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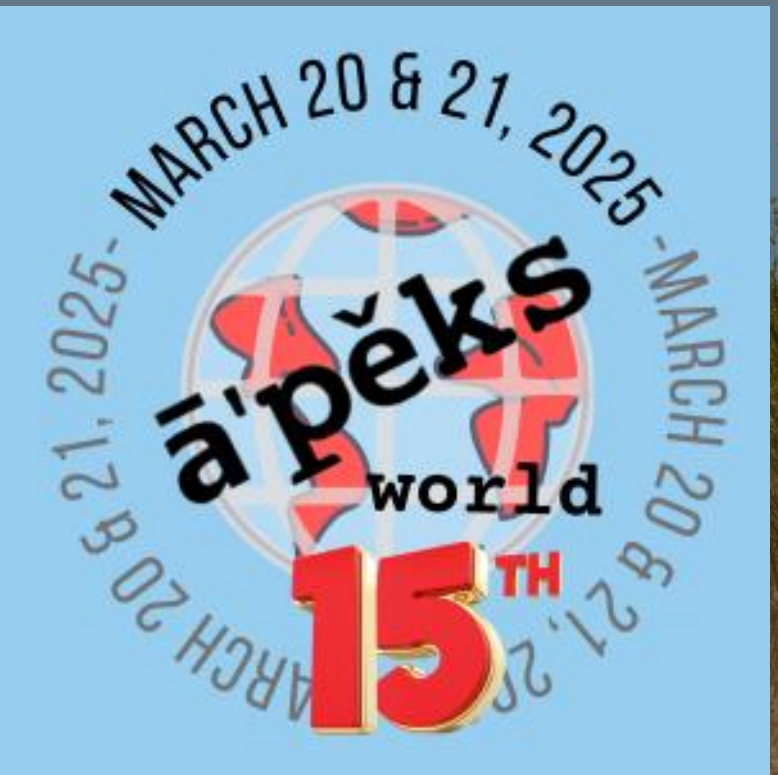
Enhancing Workflow in APEX with Flows for APEX: An Introduction and Update



Richard Allen
Director
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Richard Allen – About Me

Richard@Flowquest.net
@FlowquestR

Using Oracle since V4.1 (1985)

Ex-Oracle (twice!)

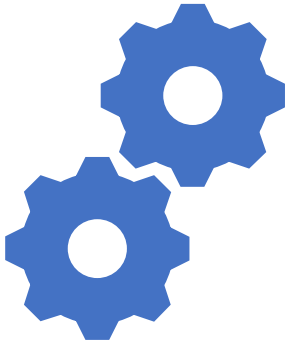
Lived in UK, US, Singapore and Malaysia

Developing Flows for APEX since 2020

Started Flowquest Limited to further develop Flows for APEX and support our enterprise users

flowquest

Warning!



Workflow is a big and complex topic, with many moving parts.

In 50 minutes, we can’t cover everything…
There is more detail in the slides.

Agenda

01

Intro to
Flows for APEX
and basic demo

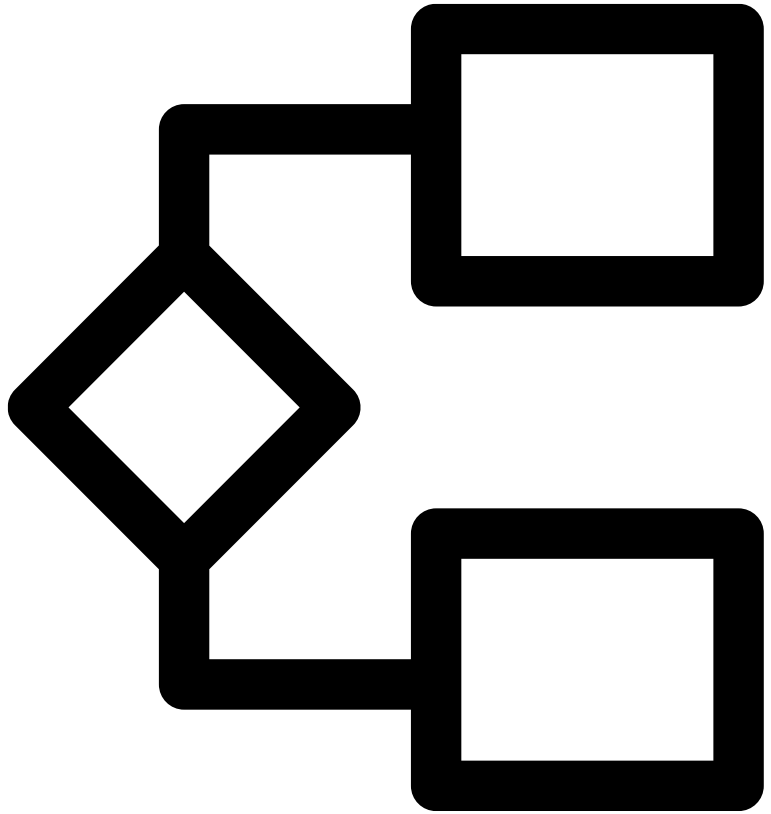
02

Key Workflow
Features

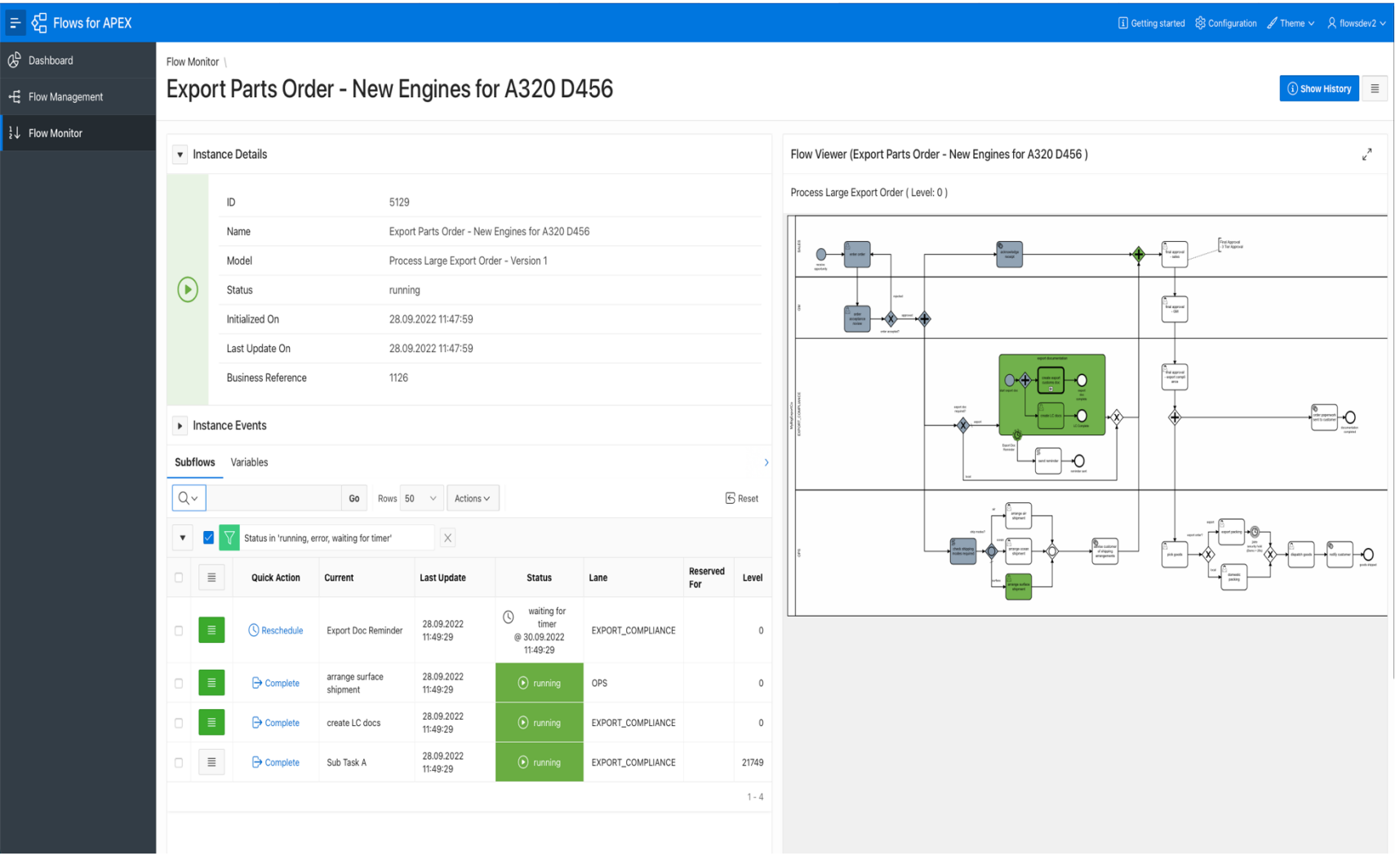
03

What's New

What is Flows for APEX?



Flows for APEX - BPMN based Workflow for APEX



Design and define your business processes

Develop them into APEX applications

Execute instances of the process

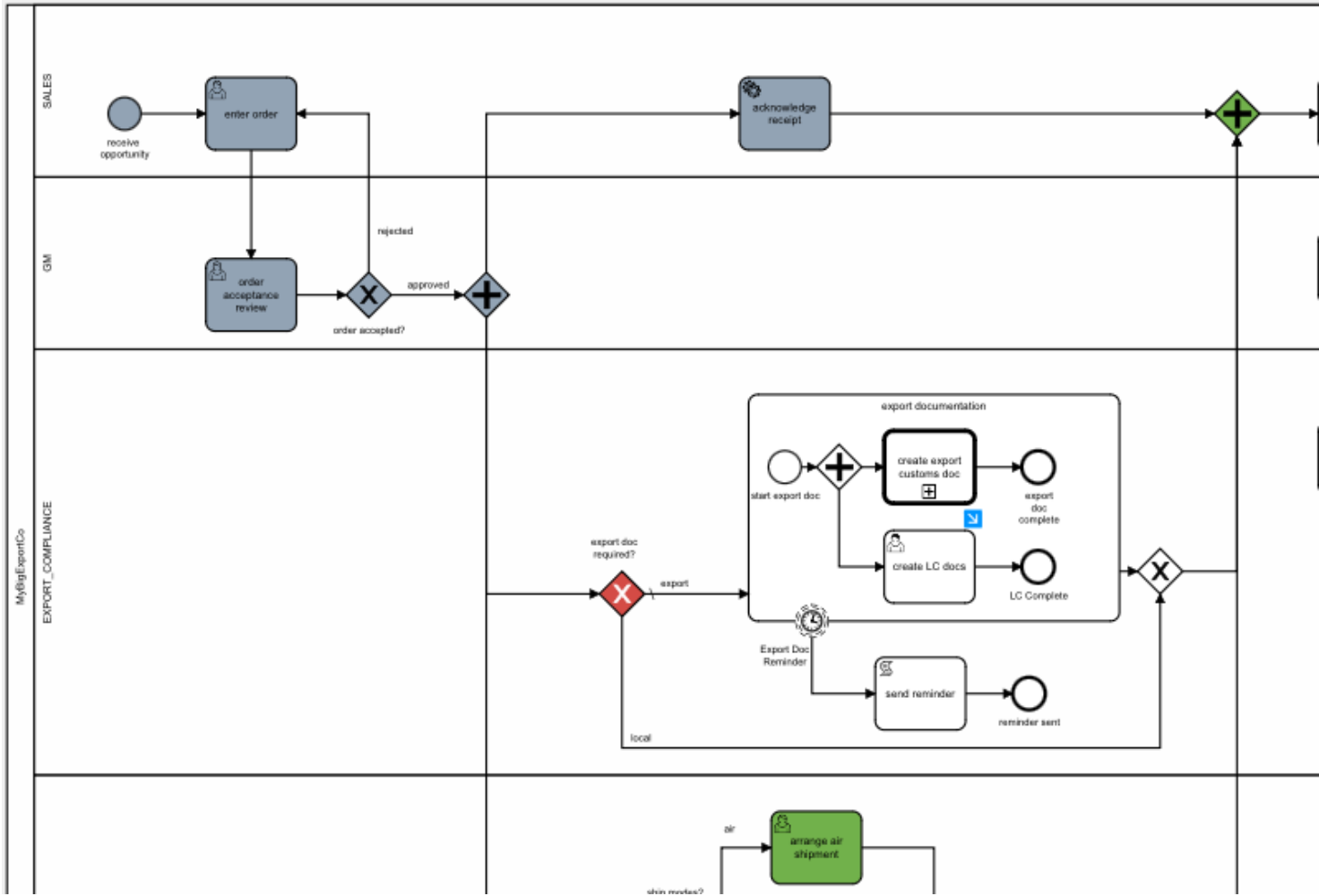
Monitor running process instances

Report on process performance

Flows for APEX is a BPMN 2.0 based Workflow System for APEX Developers

Business Process Model and Notation (BPMN) 2.0 is the accepted standard for Business Process Modelling.

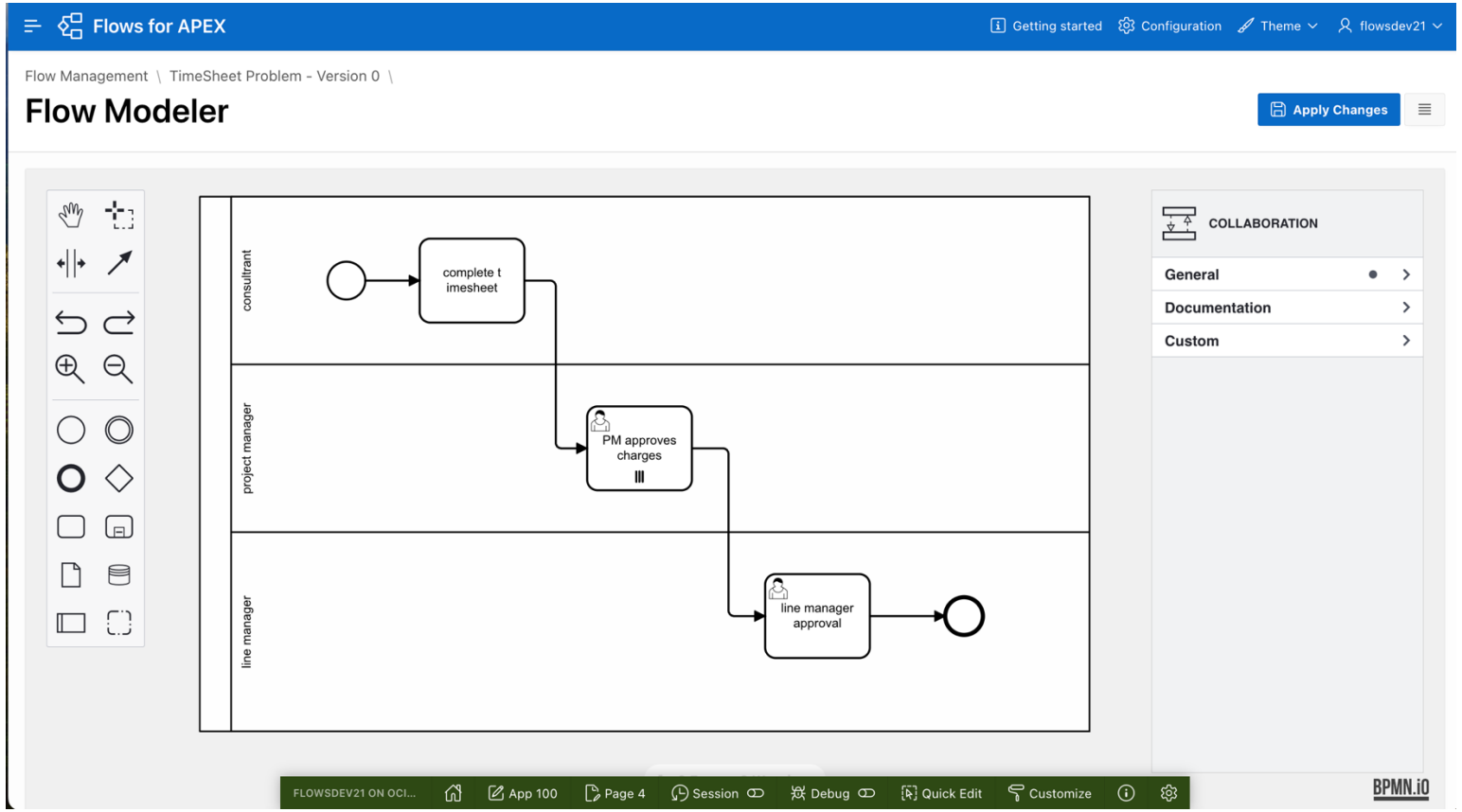
- allows modeling of simple AND complex business processes
- standard graphical notation that allows communication between business and IT
- And … it's understood by LLMs, e.g., gpt-4o, can explain, debug, translate and advise on BPMN processes.



…Business Process Modeler

Powerful, Easy to Use Modeler

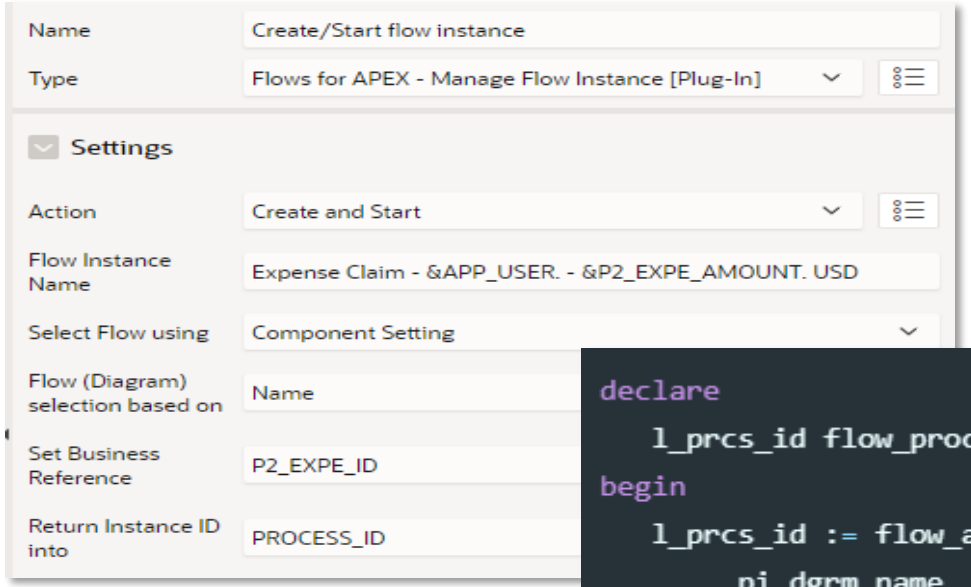
- Modeler runs in the Flows for APEX Application using the bpmn.io modelers and viewers
- Top-down process modeling and design
- Models are stored in Oracle as both BPMN / XML and in a parsed / relational format.



…Declarative Integration into APEX

Development, APEX-style!

- Declarative Development
- Uses SQL and PL/SQL API
- REST Enabled for remote calling
- Leverages Oracle and APEX
- Separate Process Logic from App Logic…



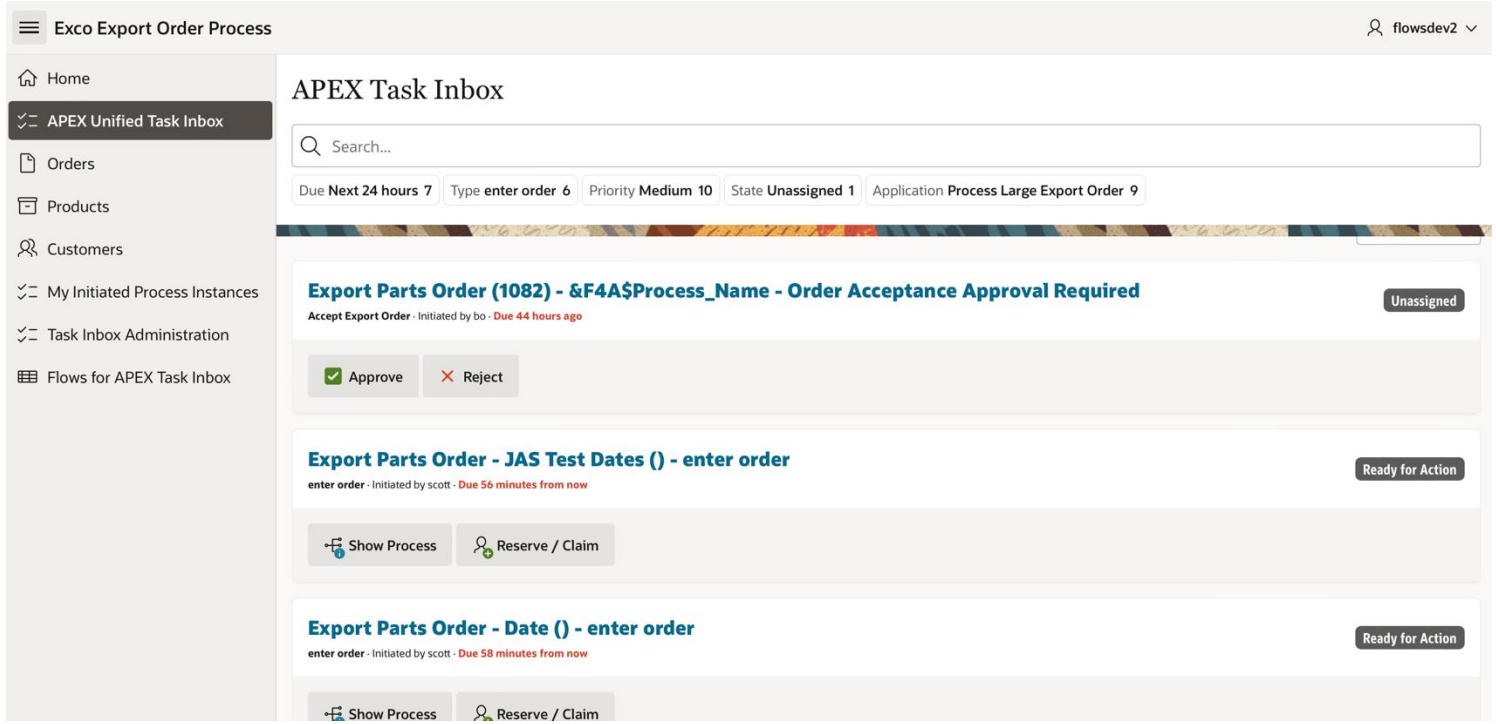
```
declare
   l_prcs_id flow_processes.prcs_id%type;
begin
   l_prcs_id := flow_api_pkg.flow_create(
        pi_dgrm_name    => 'My Model'
      , pi_dgrm_version => '0'
      , pi_prcs_name    => 'My Instance Name'
   );

   flow_api_pkg.flow_start(
      p_process_id => l_prcs_id
   );
end;
```

...Integrates with APEX Human Tasks and Workflow

Workflow can be integrated into all applications in the Workspace to create consistent interface across many workflows

- In-built tools for process visibility, task inboxes, etc.

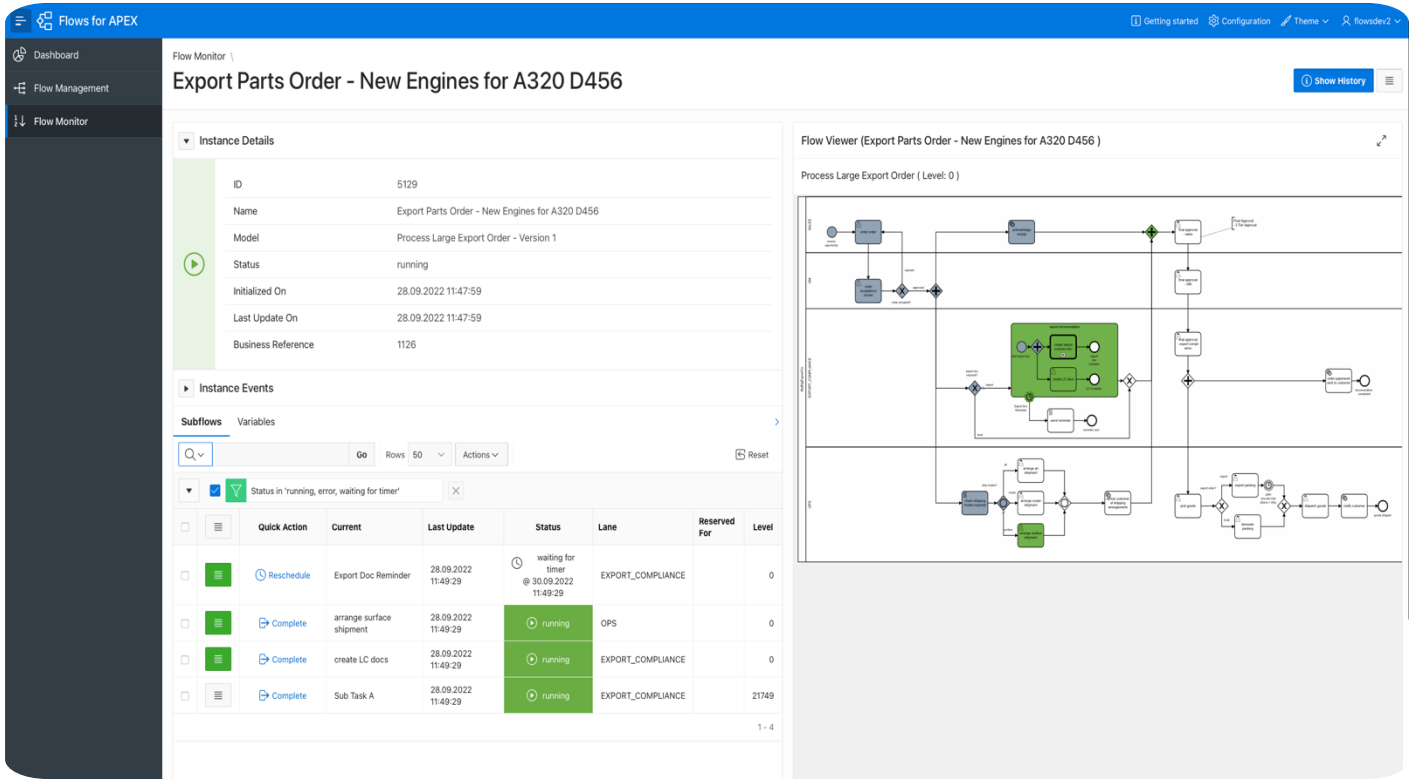


… Includes Process Monitoring, Audit, Stats

Flows for APEX Flow Monitor

- Monitor Process Driven Apps
- Full Logging, Audit, Process Archive features
- Fully leverages Oracle Platform
- Process Performance Statistics and Trends

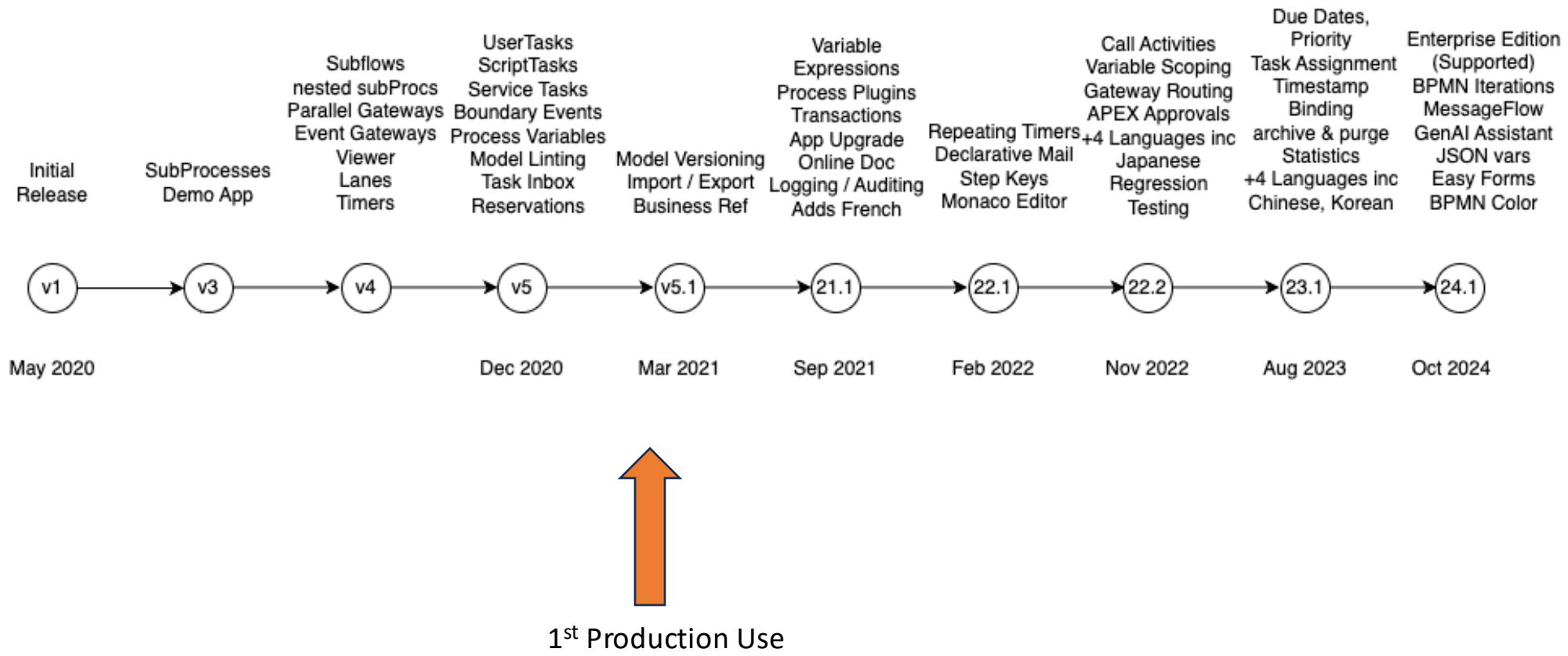
Stored separately from APEX meta-data.



Demo

- Model & Run Simple Model

Flows for APEX Project Releases



The Open Source Project Team

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Amthor
Hyand

Louis
Moreaux
Insum

Jörg
Doppelreiter
Solicon

A special thanks also goes out to our language translators and proof readers!

Some Flows for APEX Customers in Production or Development

Dealer Management

Major Regional Telco (UAE)
ERP Approval Management

Govt Process Automation
(with Fujitsu)

Oracle

Multiple Production Apps

Patient Billing / Insurance

Israel University Projects

US Defense Contractor
HR Processes

Aviation Charter Reservations
(Insum) (OCI)

Electric Motor Manufacturer
EBS Extension (Insum)

Auto Parts Manufacturer
HR Processes

Fund Management
Customer Support Processes

Nomura Research
AML / NYC System (OCI)

HyperGRC – MyRisk
Security Vulnerability Products
on OCI

UK Royal Navy
HR Processes

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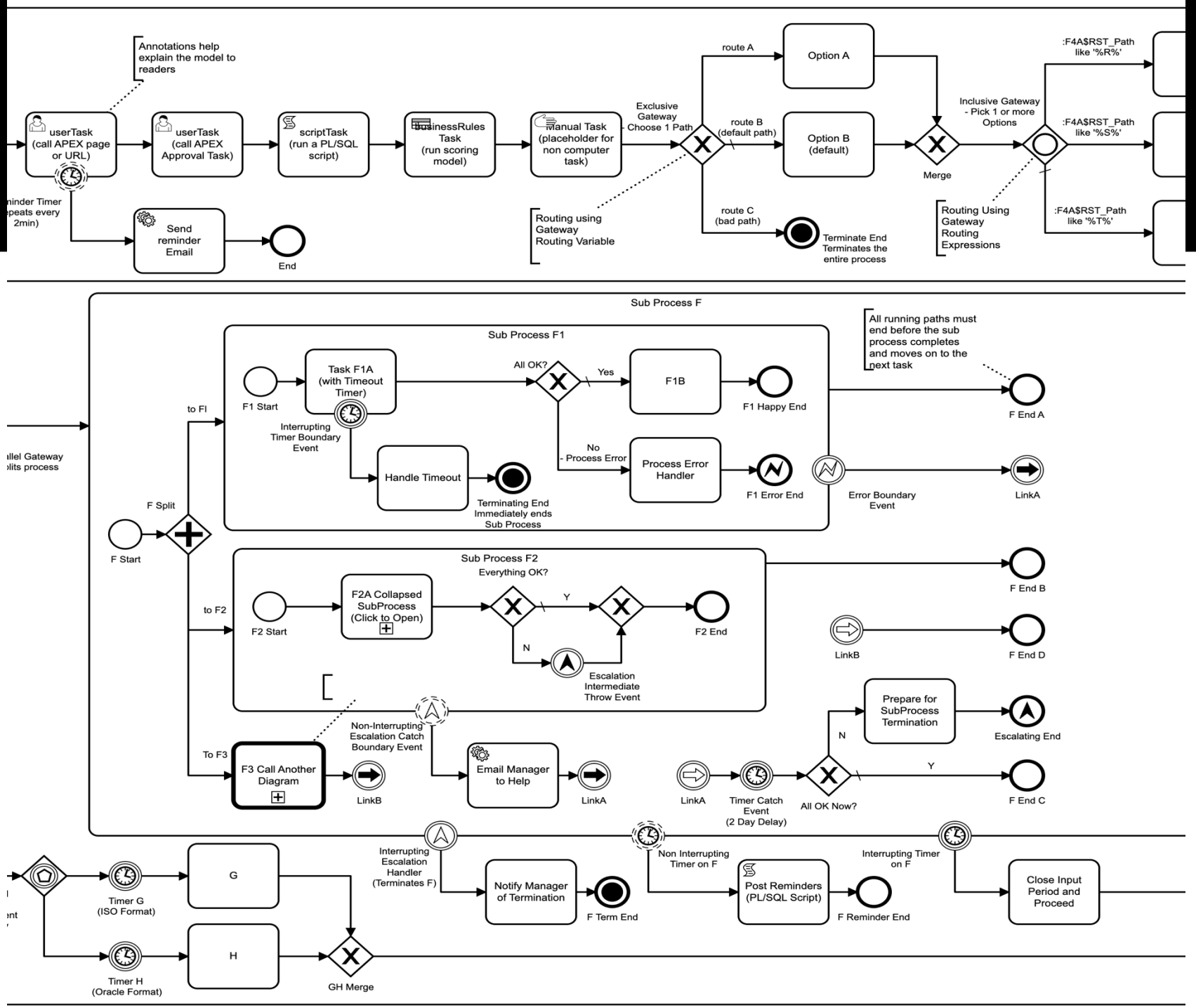
More Advanced Features...



Human Task Types – BYO, Use APEX Approvals, or Don't...

APEX Page

Build your own APEX page to collect required data.

Using Flows for APEX process plugins, declaratively connect your task page to the Flows for APEX workflow engine.

APEX Human Task

Use the APEX Approval Task / APEX Action Task tasks from APEX.

APEX manages the task, including delegation, request for information, expiry – returns an Outcome when completed.

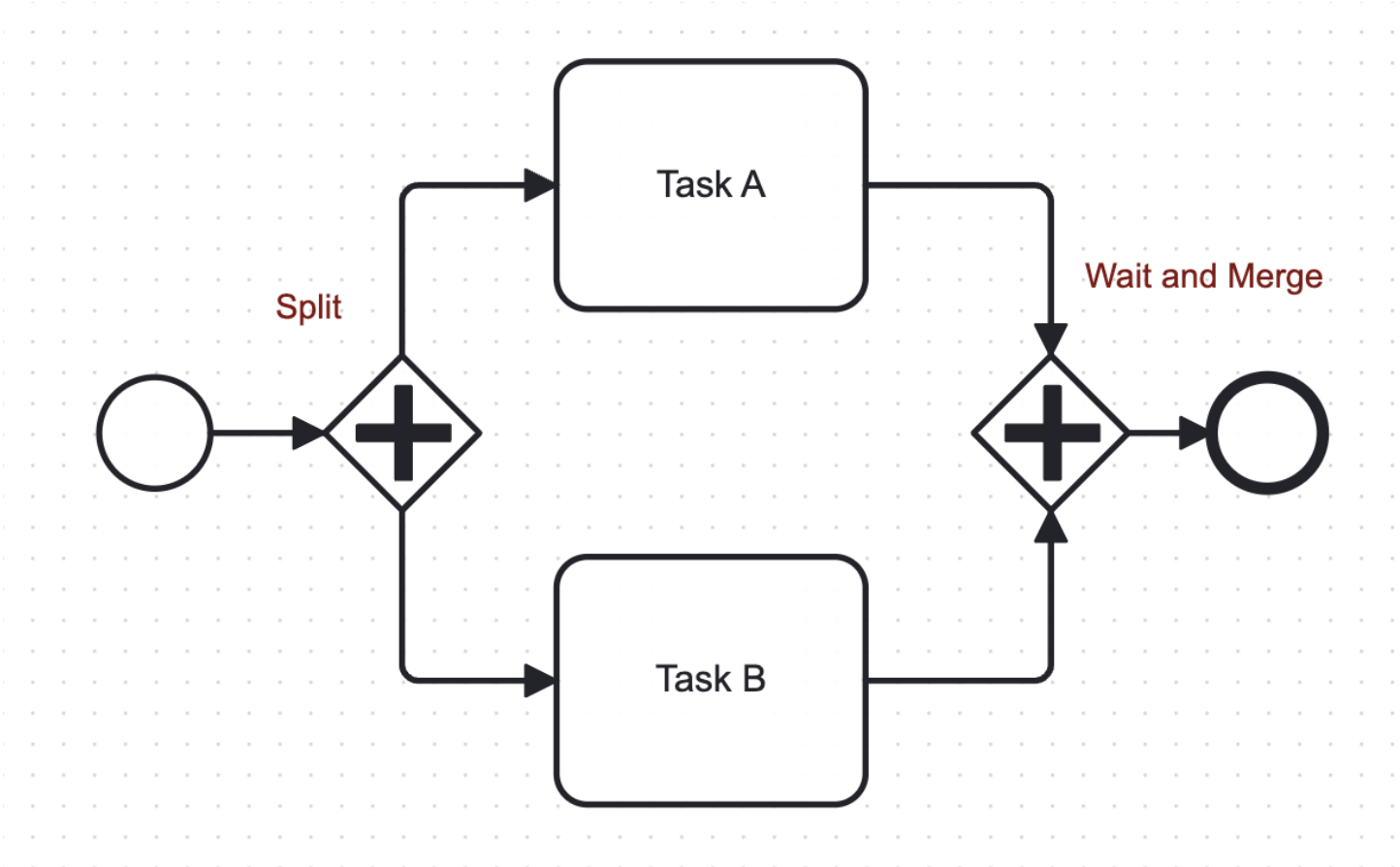
Simple Form

Uses Dynamic JSON Region Plugin from Ewe Simon.

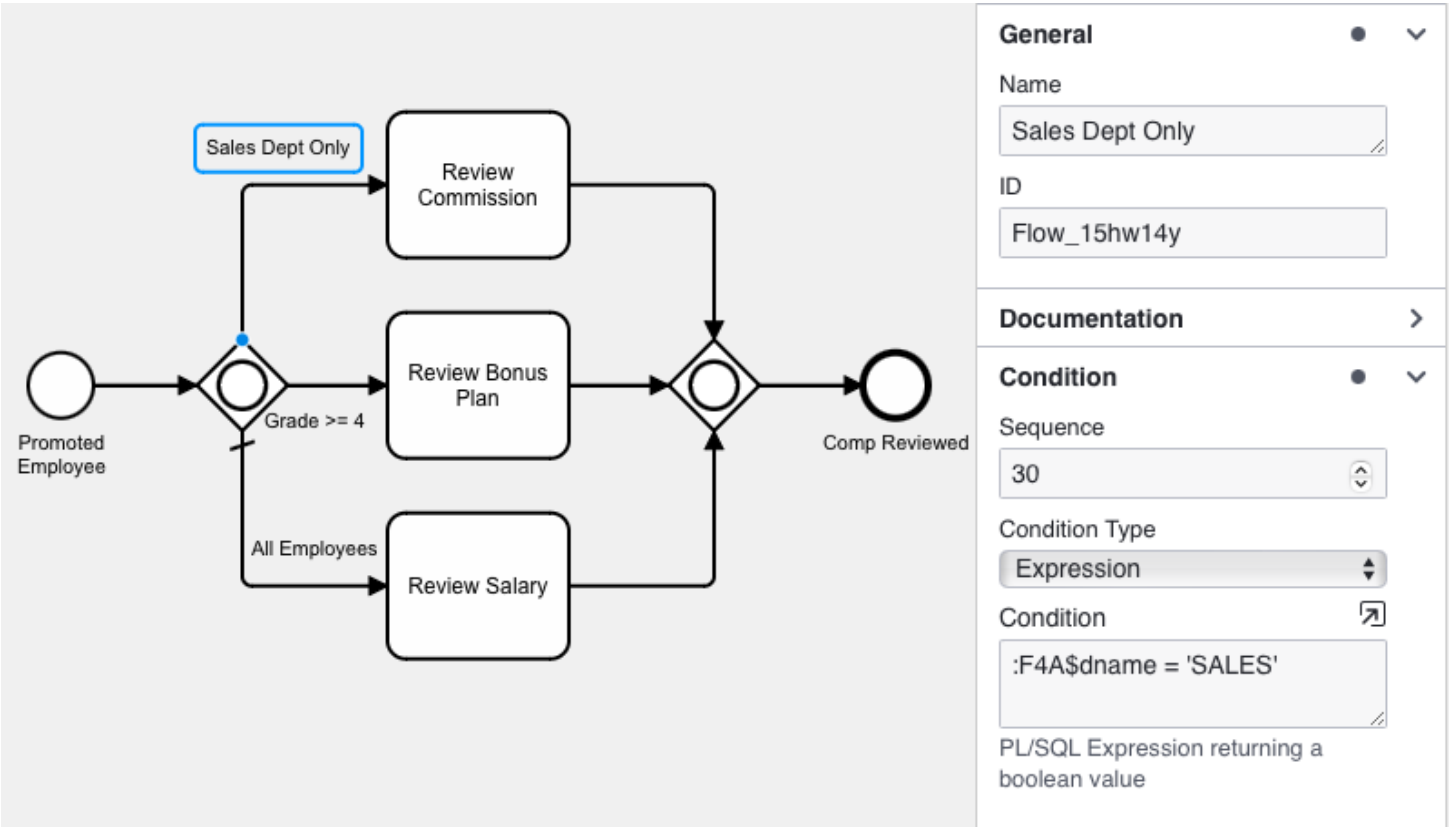
Collect simple form data from users just by specifying a JSON schema of the items required.

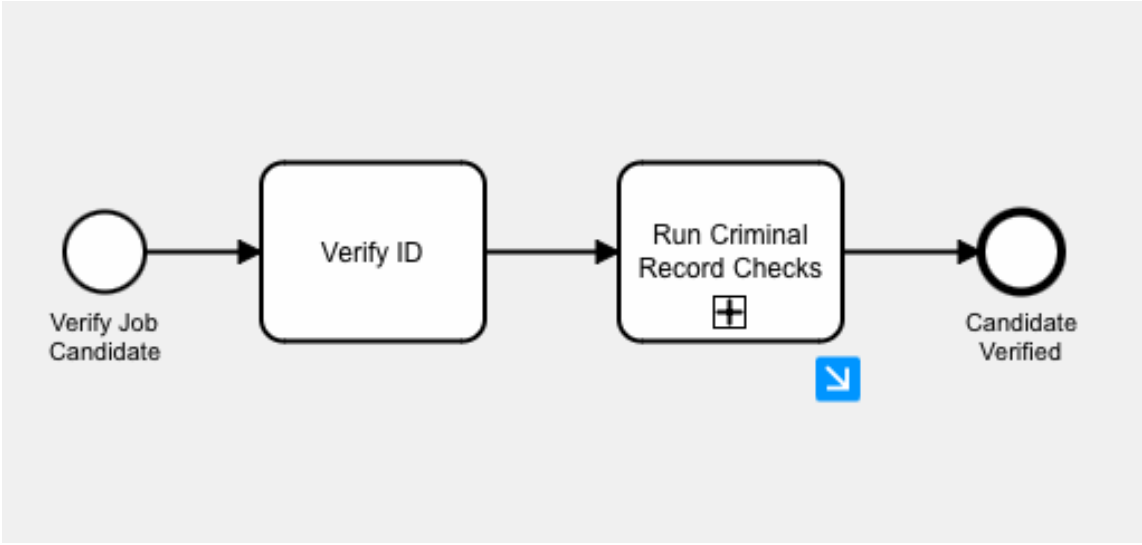
Region Plugin dynamically renders APEX page to collect required data, using appropriate APEX Page Items.

Parallel Execution



Conditional Parallel Execution

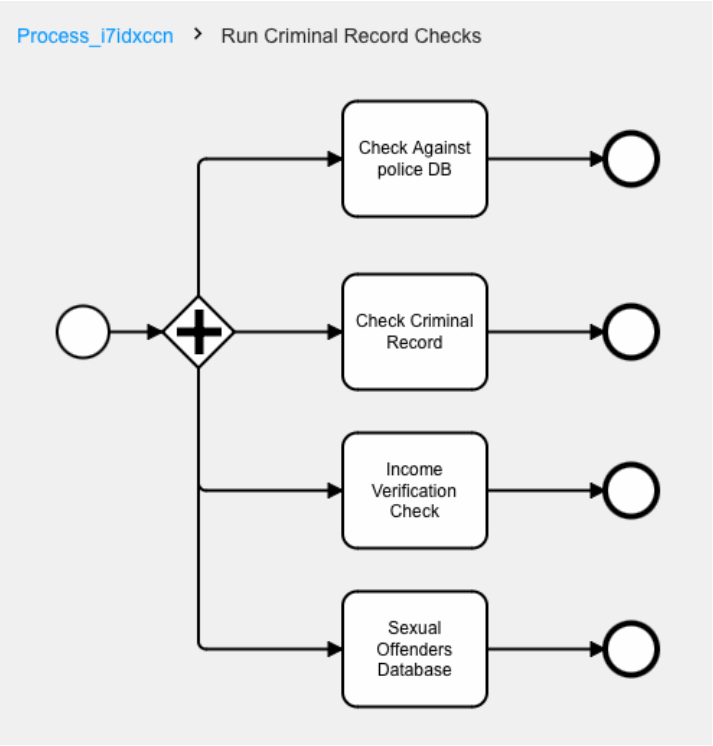




Sub Processes

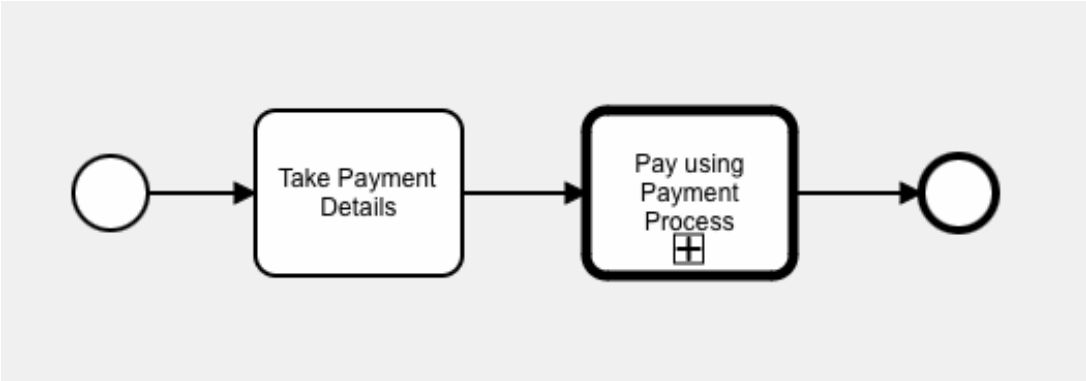
Hide detail within the same process diagram by using Sub Processes…

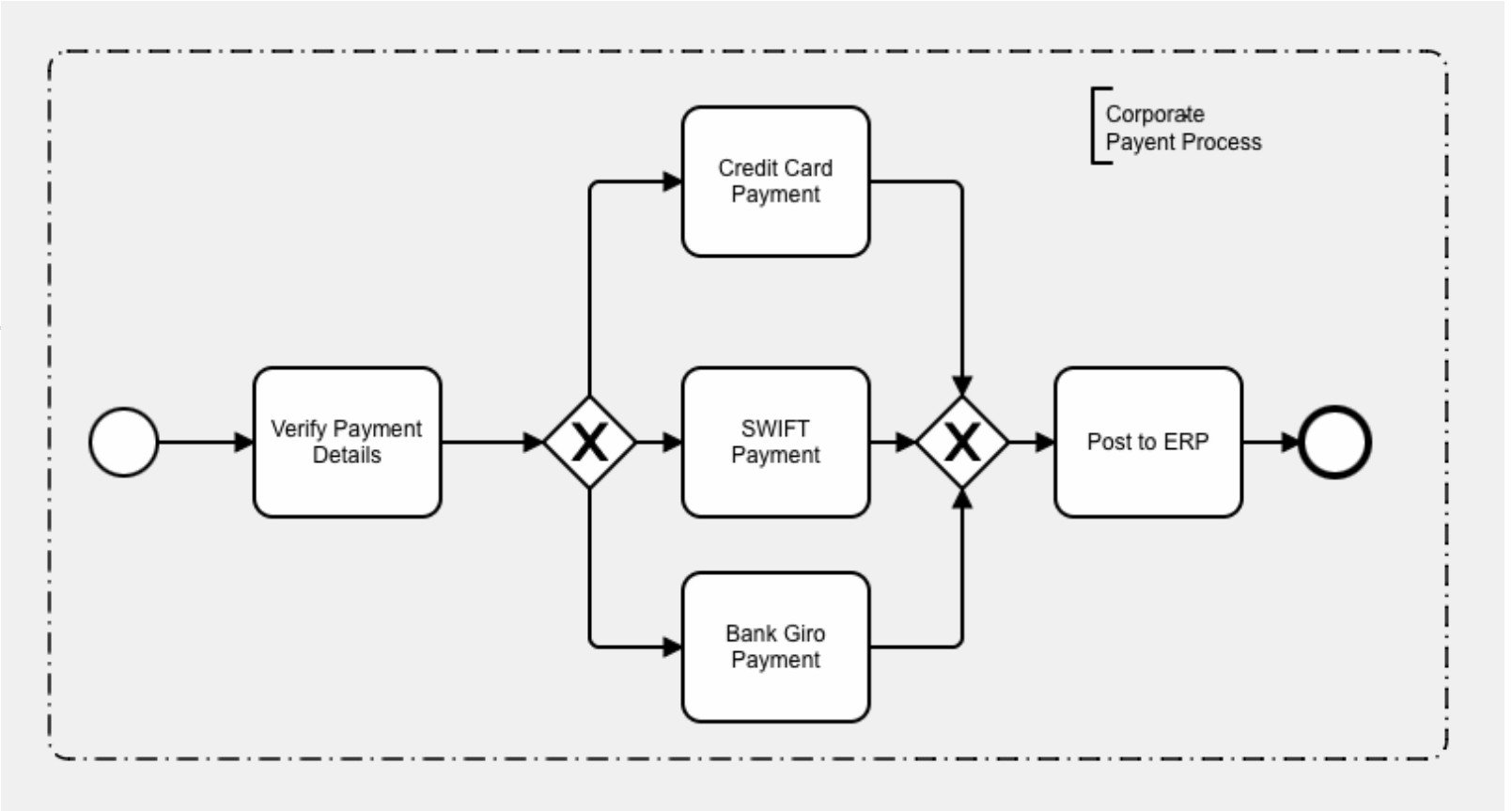
Drill down to see detail in Modeler and Viewer…



Call Activities

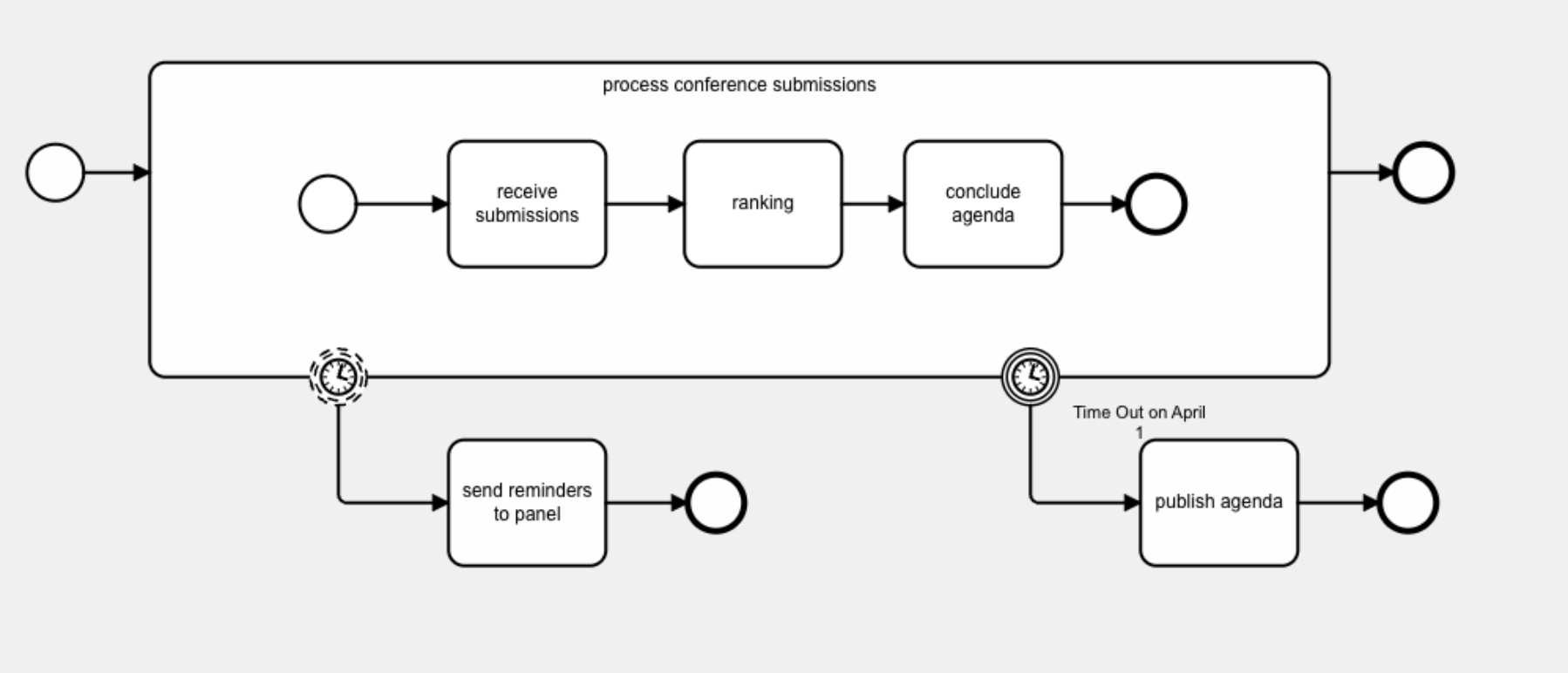
Or have a diagram call another diagram to execute the details…





Timers, Timeouts & Reminders

- Specify process activity for process error and escalation conditions
- - interrupting
- - non-interrupting

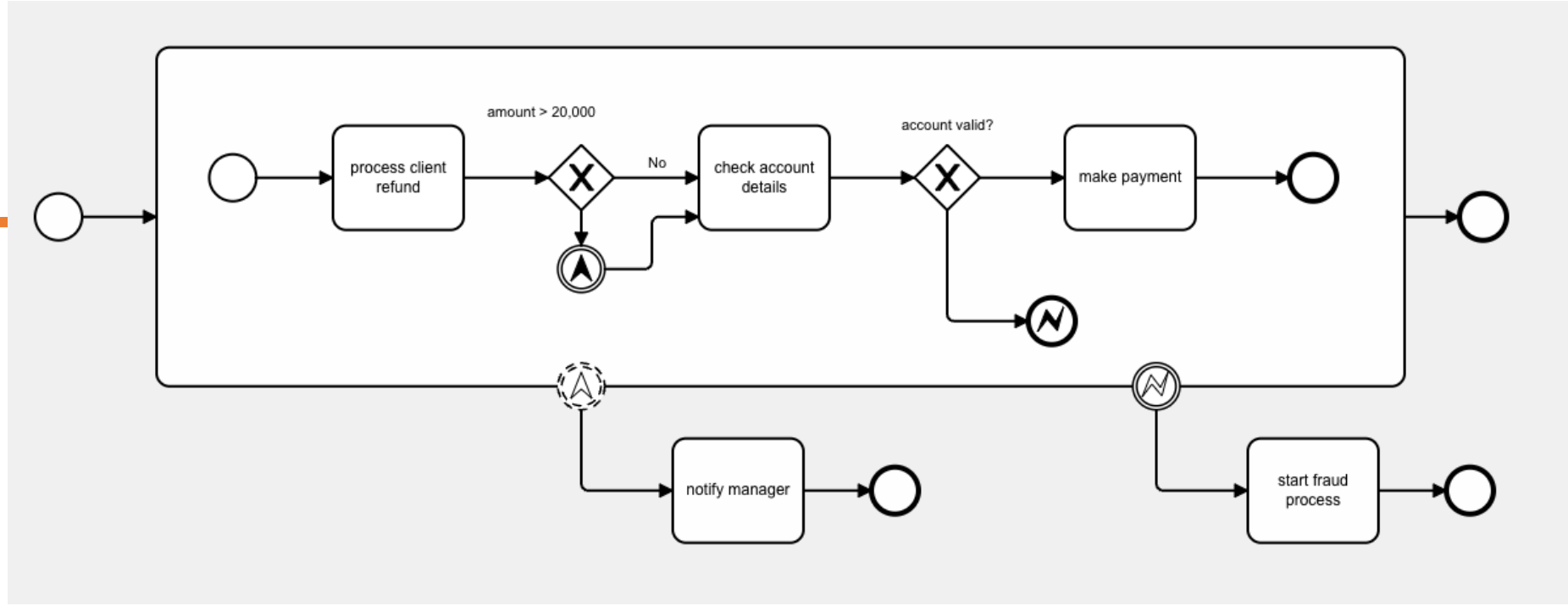


(BPMN Interrupting and Non-Interrupting Timer Events)

Escalations and Errors

Specify process activity for process error and escalation conditions

- interrupting
- non-interrupting



(BPMN Intermediate Catch and Throw Events, BPMN Boundary Events)

BPMN Loops and Iterations

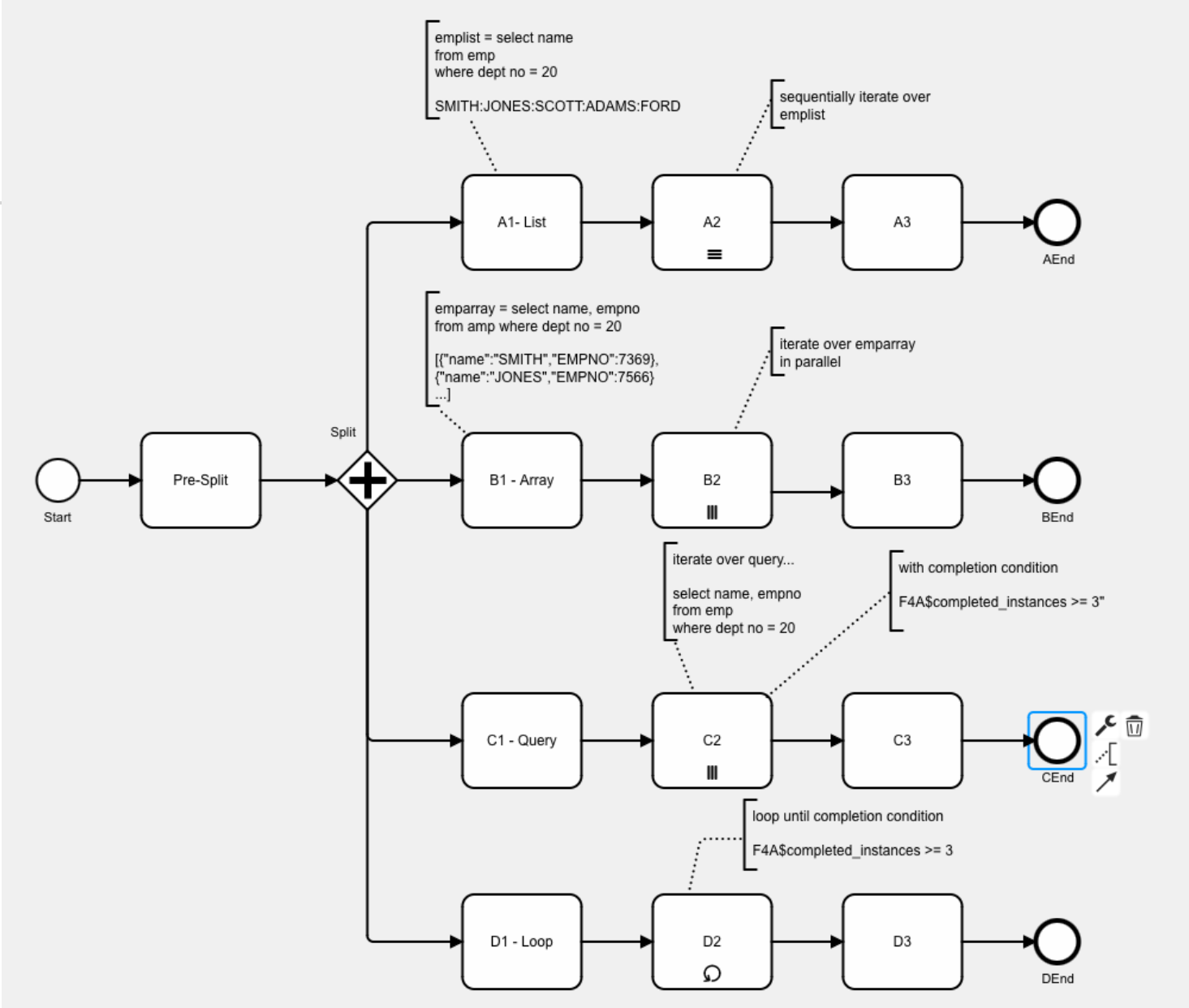
Iterations: Perform Task for each item in a list

- Sequentially or In Parallel
- List, JSON Array, or SQL Query
- Optional Completion Condition

Loops: Repeat task until meeting Completion Condition

For all Task types and SubProcesses

Flow Viewer visualization support to see status of all iterations of tasks and sub-processes



Iterations Use Case: Consulting Timesheet

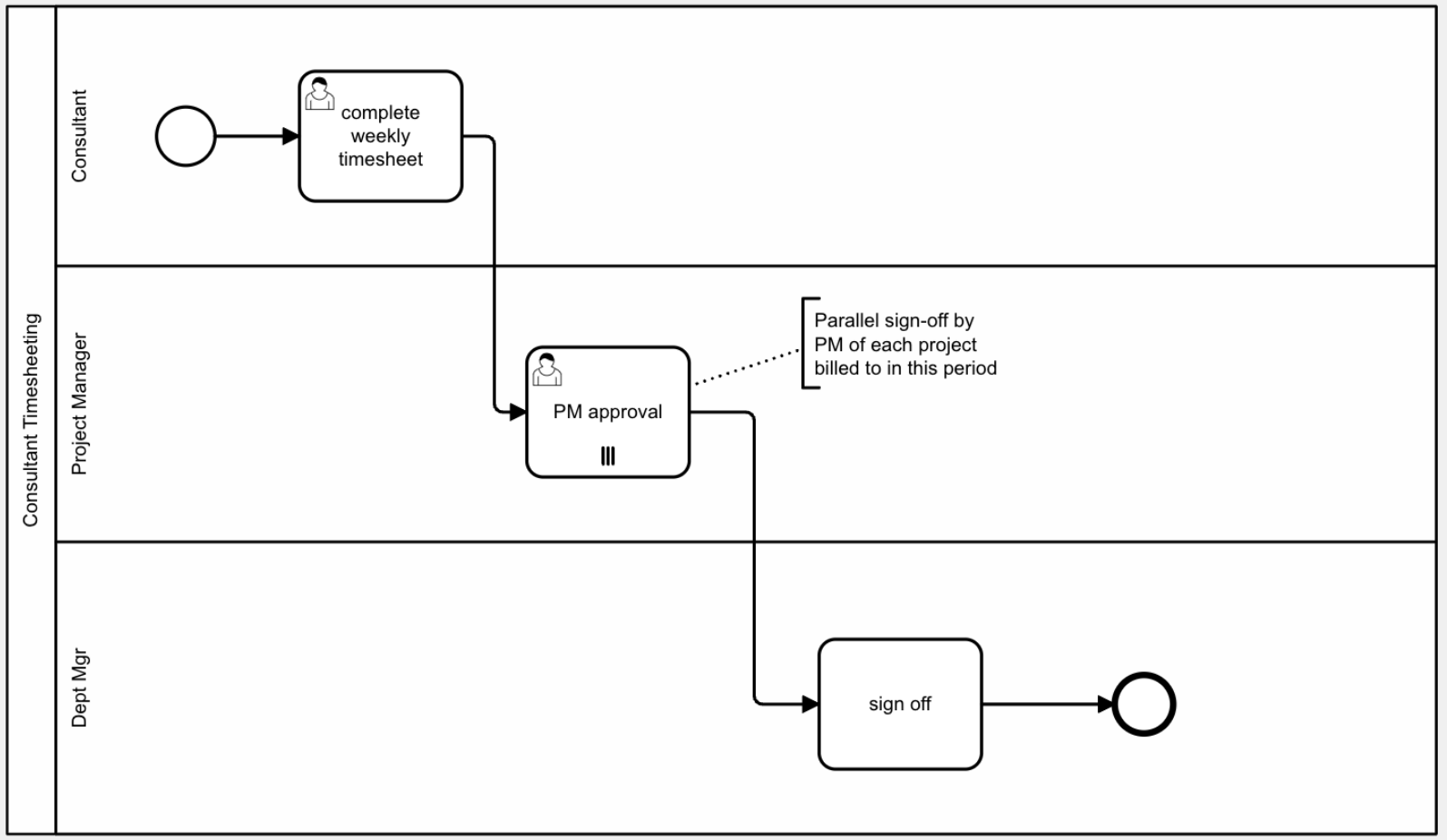
Each consultant can work on one or more projects during the week.

At the end of the week, they submit a timesheet showing how many hours they bill to each project they worked on.

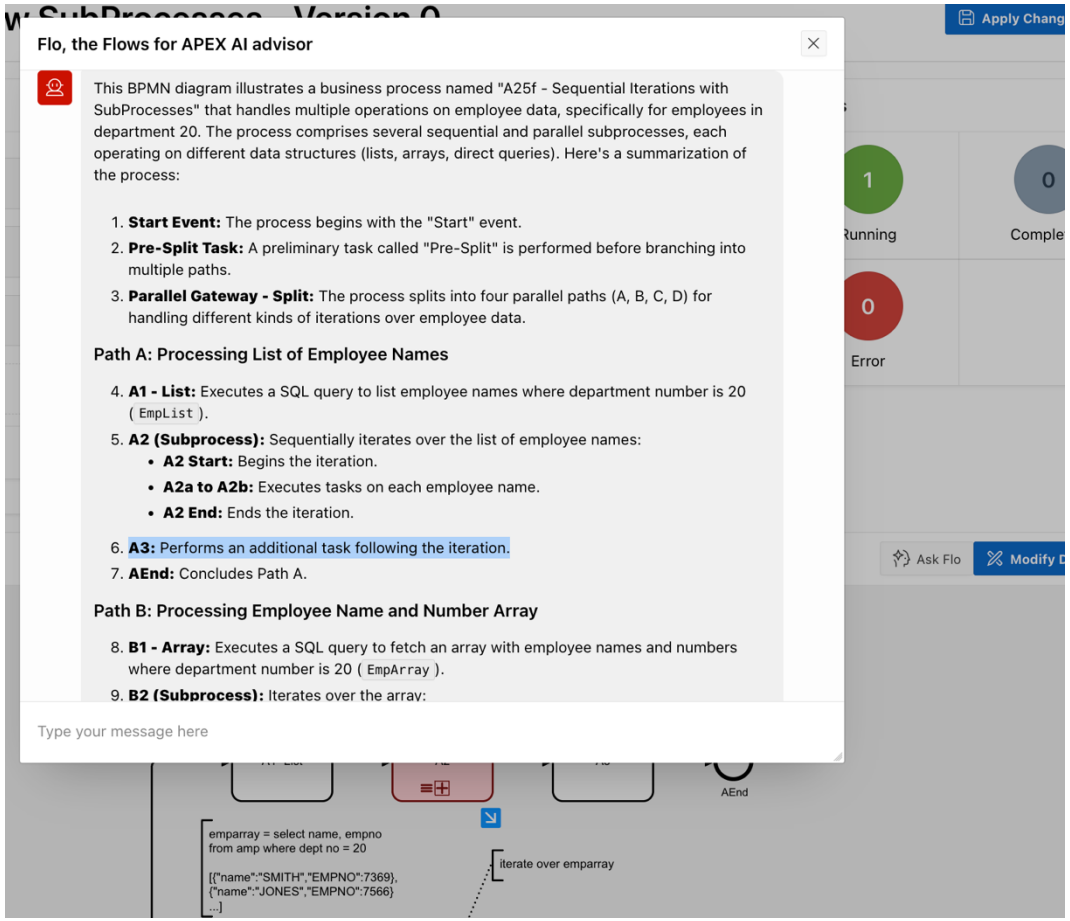
The Project Manager must approve any billing to their project.

Once all the Project Managers have approved, the line manager signs off the timesheet.

Use Case: Consulting Timesheet



GenAI Support for BPMN Modeler



Use of BPMN allows today's LLMs to assist the business modeler in use cases:

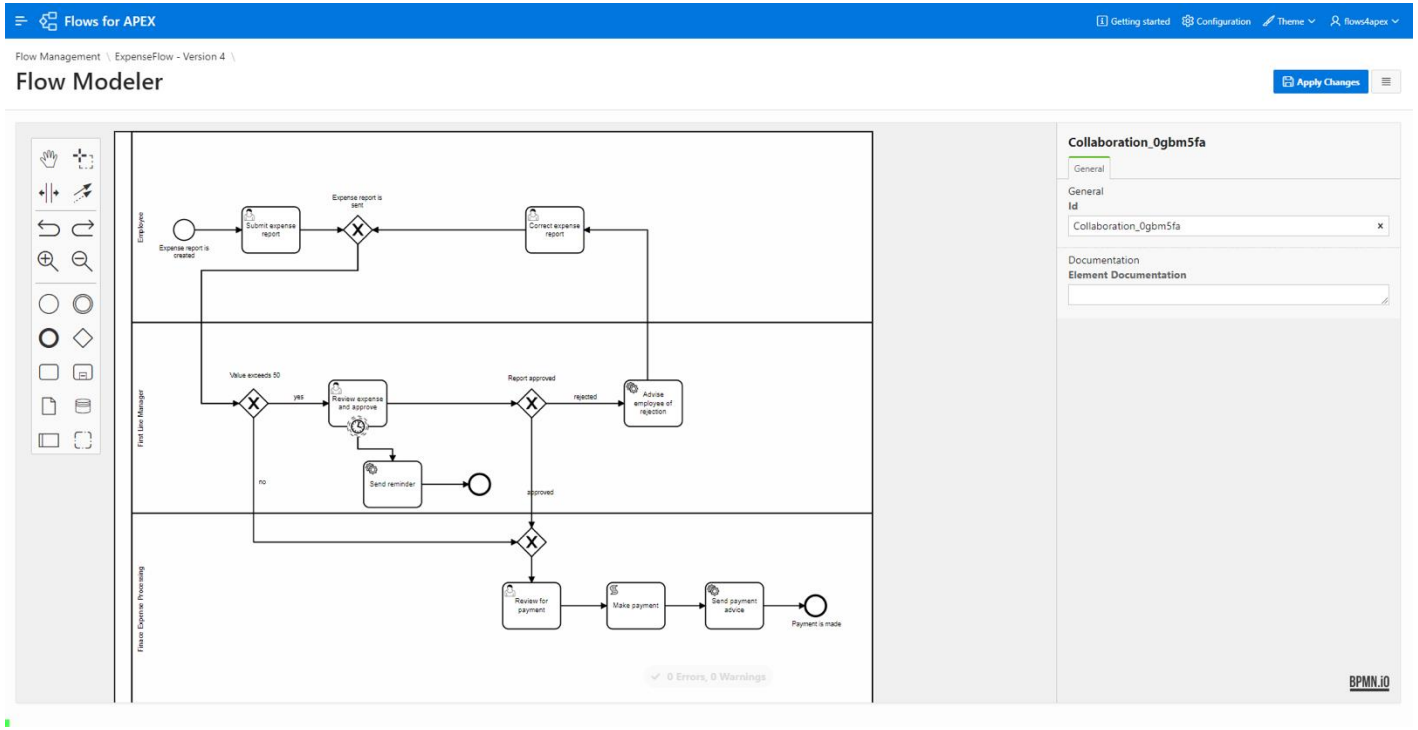
- Model summarization
- Error detection and explanation
- Improvement suggestions
- Translation

Other use cases will follow, including in-process AI support and model generation

Process Variable System

Process instances need to keep variables and process state for the duration of the process

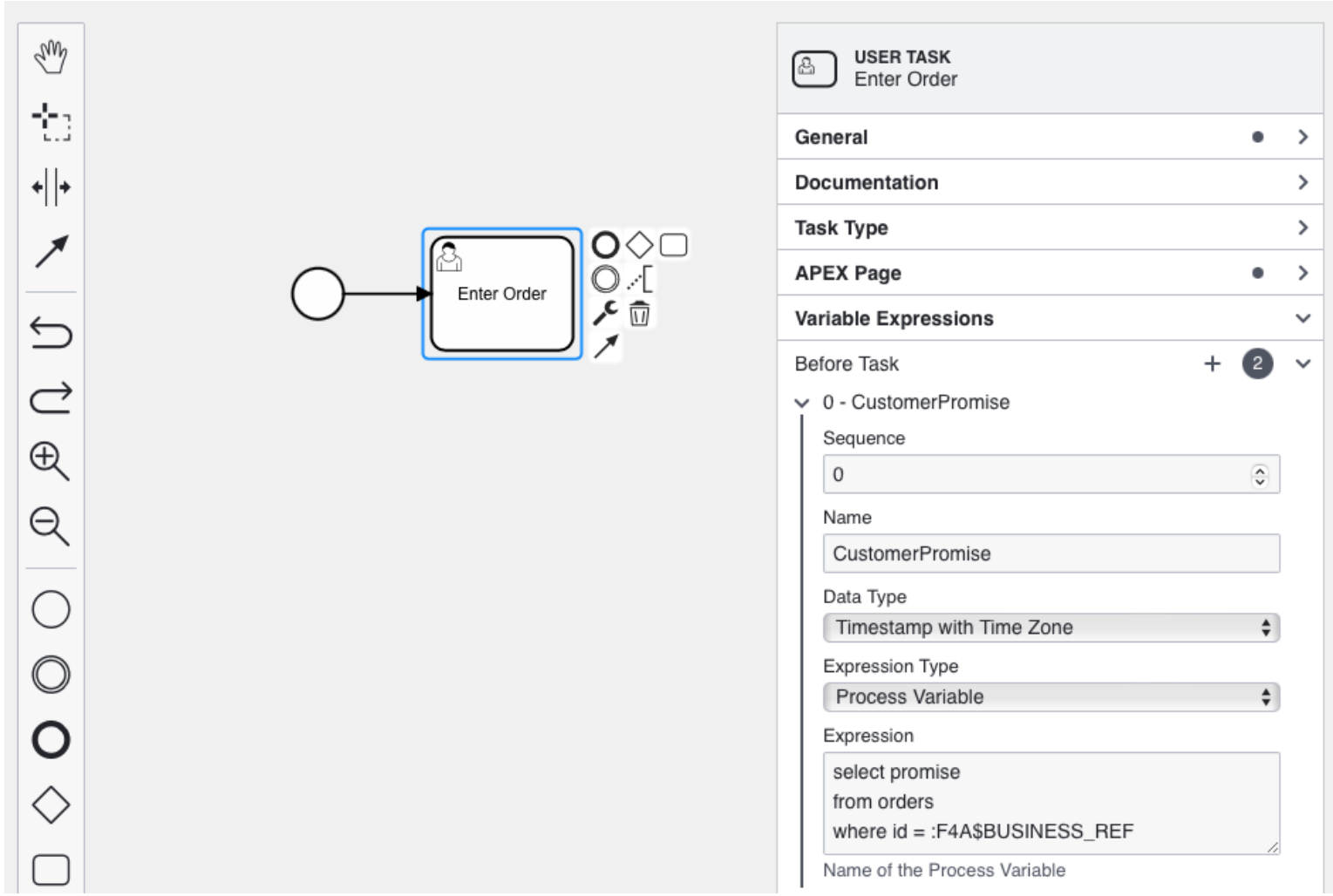
- typed (varchar2, number, date, timestamp with time zone, clob, json)
- set/get using API or APEX Plugins
- scoped – to avoid conflicts on call activities and iterations



Variable Expressions

Each step in a process can evaluate SQL / PL/SQL expressions to set process variables

- ‘Triggers’ that fire before and after each process step
- Used to dynamically control process flow, assignment, execution based on database data.



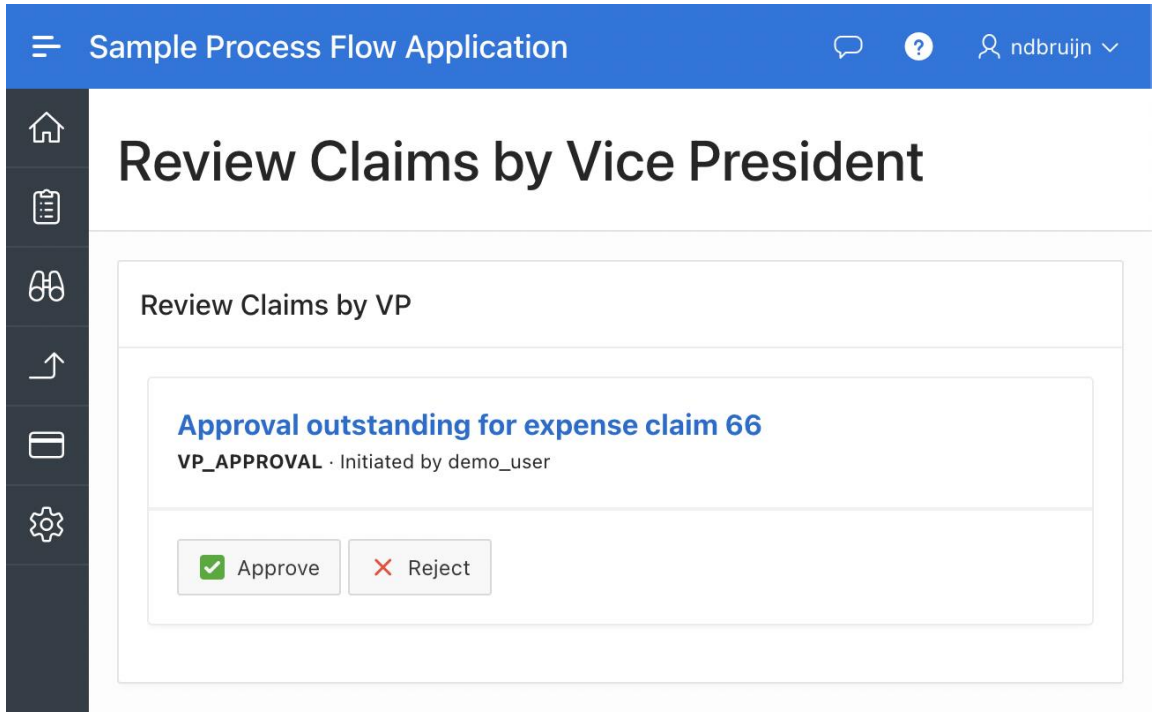
Integration with APEX Workflow and APEX Human Tasks

APEX Human Tasks (Approval & Action Tasks)

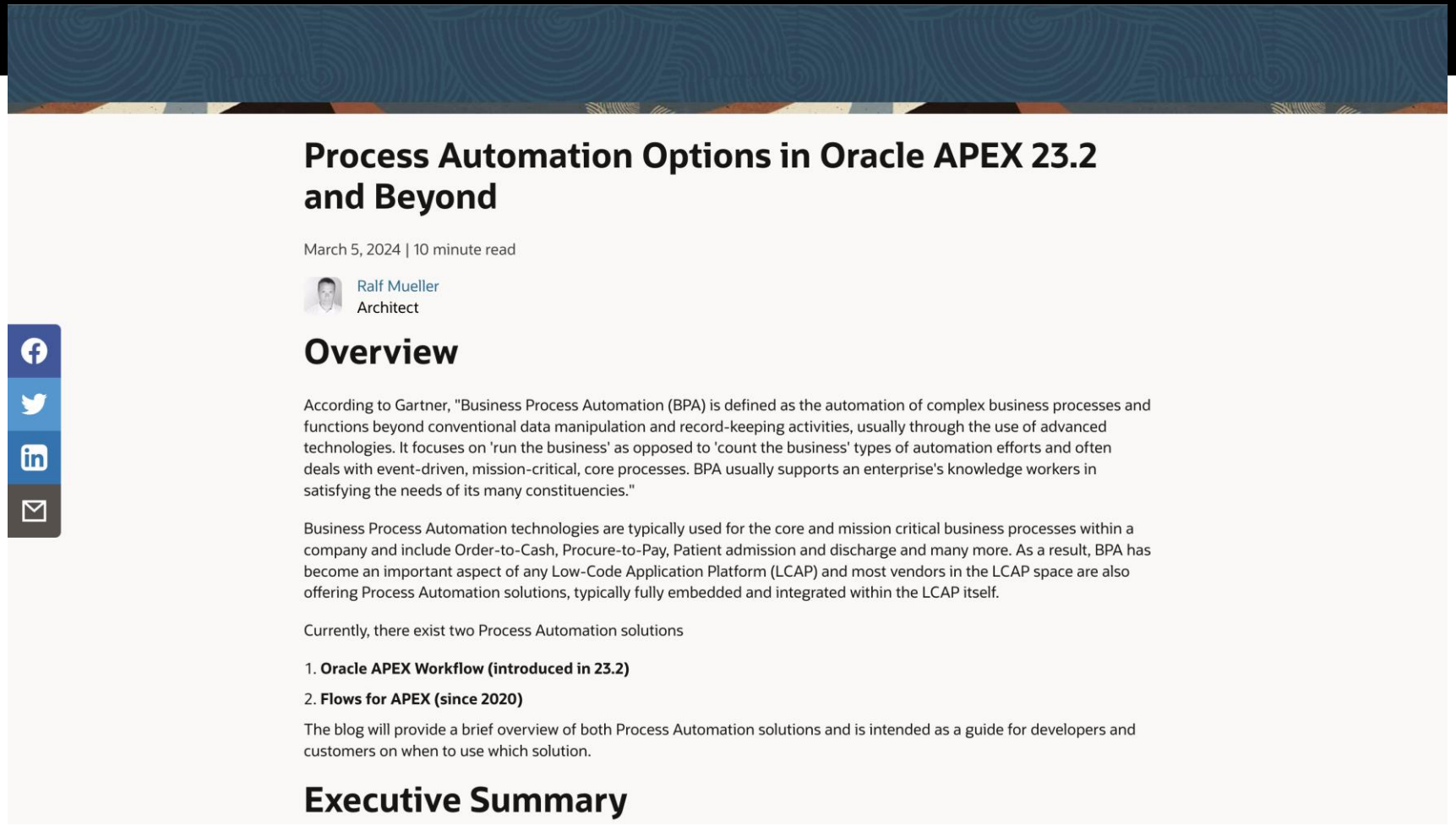
- A user task can implemented as an APEX Approval Task for an approval as part of a wider BPMN process
- In your custom app, you can use a new process plug-in "Return to Flows for APEX", no coding required for the integration
- Flows for APEX tasks can be shown inside the APEX Unified Task List with minor configuration

APEX Workflow (from APEX 23.2)

- Goal: Flows for APEX workflows should be able to start & be started by APEX Workflow, and vice-versa.
- Flows for APEX will continue to be a good option for customers with BPMN requirements / investment.



Flows for APEX or APEX Workflow?



Process Automation Options in Oracle APEX 23.2 and Beyond

March 5, 2024 | 10 minute read

Ralf Mueller
Architect

Overview

According to Gartner, "Business Process Automation (BPA) is defined as the automation of complex business processes and functions beyond conventional data manipulation and record-keeping activities, usually through the use of advanced technologies. It focuses on 'run the business' as opposed to 'count the business' types of automation efforts and often deals with event-driven, mission-critical, core processes. BPA usually supports an enterprise's knowledge workers in satisfying the needs of its many constituencies."

Business Process Automation technologies are typically used for the core and mission critical business processes within a company and include Order-to-Cash, Procure-to-Pay, Patient admission and discharge and many more. As a result, BPA has become an important aspect of any Low-Code Application Platform (LCAP) and most vendors in the LCAP space are also offering Process Automation solutions, typically fully embedded and integrated within the LCAP itself.

Currently, there exist two Process Automation solutions

1. **Oracle APEX Workflow (introduced in 23.2)**
2. **Flows for APEX (since 2020)**

The blog will provide a brief overview of both Process Automation solutions and is intended as a guide for developers and customers on when to use which solution.

Executive Summary

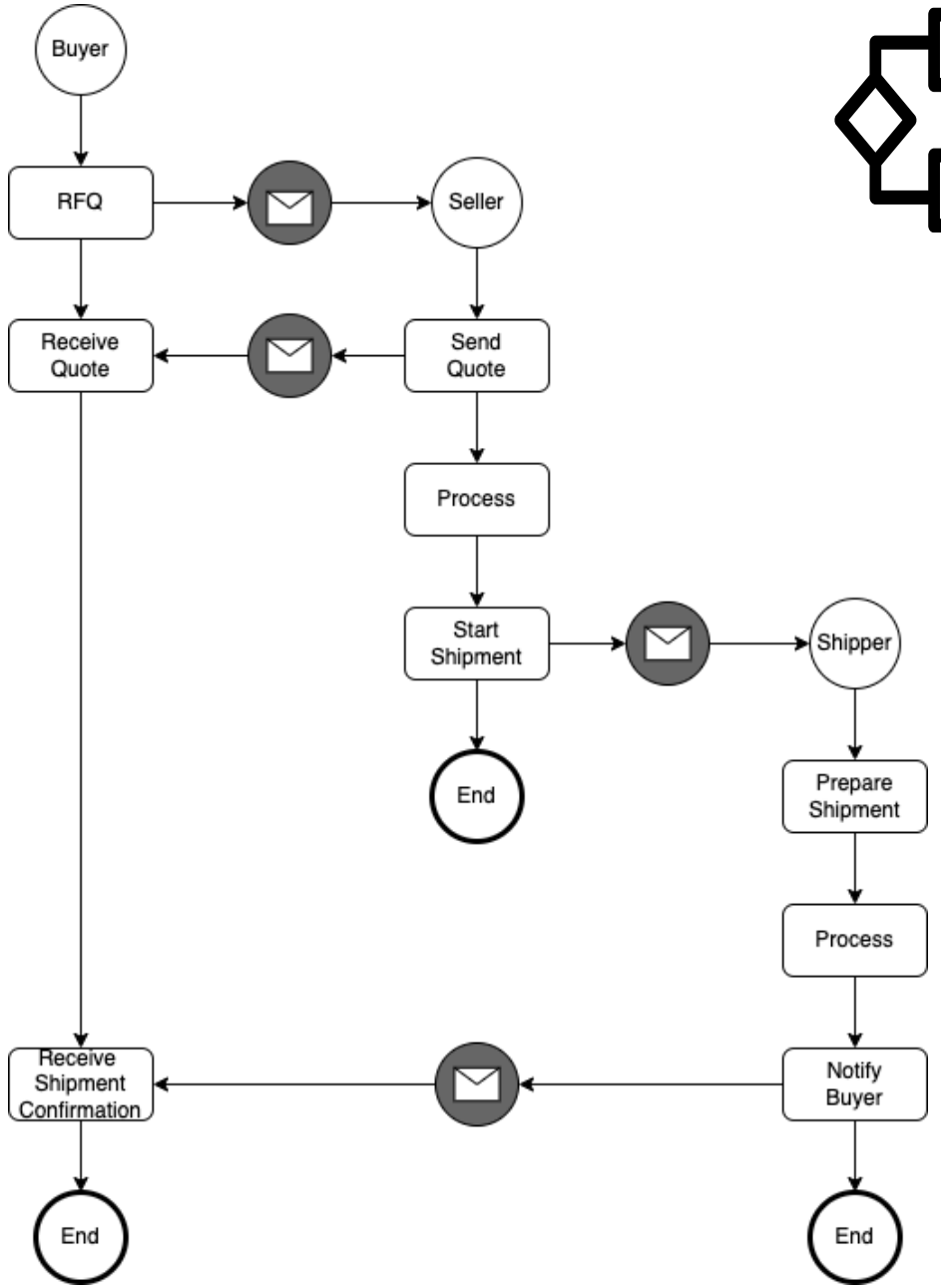
https://blogs.oracle.com/apex

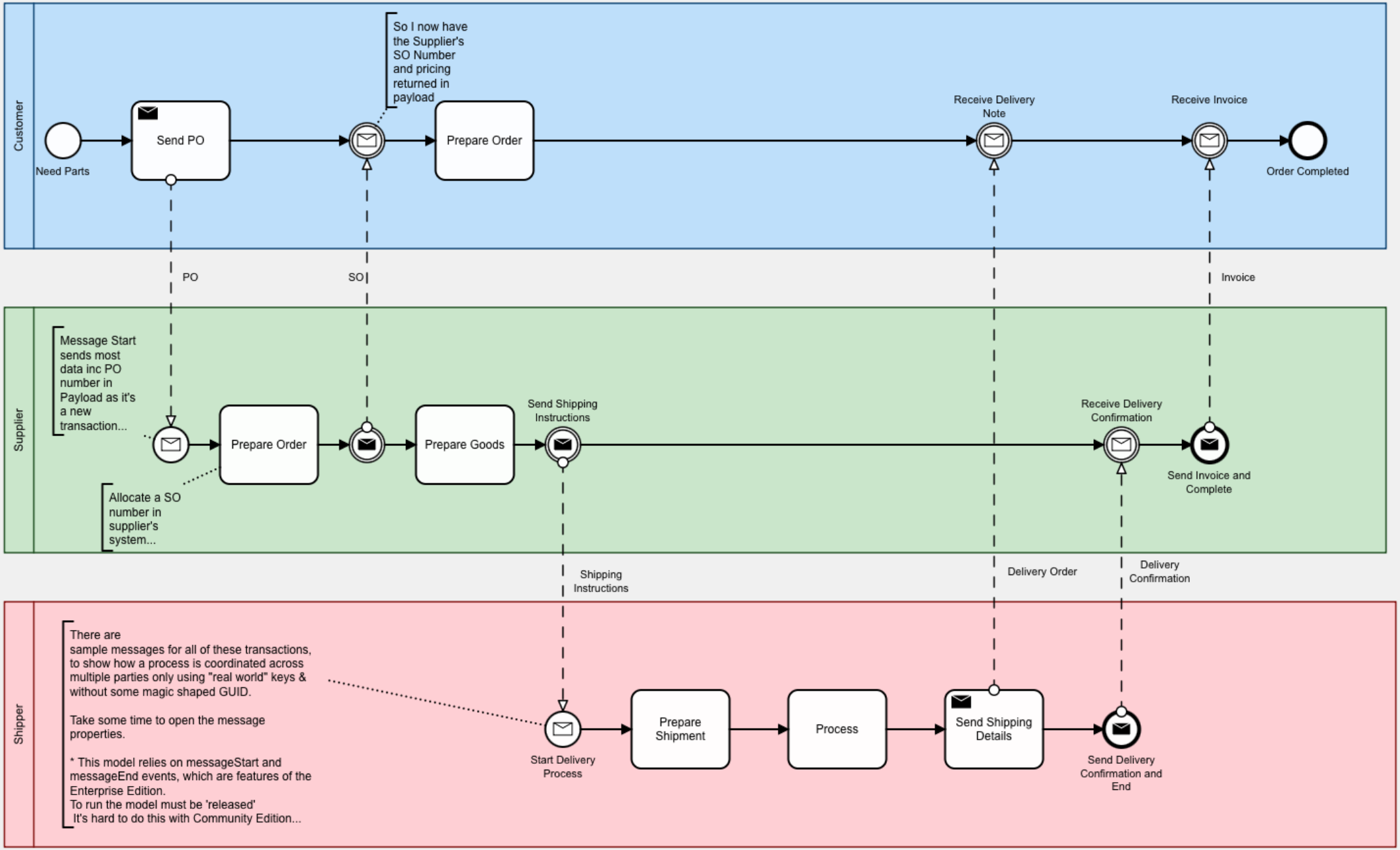
Inter Process Collaboration – BPMN MessageFlow

Allow workflows to collaborate by exchanging formatted messages.

Message correlation is based on business data, not a GUID or workflow IDs.

- Catching Events subscribe and wait for an incoming message
  - Start Event, Intermediate Event, Boundary Event
- Throwing Events emit a message
  - Intermediate and End Events




Customer
Need Parts
Send PO
So I now have the Supplier's SO Number and pricing returned in payload
Prepare Order
Receive Delivery Note
Receive Invoice
Order Completed
PO
SO
Invoice
Supplier
Message Start sends most data inc PO number in Payload as it's a new transaction...
Prepare Order
Prepare Goods
Send Shipping Instructions
Receive Delivery Confirmation
Send Invoice and Complete
Allocate a SO number in supplier's system...
Shipping Instructions
Delivery Order
Delivery Confirmation
Shipper
There are sample messages for all of these transactions, to show how a process is coordinated across multiple parties only using "real world" keys & without some magic shaped GUID.
Take some time to open the message properties.
* This model relies on messageStart and messageEnd events, which are features of the Enterprise Edition.
To run the model must be 'released'
It's hard to do this with Community Edition...
Start Delivery Process
Prepare Shipment
Process
Send Shipping Details
Send Delivery Confirmation and End

Logging

Capture, Archive, Purge

Granular Logging for management, debugging, and audit

Instance Archive – a JSON summary of all instance events for an instance created after process completion.

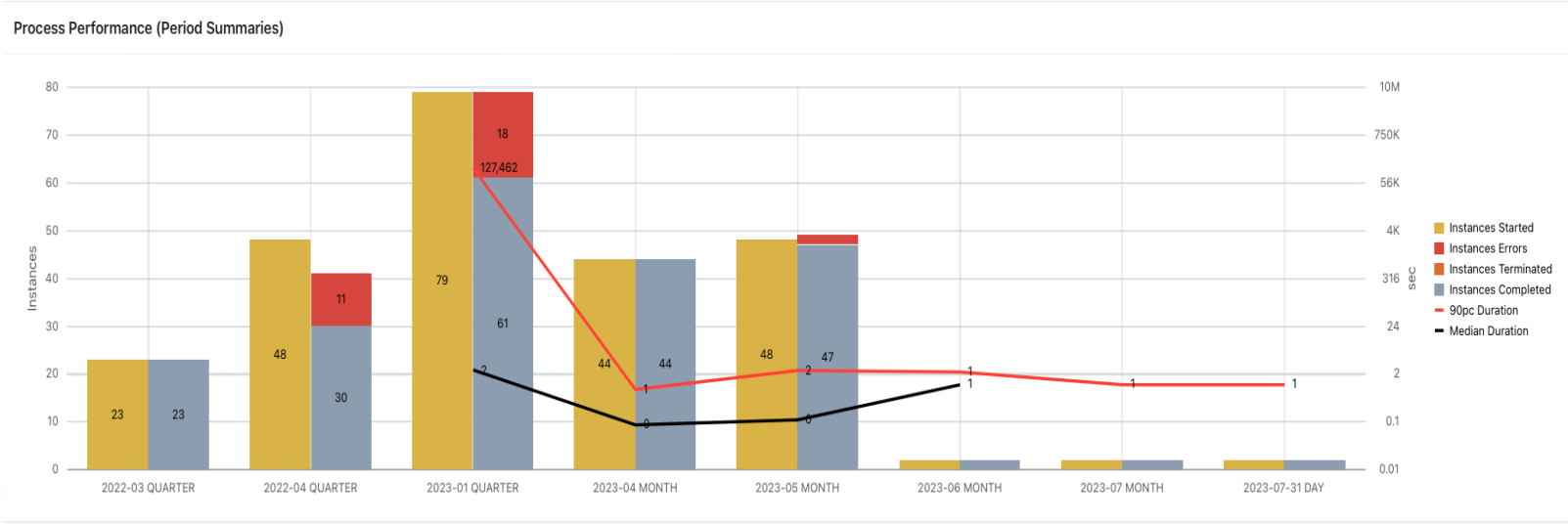
Logging data purged after retention period

Design intention to create multi-year forensic archive capability using Instance Archives and Diagram Archives stored in OCI Object Store.

Process Statistics

Capture, Summarize, Purge

- What is my process performance compared to last week /month / year?
- Where are the bottlenecks in my processes?
- Where do I prioritize automation or process redesign?



Generates daily summary statistics for each process type and process step type, with frequency, active time and wait time

Aggregates into month-to-date, monthly, and quarterly summaries.

Used for Dashboard and drill-down process statistics

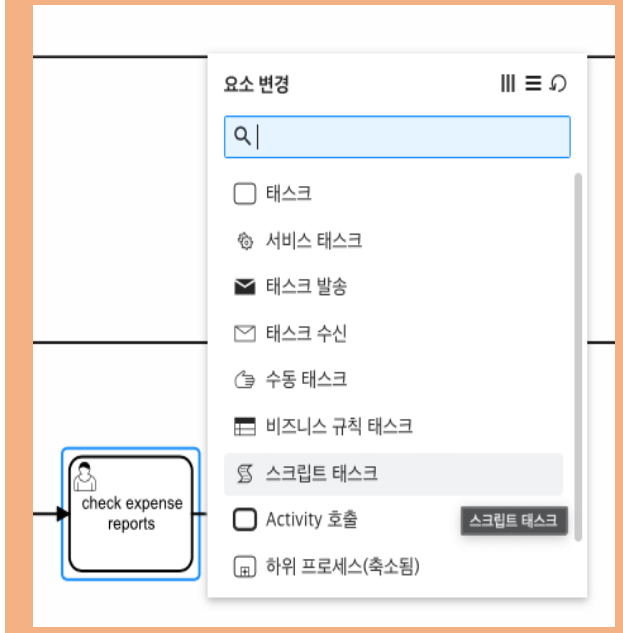
Beta / Lab Feature that we will enhance over future releases

Please turn on Statistics and start capturing data…

Language Availability

Now supporting all 10 APEX Developer Languages:

CHINESE



KOREAN

Supported Languages:

- English
- French
- German
- Spanish
- Italian
- Portuguese
- Japanese
- Korean
- Simplified Chinese
- Traditional Chinese

Thank you to our Translation Volunteers!

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What's New

Flows for APEX Editions

Community Edition

Remains Open Source

MIT License from Hyand

Some new features

Community Support via Github Issues

Remains Free

Enterprise Edition

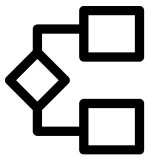
Adds Advanced Features to Community Edition

Software support from Flowquest

Exciting development agenda

Commercial license from Flowquest

Annual subscription basis



Flows for APEX v24.1 - Editions

Community Edition

- JSON-typed Process Variables
- BPMN Color support
- UserTask with APEX Simple Form
- Simple Process Starter

Community Support

MIT Licence
Download from flowsforapex.org

Enterprise Edition

All Community Edition features plus:

- Process collaboration / BPMN MessageFlow
- Task and SubProcess Iteration and Loops
- GenAI assistance for Modeler

Product Support and Helpdesk

Commercial Licence from Flowquest – info@Flowquest.net

Flows For APEX v25.1 (target mid-year 2025)

Community Edition

- Enhanced Event-based task logging and debugging
- Enhancements to APEX Human Task and Workflow integration
- Enhanced Flow Viewer as web component, with badging
- Usability and productivity enhancements

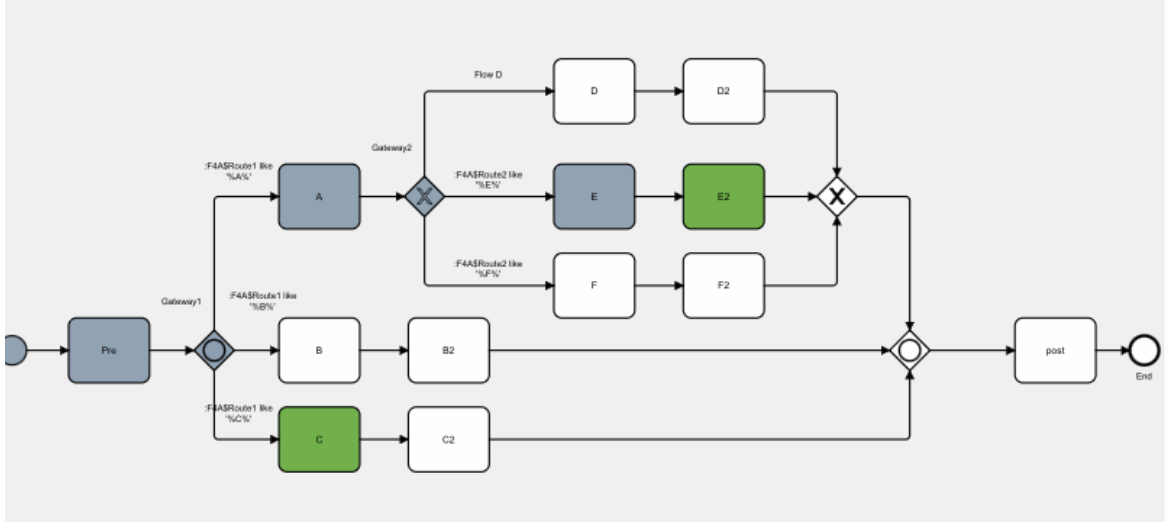
Enterprise Edition

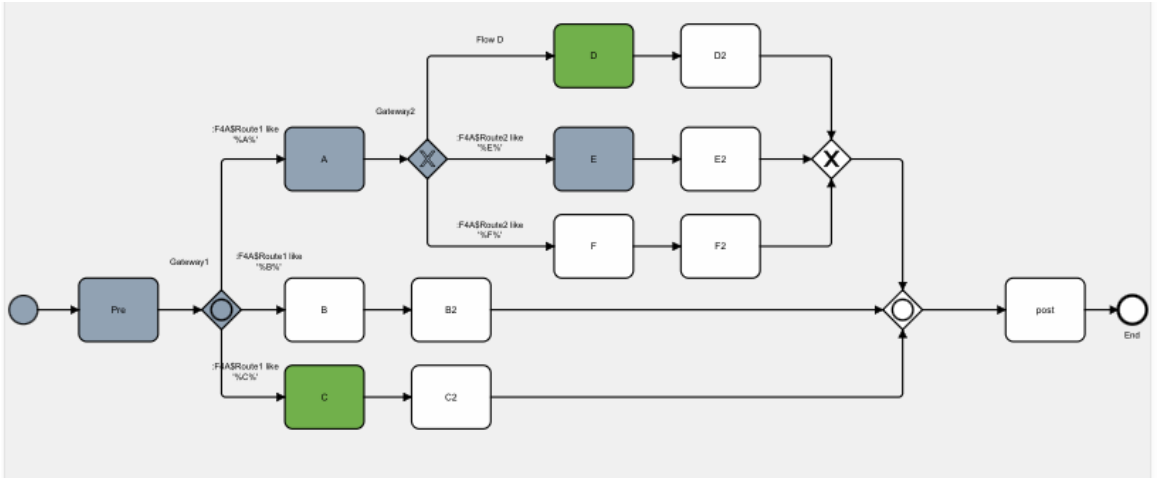
- Process Suspend, Rewind and Resume for admin of “bad” processes.
  (BPMN can be rewound!)
- MessageFlow architecture improvements (inbound message queueing, outbound endpoint specification)

Process Suspend / Rewind / Resume

BPMN models how your business process should work…
… but sometimes things go wrong, users make bad choices, bad data causes the wrong path….

- Suspend and Resume
- Return to previous Step
- Return to Previous Gateway
- Rewind from SubProcess
- Rewind from Call Activity
- Force next step on error
- Restart step on error
- Hold incoming Messages
- Suspend Timers





More Info

Web:
- www.flowsforapex.org
- www.Flowquest.net

Contains feature list, documentation, tutorials, blog, video resources

More Info:
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Please fill in your evaluations