Interstage Business Process Manager Analytics V12.1

Handbook for the Process Discovery

Solaris

About this Manual

This section explains summary, chapter overview, abbreviations, and provides useful information.

The contents in this section are as follows:

Purpose

This handbook briefly describes how to operate Process Discovery.

Intended Audience

This manual is intended for those who require an overview of the Process Discovery functionality.

Chapter Overview

Chapter	Title	Description
1	Preparing Input Data	Describes the type of data to be input into Process Discovery and how to process it using this tool
2	Process Generation	Explains how to generate processes
3	Process Analysis	Explains how to analyze processes

Typographical Conventions

The following conventions are used throughout this manual.

Example	Meaning
Command	User input that must be typed is identified by the Courier font
screen text	- GUI options to be selected by the end user are **bold** - GUI options that are emphasized are **bold**
Reference	Reference material or related documentation is specified in *italics*
Parameter	Command parameters are identified by the Courier font

Reference Materials

The following related documentation is also available.

Release Notes

Contains an overview of the Analytics software and late-breaking information that could not be included in the manuals

Overview

Describes the architecture and features of the Analytics software

Installation Guide

Explains how to install Analytics

Dashboard / Output Guide

Explains how to use the Analytics Dashboard

Administration Guide

Covers administration tools and tips, message references, and troubleshooting

Analytics Studio Guide

Explains how to use the Analytics Studio to configure parameters that enforce Analytics features

Management Console Guide

Explains how to use the Management Console and Management Commands to configure key parameters, such as how to start/stop the Analytics software service or how to display the software status

Process Discovery Guide

Explains how to use Process Discovery that generates process diagrams using historical data

Abbreviations

The following abbreviations are used throughout this document.

Name	Abbreviation
Oracle Solaris 11	Solaris 11, Solaris
Microsoft(R) Windows Server(TM) 2003, Standard Edition Microsoft(R) Windows Server(TM) 2003, Enterprise Edition Microsoft(R) Windows Server(TM) 2003 R2, Standard Edition Microsoft(R) Windows Server(TM) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2008, Standard Edition Microsoft(R) Windows Server(R) 2008, Enterprise Edition Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise	Windows Server
Microsoft(R) Windows Server(TM) 2003, Standard x64 Edition Microsoft(R) Windows Server(TM) 2003, Enterprise x64 Edition Microsoft(R) Windows Server(TM) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(TM) 2003 R2, Enterprise x64 Edition	Windows Server 2003 (x64) or Windows Server 2003
Microsoft(R) Windows Server(R) 2012 Microsoft(R) Windows Server(R) 2012 Datacenter Microsoft(R) Windows Server(R) 2012 Standard Microsoft(R) Windows Server(R) 2012 Foundation	Windows Server 2012
Microsoft(R) Windows(R) XP Professional operating system Microsoft(R) Windows(R) XP Home Edition operating system	Windows XP or Windows
Microsoft(R) Windows Vista(R) Business Microsoft(R) Windows Vista(R) Enterprise Microsoft(R) Windows Vista(R) Ultimate	Windows Vista or Windows
Microsoft(R) Windows(R) 7 Home Premium Microsoft(R) Windows(R) 7 Professional Microsoft(R) Windows(R) 7 Ultimate	Windows 7 or Windows

Name	Abbreviation
Microsoft(R) Windows(R) 8 Microsoft(R) Windows(R) 8 Pro Microsoft(R) Windows(R) 8 Enterprise	Windows 8 or Windows
Microsoft(R) Internet Explorer 7.0 Microsoft(R) Internet Explorer 8.0 Microsoft(R) Internet Explorer 9.0 Microsoft(R) Internet Explorer 10.0	Internet Explorer
Red Hat Enterprise Linux AS Red Hat Enterprise Linux ES Red Hat Enterprise Linux 5 Red Hat Enterprise Linux 6	Linux
Interstage Application Server Enterprise Edition Interstage Application Server Standard-J Edition	Interstage Application Server
Interstage Business Process Manager	Interstage BPM or IBPM
Oracle Database 10g Enterprise Edition R10.1.0/R10.2.0 Oracle Database 10g Standard Edition R10.1.0/R10.2.0 Oracle Database 10g Standard Edition One R10.1.0/R10.2.0	Oracle10g or Oracle
Oracle Database 11g Enterprise Edition Oracle Database 11g Standard Edition Oracle Database 11g Standard Edition One Oracle Database 11g R2 Enterprise Edition Oracle Database 11g R2 Standard Edition Oracle Database 11g R2 Standard Edition One	Oracle11g or Oracle
Microsoft SQL Server 2005 Standard Edition Microsoft SQL Server 2005 Enterprise Edition	SQL Server 2005 or SQL Server
Microsoft SQL Server 2008 Standard Edition Microsoft SQL Server 2008 Enterprise Edition	SQL Server 2008 or SQL Server

Export Regulations

Fujitsu documents may include special technology regulated by foreign exchange and foreign trade regulation laws. If special technology is included, permission must be obtained under these laws before exporting a document or providing it to a non-resident.

Trademarks

- Microsoft, Windows, and Windows Server are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.

- Oracle and Java are registered trademarks of Oracle and/or affiliates. Other names may be trademarks of their respective owners.

- SQL Server is a Microsoft Corporation (USA) product.

- All other company and product names referred to in this document are general trademarks or registered trademarks of their respective owners.

Requests

- This document may be revised without notice.

- Do not pass on this document to other parties without permission.

- Our company bears no responsibility for third-party infringements of patent or other rights arising out of use of the data contained in this document.

Copyright

Copyright 2013 FUJITSU LIMITED

Contents

Chapter 1 Preparing Input Data

This section provides an overview of the type of data to be input into Process Discovery and how to process it using this tool.

1.1 Overview

It is essential that the business data to be input into Process Discovery comprises the "Event Key" ID to internally distinguish the process data, "Event Type" that indicates the business content, and the "Timestamp" information. Additionally, a header line and a data section, as displayed in the following figure, must also exist.

Figure 1.1 Input data format example

ID	Timestamp	Department	Name	Business Content	Header
ID83070	2011/9/30 12:36	Development Dept.	Toshi, K	FSC Approval	
ID83070	2011/9/30 11:59	Inspection Dept.	Jiro, I	Inspection Approval	
ID83070	2011/9/27 20:38	Development Dept.	John, S	Business Unit Approval	
ID83070	2011/9/27 20:15	Development Dept.	Saburo, H	Request for Manager Approval	
ID83070	2011/9/27 19:03	Inspection Dept.	Ichiro, M	Inspection point out	
ID83070	2011/9/27 15:20	Development Dept.	John, S	Business Unit Approval	Data
ID83070	2011/9/27 14:35	Development Dept.	Saburo, H	Request for Manager Approval	
ID83076	2011/9/26 17:55	Development Dept.	Toshi, K	FSC Approval	
ID83076	2011/9/26 17:22	Inspection Dept.	Jiro, I	Inspection Approval	
ID83076	2011/9/26 12:54	Development Dept.	John, S	Business Unit Approval	
ID83076	2011/9/26 11:43	Development Dept.	James, B	Request for Manager Approval	

The most important of these is how to specify the event type. Process Discovery can handle the following three input formats:

Format 1. When the event type is the internal data

If the event type and the timestamp are in one row in the input data, the process diagram can be output with the row data as the event type.

Format 2. When the event type is the header

If multiple timestamp rows are within one input data, the process diagram can be output with the header name corresponding to the timestamp set as the event type.

Format 3. When data is split into multiple tables

Each type of business data is managed as a separate table, and if the tables share commonalities, the process diagram can be output with the table name displayed as the event type.

1.2 Relation between Business Data and Process Diagrams

Process Discovery uses the following rules to analyze data, and then generate process diagrams.

- For processing, data with the same ID is grouped to generate a process diagram.

- The data for each event type is defined as an event on process diagrams.

- From the event type and timestamp relations, event transitions are displayed.

The following examples illustrate the input data with its corresponding output in the form of a process diagram for the three types of data formats covered in the previous section. In these examples, the input data within a solid line (red) corresponds with the solid line (red) arrows in process diagrams, while the input data within a dotted line (blue) corresponds with the dotted line (blue) arrows in process diagrams.

Format 1. When the event type is the internal data

This table tracks a problem from when it occurs till it is resolved for a product.

◯ Incident Management

	ID	Timestamp	Department	Name	Business Content
7	D83070	2011/9/30 12:36	Development Dept.	Toshi, K	FSC Approval
6	D83070	2011/9/30 11:59	Inspection Dept.	Jiro, I	Inspection Approval
5	D83070	2011/9/27 20:38	Development Dept.	John, S	Business Unit Approval
4	D83070	2011/9/27 20:15	Development Dept.	Saburo, H	Request for Manager Approval
3	D83070	2011/9/27 19:03	Inspection Dept.	Ichiro, M	Inspection point out
2	D83070	2011/9/27 15:20	Development Dept.	John, S	Business Unit Approval
1	D83070	2011/9/27 14:35	Development Dept.	Saburo, H	Request for Manager Approval
4	D83076	2011/9/26 17:55	Development Dept.	Toshi, K	FSC Approval
3	D83076	2011/9/26 17:22	Inspection Dept.	Jiro, I	Inspection Approval
2	D83076	2011/9/26 12:54	Development Dept.	John, S	Business Unit Approval
1	D83076	2011/9/26 11:43	Development Dept.	James, B	Request for Manager Approval

Event Key · Event Name Item

Group of processes (same ID for each process)
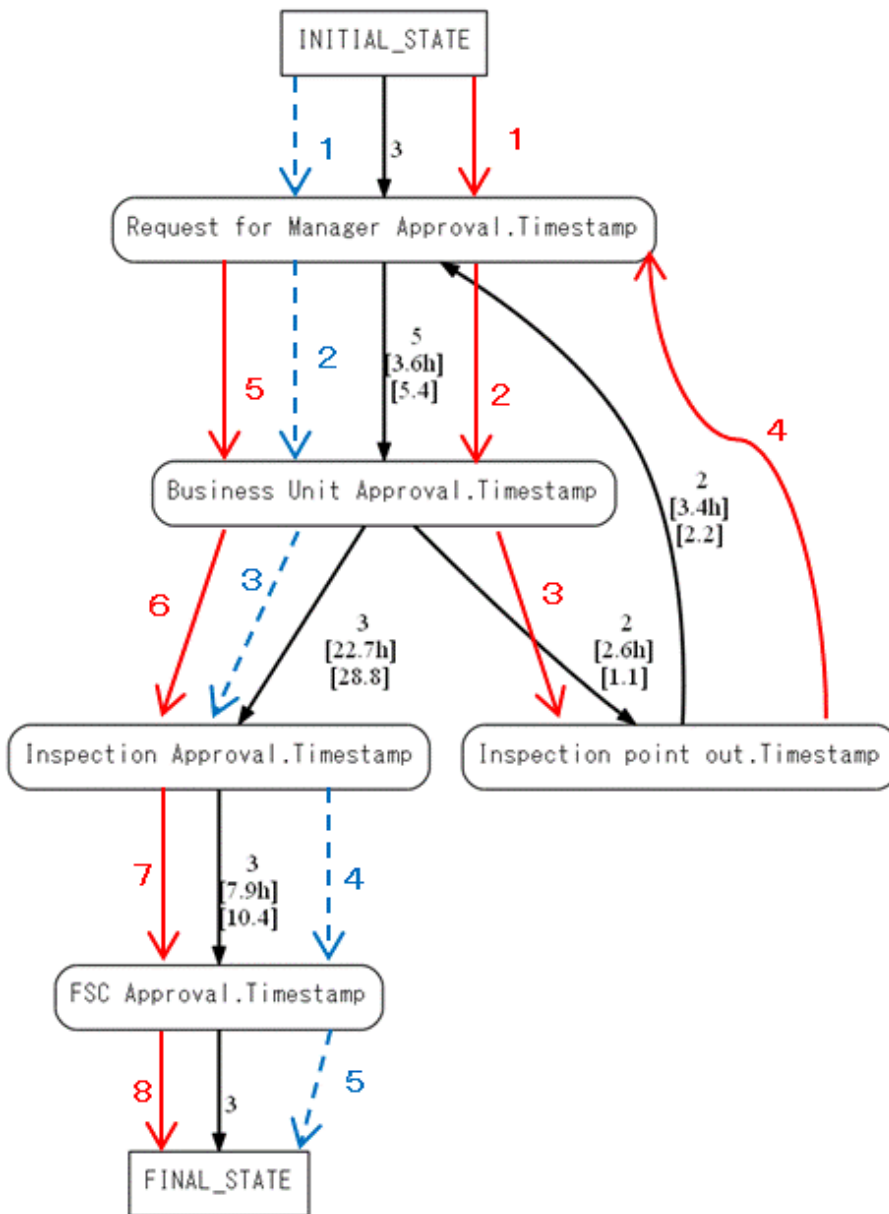
Format 2. When the event type is the header

This table tracks goods - from their receipt to their delivery.

○ Dispatch Operation

Event Key   Event Name Item

Slip Number	Person in Charge	Accept Time		Estimation Time		Receive Time	Plan Time		Confirmation Time	Delivery Time	Reject Time	Cancel Time
ID001	Smith		2006/12/11		2006/12/14	2006/12/16	2006/12/19		2006/12/21	2007/1/8		
ID002	Tanaka	1	2006/12/13	2	2006/12/16	3		4	5	6		2006/12/23
ID003	Tanaka		2006/12/19		2006/12/23	2006/12/25	2007/1/10		2007/1/17		2007/1/17	
ID004	Tomas		2007/1/10		2007/1/12	2007/1/19	2007/1/28		2007/2/5	2007/2/10		
ID005	Smith		2007/1/15		2007/1/20	2007/1/25	2007/2/2		2007/2/12	2007/2/15		
ID006	Carter		2007/1/16									2007/1/17
ID003	Tanaka	1	2007/1/21		2007/1/24					2007/1/26		2
ID007	Tomas		2007/1/22		2007/2/1	2007/2/4	2007/2/5		2007/2/8	2007/2/13	2007/2/16	
ID007	Tomas		2007/2/18							2007/2/21		

- 3 -
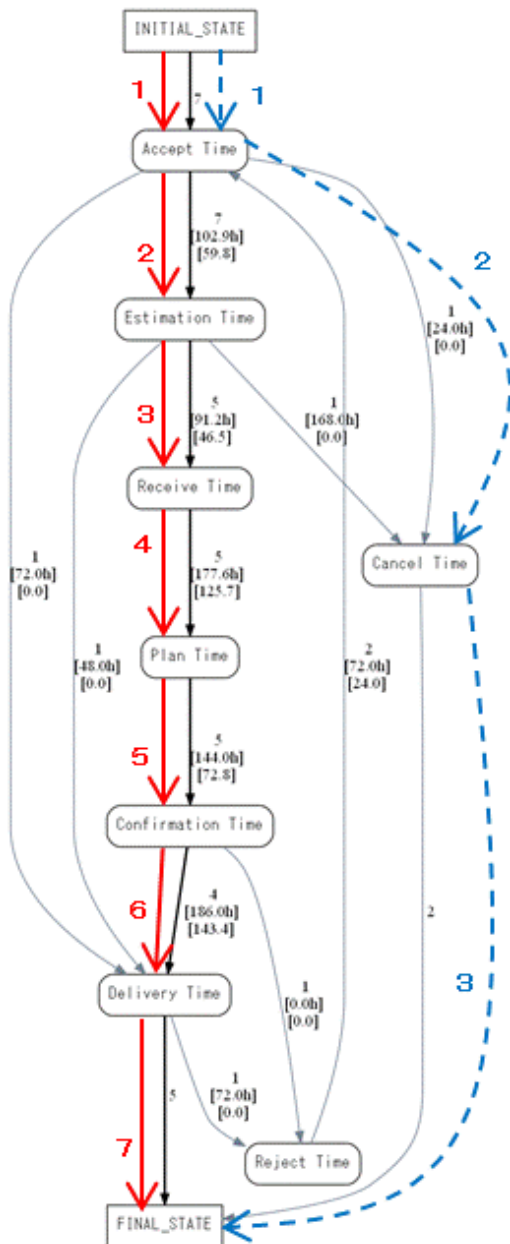
Format 3. When data is split into multiple tables

These three tables track product orders, delivery, and shipping.
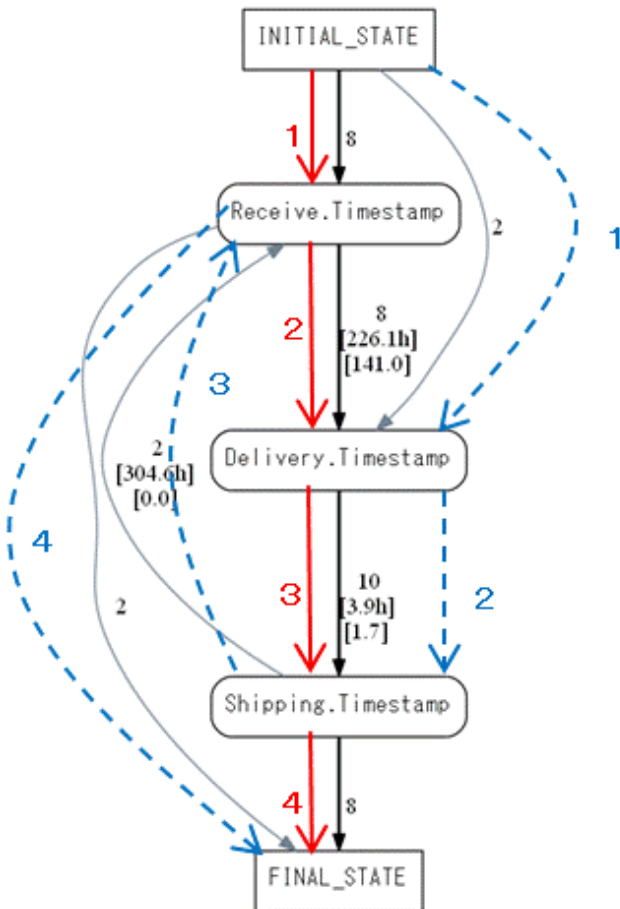
○ Receive Table — Event Name Item / Event Key

Receive ID	Product Name	Customer Name	Timestamp
10010	FM/V L50	FJ	2011/9/30 12:36
10011	FM/V L200	FNST	2011/10/1 9:20
10012	FM/V L10	FCT	2011/11/30 15:10
10013	FM/V L10	FCT	2011/11/30 15:10
10014	FM/V L10	FCT	2011/11/30 15:10
10015	FM/V L200	FJ	2011/12/21 10:35
10016	FM/V L200	FJ	2011/12/21 10:35
10017	FM/V L50	FCT	2012/2/1 9:00
10018	FM/V L50	FCT	2012/2/1 9:00
10019	FM/V L50	FCT	2012/2/1 9:00

○ Shipping Table — Event Name Item / Event Key

Shipping ID	Receive ID	Product Name	Customer Name	Timestamp
200	10010	FM/V L50	FJ	2011/10/6 9:00
201	10011	FM/V L200	FNST	2011/10/9 9:00
202	10012	FM/V L10	FCT	2011/12/14 17:00
203	10013	FM/V L10	FCT	2011/12/14 17:00
204	10014	FM/V L10	FCT	2011/12/21 15:00
205	10015	FM/V L200	FJ	2011/12/8 11:00
206	10016	FM/V L200	FJ	2011/12/8 11:00
207	10017	FM/V L50	FCT	2012/2/5 12:00
208	10018	FM/V L50	FCT	2012/2/5 12:00
209	10019	FM/V L50	FCT	2012/2/5 12:00

○ Delivery Table — Event Name Item / Event Key

Delivery ID	Receive ID	Product Name	Customer Name	Timestamp
3000	10010	FM/V L50	FJ	2011/10/6 12:00
3001	10011	FM/V L200	FNST	2011/10/9 12:00
3002	10012	FM/V L10	FCT	2011/12/14 19:00
3003	10013	FM/V L10	FCT	2011/12/14 19:00
3004	10014	FM/V L10	FCT	2011/12/21 18:00
3005	10015	FM/V L200	FJ	2011/12/8 18:00
3006	10016	FM/V L200	FJ	2011/12/8 18:00
3007	10017	FM/V L50	FCT	2012/2/5 16:00
3008	10018	FM/V L50	FCT	2012/2/5 16:00
3009	10019	FM/V L50	FCT	2012/2/5 16:00

INITIAL_STATE

1 / 8

Receive.Timestamp

2 / 8 [226.1h] [141.0]

Delivery.Timestamp

2 [304.6h] [0.0]

3 / 10 [3.9h] [1.7]

Shipping.Timestamp

4 / 8

FINAL_STATE

1.3 Processing and Normalizing Data

Data can be input into Process Discovery in the CSV file format. CSV files are prepared from database dumps or an Excel CSV output. However, for simply retrieving data, the input data may not be sufficient. You might need to further process the data so that it can be used by Process Discovery. Take the following points into consideration before you input data into Process Discovery.

1. Check the required items.

2. Check the adequacy of the event type.

3. Check for errors in the input data.

These considerations are described below.

1.3.1 Check the Required Items

As described in Section 1.1 above, you must ensure that the CSV file required for process generation contains event keys, timestamp information, and event types.

Also, it is assumed that the input CSV file contains a header line for use in Process Discovery. If not, add relevant values beforehand.

1.3.2 Check the Adequacy of the Event Type

It is necessary to verify whether the event type definition is correct to output the appropriate process diagram.

An example where the event type definition is inadequate is shown below. In this example, when the history data is output to a CSV file, even though the type is the same "Issue Incident Report", the processing can be different depending on the sentence contents ("Save temporarily" and "Issue").

In this state, when the **Type** column is selected as the event type, these lines are transitioned to the same state and then output. Therefore, correct analysis cannot be performed.

For such cases, monitor the sentence for a proper fixed phrase. If the **Type** is the same, the data is then separated according to the matching sentence section pattern.

Original history data (type is the same, however the processing is different based on the sentence contents)

[2011/11/03 12:03:23 Inspection Dept.) Shiro][Type: Issue Incident Report] Main Contents: ID85604 was saved temporarily in issue work.
[2011/11/03 17:08:17 Inspection Dept.) Shiro][Type: Issue Incident Report] Main Contents: ID85604 was issued.

Data after converting to CSV

ID	Timestamp	Department	Name	Business Content
ID85604	2011/11/03 12:03:23	Inspection Dept.	Ichiro, M	Issue Report
ID85604	2011/11/03 17:08:17	Inspection Dept.	Ichiro, M	Issue Report

Processing of the data

ID	Timestamp	Department	Name	Business Content
ID85604	2011/11/03 12:03:23	Inspection Dept.	Ichiro, M	Temporarily save the issue report
ID85604	2011/11/03 17:08:17	Inspection Dept.	Ichiro, M	Issue Report

1.3.3 Check for Errors in the Input Data

To avoid errors during process generation, correct the input data for any of the following issues:

- If the header line is blank, add relevant values.

- If the header line cells have merged and there are two header lines, set it in one row.

- If there is a line feed character in the data, remove it. Note that if a line feed character is detected during process generation, a warning is displayed and the data with the line feed character is ignored. The process diagram is then generated.

The following figures illustrate these input data errors.

Figure 1.2 Erroneous data examples

Header contains space characters

Shipping ID	Receive ID	Product Name	Customer Name	
3000	10010	FM/V L50	FJ	2011/10/6 9:00
3001	10011	FM/V L200	FNST	2011/10/9 9:00
3002	10012	FM/V L10	FCT	2011/12/14 17:00
3003	10013	FM/V L10	FCT	2011/12/14 17:00
3004	10014	FM/V L10	FCT	2011/12/21 15:00
3005	10015	FM/V L200	FJ	2011/12/8 11:00
3006	10016	FM/V L200	FJ	2011/12/8 11:00
3007	10017	FM/V L50	FCT	2012/2/5 12:00
3008	10018	FM/V L50	FCT	2012/2/5 12:00

Header spans across two lines because some header cells have merged

Shipping ID	Receive ID	Product Name	Customer		Timestamp
			Code	Name	
3000	10010	FM/V L50	F001	FJ	2011/10/6 9:00
3001	10011	FM/V L200	F002	FNST	2011/10/9 9:00
3002	10012	FM/V L10	F003	FCT	2011/12/14 17:00
3003	10013	FM/V L10	F003	FCT	2011/12/14 17:00
3004	10014	FM/V L10	F003	FCT	2011/12/21 15:00
3005	10015	FM/V L200	F001	FJ	2011/12/8 11:00
3006	10016	FM/V L200	F001	FJ	2011/12/8 11:00
3007	10017	FM/V L50	F003	FCT	2012/2/5 12:00

Shipping ID	Receive ID	Product Name	Customer Name	Timestamp	Note
3000	10010	FM/V L50	FJ	2011/10/6 9:00	Nothing
3001	10011	FM/V L200	FNST	2011/10/9 9:00	Person in charge: Mr. Smith
3002	10012	FM/V L10	FCT	2011/12/14 17:00	Nothing
3003	10013	FM/V L10	FCT	2011/12/14 17:00	Nothing
3004	10014	FM/V L10	FCT	2011/12/21 15:00	Nothing
3005	10015	FM/V L200	FJ	2011/12/8 11:00	Caution: Acceptance only occurs in the morning
3006	10016	FM/V L200	FJ	2011/12/8 11:00	Caution: Acceptance only occurs in the morning
3007	10017	FM/V L50	FCT	2012/2/5 12:00	Nothing
3008	10018	FM/V L50	FCT	2012/2/5 12:00	Nothing

**Line feed exists in the data**

After you have corrected the data and input it into Process Discovery, the next step is to generate process diagrams.

Chapter 2 Process Generation

This section covers the procedure for process generation.

For process generation, log in to the Analytics console, and then click the **Process Generator** tab. Note that to display the **Process Generator** tab, you must assign the relevant user to the **Process Generator User** group by using the **User Management** tab in the Management Console.
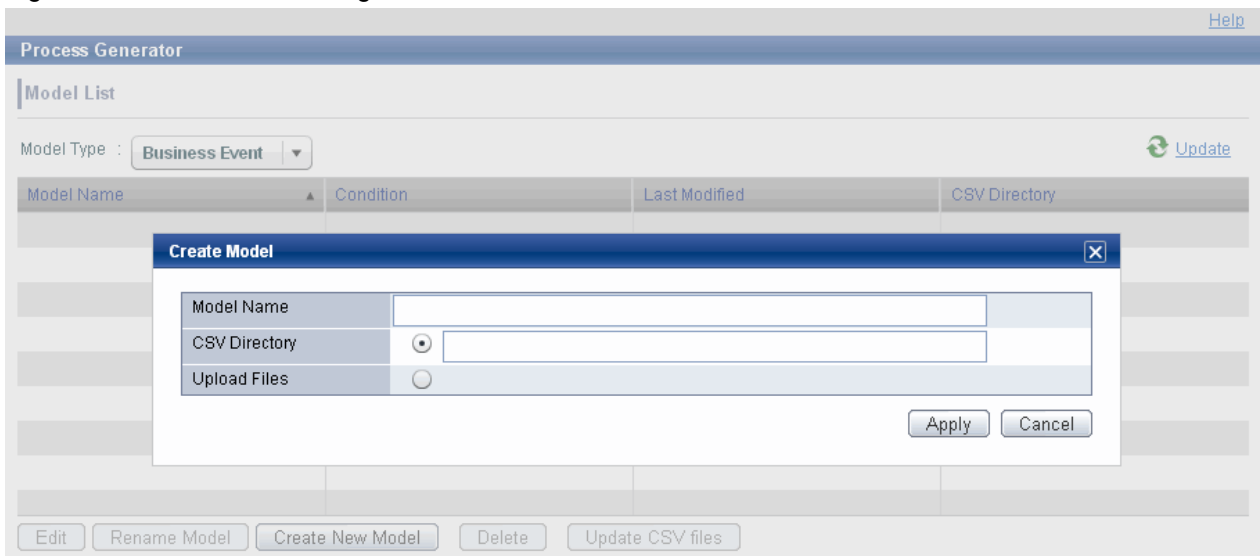
Figure 2.1 Process Generator tab
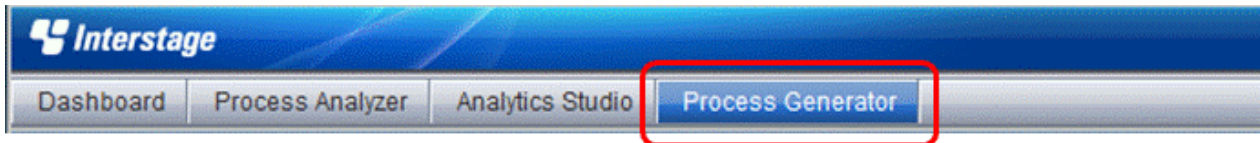
2.1 Creating a New Model

Register the new model name, and specify the CSV file to be used as the input data. You can either select the directory where the CSV file is stored, or directly upload the file.

Figure 2.2 Create Model dialog box

2.2 Profiling

On the **Profiling** tab, as long as composite items are not specified, click **Start Profiling** and continue. For information about composite items, refer to Section 6.3.1, "Setting Composite Items" in the *Process Discovery Guide*.

Figure 2.3 Profiling window
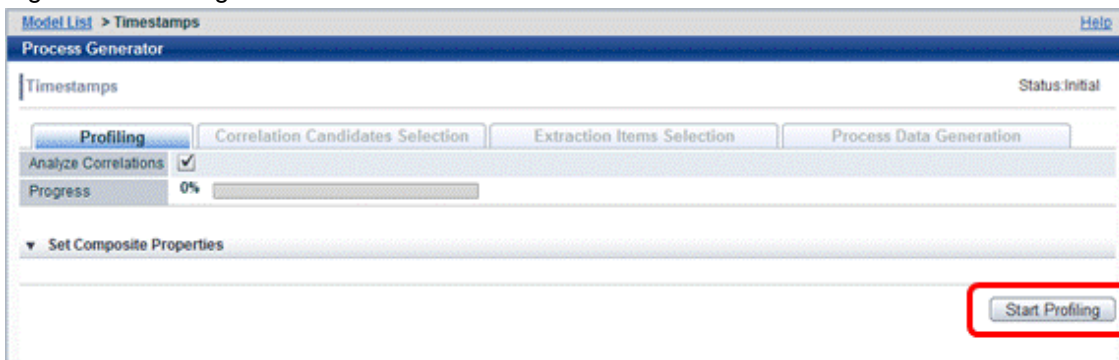
2.3 Selecting Correlation Candidates

The **Correlation Candidates Selection** tab is critical for generating correct processes.

To execute profiling, select the **Analyze Correlations** check box on the **Profiling** tab. The system calculates a correlation degree and computes a numerical value called the "score". The correlation with the highest score is automatically set. However, there is a possibility that the set correlation is not accurate, and you might need to correct it.

Take the following points into consideration to configure the correct settings:

- If there is only one type of input data (CSV file)

    In this case, it is necessary to correctly set only the event key. Check the automatically set event key, and change it if incorrect.

Figure 2.4 Example illustrating the settings in case of one type of input data
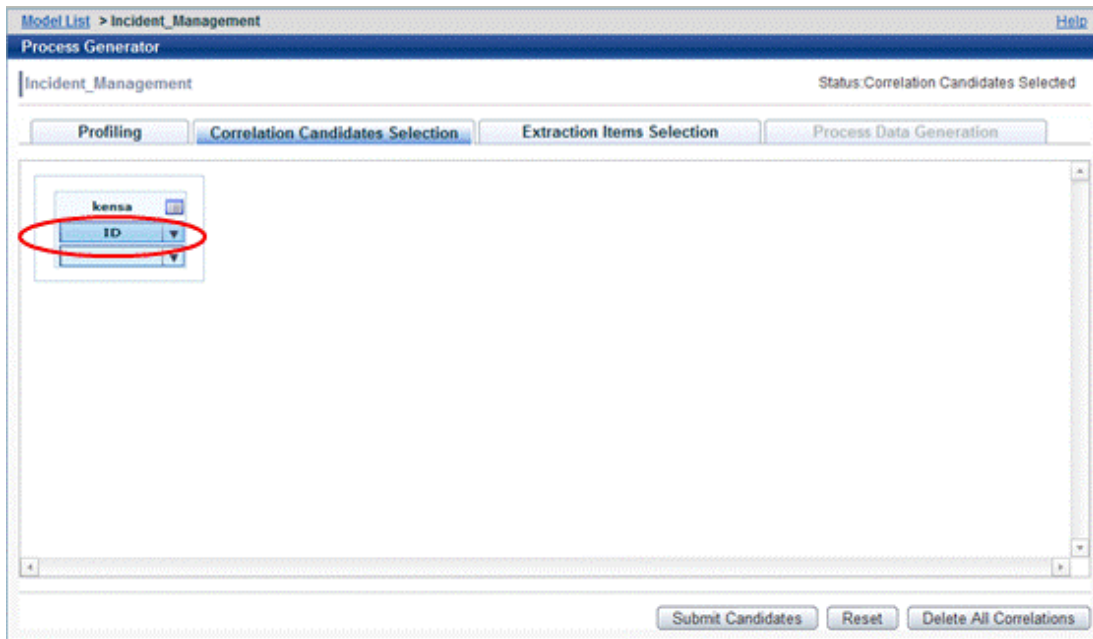
- If there is multiple input data

    Multiple input data is treated as one table, and it is important that you correctly set the correlations to ensure the data is related. If incorrect, provide the correct event key for the corresponding data and ensure the relation is correlated. Note that you can operate the event keys and arrows by dragging them or you can click on the panel icon to select correlation candidates. Refer to Section 6.4, "Selecting Correlation Candidates" in the *Process Discovery Guide* for details.

An example of correlation candidate selection when there is multiple input data is displayed below. Note that the "Receive ID" in the Receive table is correlated with the "Receive ID" in the Shipping and Delivery tables.

Figure 2.5 Example illustrating the settings in case of multiple input data
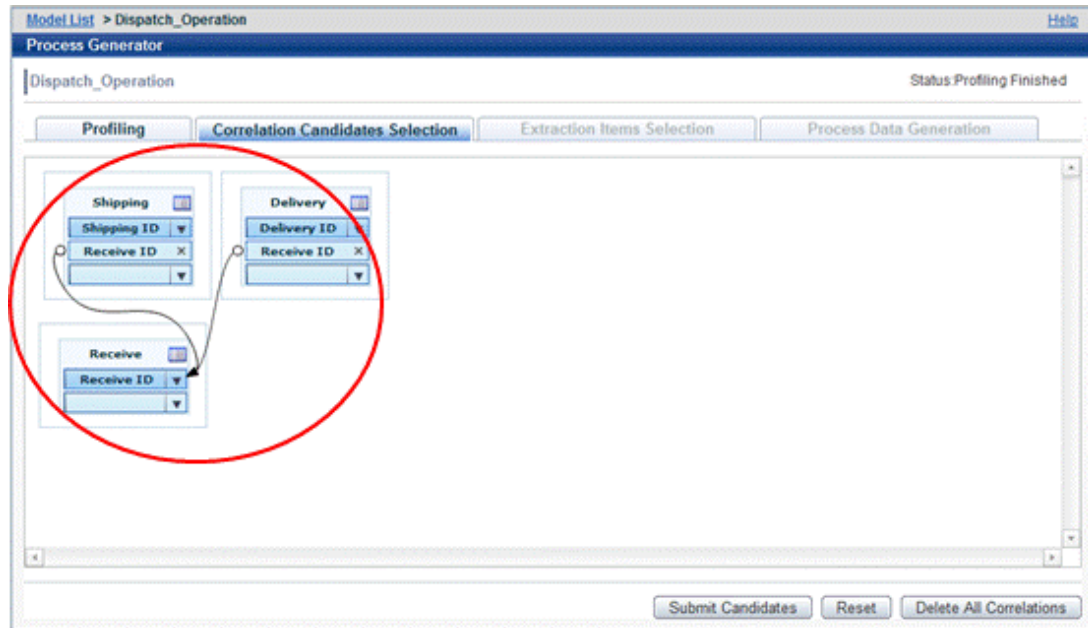
2.4 Selecting Extraction Items

For extraction items, the system sets timestamps in the order of profiling execution. However, the automatic selection of candidates may not be accurate. Verify if the correct candidates are selected.

It is also necessary to ensure that the correct settings for the input data format (timestamp and event name), as described in Section 1.1 above, are used so that the appropriate process diagram is generated.

The following examples explain the settings required for different data formats.

Format 1. When the event type is the internal data

In this case, the event type data is saved in a column, and so edit **Event Name Item** and **Timestamp Item**. Set the timestamp in **Timestamp Item** and the business content in **Event Name Item**.

Figure 2.6 Example illustrating the selection of extraction items for input data format 1
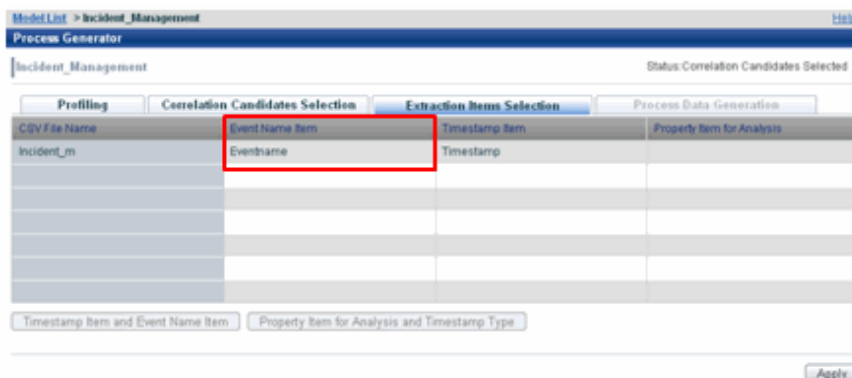
Format 2. When the event type is the header

In this case, the timestamp is the event type, and so add all timestamps in **Timestamp Item**. There are two methods to add a timestamp - **Add** and **Join**. It is recommended you use **Add**. Use **Join** only when you want to display one timestamp for multiple items by using one combined date and time.

Figure 2.7 Example illustrating the selection of extraction items for input data format 2
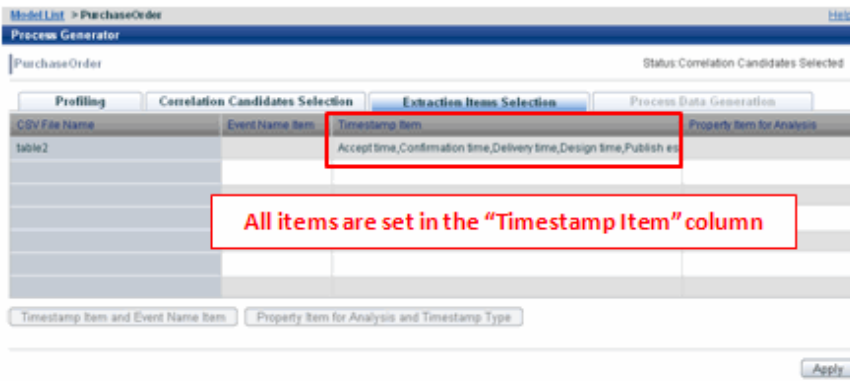
Format 3. When data is split into multiple tables

In this case, each input CSV file is an event type. You need not configure any settings for **Event Name Item**. However, ensure that the time stamp is set correctly.

Figure 2.8 Example illustrating the selection of extraction items for input data format 3
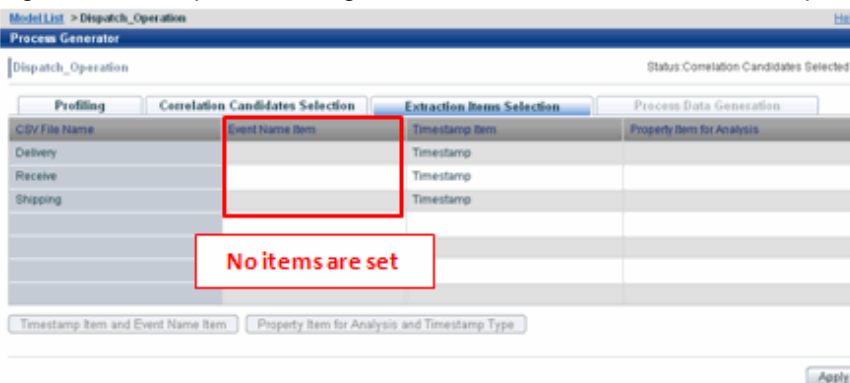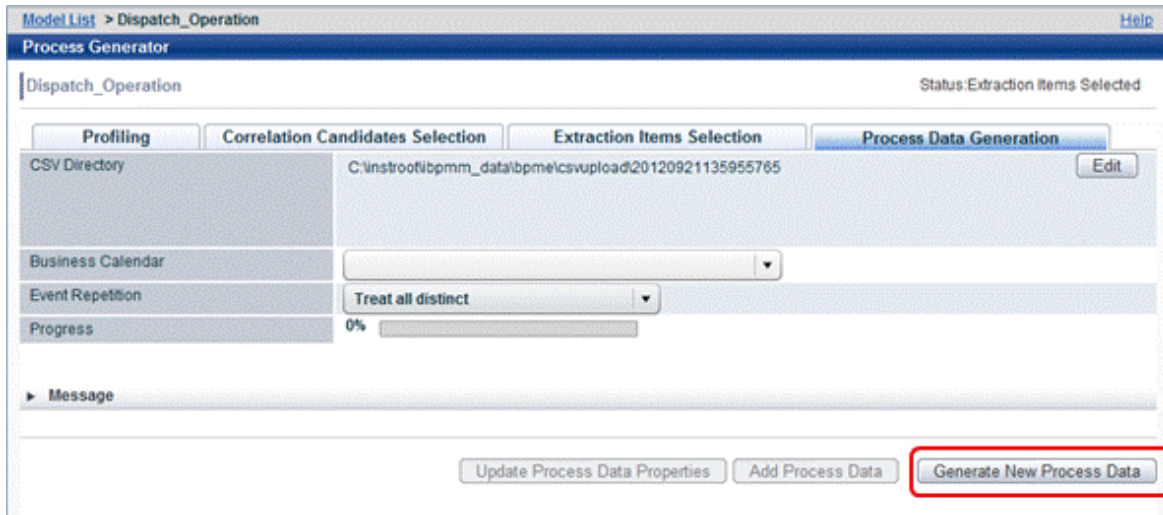

2.5 Generating Process Data

On the **Process Data Generation** tab, click **Generate New Process Data** to generate a process diagram. To add a directory with a CSV file with the same data format, click **Edit** in the **CSV Directory** area, and then add the directory.

For detailed operations on event repetition and business calendars, refer to Section 6.6, "Generating Process Data" in the *Process Discovery Guide*.

Figure 2.9 Process Data Generation tab

2.5.1 Handling Errors that Occur during Process Generation

As described in Section 1.3 above, if a space or a line feed character exists in the input data, an error message is displayed during process generation. Click either **Yes** or **No**, and then edit the model. Note that the error location is also displayed in the message. Additionally, you can verify the model status displayed at the upper-right corner in the Process Generator window. If it shows **Status：Process Data Generated,** the error has been resolved and the process diagram has been generated.

To generate a new process diagram, click **Generate New Process Data**. To view the generated process diagram, click the **Process Analysis** tab in the Process Analyzer. If a process diagram is not displayed correctly, check the settings in the **Correlation Candidates Selection** and **Extraction Items Selection** tabs and generate the process data again.

Figure 2.10 Error message
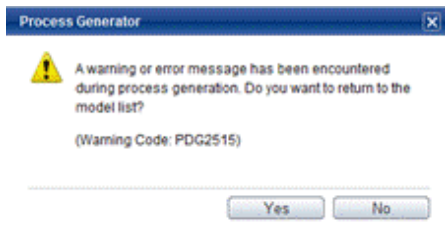
Figure 2.11 Process Generator tab displaying errors
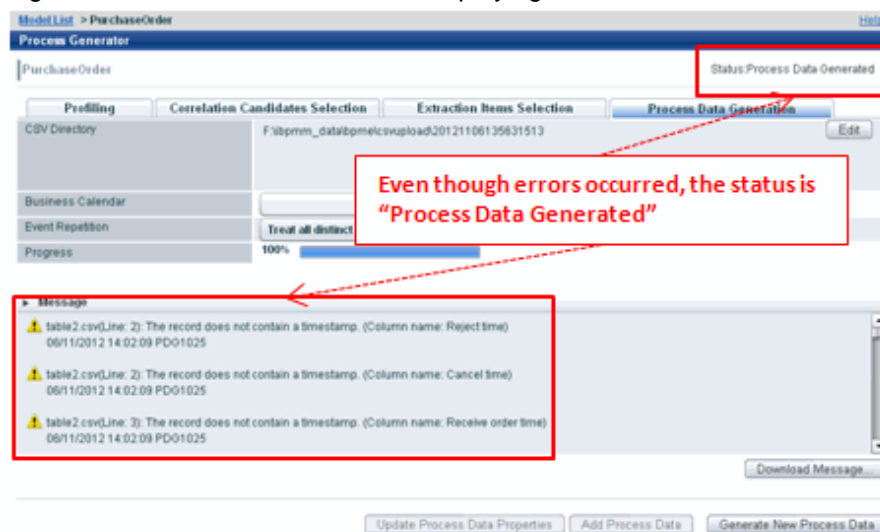
Chapter 3 Process Analysis

This section explains the flow of process analysis.

For process analysis, log in to the Analytics console and click the **Process Analyzer** tab. Note that to display the **Process Analyzer** tab, you must assign the relevant user to the **Process Analyzer User** or **Process Analyzer Power User** group by using the **User Management** tab in the Management Console.

Figure 3.1 Process Analyzer tab
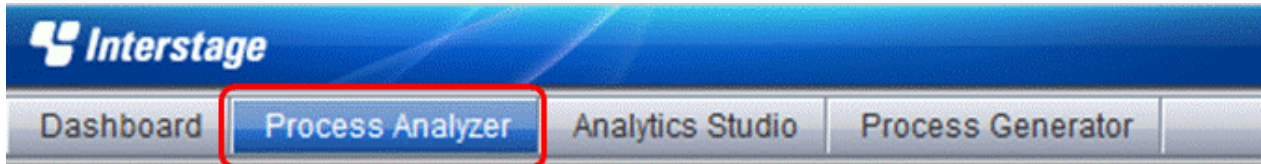
3.1 Process Analysis/Route Analysis/Exceptional Route Analysis

Select a model on the **Process Analyzer** tab to display the **Process Analysis**, **Route Analysis**, and **Exceptional Analysis** tabs. Each of these tabs support process filtering and route verification operations, enabling you to identify process bottlenecks and improve business operations. Refer to Section 8.1, "Operation Menus" in the *Process Discovery Guide* for an overview of the various operations provided by the Process Analyzer.

Process analysis, route analysis, and exceptional route analysis can be performed for process diagrams that are generated using the input data described in Section 1.2 above.

- Display all processes

    On the **Process Analysis** tab, adjust the number of processes to be analyzed by moving the slider in the **Process Filter** area in the **Control Panel**.

    In the process diagram displayed below, the **Process Filter** is set to 100 percent and displays all processes (48 processes), including exceptional routes. This enables you to verify even those processes that could be otherwise overlooked.

Figure 3.2 Example illustrating all processes displayed in a process diagram
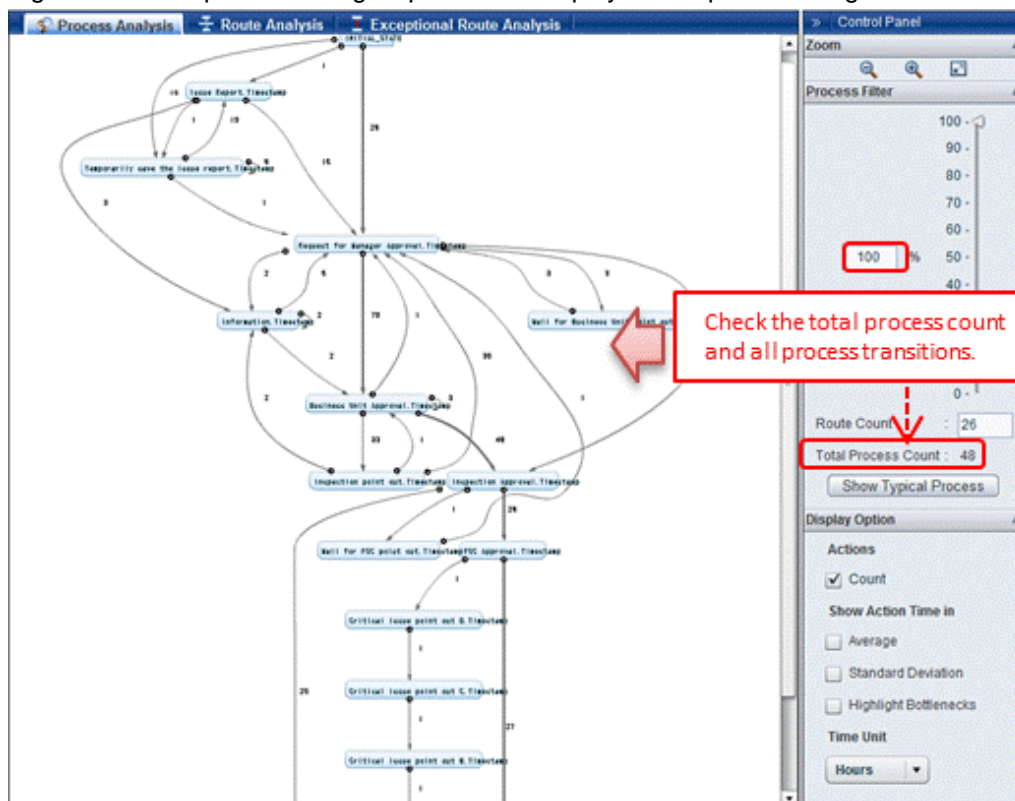
- Bottleneck detection

  Select the **Highlight Bottlenecks** check box to display in red those transitions that took more time on an average than all the displayed processes.

  The following diagram illustrates how clicking **Show Typical Process** excludes exceptional processes, and on selecting **Highlight Bottlenecks**, the transition from "Issue Report" to "Request for Manager Approval" that took the most time amongst all typical processes is identified.

Figure 3.3 Bottleneck detection example
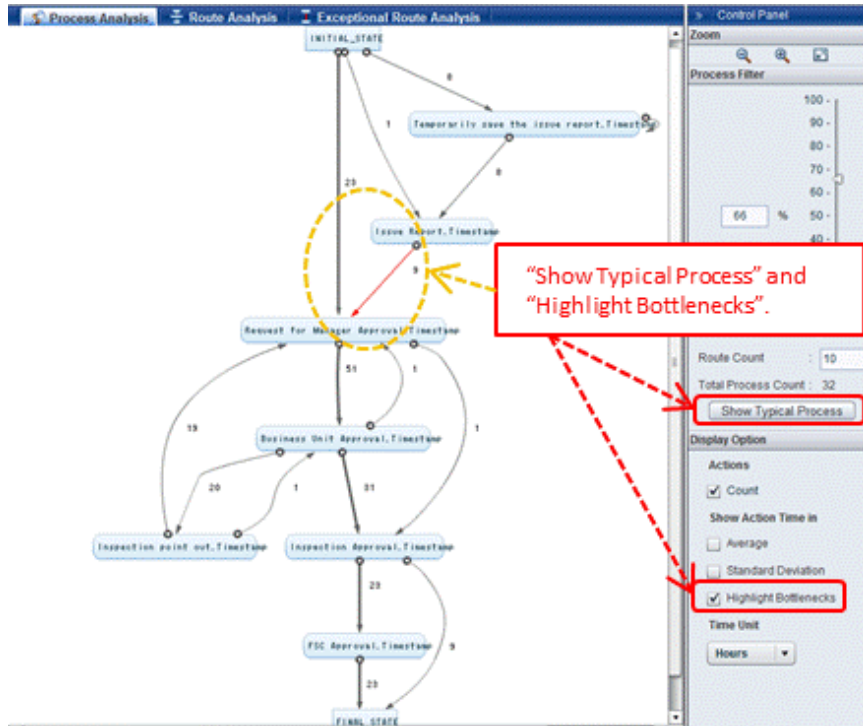
- Route analysis

  On the **Route Analysis** tab, review the items listed in **Route List** and select a route. Doing this displays detailed information about each action. Verify the displayed information for the action that caused the bottleneck.

In the following process diagram, notice the difference in the execution time of each route. Further, by referring to **Action Details**, you can analyze the different actions and identify the most time-consuming actions.

Figure 3.4 Route analysis example
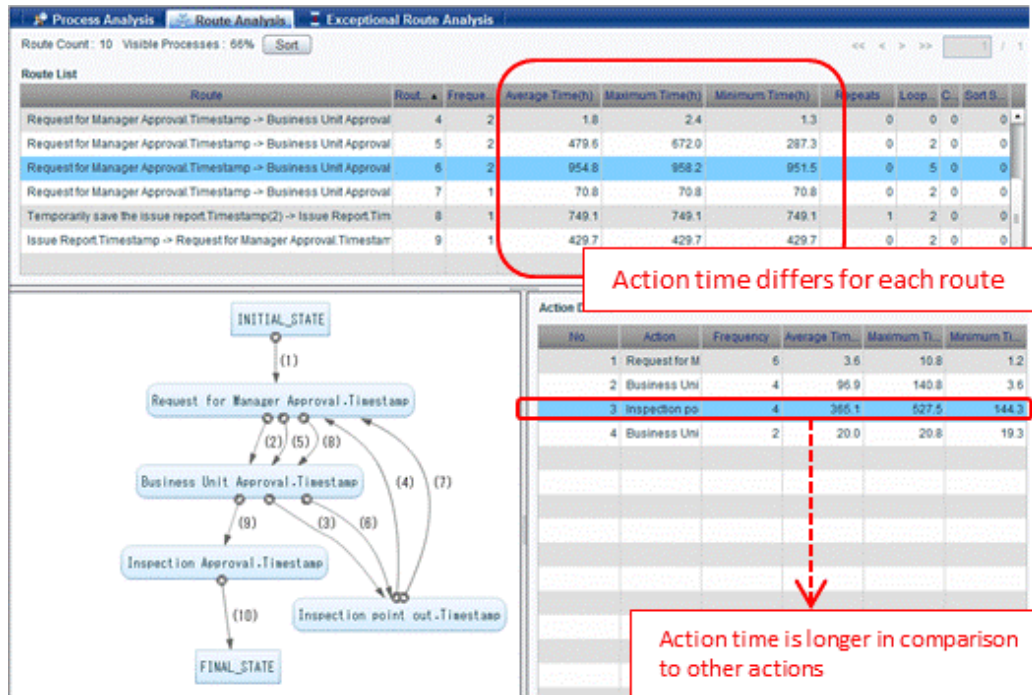
- Exceptional route analysis

The **Exceptional Route Analysis** tab is similar to the **Route Analysis** tab except that it list routes that have a problem. These routes can be monitored and sorted using **Exceptional Route List**. By selecting a column, you can analyze the difference between typical routes. Note that, in a process diagram, the number within the parentheses, "()", indicates the order of transitions.

In the following process diagram, routes with a high process return frequency are monitored. The results of the analysis identifying events with high process return frequencies are displayed. In the following example, it is shown that "Request for Manager Approval" has the highest process return frequency.

Figure 3.5 Exceptional route analysis example
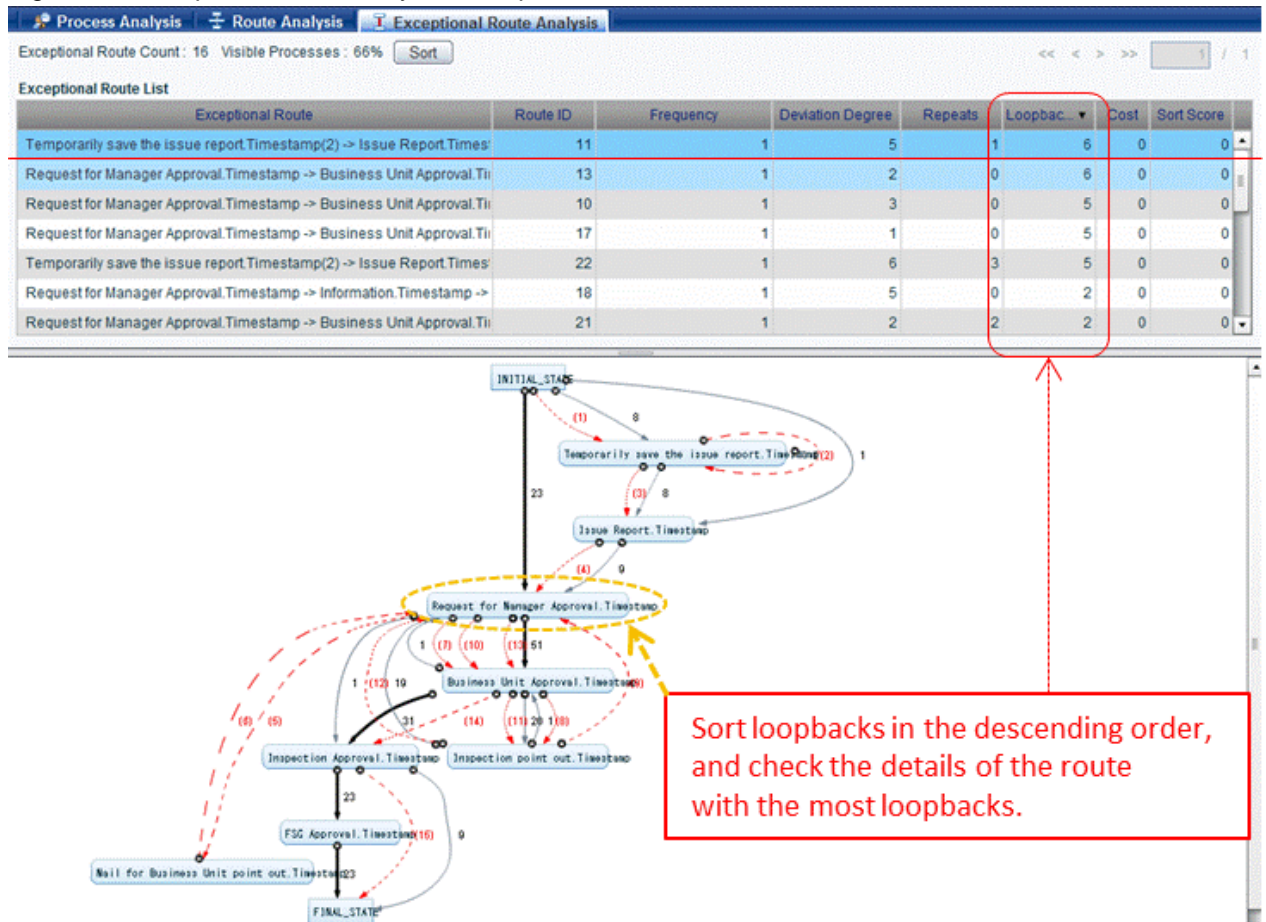
3.2 Configuring Fixed-Point Monitoring

To configure fixed-point monitoring for the dashboard, assign the relevant user to the **Process Analyzer Power User** group.

Additionally, configure fixed-point monitoring for Process Discovery using the Management Console, and then create KPI charts/alerts using the **Process Analysis** tab (in the Process Analyzer) for the selected model. Note that during process generation, if the CSV file in the registered directory is updated, regular collection/updates are performed according to the fixed-point monitoring schedule on activating **Process Discovery Connection** on the **Sensor Management tab** in the Management Console. However, editing operations using the **Process Generator** will no longer be possible after these settings have been configured for a model.

Moreover, the KPI charts/alerts created using the **Process Analysis** tab must be first published using the Analytics Studio to display them on the dashboard. This procedure is described in the following sections.

Figure 3.6 Fixed-point monitoring settings in the Management Console
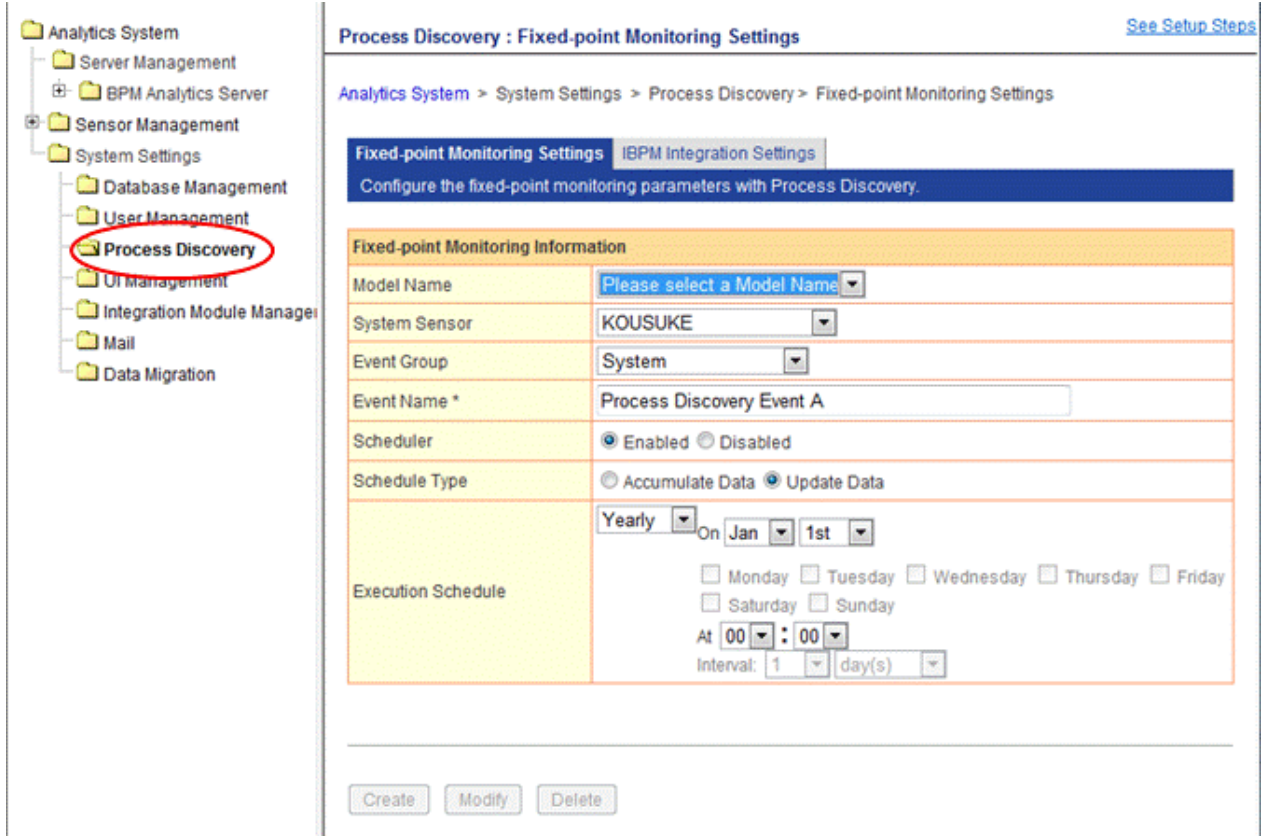
3.2.1 Creating KPI Charts/Alerts

KPI charts/alerts can be created for an entire process by simply right-clicking in a process diagram displayed on the **Process Analysis** tab. You can also create charts/alerts to monitor states and transitions by moving the mouse pointer over the object, and when it changes color and is emphasized, right-click the object to create a KPI chart/alert.

Note that the default unit for action time threshold values and alert items is "seconds", but this can be changed to days/hours/minutes.

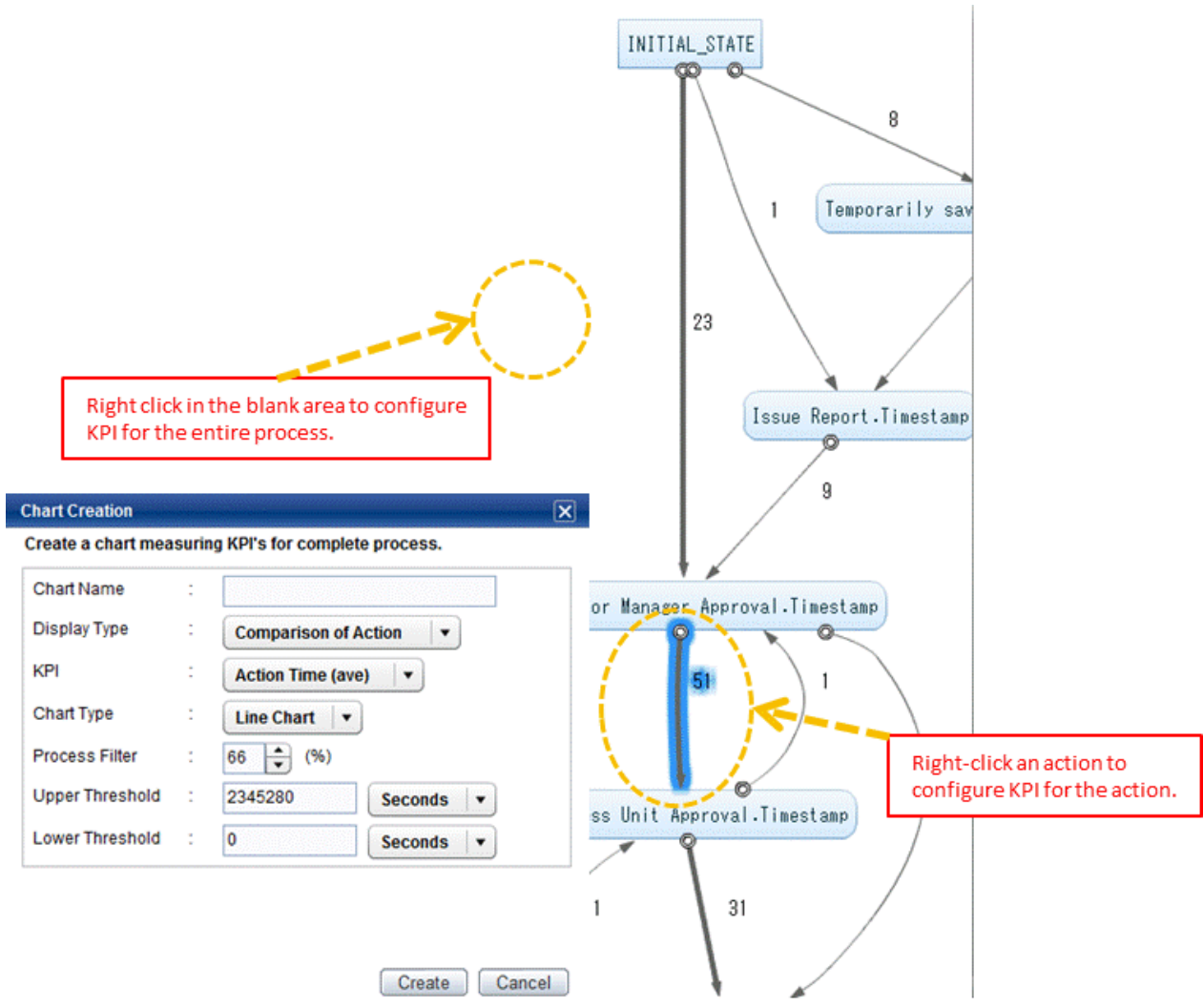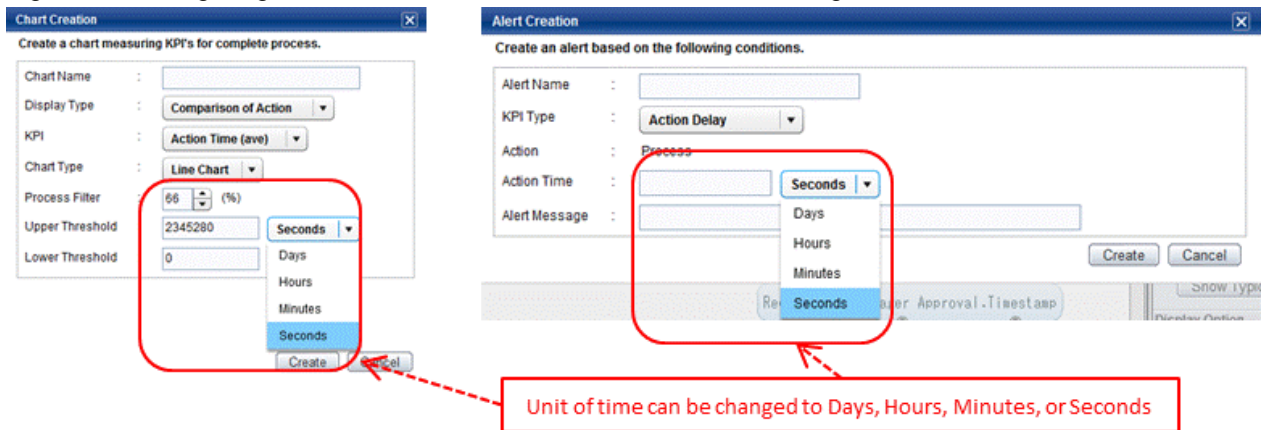Figure 3.7 Configuring KPI settings on the Process Analysis tab

Figure 3.8 Configuring KPI chart threshold values and alert time settings


3.2.2 Configuring Additional Settings for KPI Charts Using the Analytics Studio

By default, the action time is displayed in "seconds" for charts generated using the **Process Analysis** tab. However, you can change this default unit to display the action time in days/hours/minutes by editing the chart settings using the Analytics Studio.

1. In the Analytics Studio, click **View** > **Refresh** to display all elements.

2. For the selected chart, click **Edit**.

Figure 3.9 Editing a chart
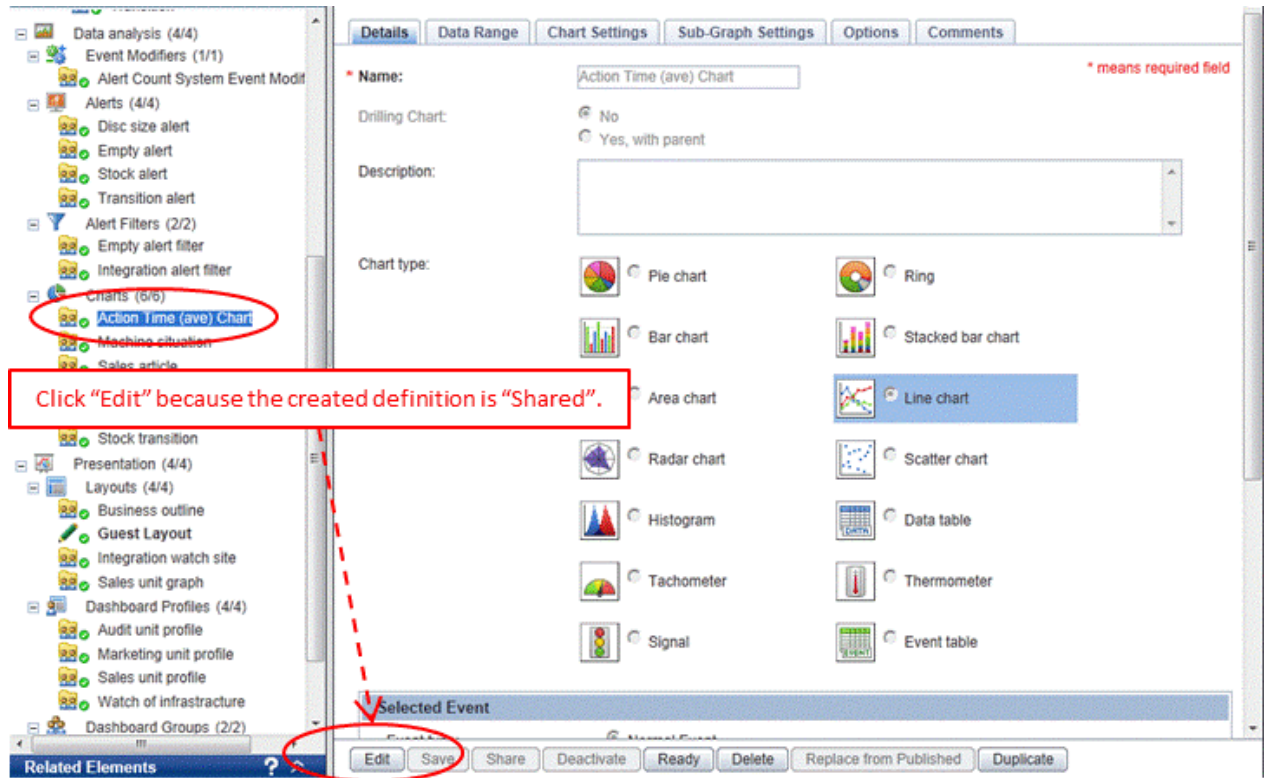
3. On the **Details** tab, click **Advanced**, and then specify appropriate values for **Operation for data attribute** to convert the default unit.

   - For day : Click / in the list, and type **86400** as the value.

   - For hours : Click **/** in the list, and type **3600** as the value.

   - For minutes: Click / in the list, and type **60** as the value.

Figure 3.10 Operation for data attribute settings
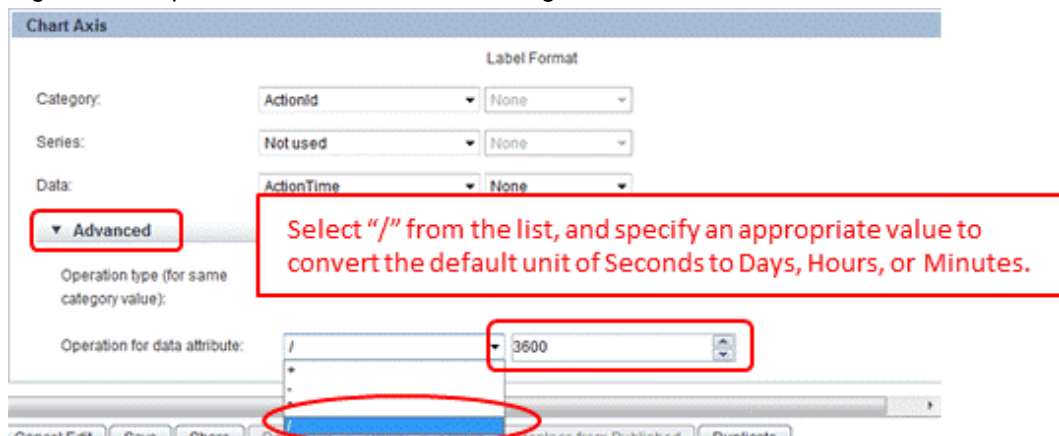
P Point
. . . .
In case you want to display Data values using time format (hh:mm:ss), select "time" as Label Format of Data.
. . . .

4. On the **Chart Settings** tab, in the **Threshold** area, if a threshold value is set, change its value as described in step 3.

Figure 3.11 Threshold value settings

5. After making the changes, click **Save**, then click **Share**, and finally click **Ready**.

In the following dashboard example, the bar graph shows the average time for each action with the unit set to one hour. Additionally, the lower threshold value is set for 50 hours, and the upper threshold value is set for 150 hours.

Figure 3.12 Sample dashboard display

## 3.2.3 Publishing Elements Using the Analytics Studio

Users responsible for publishing elements using the Analytics Studio for display on the dashboard must be assigned to the **Publisher** group in the Management Console. Note that users should already have publishing rights when creating charts and alerts.

To display elements on the dashboard, you need to create additional presentation elements.

- For alerts, the following elements need to be created:

    - Alert filters: Require alert details for creation

    - Dashboard profiles: Require alert filter details for creation

    - Dashboard groups: Require dashboard profile details for creation

- For charts, the following elements need to be created:

    - Layouts: Require chart details for creation

    - Dashboard profiles: Require layout details for creation

    - Dashboard groups: Require dashboard profile details for creation

After creating these elements, publish them all.

Figure 3.13 Publishing elements in the Analytics Studio
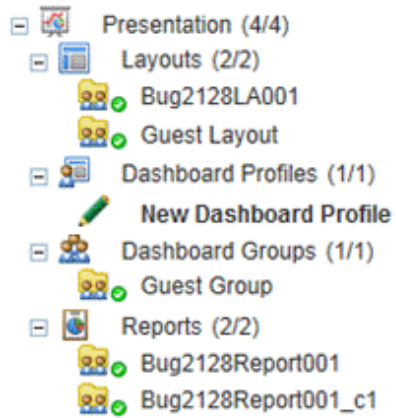
In addition to charts and alerts, presentation elements must also be configured.