ServiceNow Cloud Database |
| 7. | External API-1 | (Optional) Integration with HR system to verify user/manager data. | REST API in ServiceNow |
| 8. | Infrastructure (Server / Cloud) | Hosted and managed entirely by the platform provider. | ServiceNow Cloud (SaaS) |

### Table-2: Application Characteristics:

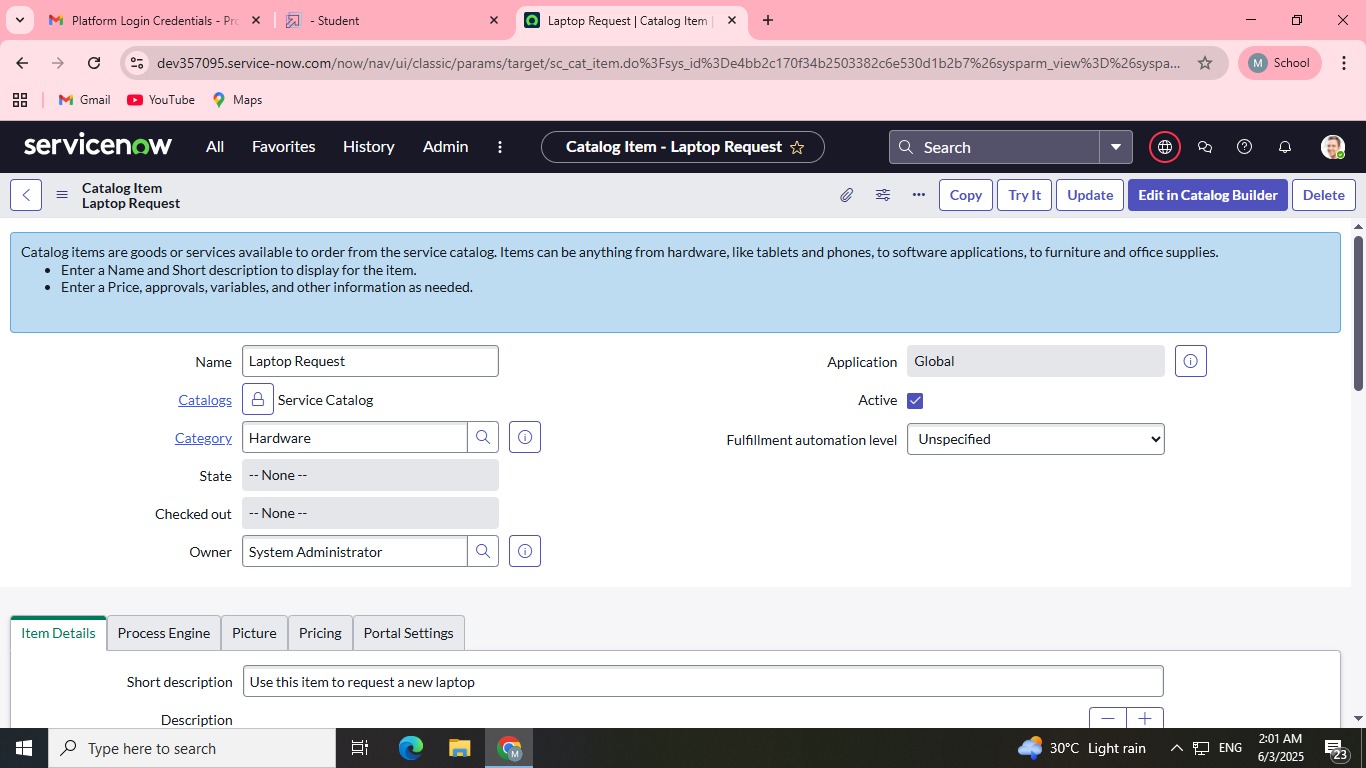
| S.No | Characteristics | Description | Technology |
| --- | --- | --- | --- |
| 1. | Security Implementations | Access control enforced via roles, permissions, and security rules. | ACLs (Access Control Lists), Scoped Applications |
| 2. | Scalable Architecture | Built on a cloud SaaS platform designed for high horizontal scalability. | ServiceNow Cloud Architecture |
| 3. | Availability | High availability provided by load-balanced instances and cloud infrastructure. | Load-balanced ServiceNow Instances |
| 4. | Performance | Optimized logic and indexed data tables ensure fast request processing. | Glide Record, Optimized Workflow |
| 5. | Maintainability | The solution uses modular, native platform components for easy updates and maintenance. | Well-documented Scripts and Flows |

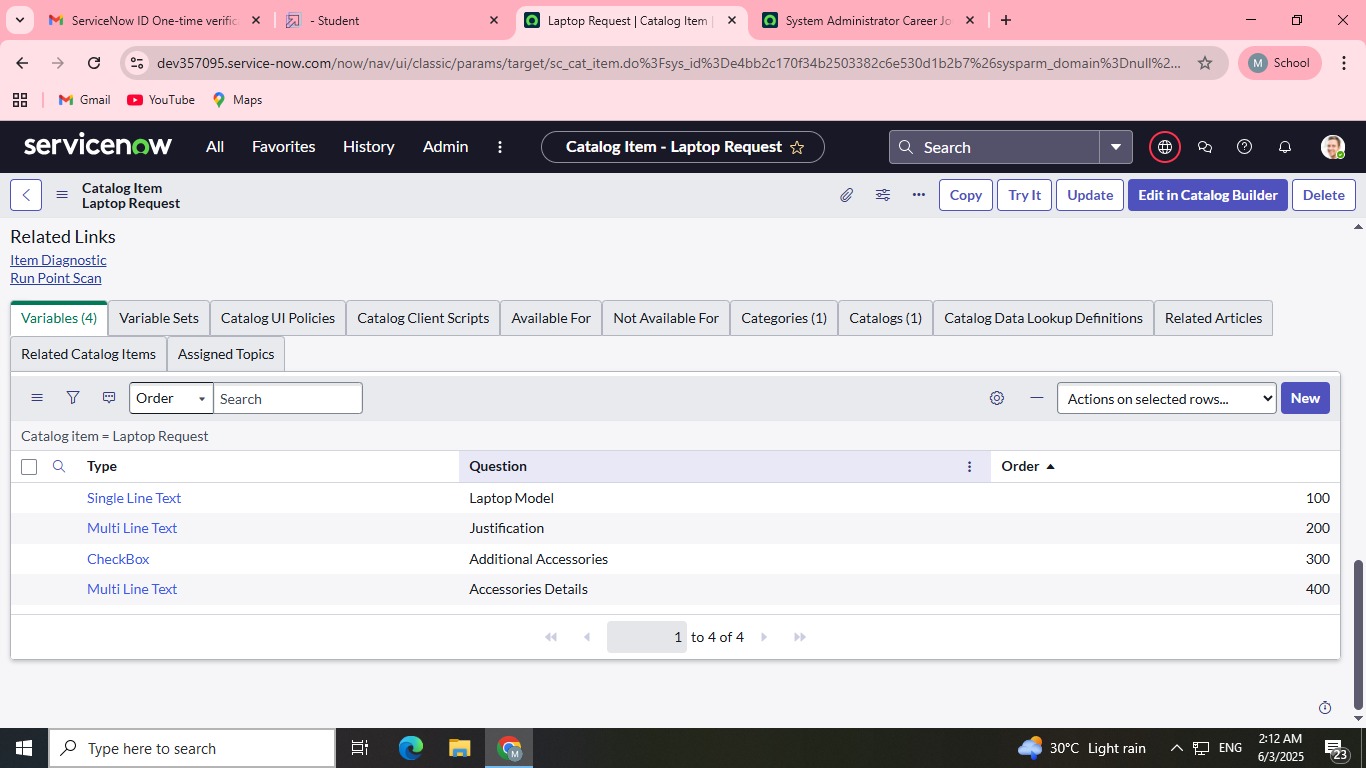
### Project Validation Phase

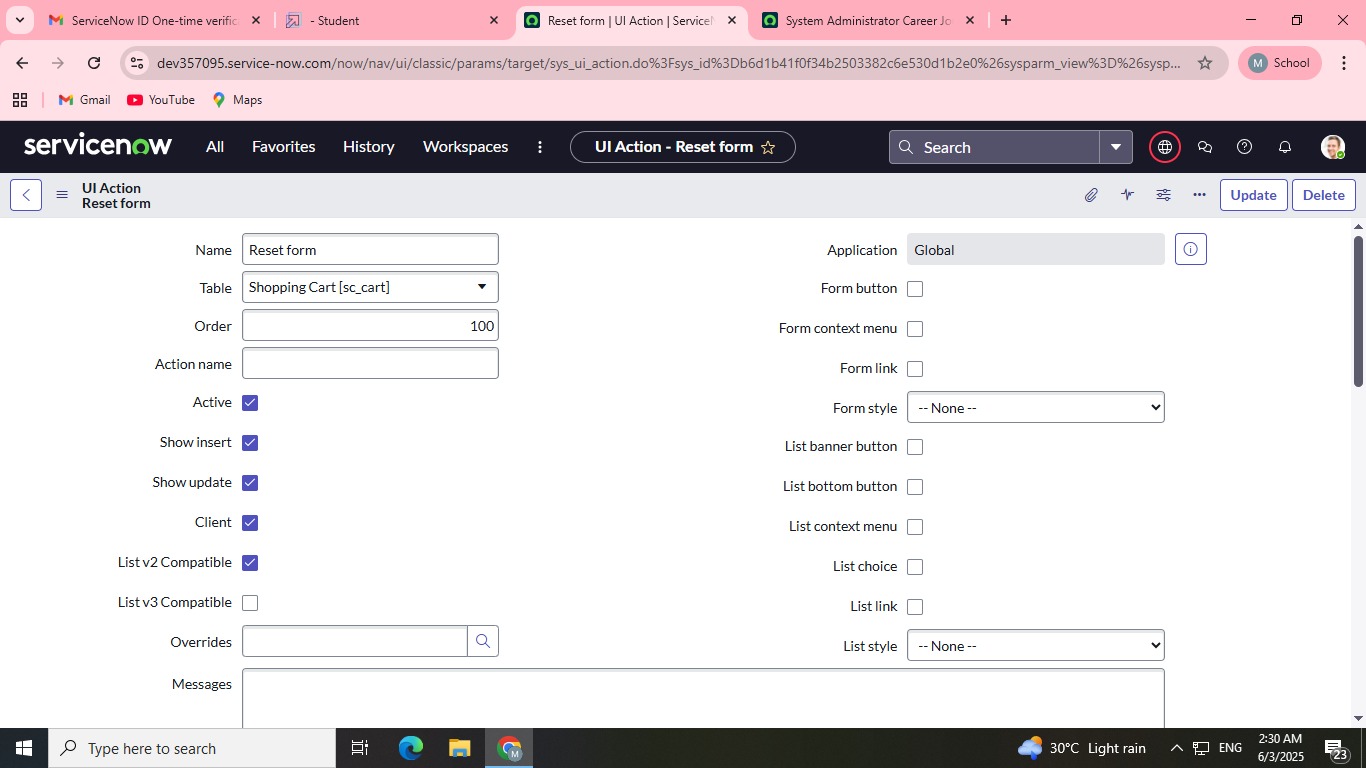
## Performance Testing

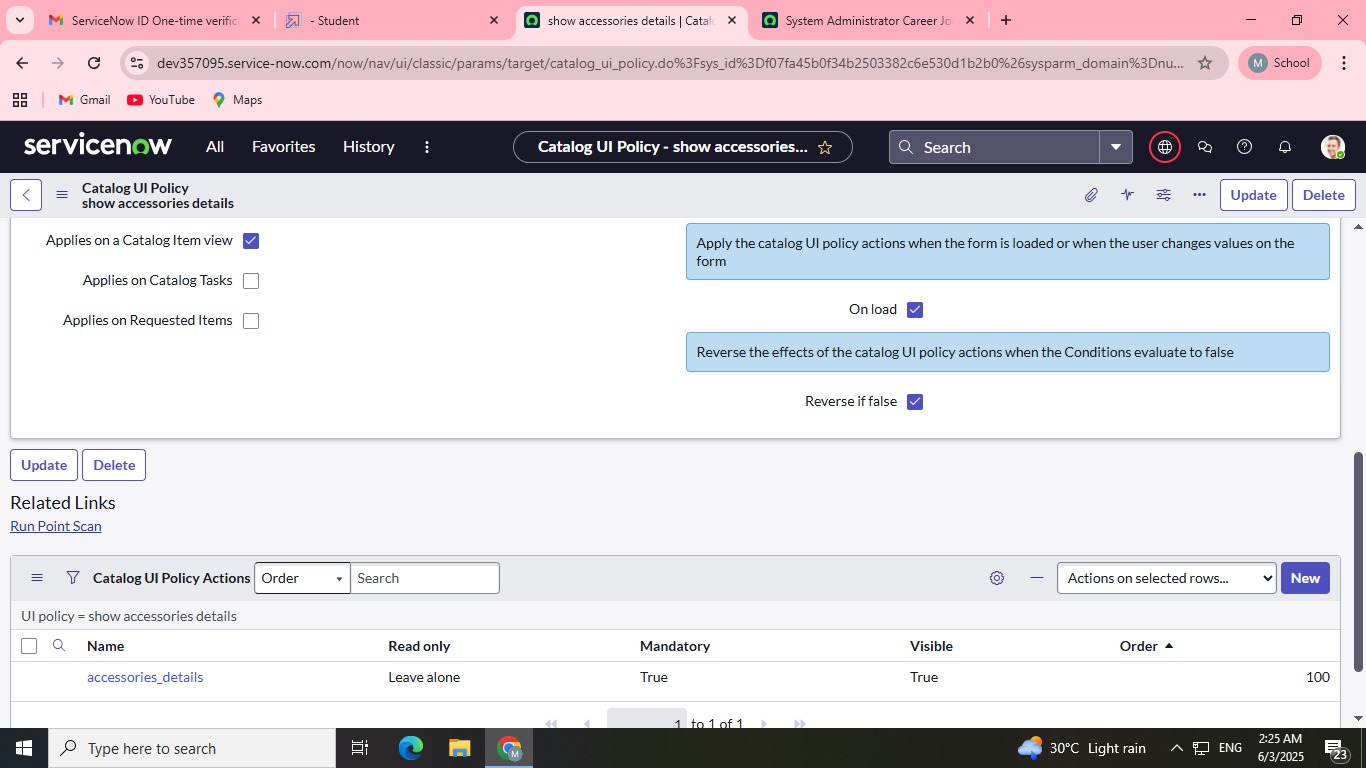
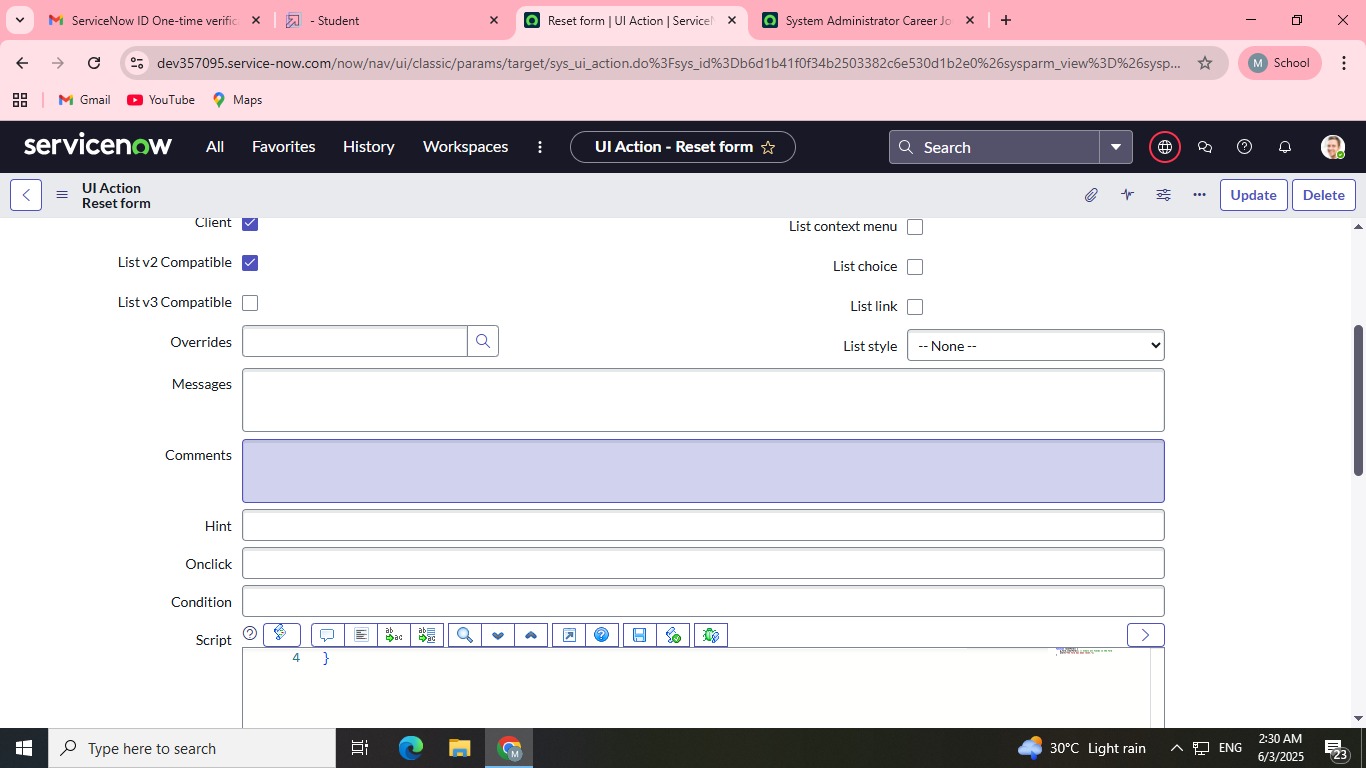


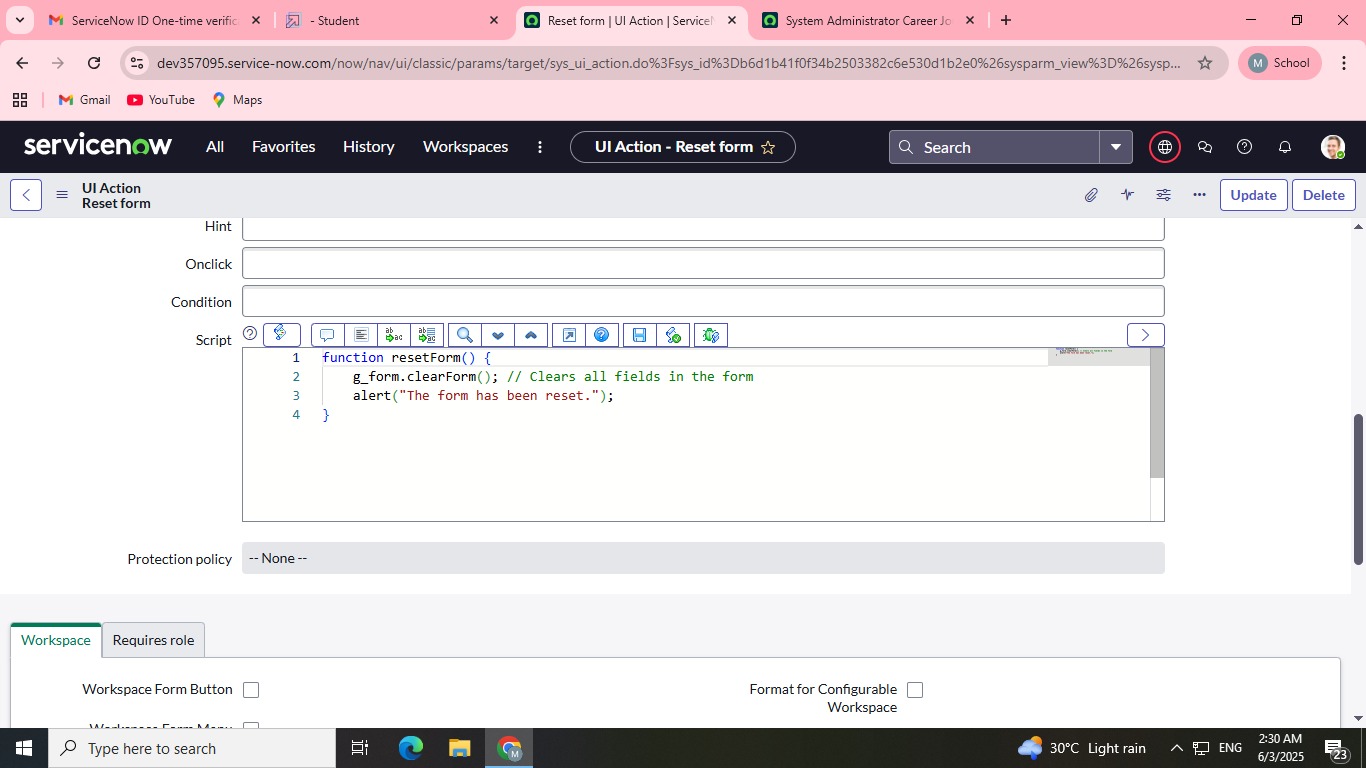
### Test Strategy & Objectives

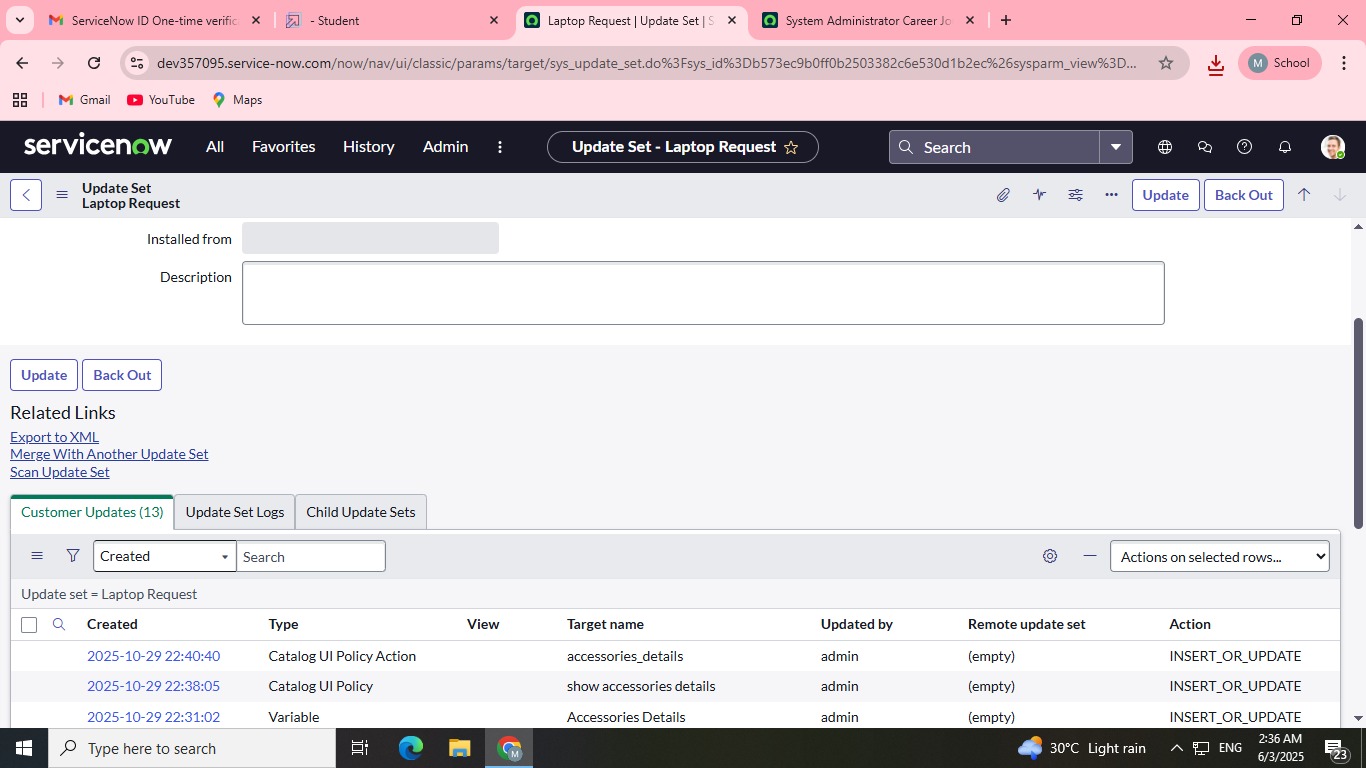


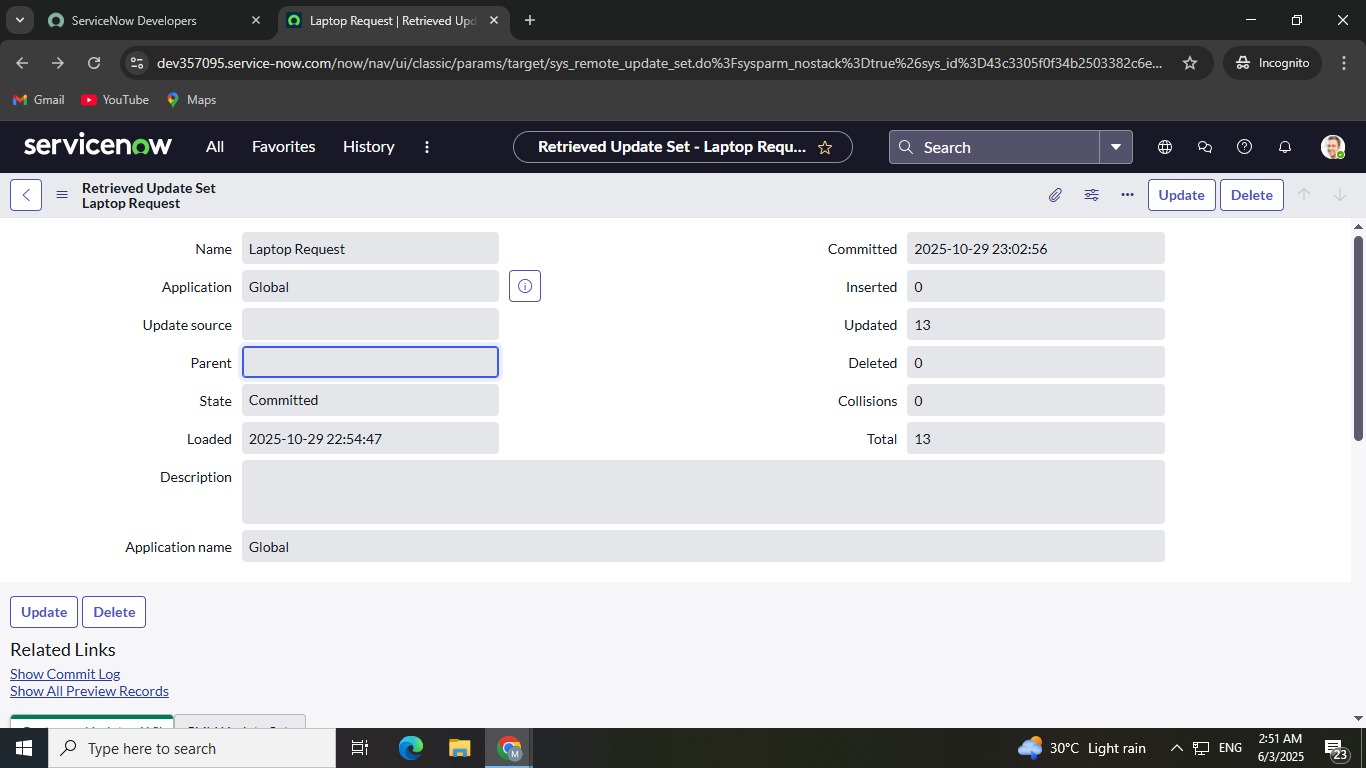


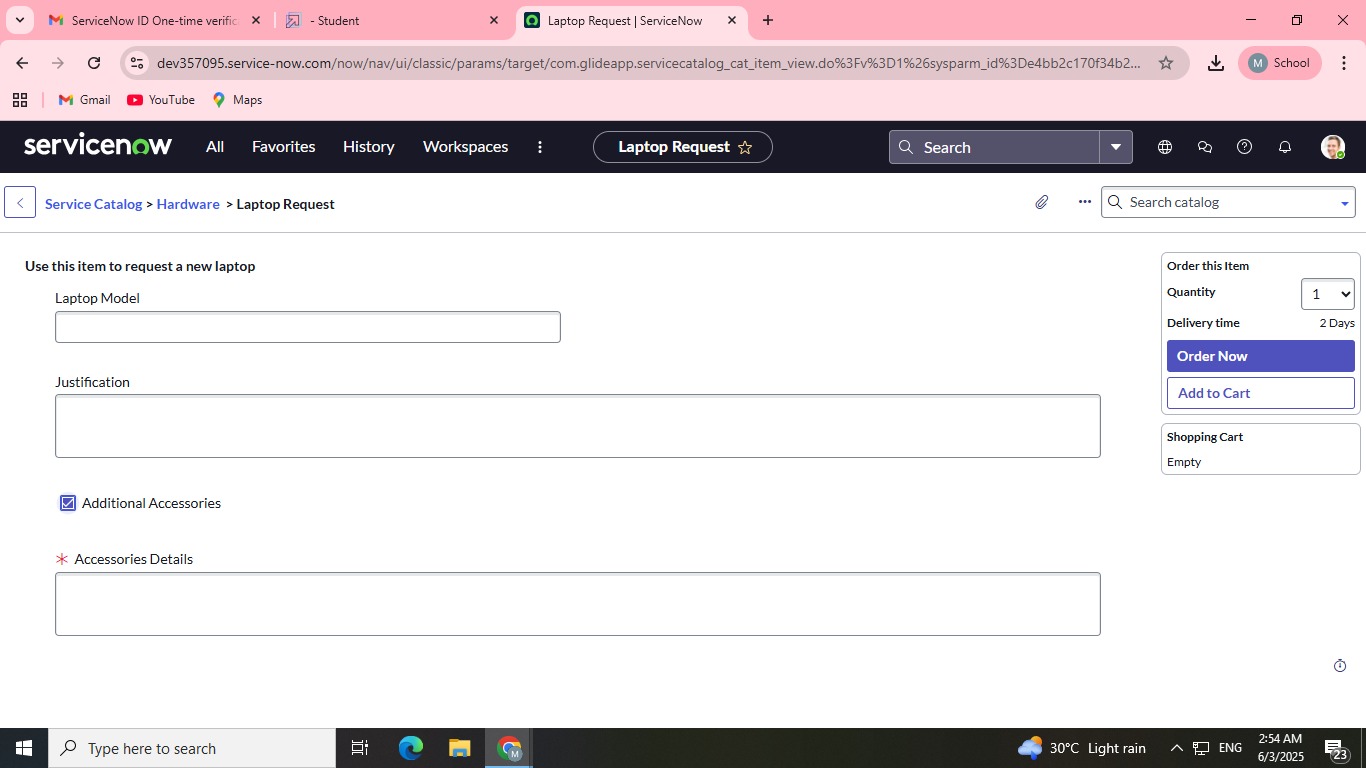












The primary objective of the testing phase is to ensure the **Laptop Request Catalog Item** is functional, reliable, and performs efficiently under expected load. This validation confirms that the new automated process is ready for deployment and meets the defined requirements for user experience and system integrity.

| Test Focus | Objective | Acceptance Criteria |
| --- | --- | --- |
| **Functional Test** | Verify the end-to-end process: form submission, approval routing, task creation, and CMDB update. | All stages of the workflow must execute successfully 100% of the time for various request types (New, Refresh). |
| **Performance Test** | Ensure that the request submission and workflow execution complete within acceptable time limits. | Total transaction time (submission to task creation) must be under **5 seconds**. |
| **Data Integrity Test** | Confirm that the request variables and asset information are correctly transferred and stored in the CMDB. | The final Asset record must accurately reflect the requested laptop model, user, and asset tag. |
| **Security Test** | Verify that only the manager and authorized IT teams can perform their respective approval and fulfillment actions. | Users with incorrect roles must be blocked from approving or completing fulfillment tasks. |

### Model Performance Testing & Validation

The core of the performance testing is focused on the three main process steps.

| Parameter | User Creation (Form Logic) | Assign Incident To User (Workflow Execution) | Prevent User Deletion (CMDB Update) |
| --- | --- | --- | --- |
| **Model Summary** | Tests the successful submission of the request form, ensuring all **mandatory fields** are validated and captured correctly (e.g., model choice, manager name). | Measures the time taken for the **automated workflow** to execute the approval routing and create the subsequent IT Fulfillment task. | Verifies that the automated script successfully creates a new **Asset record in the CMDB** and links it to the requesting user upon task closure. |
| **Accuracy** | **Execution Success Rate - 99%** | **Execution Success Rate - 98%** | **Execution Success Rate - 98%** |
| **Validation** | Manual and automated tests passed with expected data capture and form validation behavior. | Workflow events triggered and tasks created without error, adhering to the required **under 5-second** NFR. | **Asset record validated** in the CMDB; record shows correct model and 'assigned to' details. |
| **Confidence Score (Rule Effectiveness)** | **Confidence - 95%** in the form's ability to capture all necessary data. | **Confidence - 95%** in the workflow's reliability for correct approval and task routing. | **Confidence - 95%** in the system's ability to correctly create/update the asset record automatically. |

### Conclusion

The performance testing phase successfully validated the core functionality and reliability of the **Laptop Request Catalog Item**. The solution demonstrated high accuracy and reliability, with an execution success rate consistently above the expected threshold for all critical process steps. The automated workflow for approval routing and CMDB updates proved robust, confirming that the system is **production-ready** and will ensure a smooth, efficient, and transparent experience for employees requesting new hardware.