

# IBM Cloud Pak for Business Automation

## Demos and Labs

### IBM Process Mining

*Using BPMN Process Diagrams from IBM Blueworks Live in IBM Process Mining*

IBM Process Mining v1.14

Lab Version 1.2

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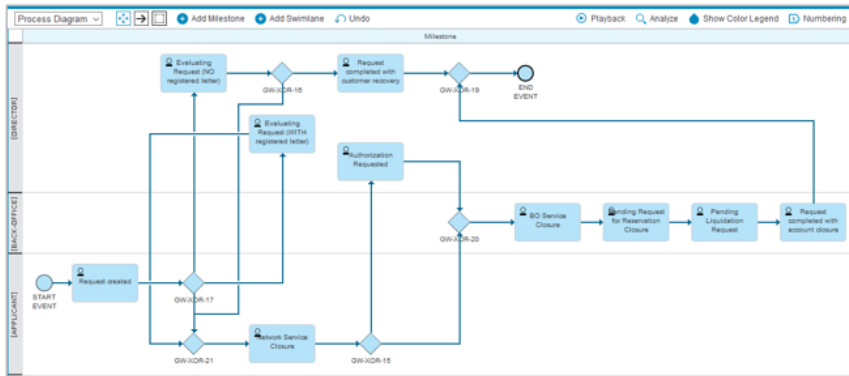


## 1.3 Process Modeling and Process Mining Working Together

While IBM Blueworks Live supports all aspects of process modeling, it provides no simulation capabilities. On the other hand, IBM Process Mining provides simulation capabilities useful to establish ROI associated with automation initiatives, but it does not offer a collaborative process modeling environment.

In this lab, you will learn how to use IBM Process Mining to **simulate and optimize** the BPMN processes modeled in IBM Blueworks Live.

### IBM Blueworks Live – Process Modelling



### IBM Process Mining – Process Improvement

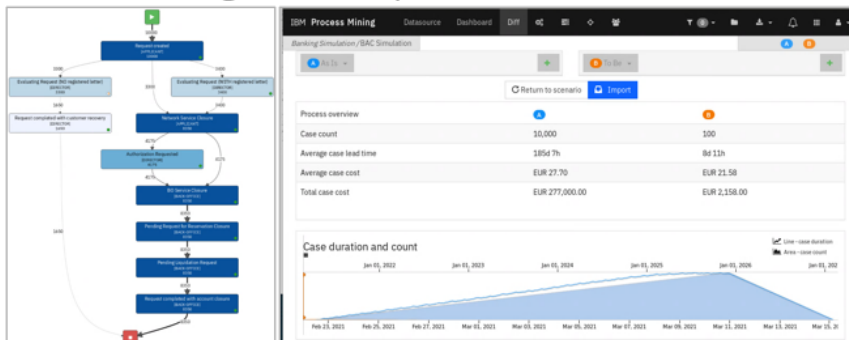


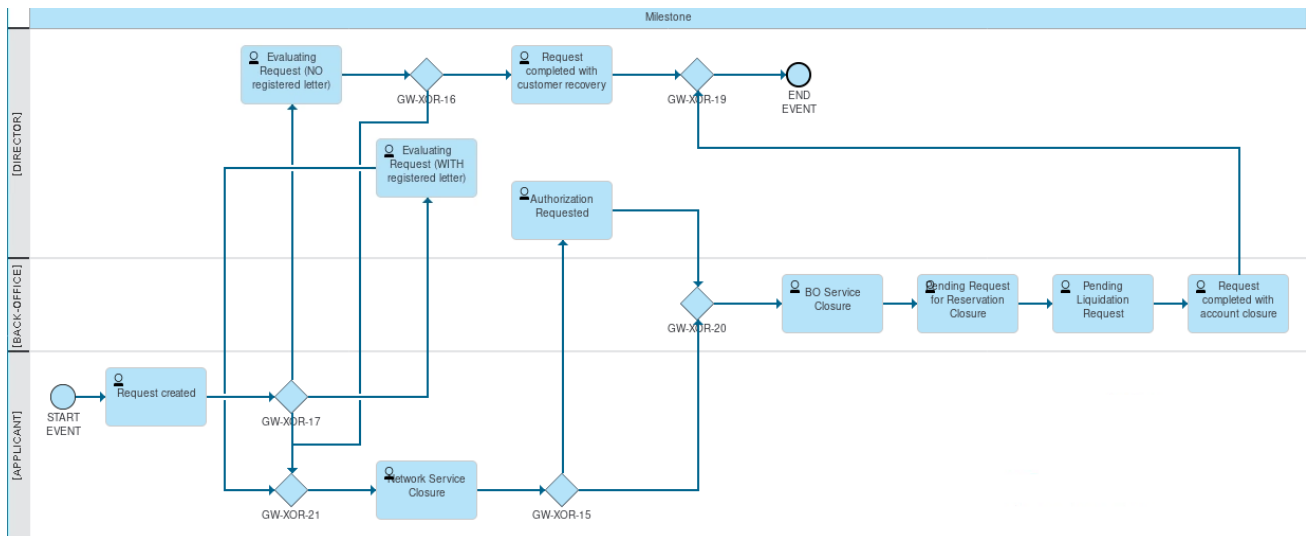
Figure 3. Model Processes in IBM Blueworks Live. Simulate and Optimize in IBM Process Mining.

Complete logs from all systems involved in a process are typically required to engage in process mining activities. Extracting and preparing such logs is costly, time-consuming, and a significant entry barrier for organizations to benefit from process mining tools such as IBM Process Mining.

In this lab, you will learn how IBM Process Mining can **generate event data**, an alternative to extraction and preparation, that can be used to perform typical process mining activities.

### 1.3.1 Business Scenario

The business scenario used in this lab is a simplified Bank Account Closing scenario, including three swim lanes corresponding to roles and ten activities.



## 1.4 How to Prepare an IBM Blueworks Live Process

You DO NOT need to perform the lab steps in this section and its subsections; they illustrate what has been done for you already.

This section outlines the steps needed to generate a well-behaved BPMN process diagram that works well with IBM Process Mining.

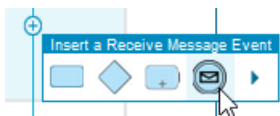
The Bank Account Opening process used in this lab was already created for you and exported, so you do not need to build it in IBM Blueworks Live. If you want to examine the process used in this lab, you can import it to IBM Blueworks Live using the *Banking Account Closure.zip* file provided.

Recall that you imported this file to the desktop.

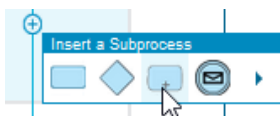
### 1.4.1 Basic Requirements

The process model must **not** include the following BPMN modeling elements

- Message Events



- Subprocesses



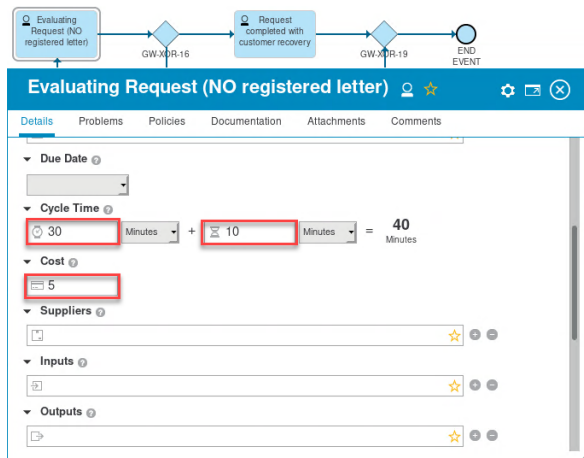
- Multiple links lead to activity.



### 1.4.2 Process Mining Simulation Parameters

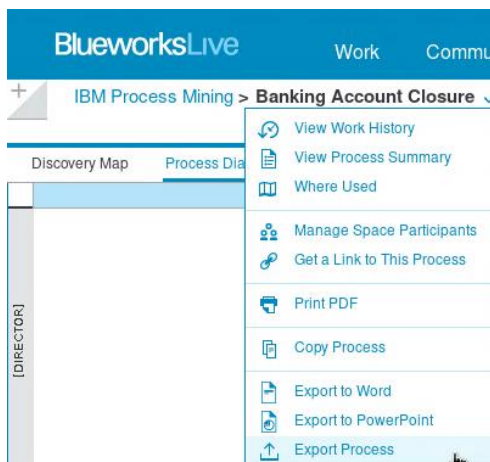
For each process activity, the following attributes (highlighted by red boxes) in IBM Blueworks Live will be exported and used by the Simulation feature in IBM Process Mining and have the following names:

- Work Time
- Wait Time
- Cost

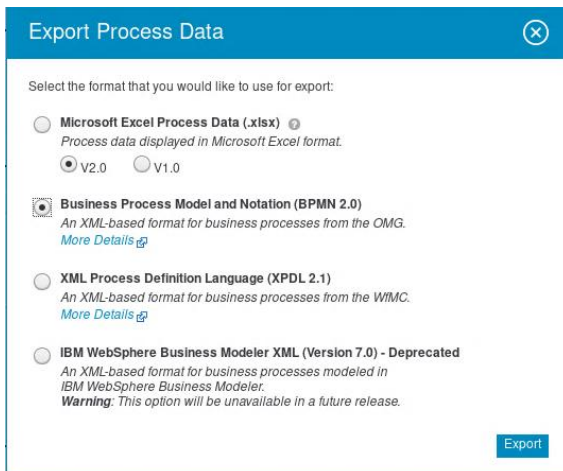


### 1.4.3 Exporting Process from IBM Blueworks Live

\_1. Use standard BWL Process Export.



## \_2. Select **BPMN 2.0**

A dialog box titled "Export Process Data" with a close button in the top right corner. It contains a section "Select the format that you would like to use for export:" with four radio button options. The first option is "Microsoft Excel Process Data (.xlsx)" with a sub-note "Process data displayed in Microsoft Excel format." and sub-options "V2.0" (selected) and "V1.0". The second option is "Business Process Model and Notation (BPMN 2.0)" with a sub-note "An XML-based format for business processes from the OMG." and a link "More Details". The third option is "XML Process Definition Language (XPDL 2.1)" with a sub-note "An XML-based format for business processes from the WMC." and a link "More Details". The fourth option is "IBM WebSphere Business Modeler XML (Version 7.0) - Deprecated" with a sub-note "An XML-based format for business processes modeled in IBM WebSphere Business Modeler." and a warning "Warning: This option will be unavailable in a future release." An "Export" button is at the bottom right.

Export Process Data

Select the format that you would like to use for export:

☐ Microsoft Excel Process Data (.xlsx) Process data displayed in Microsoft Excel format.  
☒ V2.0 ☐ V1.0

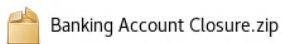
☒ Business Process Model and Notation (BPMN 2.0)  
An XML-based format for business processes from the OMG.  
[More Details](#)

☐ XML Process Definition Language (XPDL 2.1)  
An XML-based format for business processes from the WMC.  
[More Details](#)

☐ IBM WebSphere Business Modeler XML (Version 7.0) - Deprecated  
An XML-based format for business processes modeled in IBM WebSphere Business Modeler.  
Warning: This option will be unavailable in a future release.

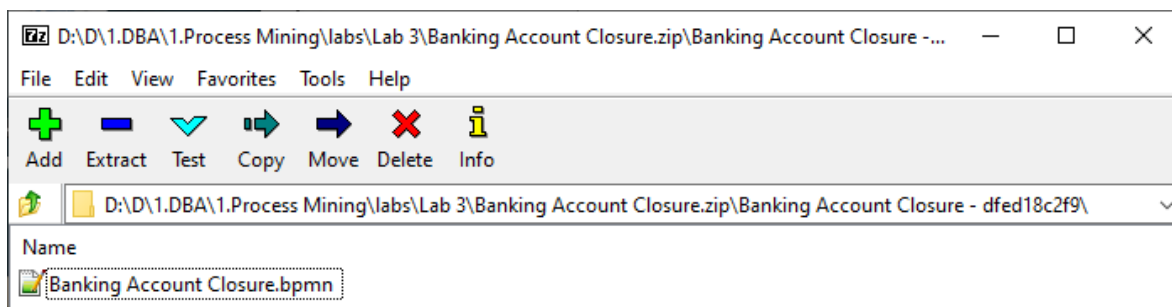
Export

This will create a zip file.



Note that you cannot import this zip file directly to IBM Process Mining. You will need to extract the BPMN file first.

\_3. To extract the BPMN file, open the exported zip file, navigate to the BPMN file, and extract it from the zip file.





## 2 Lab Setup

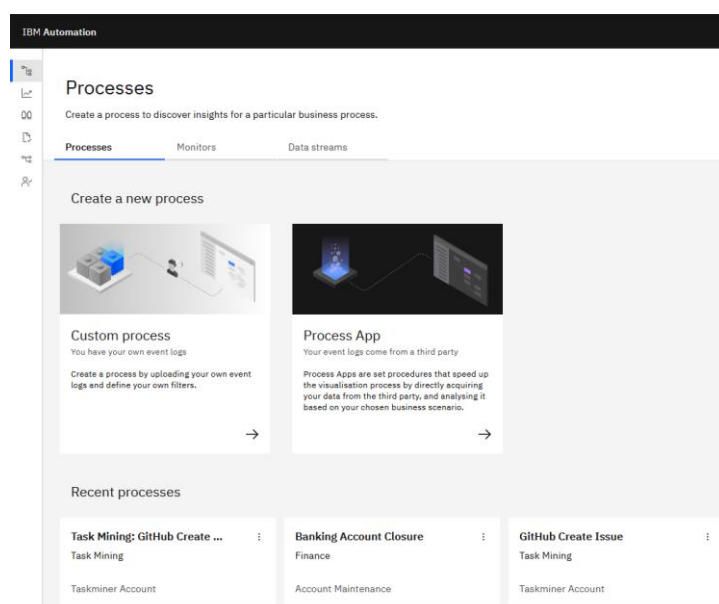
### 2.1 Provision Process Mining Environment

You DO NOT need to provision an environment if you are attending an event where the IBM team has done this for you. Only IBMers and IBM Business Partners have access to provision these environments.

- \_1. Download [this](#) document and follow the instruction for reserving a Tech Zone environment.
- \_1. Follow the instructions in "**3.4.1 Accessing PM Web Client from the Desktop's Web Browser**" to access the PM web console.

### 2.2 Open IBM Process Mining Application

- \_1. Launch the IBM Process Mining Web UI console (if you are uncertain, ask your IBM event host or use the following section of the document linked above if you provisioned your own environment: "3.4.1 Accessing PM Web Client from the Desktop's Web Browser.")
- \_2. You should now see the IBM Process Mining web UI.



### 2.3 Import Lab Files

- \_1. Use this [link](#) to download the following files:
  - Banking Account Closure.bpmn
  - Banking Account Closure.zip

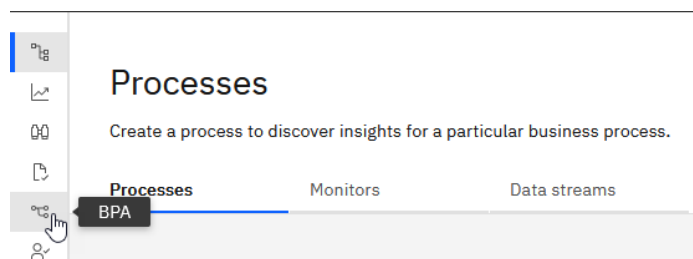
These files must be accessible from the IBM Process Mining web application. You will use them in this lab.

## 3 Lab Instructions

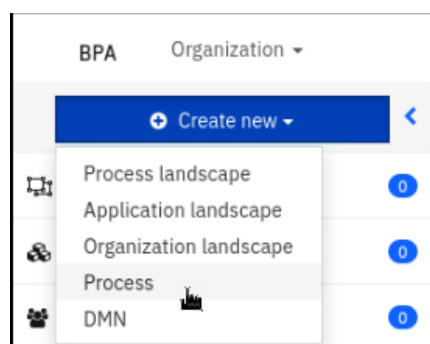
### 3.1 Create BPMN Process

You will now use the BPMN file extracted from the IBM Blueworks Live process export file to create a BPMN process in IBM Process Mining.

\_1. Click **BPA**



\_2. Select **+ Create New > Process**



\_3. Enter the following and then click **Create**

*Add to* - select **New process**

*Organization* - select **local**

*Name* - enter **BAC**

*Import from file (optional)* - select **Banking Account Closure.bpmn** file

Recall that you downloaded this file earlier in this lab.

A screenshot of the 'Create new process' dialog box. The dialog has the following fields and options:

- Add to:** Radio buttons for 'New process' (selected) and 'Existing process'.
- Organization:** A dropdown menu with 'local' selected.
- Name:** A text input field containing 'BAC'.
- Import from file (optional):** A section with a file input field containing 'Banking Account Closu', a 'Remove' button, and a 'Browse...' button.
- Managed by:** A section with a toggle switch and a dropdown menu.
- Buttons:** 'cancel' and 'Create' buttons at the bottom right.

You should now see the BPMN diagram equivalent to the IBM Blueworks Live process diagram.

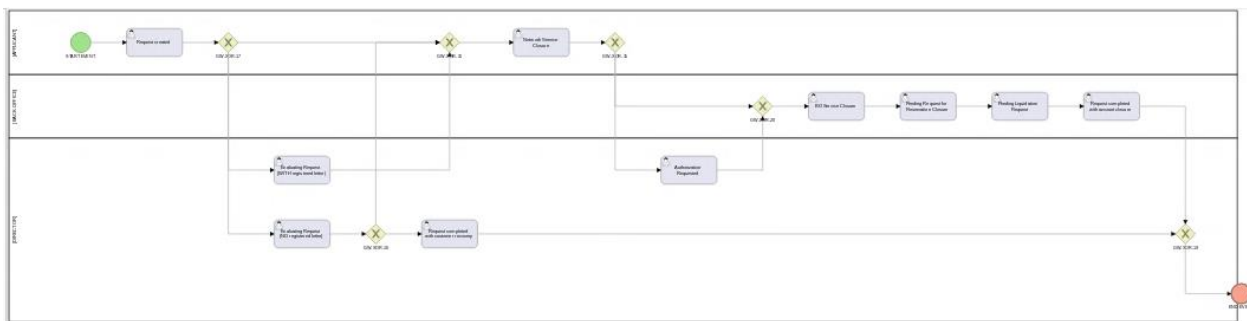


Figure 4. IBM Process Mining

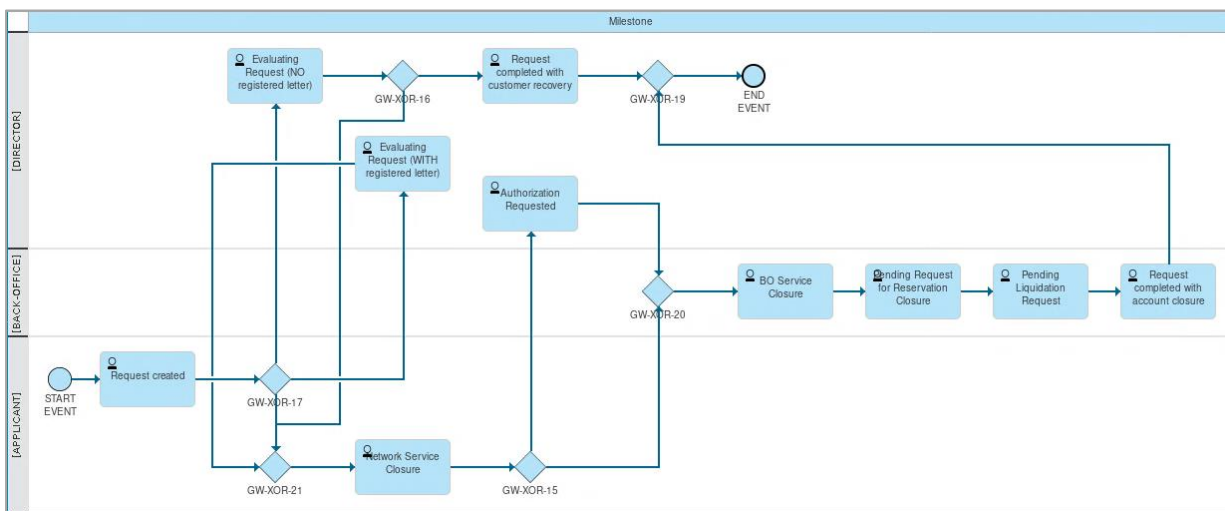


Figure 5. IBM Blueworks Live

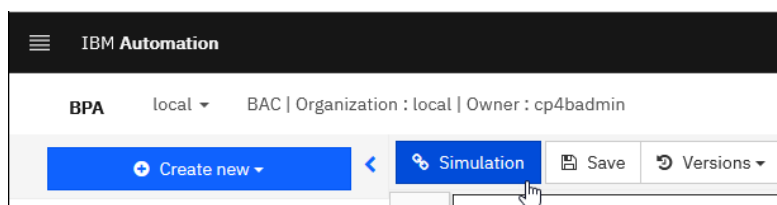
## 3.2 Initialize and Run Simulation

You will now review and initialize the missing simulation parameters and then run a simulation to generate process events used by IBM Process Mining to create a Project.

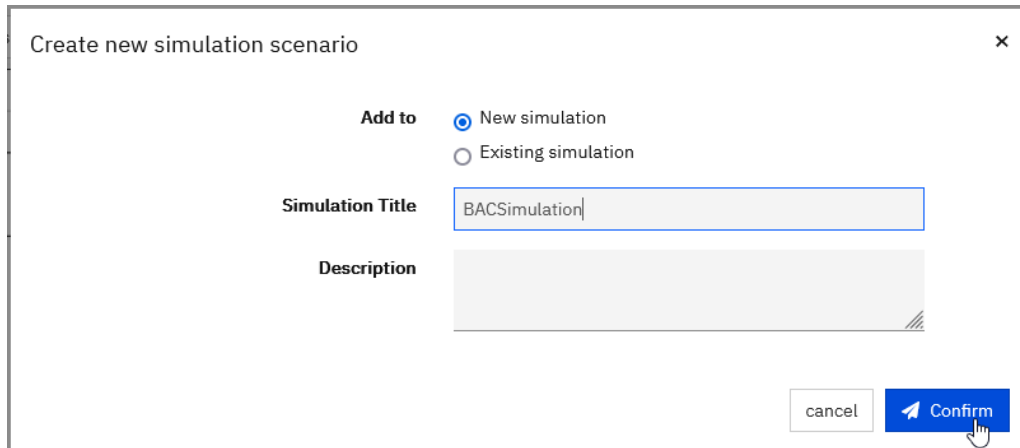
The Project created from the simulated events can be used to gain business insights and discover automation opportunities to improve the process you modeled in IBM Blueworks Live.

### 3.2.1 Create a Simulation

\_1. Click **Simulation** button

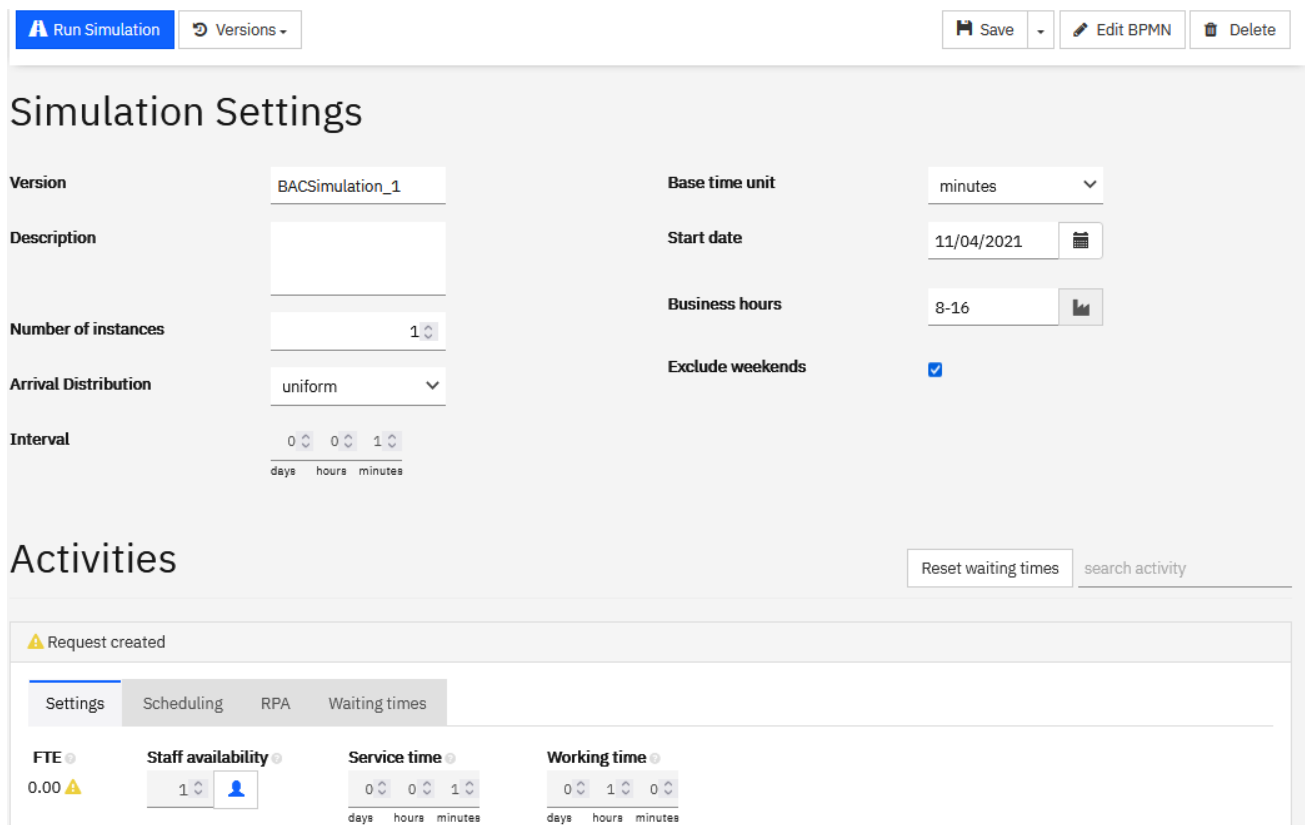


\_2. On **Create new simulation scenario** window, for *Simulation Title*, enter **BACSimulation** and then click **Confirm**.



The dialog box titled "Create new simulation scenario" has a close button (X) in the top right corner. It contains two radio buttons under the "Add to" label: "New simulation" (selected) and "Existing simulation". Below this is a text input field for "Simulation Title" containing the text "BACSimulation". Underneath is a larger text area for "Description". At the bottom right, there are two buttons: "cancel" and "Confirm". A mouse cursor is pointing at the "Confirm" button.

You should now see the new BACSimulation simulation.



The interface shows the "Simulation Settings" page. At the top, there are buttons for "Run Simulation", "Versions", "Save", "Edit BPMN", and "Delete". The settings are organized into two columns. The left column includes: "Version" (BACSimulation\_1), "Description" (empty), "Number of instances" (1), "Arrival Distribution" (uniform), and "Interval" (0 days, 0 hours, 1 minute). The right column includes: "Base time unit" (minutes), "Start date" (11/04/2021), "Business hours" (8-16), and "Exclude weekends" (checked). Below the settings is the "Activities" section, which has a "Reset waiting times" button and a search bar. A notification bar at the bottom says "Request created". Below the notification bar are four tabs: "Settings", "Scheduling", "RPA", and "Waiting times". The "Settings" tab is active and shows four sections: "FTE" (0.00), "Staff availability" (1 person icon), "Service time" (0 days, 0 hours, 1 minute), and "Working time" (0 days, 1 hour, 0 minutes).

You will now change the Activity and Gateway settings.

## 3.2.2 Initialize Simulation Parameters – Service Time

### 3.2.2.1 Why do we need to change Service Time?

The BPMN import transformation maps the **Work Time (30)** to the **Working time (30)** but does not use **Wait time (10)**.

See the diagram below:

The screenshot shows the 'Evaluating Request (NO registered letter)' process configuration. The 'Cycle Time' is set to 30 minutes. A red dotted arrow points from the '30' in the 'Cycle Time' field to the '30' in the 'Working time' field.

Settings	Scheduling	RPA	Waiting times
FTE: 0.00	Staff availability: 1	Service time: 0 days, 0 hours, 1 minutes	Working time: 0 days, 0 hours, 30 minutes

To make the simulation more accurate, you will need to set **Service time** (in IBM Process Mining) to the sum of **Work Time** and **Wait Time** (from IBM Blueworks Live), as shown below:

The screenshot shows the 'Evaluating Request (NO registered letter)' process configuration. The 'Service time' is set to 40 minutes.

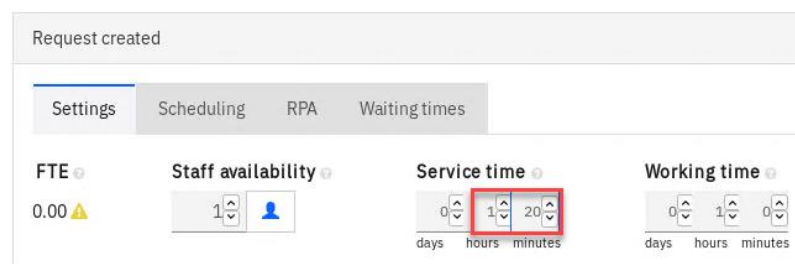
Settings	Scheduling	RPA	Waiting times
FTE: 0.00	Staff availability: 1	Service time: 0 days, 0 hours, 40 minutes	Working time: 0 days, 0 hours, 30 minutes

### 3.2.2.2 Change Service Time

Use the table below to set **Service time** for all activities:

Activity	Service time
Request created	1 hour 20 min
Evaluating Request (WITH registered letter)	47 min
Evaluating Request (NO registered letter)	40 min
Request completed with customer recovery	15 min
Network Service Closure	1 hour 33 min
Authorization Requested	23 min
BO Service Closure	52 min
Pending Request for Reservation Closure	22 min
Pending Liquidation Request	11 min
Request completed with account closure	14 min

For example, enter **1 hour 20 min** for **Request created**



Request created

Settings | **Scheduling** | RPA | Waiting times

FTE 0.00 ⚠

Staff availability 1 👤

**Service time** 0 days 1 hours 20 minutes

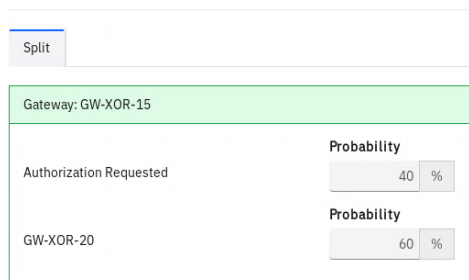
Working time 0 days 1 hours 0 minutes

### 3.2.3 Initialize Simulation Parameters – Gateway

Optionally you can also change the gateway flow distribution ratios.

\_1. For example, for the first Gateway, you can change the default from 50/50 to **40/60**

#### Gateways



Split

Gateway: GW-XOR-15

Authorization Requested Probability 40 %

GW-XOR-20 Probability 60 %

### 3.2.4 Run Simulation and Create a Project

The **Simulation Settings** section contains nine parameters that you can adjust as desired. In this lab, we will accept all the defaults except for the **Number of instances** parameter.

\_1. For the *Number of instances*, enter **1000**

This will generate 1000 Cases (instances) and a variable number of Activity Events (enough events to complete a process instance) for each instance.

## Simulation Settings

Version	BACSimulation_1
Description	
Number of instances	1000

\_2. Click **Run Simulation**



Note that the simulation engine generated 1000 process instances and activity events for each process instance and used the execution and wait time settings we set for each activity.

Activity instances			
Name	Count	Avg Execution time	Avg Wait time
Authorization Requested	334	23min	3min
BO Service Closure	835	52min	7min
Evaluating Request (NO registered letter)	330	40min	10min
Evaluating Request (WITH registered letter)	330	47min	7min
Network Service Closure	835	1h 33min	125h 56min
Pending Liquidation Request	835	11min	1min
Pending Request for Reservation Closure	835	22min	12min
Request completed with account closure	835	14min	4min
Request completed with customer recovery	165	15min	5min
Request created	1000	1h 20min	491h 30min

\_3. Click **Create Project**

Process simulation results:

## BACSimulation\_1



\_4. Click **Confirm**

Create project with simulated data

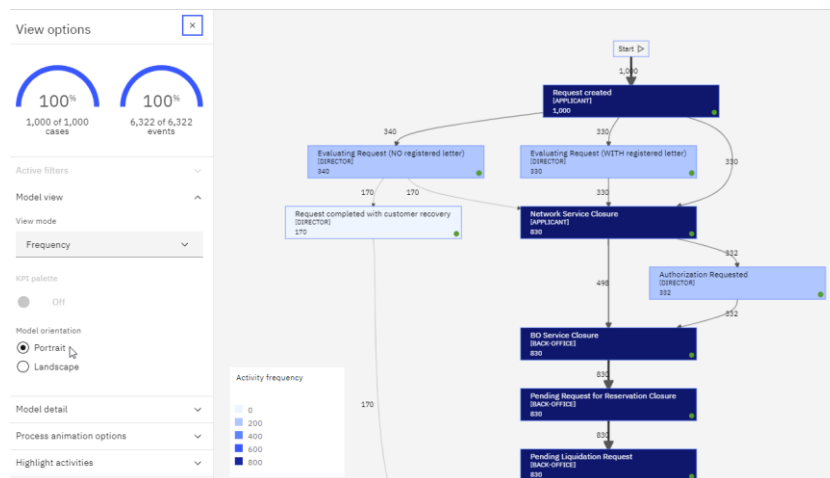
Project name

BACSimulation

cancel

Confirm

This action will open BACSimulation Project in the IBM Process Mining tool in the Model View. The event data in this Project was created for us by the Simulation Engine.



### 3.3 Examine Generated Process Data

In this part of the lab, we will examine what data was generated by the simulation engine. You will find enough data to conduct meaningful process mining activities!

#### 3.3.1 Activity cost

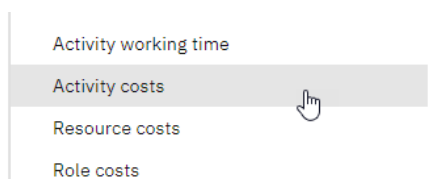
\_1. Click **Manage**

[Processes /](#)

BACSimulation













\_2. Click the **Activity costs** tab.

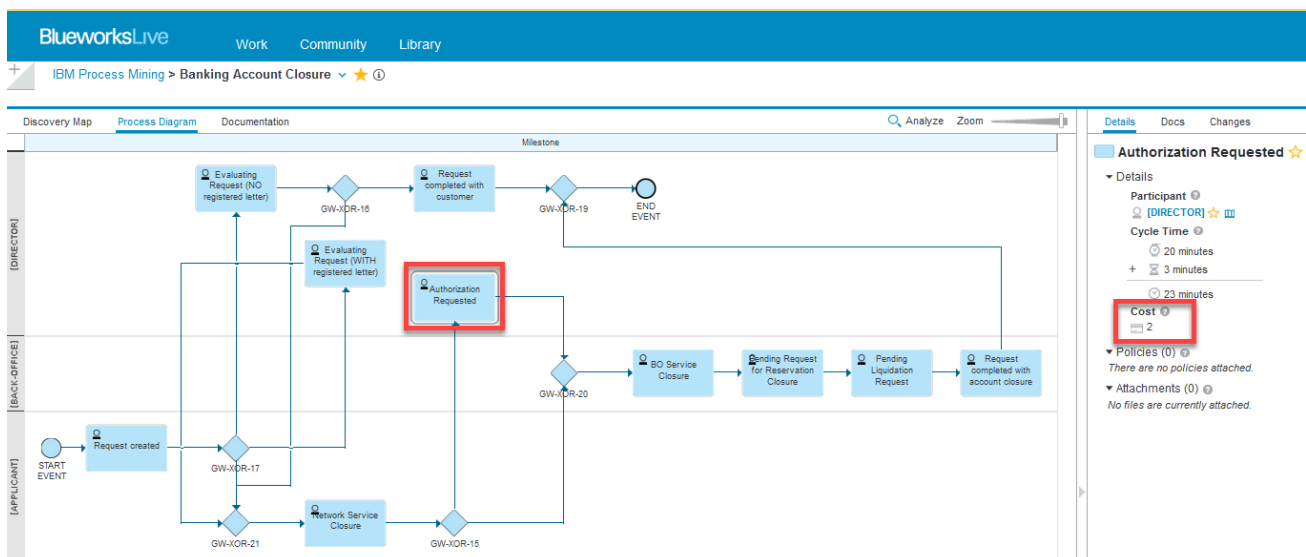




You should now see the Activity costs. Note, for example, that **Authorization Requested** is set to EUR 2.00

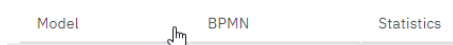
Activity	Hourly cost	Type	End date	
Default	EUR 0.00	Any	N/A	 
Authorization Requested	EUR 2.00	Manual	N/A	 
BO Service Closure	EUR 10.00	Manual	N/A	 
Evaluating Request (NO registered letter)	EUR 5.00	Manual	N/A	 
Evaluating Request (WITH registered letter)	EUR 2.00	Manual	N/A	 
Items per page: 5    1 - 5 of 11 items    1 of 3 pages				

\_3. Note that the cost values came from the Activity Settings in IBM Blueworks Live.



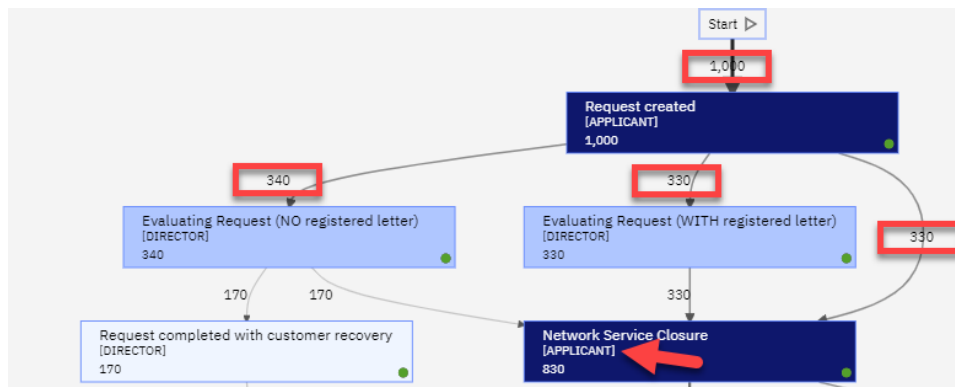
\_4. Click the **Model** tab

BACSimulation



### 3.3.2 Frequency View

The frequency view is selected by default.

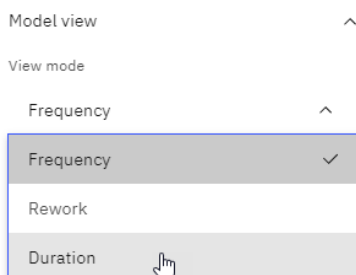


Note

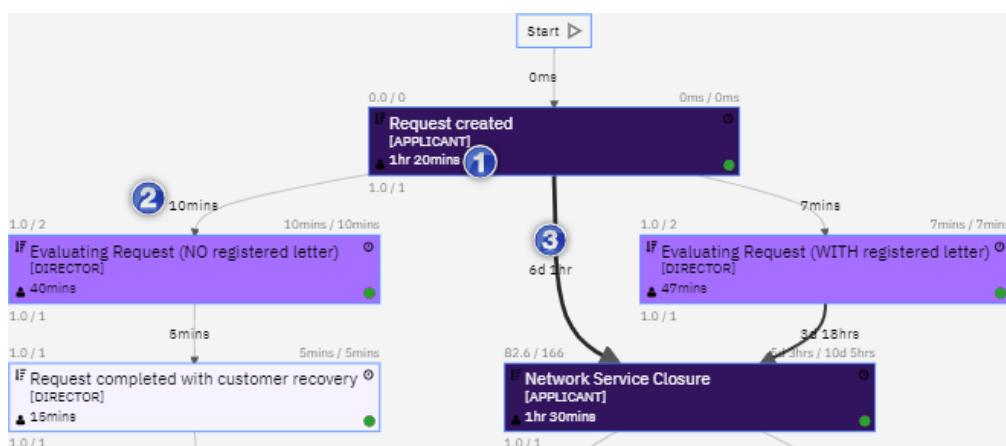
- The event frequency is shown on the links. Recall that we set the summation count to 1000, and the first gateway was set by default to be split evenly at 33%, 33%, and 34%. Hence the even path distribution leading out of the first Activity: 330, 340, and 330.
- The Role (i.e., [APPLICANT]) is shown. It comes from the swim-lane definitions in IBM Blueworks Live.

### 3.3.3 Average Duration View

#### \_1. Click Duration



You should now see the Duration View similar to this.



Note:

- Activity durations
- Wait times leading to activities
- Transition link width
- Activity color

Note that the KPI settings that determine the KPI view were pre-set for you. If you want to examine the details, select **Manage > KPI** as shown below

# BACSimulation

Model

BPMN

Statistics

Compare

Resource mapping

Manage

Project

About

General

Data stream

Data source

Reference model

End activities

Simulation

Alias

Backup & History

Integration & Api

Translations

Snapshots

Business metrics

Custom metrics

KPIs

Activity working time

Activity costs

Resource costs

Role costs

## KPIs

Overall process KPIs

Case duration thresholds

Between 1 day and 8 days

Case cost thresholds

Between 0 EUR and 0 EUR

Default activity KPIs

Activity throughput thresholds

Between 1 day and 8 days

Activity wait queue thresholds

Between 1 day and 8 days

Activity duration thresholds

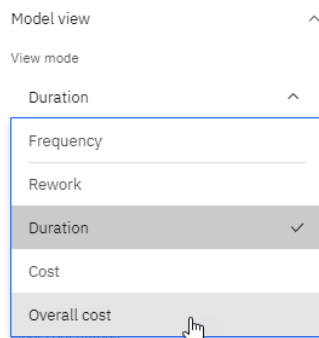
Between 1 day and 8 days

Resource allocation thresholds

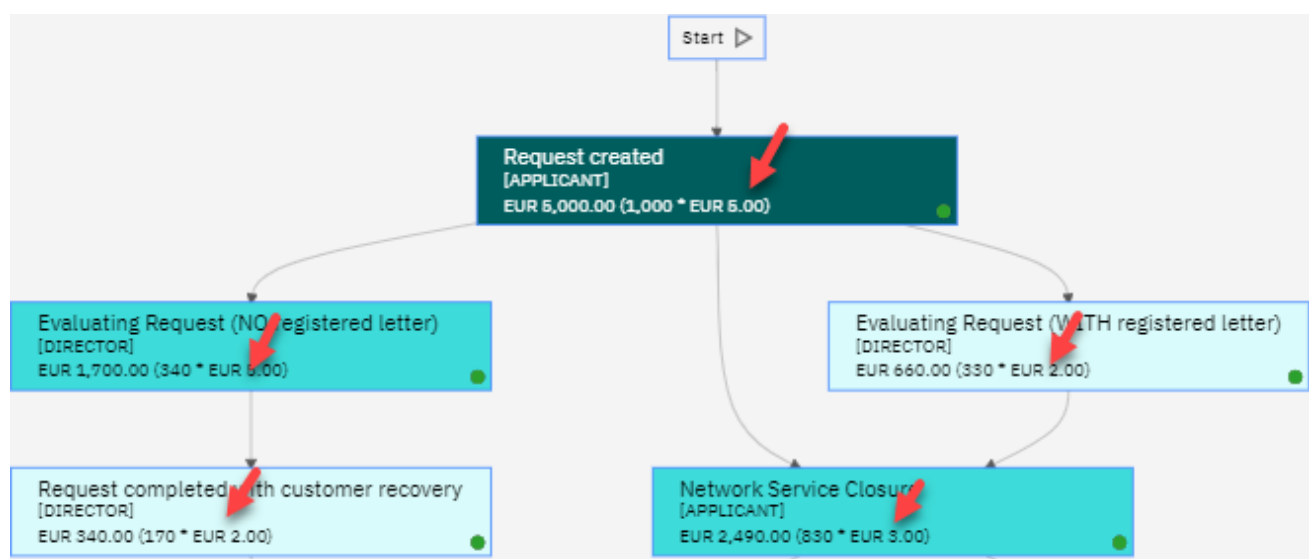
Between 33 % and 66 %

### 3.3.4 Cost View

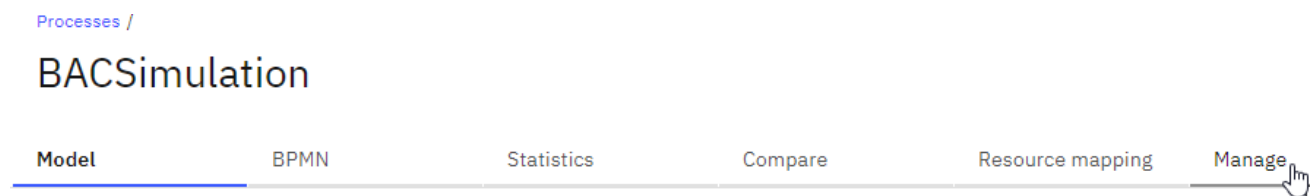
\_1. Switch to the **Overall cost** view.



You should now see the Overall Cost View. Note the Activity costs that came from IBM Blueworks Live.



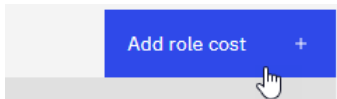
\_2. Click **Manage** tab



\_3. Click the **Role costs** section.



\_4. Click **Add role cost +**

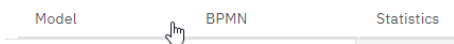


For *Role*, select **[DIRECTOR]**; for *Hourly cost*, enter **20** and then click **Add** button

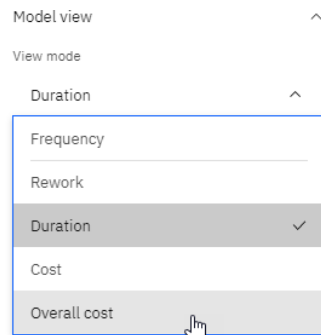
A dialog box titled 'Add role cost' with a close button (X) in the top right. It contains three fields: 'Role' with a dropdown menu showing '[DIRECTOR]' and a green checkmark; 'Hourly cost' with a text input field containing '20' and a green checkmark; and 'End date' with a date picker showing 'mm/dd/yyyy'. At the bottom, there are two buttons: 'Cancel' and 'Add', with a green checkmark over the 'Add' button and a mouse cursor pointing at it.

\_5. Click **Model** tab

BACSimulation



\_6. Switch to the **Overall cost** view.

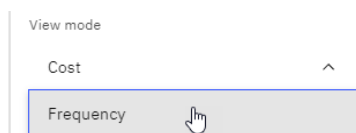


Note the changes in the [DIRECTOR] role activities. The cost calculation now includes the role cost!

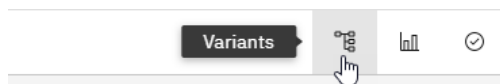


### 3.3.5 Variants

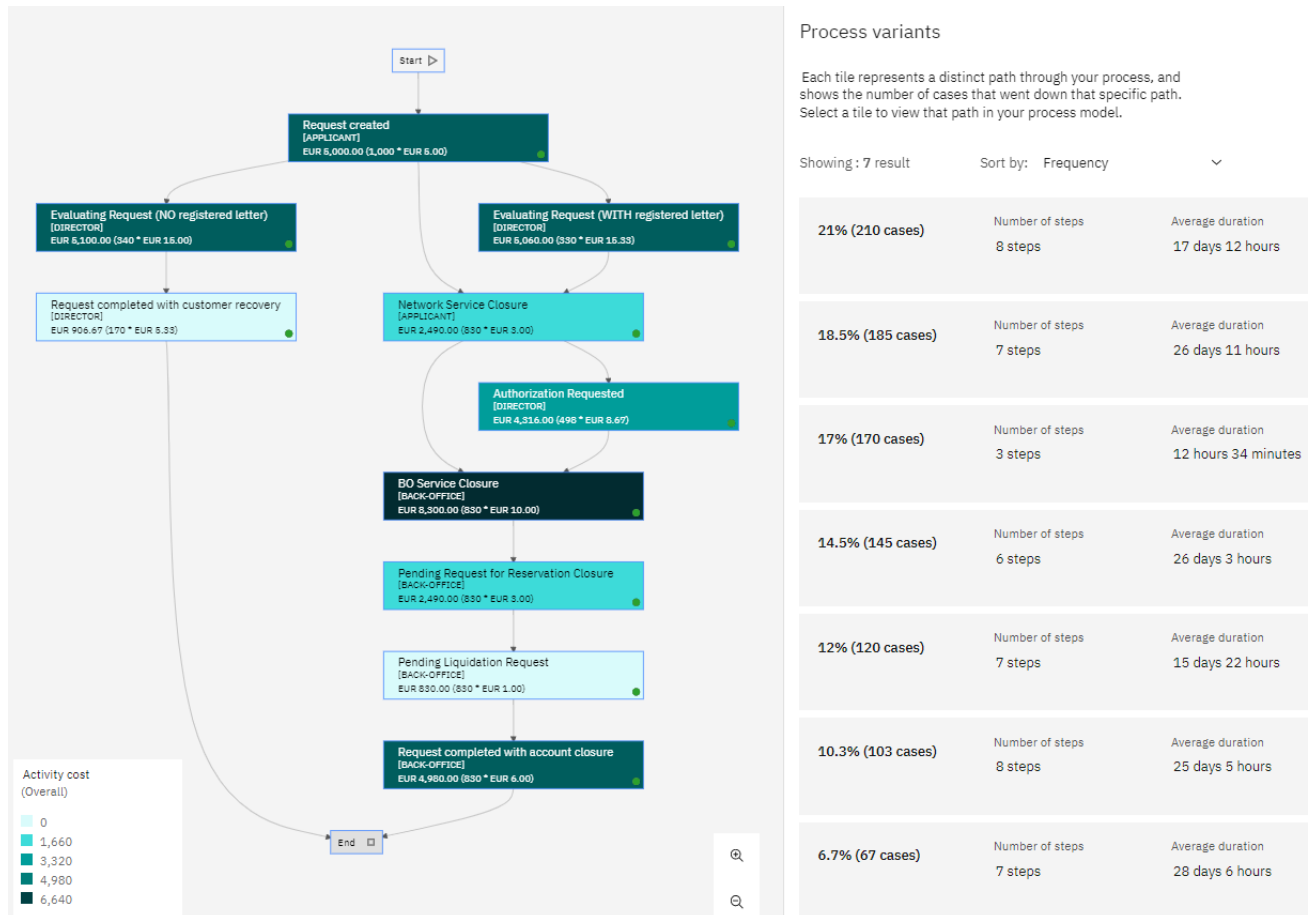
\_1. Switch to the **Frequency** view.



\_2. Click the **Variants** button.



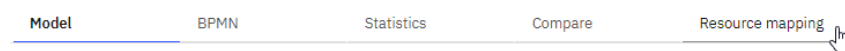
Notice that the simulation-generated event data created distinct process paths (variants).



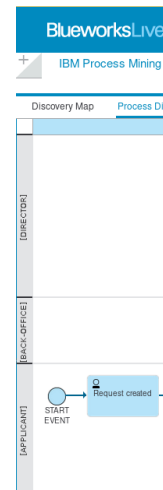
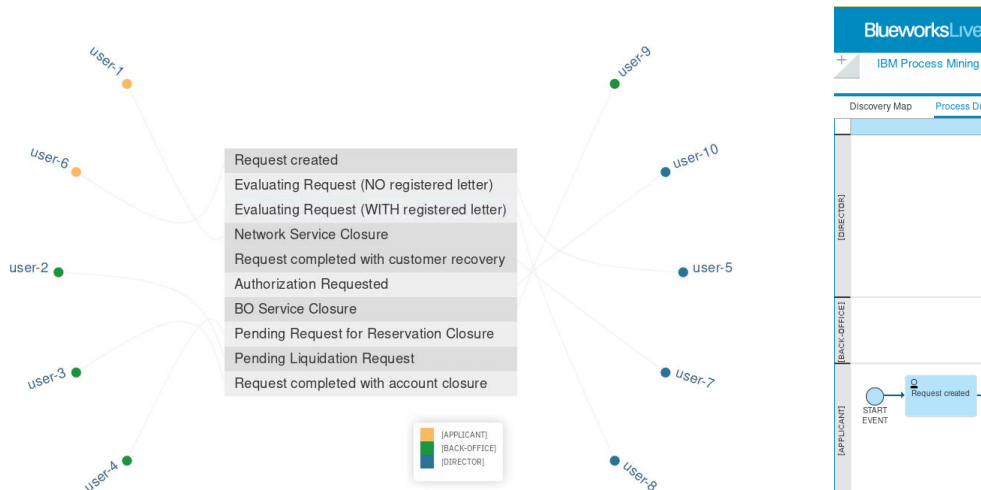
### 3.3.6 Social discovery capabilities

#### \_1. Click Resource mapping

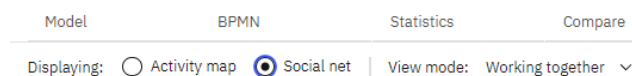
BACSimulation



Note that the simulation engine created 10 users and associated them with the Roles. Recall that the Roles originated from swim lanes in IBM Blueworks Live



#### \_2. Click Social net



Note the user distribution in the social model.



## 3.4 Create Additional Events Using New Simulation Scenarios

Let's now add more events to the process model.

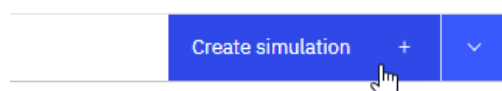
### 3.4.1 Create a new Simulation Scenario

\_1. Click **BPMN** tab

BACSimulation



\_2. Click **Create Simulation +** button.



\_3. Enter the following and then click **Create simulation** button.

- For *Add to* select **Existing simulation**;
- For the *Simulation title*, select **BACSimulation**
- For the *Version name*, enter **2**

A screenshot of a 'Create simulation' dialog box. It has a close button (X) in the top right. Under 'Add to', 'Existing simulation' is selected with a radio button. The 'Simulation title' dropdown is set to 'BACSimulation'. The 'Version name' text field contains '2'. There is a 'Description (optional)' text area with a character count '0/100'. At the bottom, there are 'Cancel' and 'Create simulation' buttons. A mouse cursor is clicking on the 'Create simulation' button.

### 3.4.2 Change Simulation Scenario Parameters

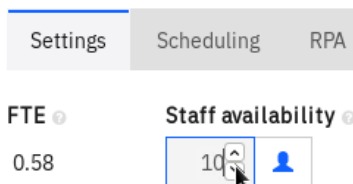
Let's change some simulation parameters.

\_1. Change the *Number of instances* to **1500**

A screenshot showing the 'Number of instances' label and a numeric input field containing the value '1500'.



\_2. For all activities, change Staff availability from 1 to **10**



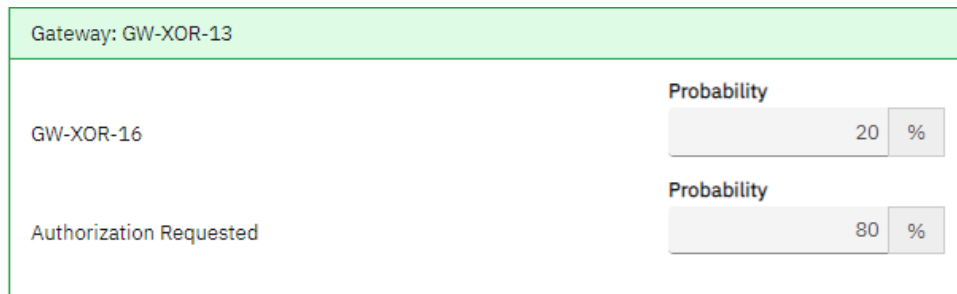
Settings   Scheduling   RPA

FTE ⓘ   Staff availability ⓘ

0.58   10

\_3. We want to find the impact of increasing the number of employees assigned to work on this process.

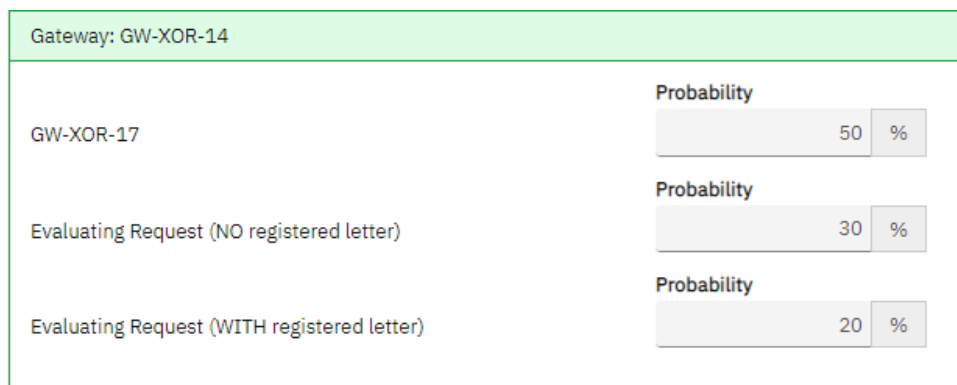
\_4. Change *Gateway: GW-XOR-13* Probability to **20 and 80**.



Gateway: GW-XOR-13

GW-XOR-16	Probability	20	%
Authorization Requested	Probability	80	%

\_5. Change *Gateway: GW-XOR-14* Probability to **50, 30 and 20**



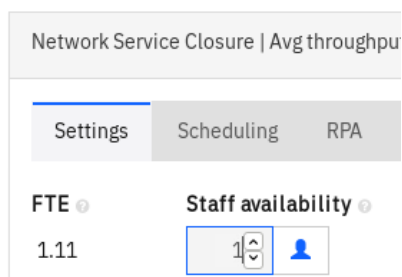
Gateway: GW-XOR-14

GW-XOR-17	Probability	50	%
Evaluating Request (NO registered letter)	Probability	30	%
Evaluating Request (WITH registered letter)	Probability	20	%

### 3.4.3 Introduce Automation

One of the activities will be partially automated by RPA bots.

\_1. For *Network Service Closure*, change the Staff Availability to **1**



Network Service Closure | Avg throughput

Settings   Scheduling   RPA

FTE ⓘ   Staff availability ⓘ

1.11   1

The Activity will be automated partially, but we will reduce the number of available employees from 10 to 1.

\_2. Click **RPA** tab

Network Service Closure | Avg throughput

Settings | Scheduling | **RPA**

FTE 1.11

Staff availability 1

\_3. For the *Robotic quote*, enter **90**, and for the *Number of robots*, enter **22**

Settings | Scheduling | **RPA** | Waiting times

**Robotic quote** 90 %

**Business hours** e.g. 8-20

**Number of robots** 22

**Service time** 0 days 0 hours 1 minutes

90% of the time, the Activity will be performed by one of the robots available from a pool of 20 robot servers.

### 3.4.4 Run the Simulation and Import Simulation Data

We will now run the new simulation scenario to generate new events and conditionally import the new events to the main model.

\_1. Click Run Simulation

Current lead time 19d 7h 59min 54sec

Estimated lead time 7d 0h 0min 0sec ⚠

**Run Simulation** Versions

We can now compare the original (A) and the new simulation scenario (B).

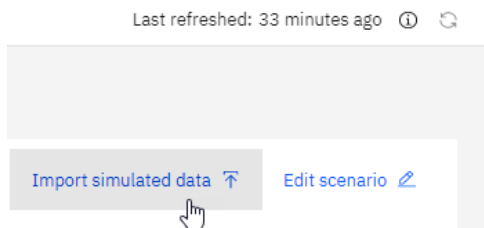
Process details		
Process overview	A	B
Case count	1,000	1,500
Average case lead time	19d 6h	2d 3h
Average case cost	EUR 38.14	EUR 26.19
Total case cost	EUR 38,143.00	EUR 39,282.33

Note that the above simulation result screenshot may differ slightly from your environment. This happens because simulation uses uniform statistical distributions when generating events!

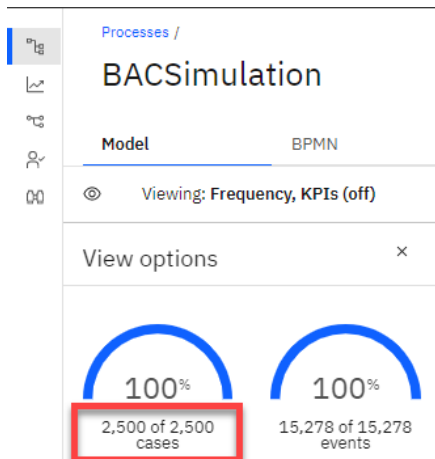
We now have two choices:

- 1) If we are not satisfied with the generated data, we can click the *Return to scenario* button and make desired simulation parameter changes.
- 2) If satisfied with the results, we can click the *Import* button to add the generated events to our main model.

## \_2. Click **Import simulated data**.



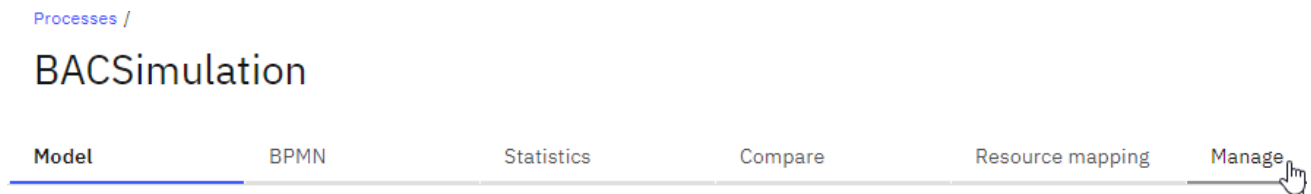
Note that you now see 1500 more cases!



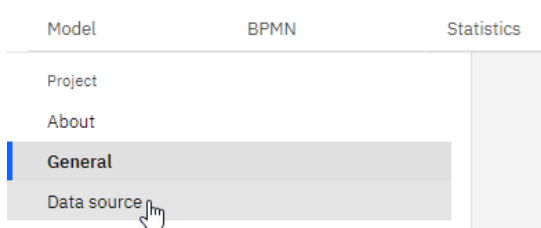
### 3.4.5 Managing Event Data

You can use the above technique to incrementally generate as many events as you need. Let's learn how to manage the generated events.

## \_1. Click **Manage** tab



## \_2. Click the **Data source** tab.



Notice the additional *BAC Simulation* data set.

Channels	Status	From date	To date	Find a data sou...	Get from simulation
<input type="checkbox"/> Name	Uploaded date	Rows	Channel	Include	
<input type="checkbox"/> BACSimulation : 3	Tue, May 9, 2023 9:17 AM	10,261	simulation	<input checked="" type="checkbox"/>	
<input type="checkbox"/> BACSimulation	Tue, May 9, 2023 8:00 AM	6,489	bpa	<input checked="" type="checkbox"/>	

This is the data set you generated when simulating for the second time.

You can either include or exclude this data set in the Process Model. For example, to get back to the original 1000 cases data set by unselecting the Include switch. Also, if you like, you can delete this data set permanently.

### **3.5 Lab Summary**

In this lab, you have learned how to leverage IBM Process Mining to run process simulations of BPMN processes modeled in IBM Blueworks Live. You also learned how the IBM Process Mining tool can generate event data required for process mining that does not require business data beyond the primary process data, such as Activity Wait Times, Teams, Users, etc.