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

Paul Pacholski
pacholsk@ca.ibm.com

Patrick Megard
patrick.megard@fr.ibm.com

NOTICES

This information was developed for products and services offered in the USA.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive, MD-NC119
Armonk, NY 10504-1785
United States of America

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product and use of those websites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

TRADEMARKS

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at "Copyright and trademark information" at www.ibm.com/legal/copytrade.shtml.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

IT Infrastructure Library is a Registered Trade Mark of AXELOS Limited.

ITIL is a Registered Trade Mark of AXELOS Limited.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Table of Contents

1 Introduction

1.1 IBM Process Mining

IBM Process Mining uses a family of techniques in process management that support the analysis of actual, running business processes based on event logs. During process mining, specialized data mining algorithms are applied to identify trends, patterns, and details in event logs recorded by an information system. Process mining aims to improve understanding of processes and drive efficiency and optimization.

More technical information about IBM Process Mining: https://ibm.box.com/v/IBMProcessMiningTechIntro

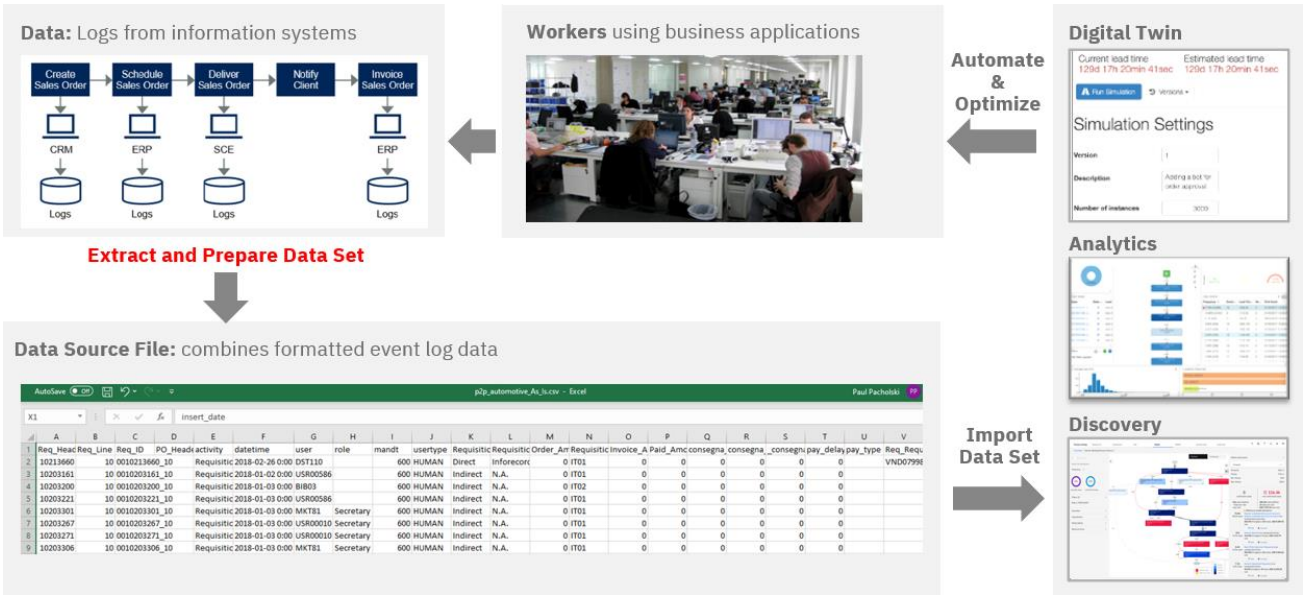


Figure 1. Process Mining

1.2 IBM Blueworks Live

IBM Blueworks Live is a cloud-based software with a dedicated, collaborative environment available anywhere to build and improve business processes through process mapping. It enables teams to work together through an intuitive and easily accessible web interface to document and analyze processes to help make them more efficient.

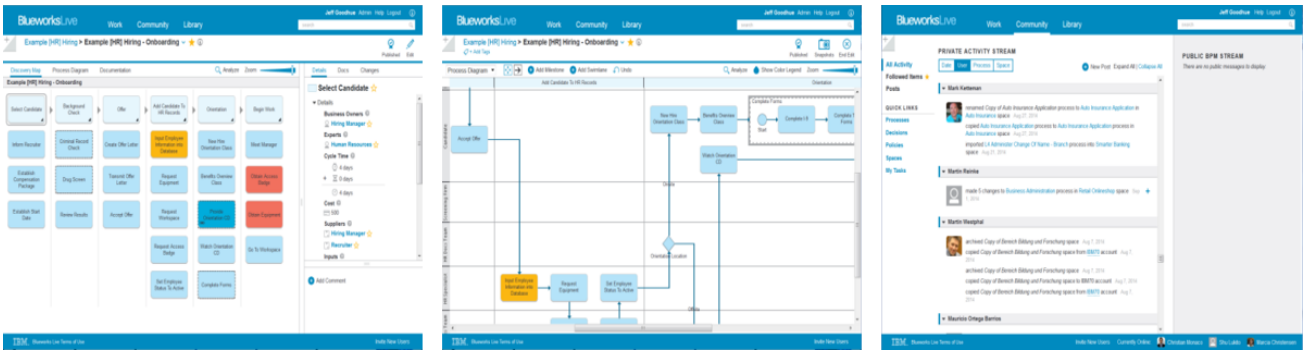


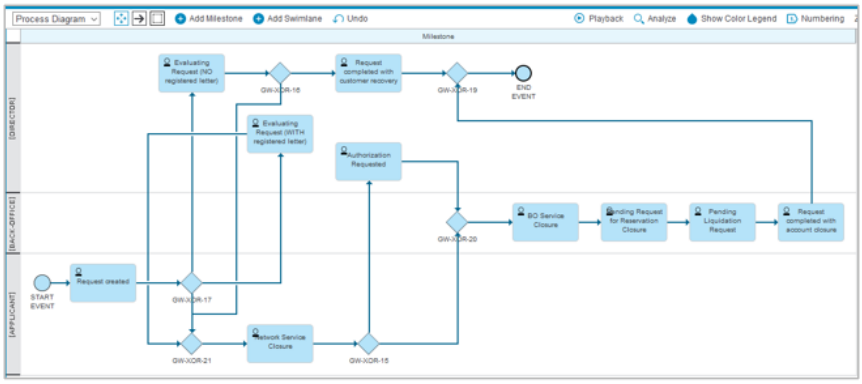
Figure 2. IBM Blueworks Live

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

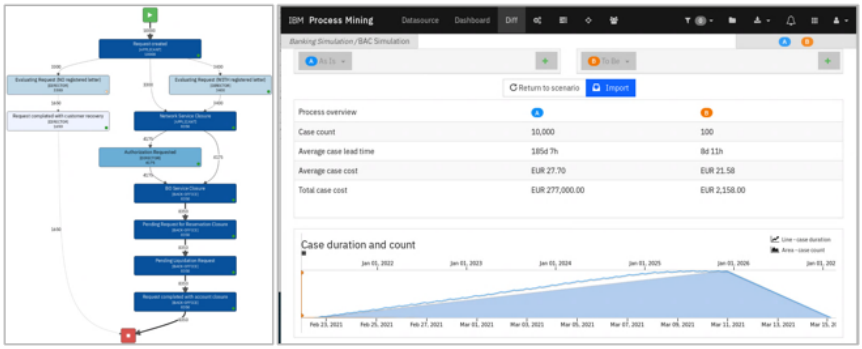


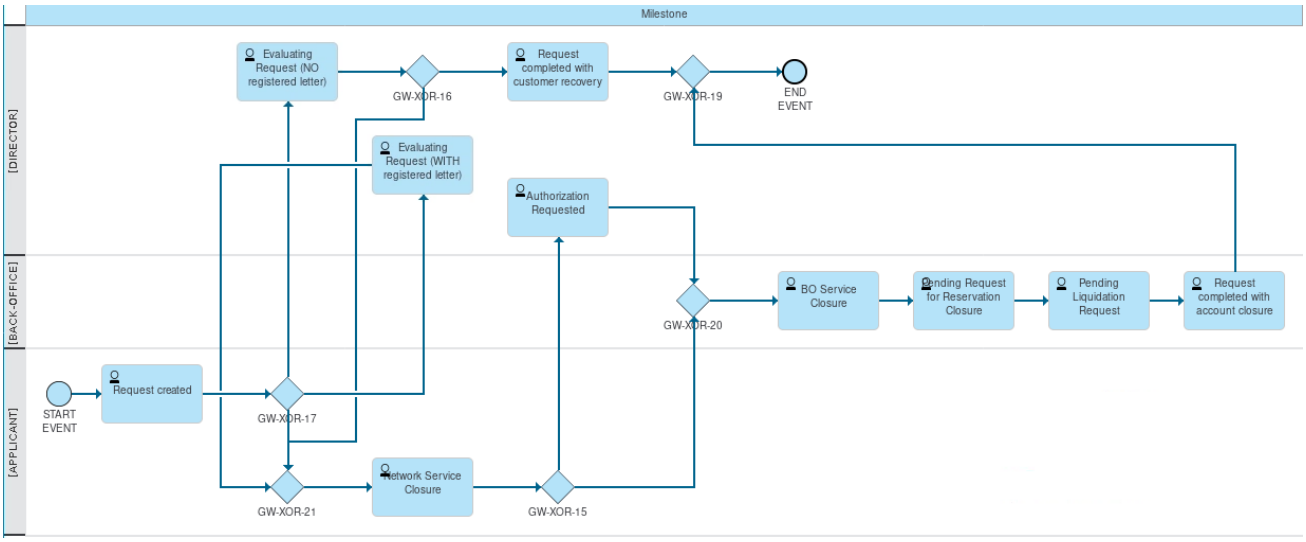
Figure 3. Model Processes in IBM Blueworks Live. Simulate and Optimize in IBM Process Mining.

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.

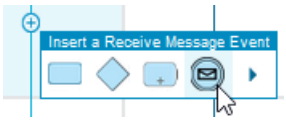
The Bank Account Opening process used in this lab was already created for you and exported, so you do not need to build it in IBM Blueworks Live. If you want to examine the process used in this lab, you can import it to IBM Blueworks Live using the *Banking Account Closure.zip* file provided.

> Recall that you imported this file to the desktop.

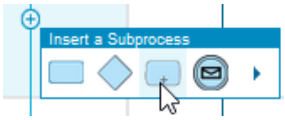
1.4.1 Basic Requirements

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

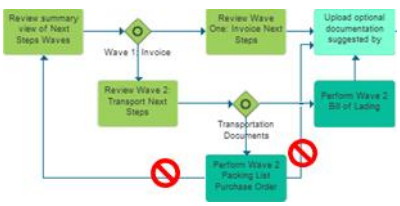
- Message Events



- Subprocesses



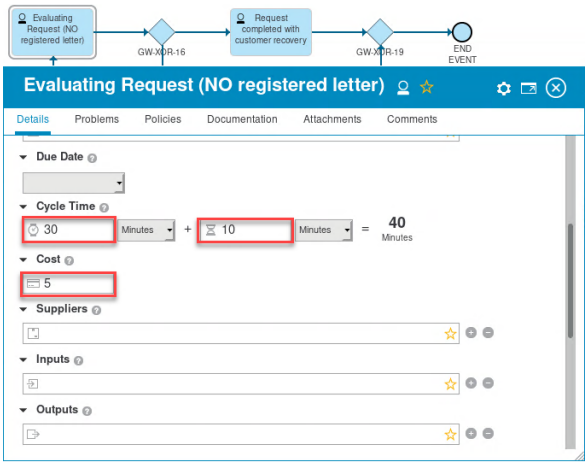
- Multiple links lead to activity.



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:

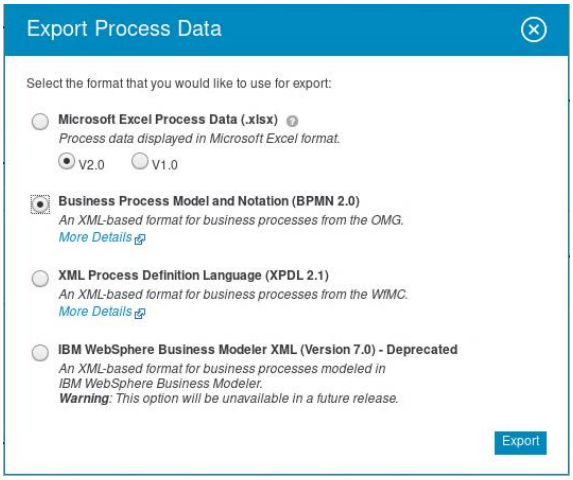
- Work Time
- Wait Time
- Cost



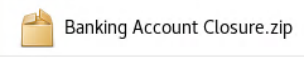
1.4.3 Exporting Process from IBM Blueworks Live

_1. Use standard BWL Process Export.

_2. Select **BPMN 2.0**

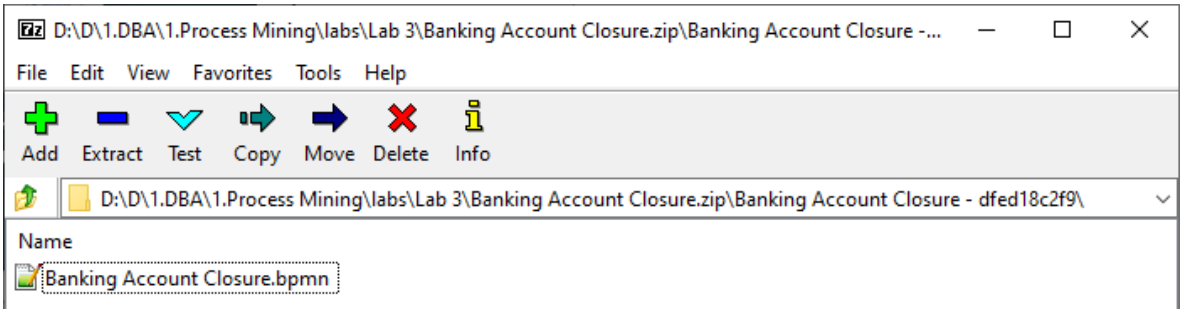


This will create a zip file.



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.

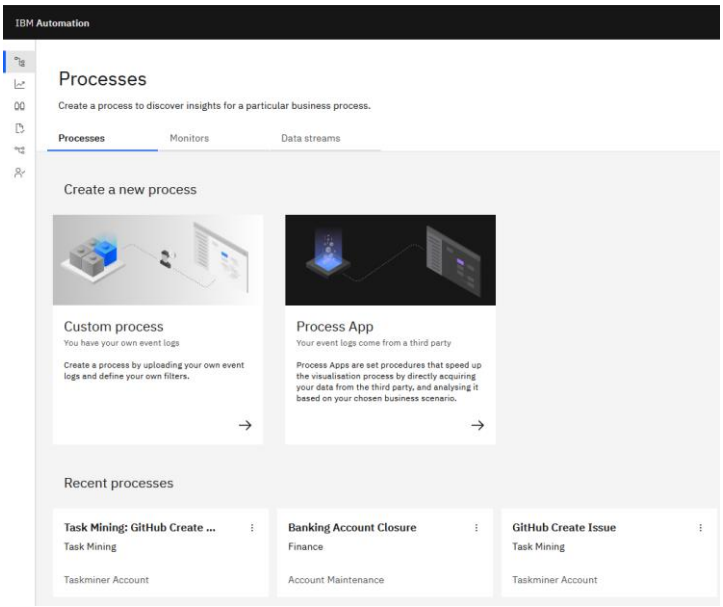
_1. Download this document and follow the instruction for reserving a Tech Zone environment.

_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

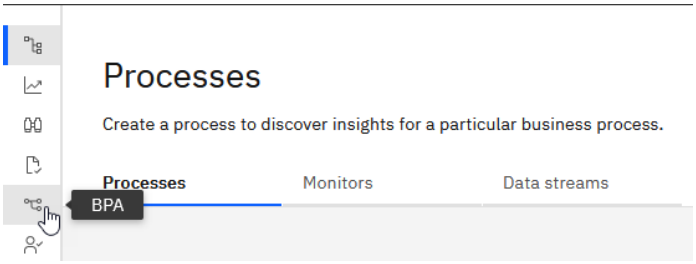
These files must be accessible from the IBM Process Mining web application. You will use them in this lab.

3 Lab Instructions

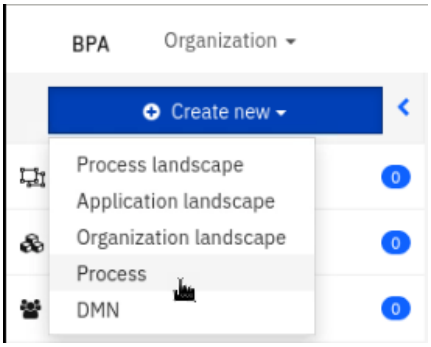
3.1 Create BPMN Process

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**

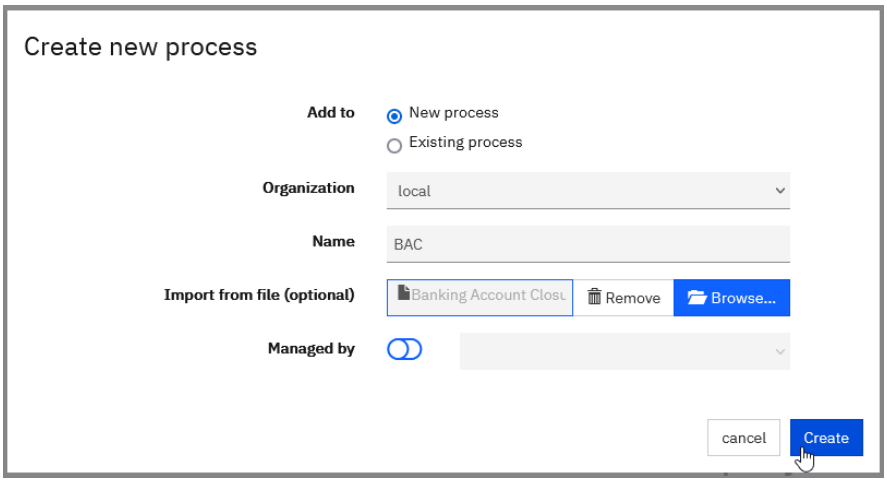
Add to - select **New process**

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.



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

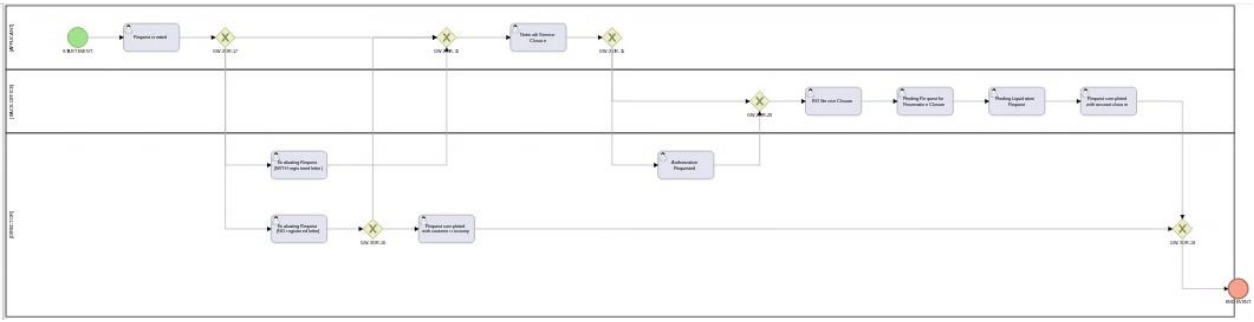


Figure 4. IBM Process Mining

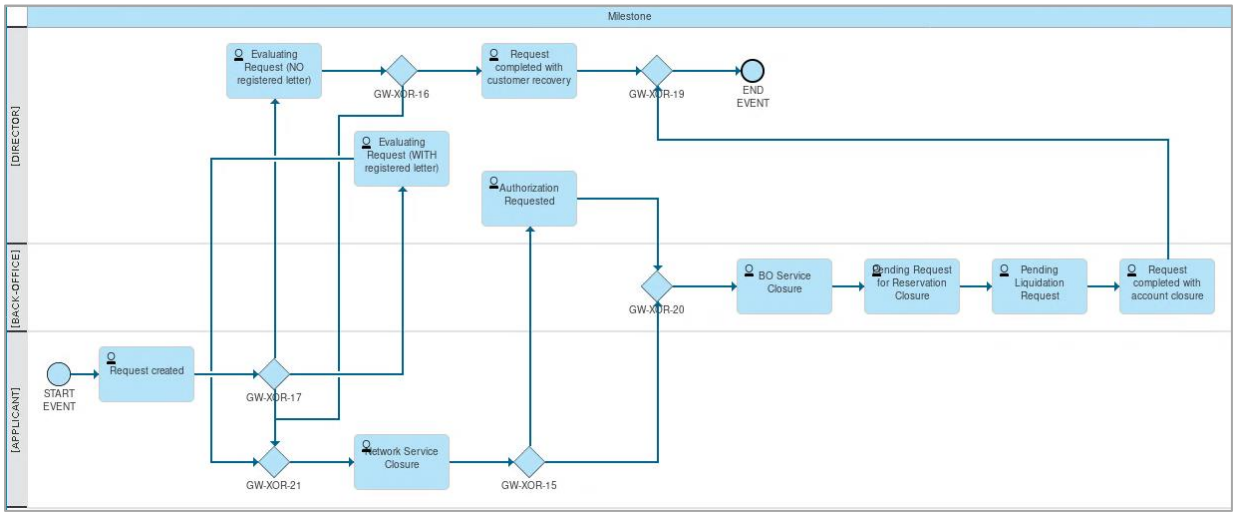


Figure 5. IBM Blueworks Live

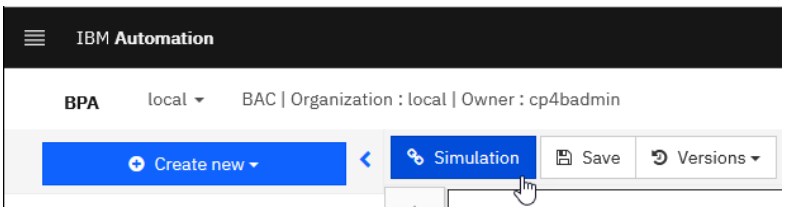
3.2 Initialize and Run Simulation

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.

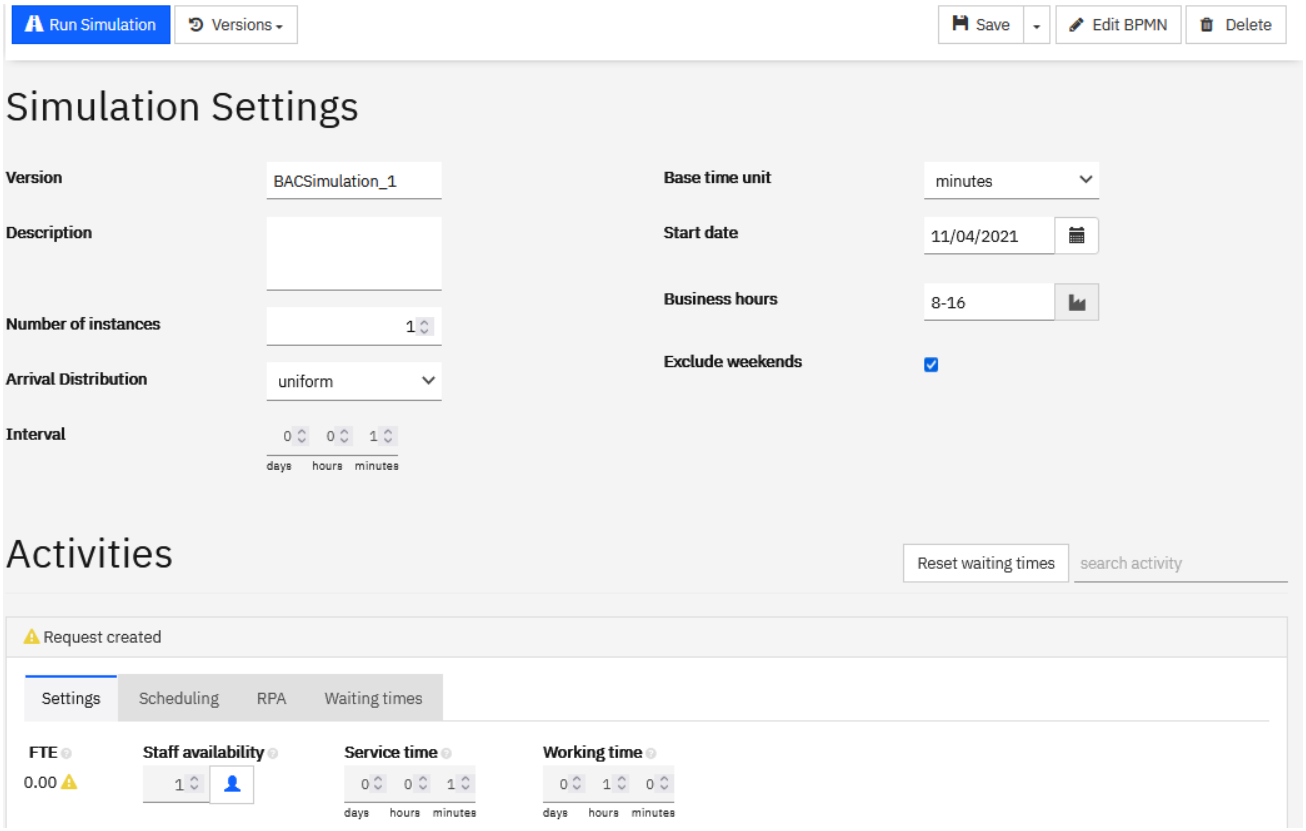
3.2.1 Create a Simulation

_1. Click **Simulation** button



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

You should now see the new BACSimluation simulation.



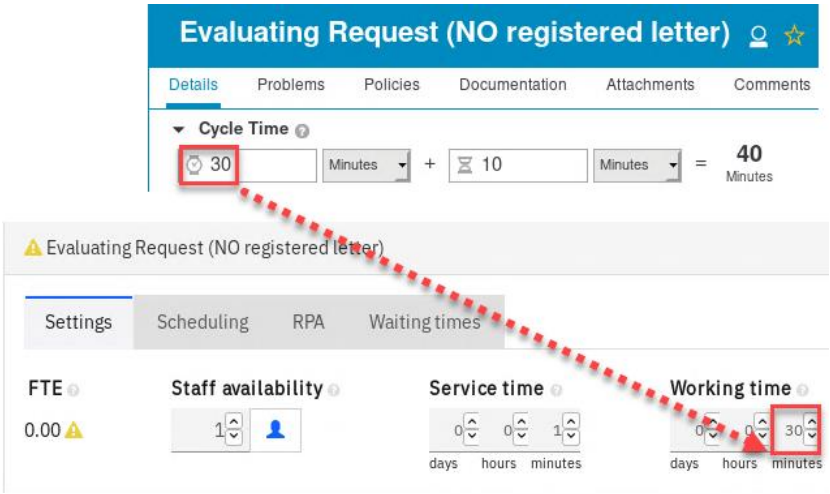
You will now change the Activity and Gateway settings.

3.2.2 Initialize Simulation Parameters – Service Time

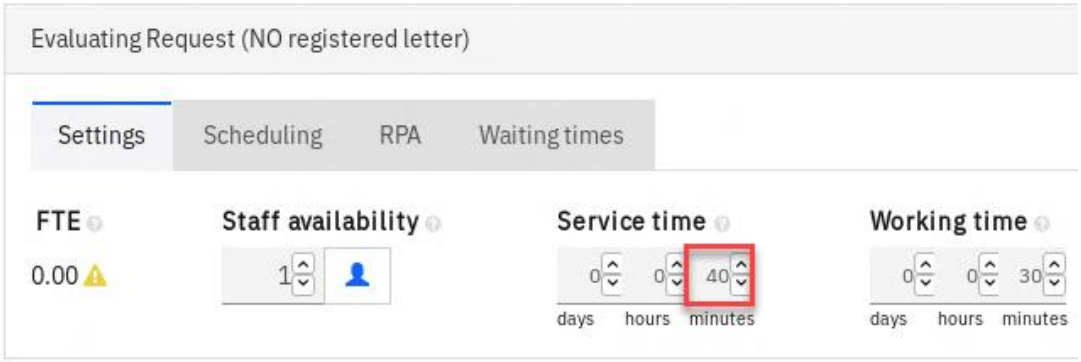
3.2.2.1 Why do we need to change Service Time?

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:



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:

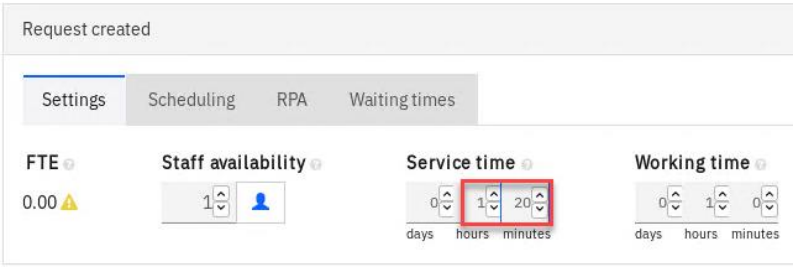


3.2.2.2 Change Service Time

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

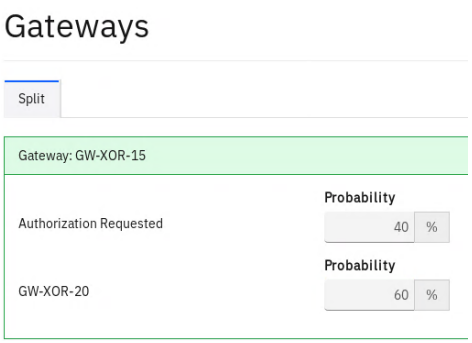
For example, enter **1 hour 20 min** for **Request created**



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**

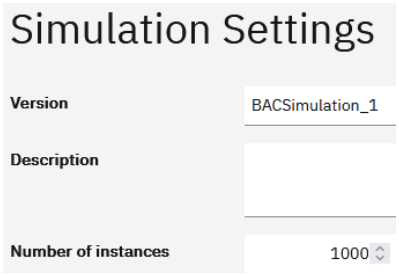


3.2.4 Run Simulation and Create a Project

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.

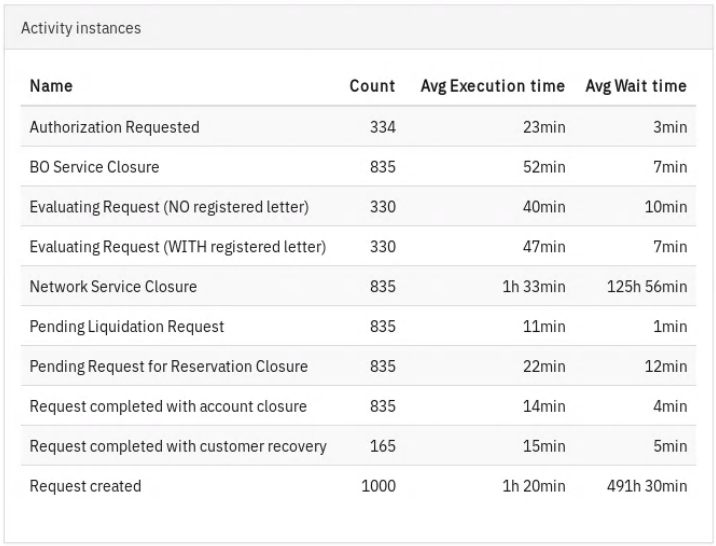
_1. For the *Number of instances*, enter **1000**

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



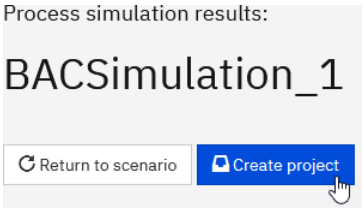
_2. Click **Run Simulation**

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.

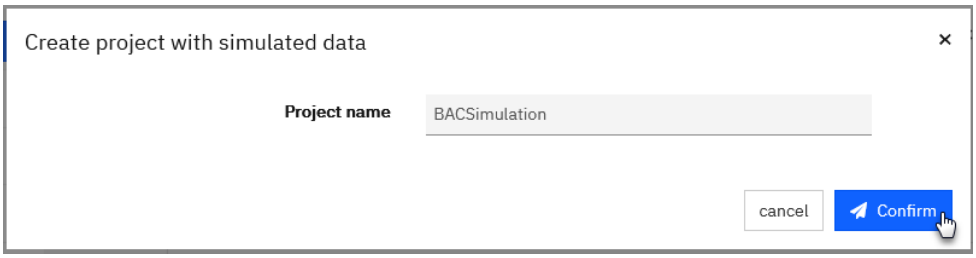


Name	Count	Avg Execution time	Avg Wait time
Authorization Requested	334	23min	3min
BO Service Closure	835	52min	7min
Evaluating Request (NO registered letter)	330	40min	10min
Evaluating Request (WITH registered letter)	330	47min	7min
Network Service Closure	835	1h 33min	125h 56min
Pending Liquidation 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

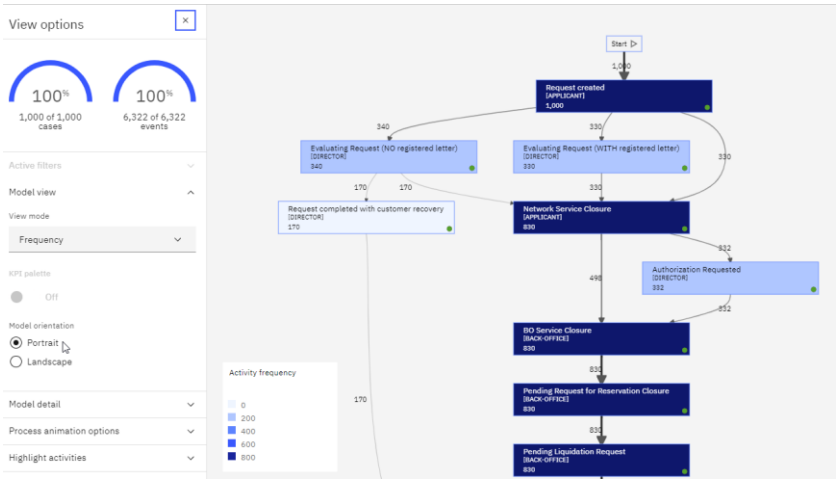
_3. Click **Create Project**



_4. Click **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.



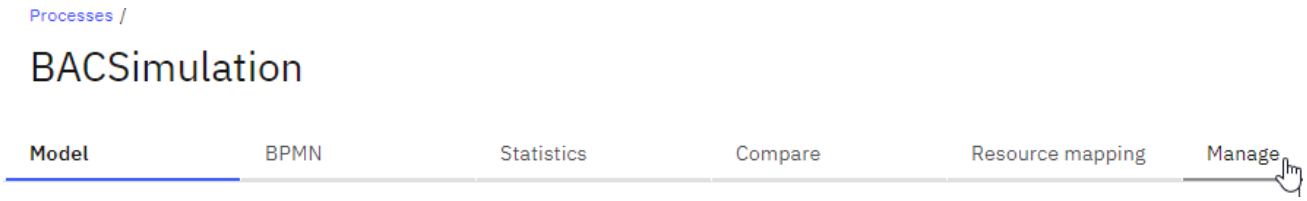
3.3 Examine Generated Process Data

In this part of the lab, we will examine what data was generated by the simulation engine.

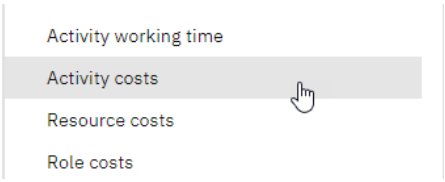
You will find enough data to conduct meaningful process mining activities!

3.3.1 Activity cost

_1. Click **Manage**



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

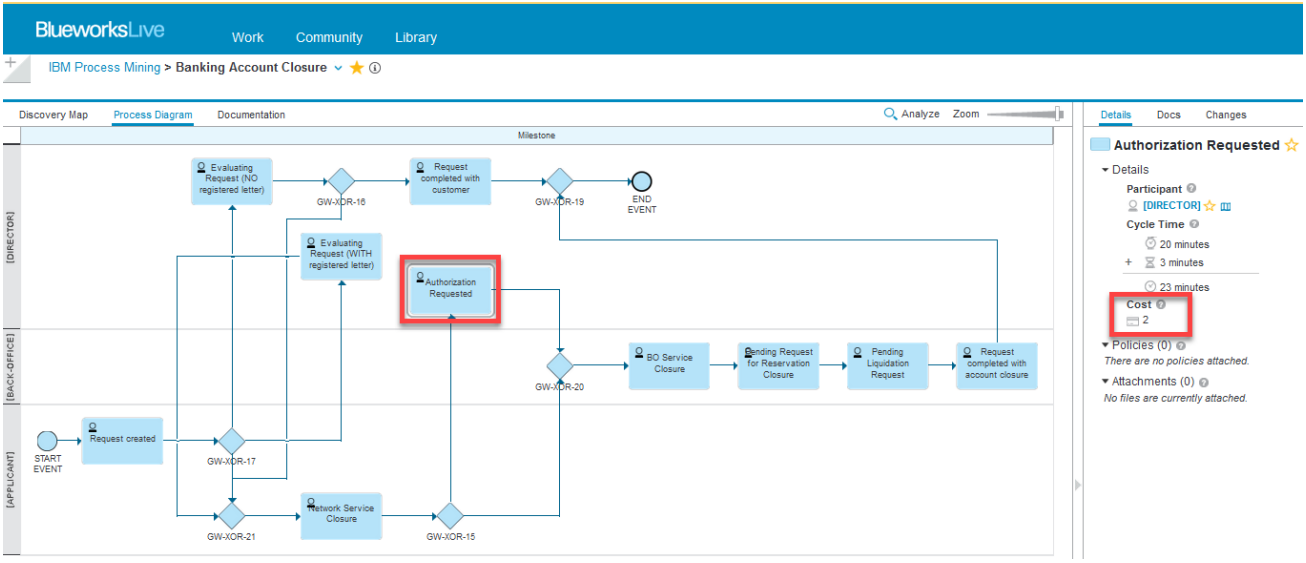


You should now see the Activity costs. Note, for example, that **Authorization Requested** is set to EUR 2.00

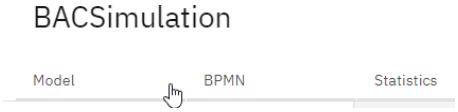
Activity	Hourly cost	Type	End date	
Default	EUR 0.00	Any	N/A	
Authorization Requested	EUR 2.00	Manual	N/A	
BO Service Closure	EUR 10.00	Manual	N/A	
Evaluating Request (NO registered letter)	EUR 5.00	Manual	N/A	
Evaluating Request (WITH registered letter)	EUR 2.00	Manual	N/A	

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.

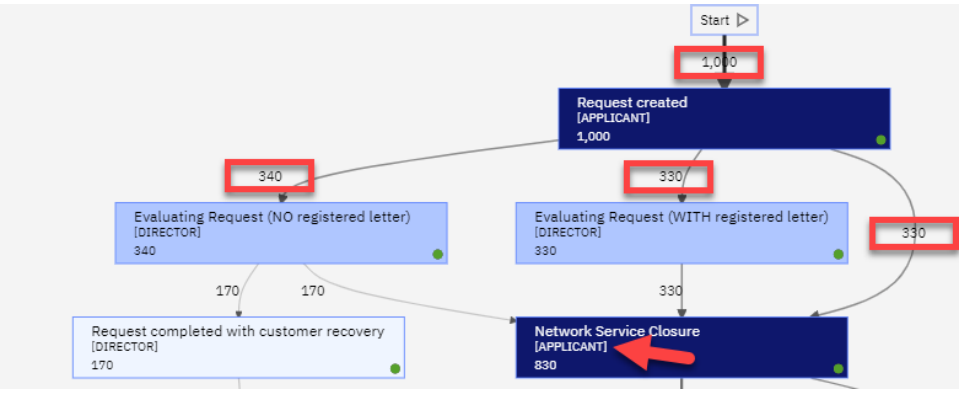


_4. Click the **Model** tab



3.3.2 Frequency View

The frequency view is selected by default.

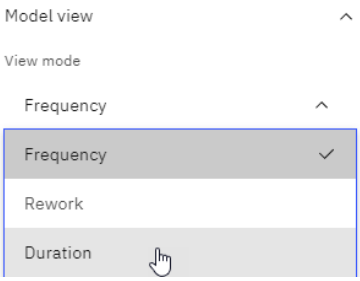


Note

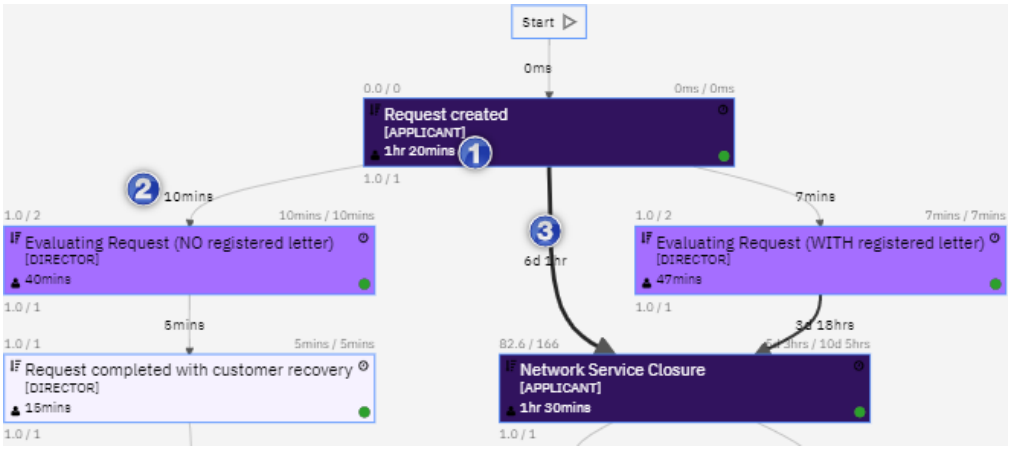
- The event frequency is shown on the links. Recall that we set the summation count to 1000, and the first gateway was set by default to be split evenly at 33%, 33%, and 34%. Hence the even path distribution leading out of the first Activity: 330, 340, and 330.
- The Role (i.e., [APPLICANT]) is shown.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

3.3.3 Average Duration View

_1. Click **Duration**



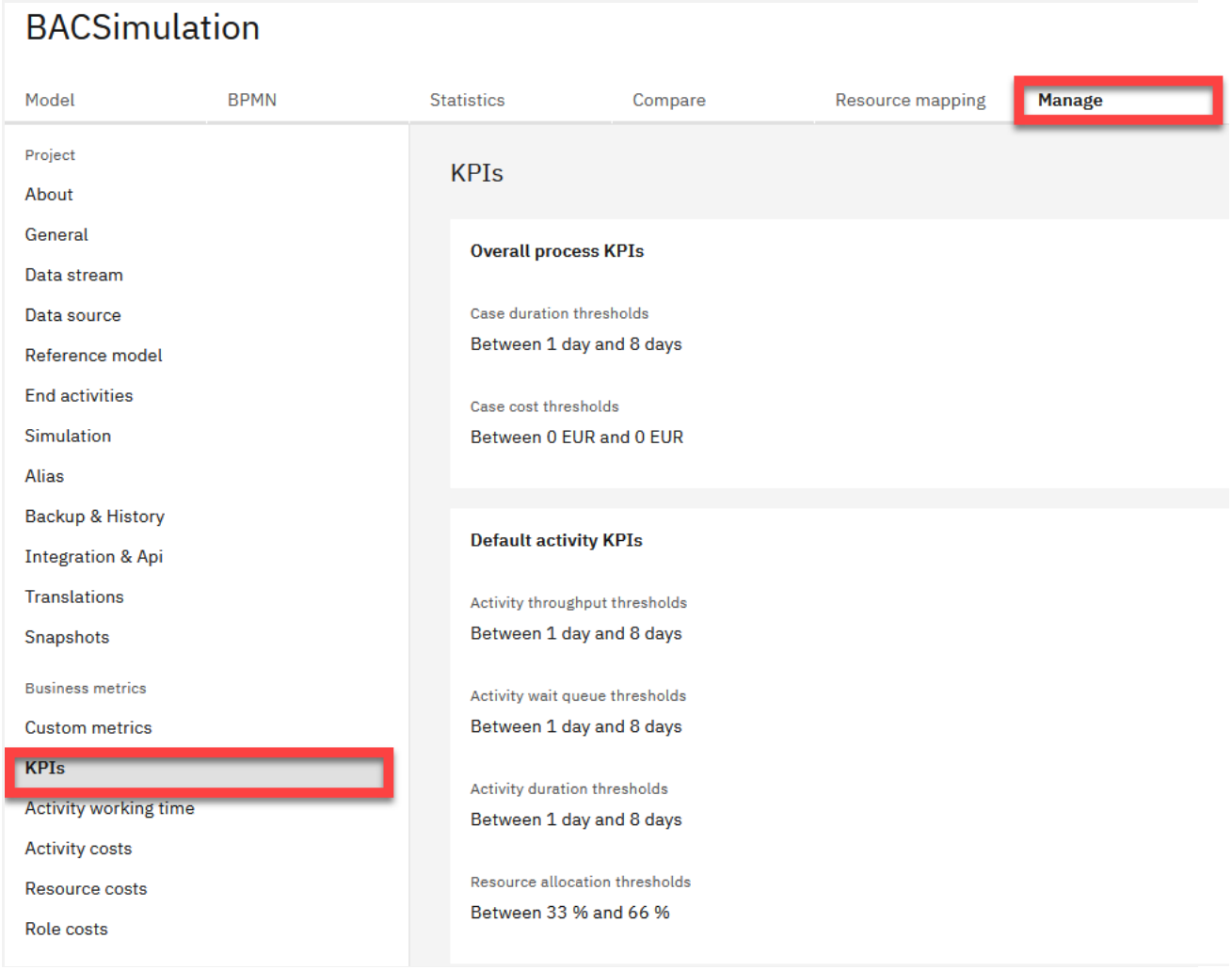
You should now see the Duration View similar to this.



Note:

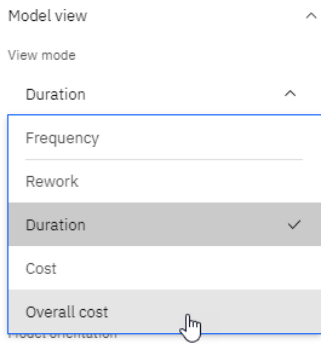
1. Activity durations
2. Wait times leading to activities
3. Transition link width
4. Activity color

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

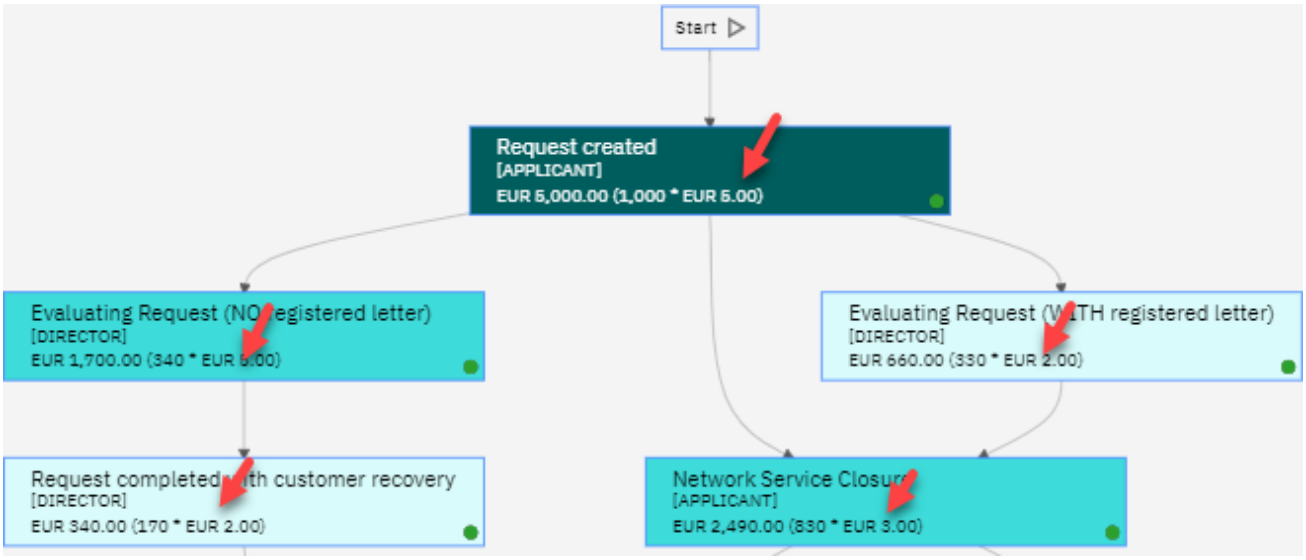


3.3.4 Cost View

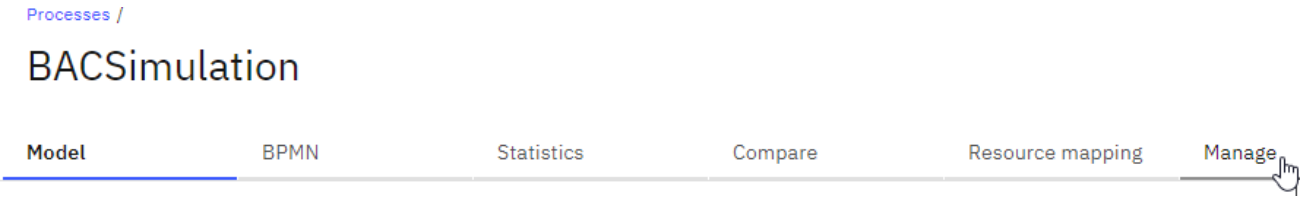
_1. Switch to the **Overall cost** view.



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

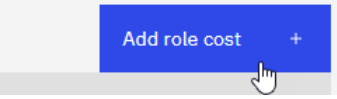


_2. Click **Manage** tab

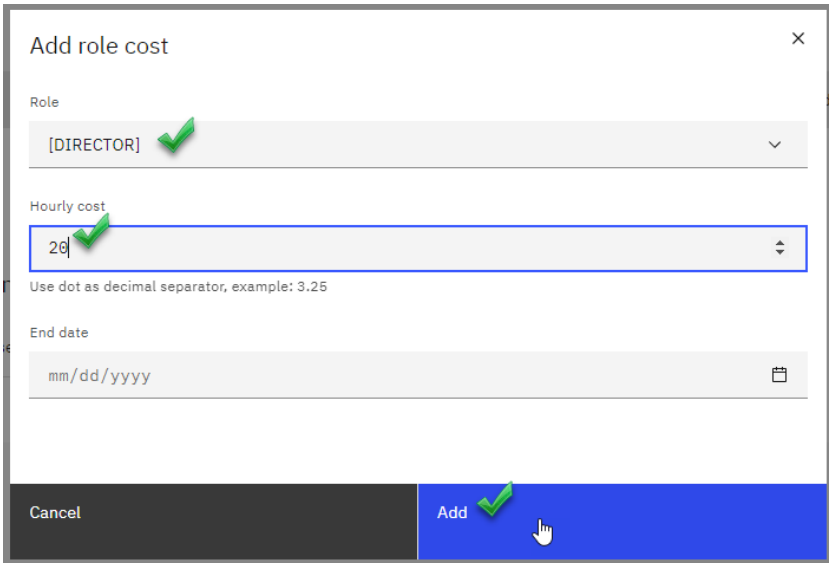


_3. Click the **Role costs** section.

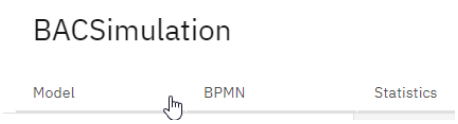
_4. Click **Add role cost +**



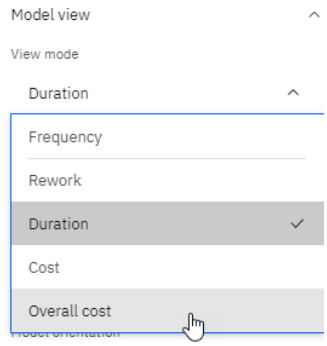
For *Role,* select **[DIRECTOR]**; for *Hourly cost*, enter **20** and then click **Add** button



_5. Click **Model** tab



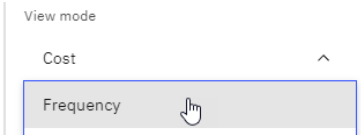
_6. Switch to the **Overall cost** view.



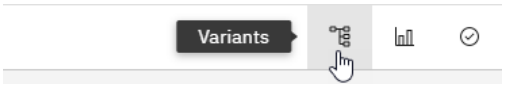
Note the changes in the [DIRECTOR] role activities. The cost calculation now includes the role cost!

3.3.5 Variants

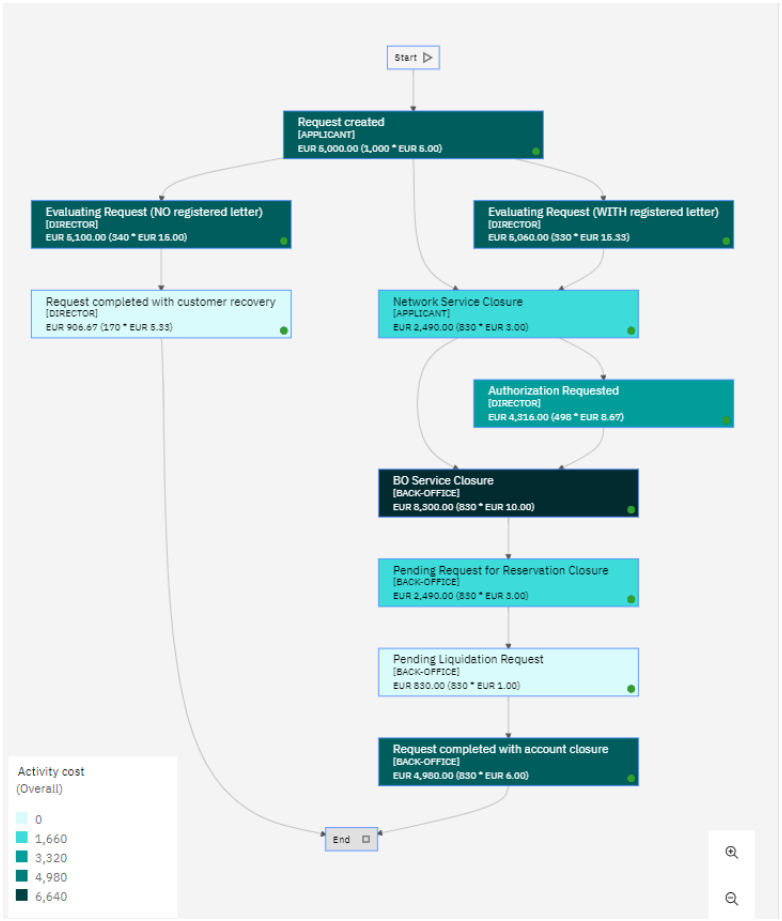
_1. Switch to the **Frequency** view.

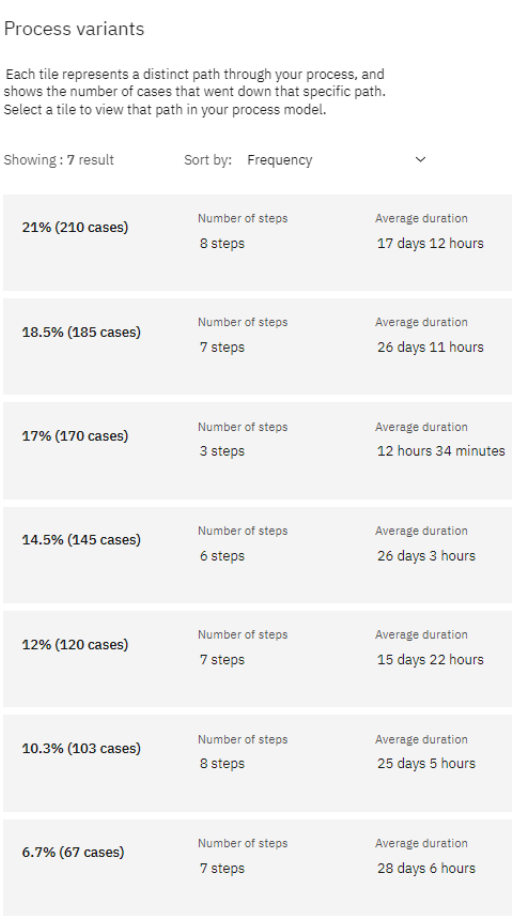


_2. Click the **Variants** button.



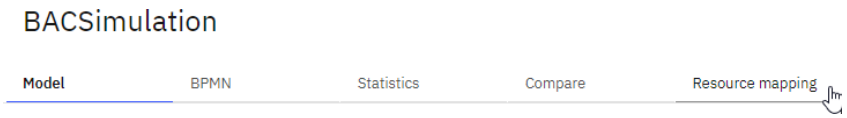
Notice that the simulation-generated event data created distinct process paths (variants).



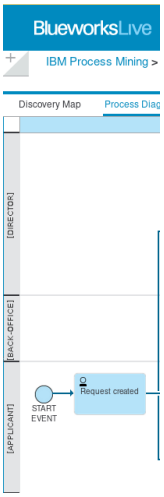


3.3.6 Social discovery capabilities

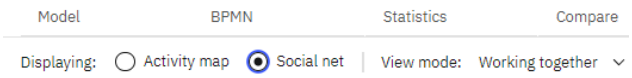
_1. Click **Resource mapping**



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.

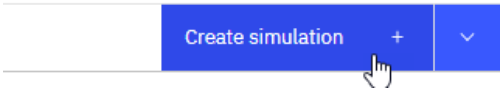
3.4 Create Additional Events Using New Simulation Scenarios

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

3.4.1 Create a new Simulation Scenario

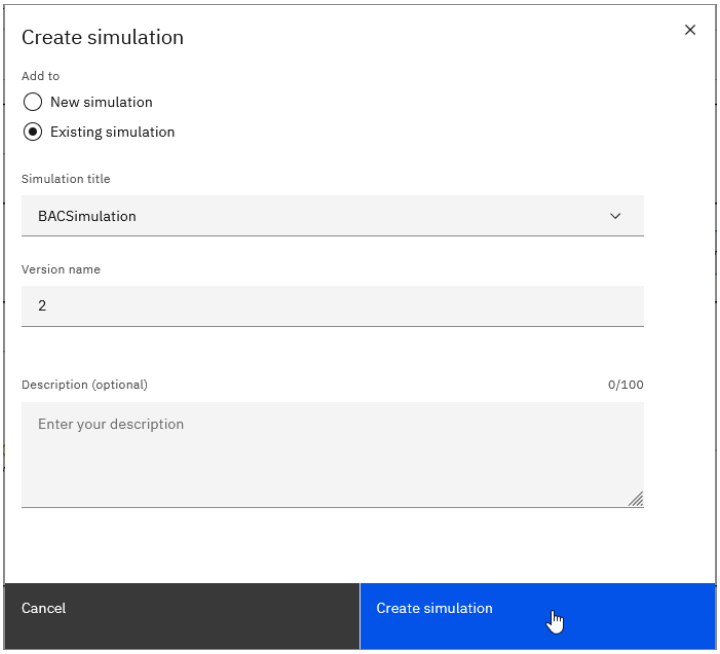
_1. Click **BPMN** tab

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



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

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

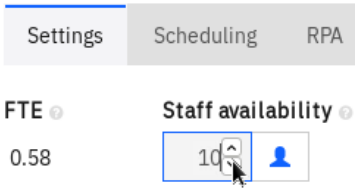


3.4.2 Change Simulation Scenario Parameters

Let's change some simulation parameters.

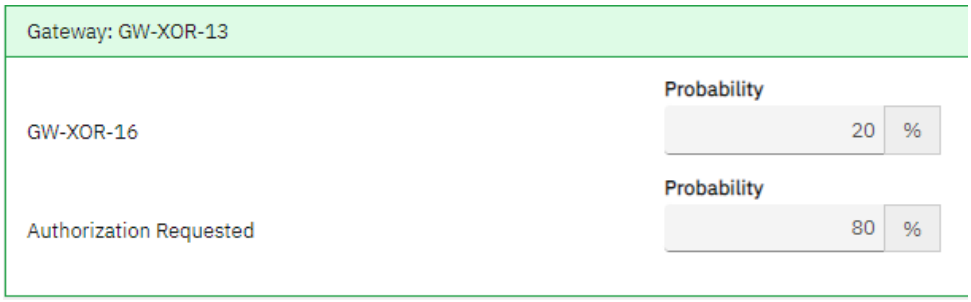
_1. Change the *Number of instances* to **1500**

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

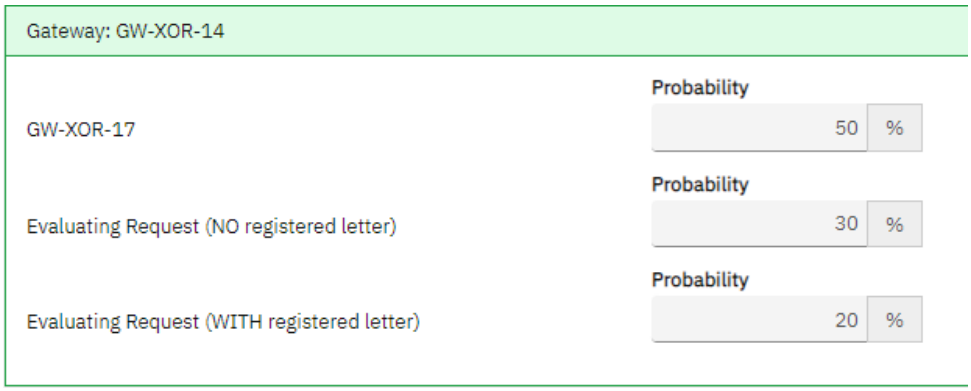


_3. We want to find the impact of increasing the number of employees assigned to work on this process.

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



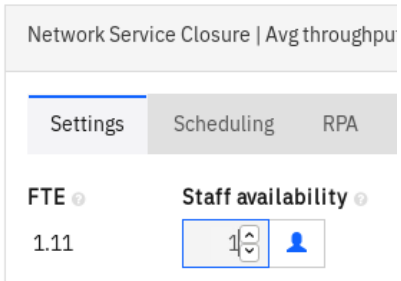
_5. Change *Gateway: GW-XOR-14* Probability to **50, 30 and 20**



3.4.3 Introduce Automation

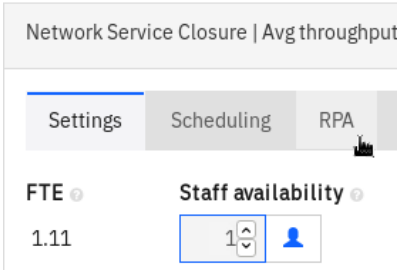
One of the activities will be partially automated by RPA bots.

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

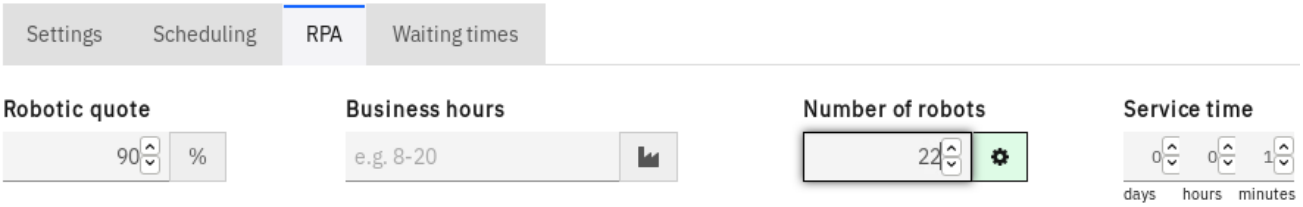


The Activity will be automated partially, but we will reduce the number of available employees from 10 to 1.

_2. Click **RPA** tab



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

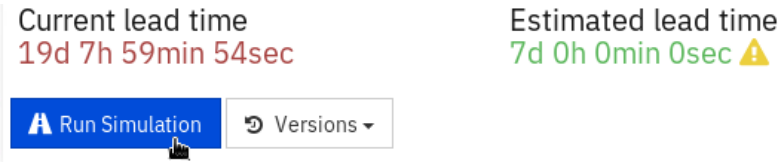


90% of the time, the Activity will be performed by one of the robots available from a pool of 20 robot servers.

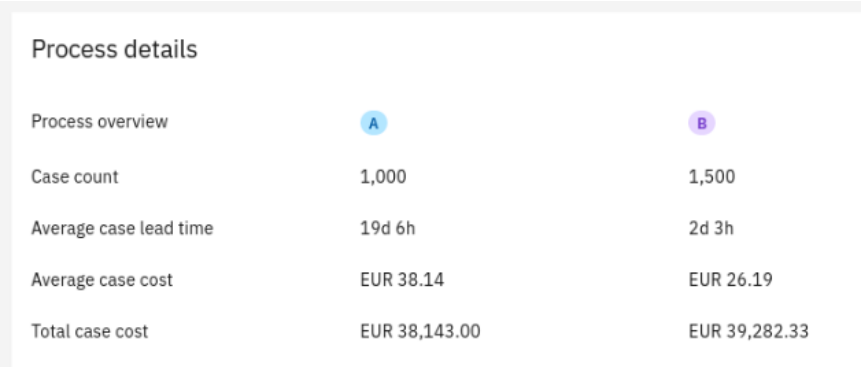
3.4.4 Run the Simulation and Import Simulation Data

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



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

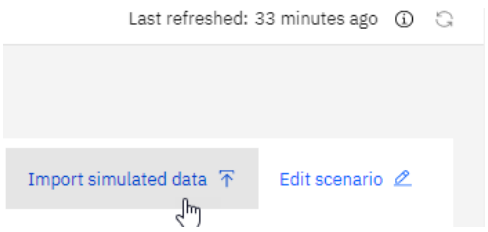


Note that the above simulation result screenshot may differ slightly from your environment. This happens because simulation uses uniform statistical distributions when generating events!

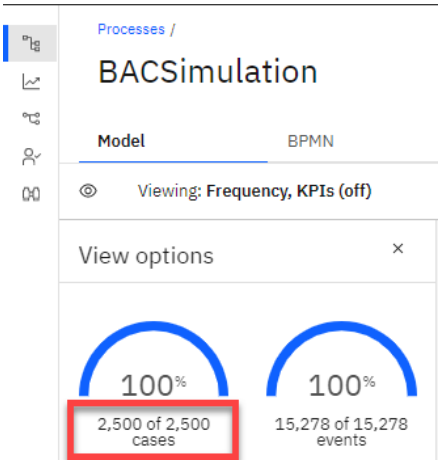
We now have two choices:

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!

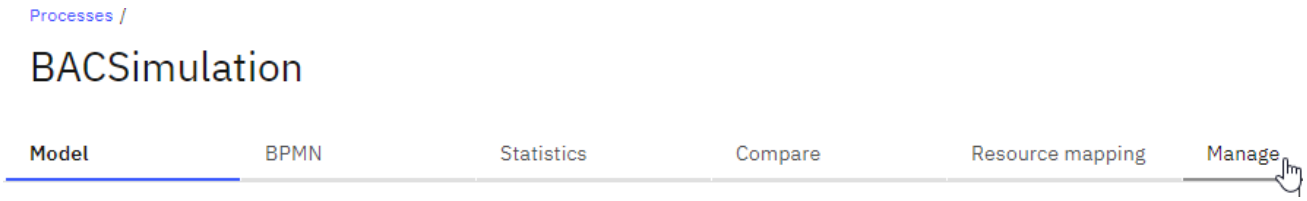


3.4.5 Managing Event Data

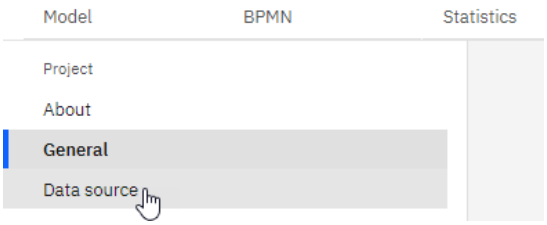
You can use the above technique to incrementally generate as many events as you need.

Let's learn how to manage the generated events.

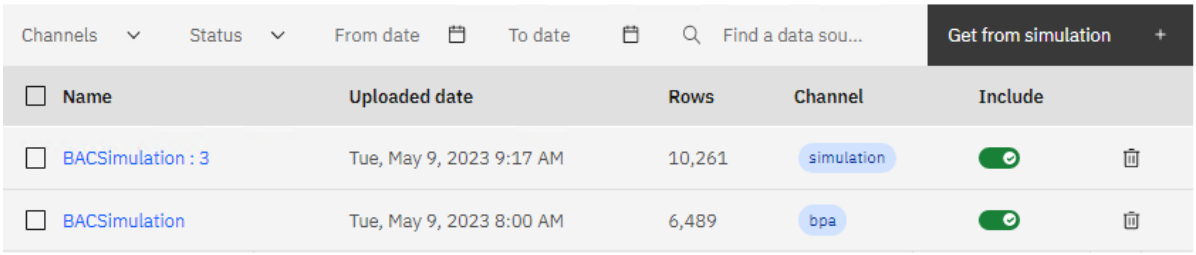
_1. Click **Manage** tab



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



Notice the additional *BAC Simulation* data set.



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.