Exploring Camunda

Journey to learning Camunda

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1 Introduction

In this article, I will share my journey of learning Camunda, an open-source platform for workflow and decision automation. As businesses strive for efficiency and agility, understanding tools like Camunda becomes crucial for streamlining processes and optimizing operations. I am very motivated to explore this powerful platform, and I embarked on a learning adventure to uncover the possibilities it offers.

I will share some valuable lessons learned throughout this article.

1.1 Motivation and Goals

I am motivated to learn camunda as it is a necessary tool for infrastructure automation and to also enhance productivity. Here are some goals that I want to accomplish:

- Gain a solid understanding of BPMN.
- Understand camunda's workflow engine.
- Effectively model and automate complex business processes.
- Camunda integration with other systems.
- Collaboration with co-workers

2 What is BPMN ?

Business Process Model and Notation was developed as a graphical notation to represent complex processes and address these challenges. It is maintained by the non-profit The Object Management Group (OMG).

2.1 Basics of BPMN

Here are the foundational elements of BPMN:

- Process.
- Activities (Tasks, Sub-Processes, and Call activities)...

  Tasks can be divided into many types, here are some of them:

  - Service Task (Invoke or execute business logic)
  - User Task (A task performed by a human participant)
  - Business Rule Task (Execute an automated business decision)
  - Script Task (Execute a Script)
  - Receive Task (Wait for a message to arrive)
- Events (Start Events, Intermediate Events, and End Events).
- Gateways (Exclusive, Parallel, and Inclusive Gateways)
- Sequence Flow.
- Data Objects.

2.2 Learning Process and Resources

I started by learning the concepts of each elements used in BPMNs (tasks, symbols, activities...), and then since I had previous knowledge of modeling languages and UML diagrams, so it all seemed similiar. Then, I created some simple examples :
One of them was automating a Car Starting System (Each car executes some checks before starting). I also read some best practices on using BPMNs.

3 What is Camunda ?

Camunda is an open-source platform for workflow and decision automation. It provides a powerful workflow engine, BPMN modeling capabilities, and tools for managing and executing business processes. With Camunda, organizations can automate and optimize their business processes, improve efficiency, and enhance visibility into process execution.

3.1 Camunda Platform 7 vs 8

The key difference between Camunda Platform 7 vs 8 is that Camunda platform 8 has more features (Connectors, Tooling, Flow engine, More scalable...), it is also not backwards compatible because Camunda Platform 8 is an extention of Camunda Cloud.

4 Creating a Simple Process

4.1 Designing a Process

For this section, I have decided to implement a small simple project using BPMN in Camunda to learn more about it. For designing the process, here are the steps I did to implement a new employee integration system:

- A start process is initiated to start the process of employee integration.
- A first task (user task) is created that represents collecting user information such as Identification, employment forms, certifications..etc
- The next task is assigning the new employee to various tasks and departements.
- Next, we execute parralel tasks (first one is a user task which orients the new employee and provides information about company policies, culture, and team introductions, and the second task is a service task which is used to automate generating welcome

emails, provisioning accounts, and preparing employee workstations).

- The last task is reviewing all the documents by the HR departement to confirm completion of all tasks.
- and now the end event is triggered to end the process.

Here is how the implemented simple process looks like:

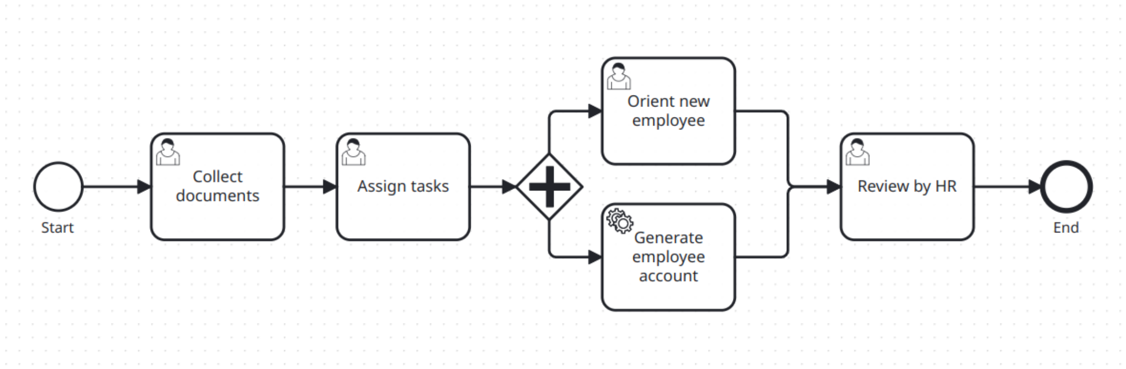

Figure 1: Simple Process

4.2 Executing the Process

Here is the process I used to deploy and execute the process:

- First, I exported the BPMN file which contains the XML representation.
- Then, we can access it on 'http://localhost:8080/camunda/app/cockpit' by loggin in using demo / demo as a username and password.
- We now can create a deployment by importing the BPMN file.
- We then check for the state of the process.
- Now, we can go to the tasklist which is accessible on 'http://localhost:8080/camunda/app/tasklist' and start the process.
- Finally by checking on Camunda Cockpit, we can see that there is an instance running.

4.3 Adding an external task (service task)

In this section I will be implementing small script in python that will be integrated with camunda as a service task.

Here are the steps it took me to implement it (following instructions from https://github.com/camunda-community-hub/camunda-external-task-client-python3):

- First I initialized a new python project using a python virtual environment ‘python -m venv venv‘, then sourcing the ‘venv/bin/activate‘ script to activate the python virtual environment.
- Next, I installed the camunda external task client using the command ‘pip install camunda-external-task-client-python3‘
- Then, I used the command ‘pip freeze > requirements.txt‘ to save all the dependencies.
- I then created a simple BPMN process using camunda modeler which contains a service task which has a topicName (for integration) as you can see in figure **??**.
- Then, I deploy that process locally ‘http://localhost:8080/camunda/app/cockpit‘.
- Next, I added the python code from camunda python external client repo.

```python
import time
from camunda.external_task.external_task import ExternalTask, TaskResult
from camunda.external_task.external_task_worker import ExternalTaskWorker

default_config = {
    "maxTasks": 1, "lockDuration": 10000,
    "asyncResponseTimeout": 5000, "retries": 3,
    "retryTimeout": 5000, "sleepSeconds": 30
}

def handle_task(task: ExternalTask) -> TaskResult:
    print("Hello world!")
    return task.complete({"var1": 1, "var2": "value"})

if __name__ == '__main__':
   ExternalTaskWorker(worker_id="1",
      config=default_config).subscribe("topicName", handle_task)
```

- Finally, executing the python code and letting it run as a daemon, we can see that it gets executed whenever the process is started.

5 What I Learned

Here are some key points that I learned from using camunda:

- Camunda as a whole and its benefits.
- The different components of the Camunda Platform.
- The basics of BPMN, the standard for process modeling.
- Execution and Orchestration of the process.
- User task management.
- Integration and deployment.
- Monitoring the process.

6 Conclusion

In conclusion, my journey of learning Camunda has provided me with valuable knowledge and skills in workflow automation and process management. Camunda's flexible platform, user task management capabilities, integration options, and community support make it a powerful tool for optimizing business processes. And now I think I am ready for real camunda projects.