Design-Time Process Simulator for Early Validation of Camunda Workflows

Challenge Title

“Camunda Design-Time Process Simulator (Entry-Level MVP)”

Describe Your Idea

Today, we can only validate Camunda workflows **after** they are deployed and wired into the **Telflow training/test environment** (enquiry, delivery process, job workers, Vault config, etc.). This means:

- We discover **BPMN/DMN defects late** (wrong variables, gateway conditions, DMN logic).
- Testing **all paths at runtime** is heavy, slow, and often incomplete.
- **Business Analysts (BAs)** who design processes can’t easily validate their models until everything is integrated.

Using the **Entry Level – Camunda Exercise** as a reference process, this challenge will deliver a **small but working MVP** of a **Camunda Design-Time Process Simulator** that runs **before deployment**, without needing the training environment.

Scope of the MVP (What We Will Actually Build in a Week)

For the specific *Entry Level – Camunda Exercise* process:

- **Inputs** (mirroring the enquiry fields):
  - `manualPriceCost` flag (manual pricing/costing).
  - `dealMarginPercent` (margin percentage).
- **Process + Decision to Simulate**
  Based on the exercise page:
  - BPMN containing:
    - `Prepare Values for DMN` (service task using `data-manipulation` headers to map `bi_dealMarginPercent` and `bi_manualPriceCost` into process variables).
    - `Look-up Results` (DMN decision call with Decision ID `entry_level_camunda_exercise_v1_0` writing to `quoteValidity`).

        - `Result / Decision Gateway` with:
            - **Default flow** → `Set Status Valid` (sets `cim_Status = "Valid"`).
            - Conditional flow `quoteValidity = "Invalid"` → `Set Status Invalid` (sets `cim_Status = "Invalid"`).
    - DMN attached on the page:
        - If **margin < 25% OR manualPriceCost = true** → `quoteValidity = "Invalid"`.
        - Otherwise → `quoteValidity = "Valid"`.

The MVP simulator will:

1. **Run the process at design time (no environment needed)**
    - Load the Entry-Level BPMN and DMN files (from disk or a simple config).
    - Accept inputs for:
        - `manualPriceCost` (true/false).
        - `dealMarginPercent` (number).
    - Execute:
        - "Mocked" `Prepare Values for DMN` (no real job worker, just variable mapping).
        - The internal DMN decision `entry_level_camunda_exercise_v1_0`.
        - The `Result / Decision Gateway` logic based on `quoteValidity`.
2. **Show the path taken and outcome**
    - Display:
        - The evaluated **DMN result**: `quoteValidity = "Valid"` or `"Invalid"`.
        - The **BPMN path** taken, e.g.:
          `Start → Prepare Values for DMN → Look-up Results → Result / Decision Gateway → Set Status Valid → End`
          or
          `… → Set Status Invalid → End`.
    - This can be a **simple text/path trace** or a very light visual representation (no complex modelling UI required for MVP).
3. **Support basic scenario exploration**
    - Allow BAs/testers to quickly run multiple "what-if" inputs (e.g. change `dealMarginPercent`, toggle `manualPriceCost`) and see:
        - Whether the process is **Valid** or **Invalid**.

        - Which branch of the gateway is taken.
    - Optionally pre-populate a few canned scenarios:
        - `manualPriceCost = true`, `dealMarginPercent = 30` → Invalid.
        - `manualPriceCost = false`, `dealMarginPercent = 24` → Invalid.
        - `manualPriceCost = false`, `dealMarginPercent = 25` → Valid.

Key Outcome (Hackathon MVP):
A **working design-time simulator for the Entry Level Camunda Exercise**, proving that BAs and testers can **mock and validate process behaviour and DMN decisions early**, without deploying to Telflow training or configuring real job workers.

What is the business / user impact of implementing your idea?

Business Impact

- **Shift-left detection of workflow/rule defects**
    - Catch misconfigured DMN logic, gateway conditions, and variable mappings **before deployment**.
    - Reduce late defects found only when the enquiry is wired to the process in training/test.
- **Lower cost of changes and faster iteration**
    - BAs can safely experiment with rule thresholds (e.g. margin cut-offs) and immediately see Valid/Invalid outcomes.
    - Less rework on BPMN/DMN after deployment.
- **Foundation for broader process testing accelerator**
    - The MVP acts as a **pattern** that can later be extended to other BPMN/DMN models beyond the entry-level exercise.

User / Internal Team Impact

- **Business Analysts**
    - Can “test drive” their Entry-Level process **in Camunda design time** using only the modeller and simulator.
    - Immediately see how different `manualPriceCost` and `dealMarginPercent` combinations affect **quote validity and path routing**.
- **Test Engineers**
    - Move some validation **earlier**, instead of only at runtime via the full enquiry + delivery process flow.

    - Use design-time scenarios as a starting point for later **runtime regression tests** in Telflow.
- **Developers**
    - Receive **better-validated models** from BAs, with fewer logic errors to fix post-deployment.
    - Gain a simple harness they can reuse when implementing or refactoring job workers.

What other skills do you need to make your idea a reality?

Given the team you already have (Camunda-expert BA, Telflow test engineer, backend dev), the **MVP is feasible in a week**. The skills required fit your current mix:

Camunda & Modelling Skills (BA / Tech BA)

- Comfortable with **Camunda Modeler**, BPMN, and DMN (already used in the Entry Level exercise page).
- Able to validate that the simulator's behaviour matches:
    - The DMN logic `entry_level_camunda_exercise_v1_0`.
    - The gateway conditions and status-setting behaviour described on the Confluence page.

Test Engineering (Runtime & Design Testing in Telflow)

- Define **test scenarios** and expected outcomes based on the enquiry/DMN rules:
    - Edge cases for margin and manual pricing combinations.
- Compare simulator results with actual behaviour in **training** (post-deployment) to show value.

Backend / Integration Development

- Implement a small **simulation service** that:
    - Accepts input variables and scenario definitions.
    - Mocks the `data-manipulation` worker behaviour (no real worker or Vault).
    - Invokes DMN evaluation for `entry_level_camunda_exercise_v1_0`.
    - Determines and returns the executed path (Valid vs Invalid branch).
- Provide a **minimal UI or API** that BAs and testers can use during the hackathon demo.

Which of the hackathon themes does your challenge best apply to?

Theme: Solution Accelerator

This MVP is a **Solution Accelerator** because it:

- Turns the existing **Entry Level – Camunda Exercise** guide into a **working design-time testing tool**.
- Demonstrates a **reusable pattern** for simulating Camunda processes and DMN decisions **before** integration with Telflow.
- Directly tackles the pain point of **late, runtime-only path testing** by enabling **early, BA-driven validation** of Camunda workflows.

Reference

Entry Level - Camunda Exercise