Oracle Financial Services Investigation Hub

User Guide

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Financial Services

OFS Investigation Hub User Guide

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Document Control

Table 1 lists the document control of this guide.

Table 1: Document Control

Version Number	Revision Date	Change Log
8.1.2.6.0	April 2024	Added the Network Evolution Settings section.
8.1.2.6.0	February 2024	Added the following sections: ● Access the Investigation Hub Notebook ● ECM Case Narrative Notebook ● Investigation Process Flow using Investigation Hub Notebooks Updated description for result and visible graphs in the Graph Types section. Updated steps in the Exporting a Notebook, Invalidating Session, and Deleting a Notebook sections.
8.1.2.4.0	August 2023	Removed features related to review alerts generated by ML models in the Key Features section.
8.1.2.4.0	June 2023	Deprecated L2 and Generate Correlation Networks notebooks. Updated note in the Viewing the Entity Summary Historical Report section. Removed the "Investigator Brief" section.
8.1.2.1.0	December 2022	● OJET Upgrade (all UI elements are updated according to UI in the entire document). ● Renamed Advanced Options to Model Pipelines in the entire document. ● Updated screen in the Investigation Summary section.
8.1.2.0.0	April 2022	Modified the following sections: ● Updated the heading for Case related Features, Importance and Description section. ● Removed Investigator Guidance section.
8.1.1.1.0	December 2021	There is no content update from the previous version. Only version number has been changed.
8.1.1.0.0	October 2021	This is the first version created for IH 8.1.1.0.0 release based on OFS Compliance Studio 8.1.1.0.0 release.

Table of Contents

1 Preface

This section provides the functional and navigational information about the Oracle Financial Services Investigation Hub (OFS IH) application.

Topics:

- Summary
- Documentation Accessibility
- Audience
- Related Documents
- Conventions
- Abbreviations

1.1 Summary

You can find the latest copy of this document in the Oracle Help Center (OHC) Documentation Library which includes all the recent additions/revisions (if any) done to date.

1.2 Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website.

1.3 Audience

The Oracle Financial Services Investigation Hub User Guide is intended for end-users such as Data Analysts and Data Scientists.

1.4 Related Documents

This section identifies additional documents related to the OFS IH application.

The following OFS IH documents are available in Oracle Help Center Documentation Library:

- Oracle Financial Services Investigation Hub Installation Guide
- Oracle Financial Services Investigation Hub Administration and Configuration Guide
- Oracle Financial Services Investigation Hub Release Notes

1.5 Conventions

Table 2 lists the conventions used in this document.

Table 2: Conventions Used in This Guide

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text on the screen, or text you enter.

1.6 Abbreviations

Table 3 lists the abbreviations used in this document.

Table 3: Abbreviations Used in This Guide

Abbreviation	Meaning
OFS	Oracle Financial Services
AAI	Analytical Applications Infrastructure
PGX	Parallel Graph Analytics
PGQL	Property Graph Query Language
LHS	Left Hand Side
OFSAA	Oracle Financial Services Analytical Applications
OFS IH	Oracle Financial Services Investigation Hub
FCGM	Financial Crime Graph Model
FCDM	Financial Crime Data Model
SQL	Structured Query Language
IH	Investigation Hub
ECM	Enterprise Case Management
AML	Anti-money Laundering
BD	Behavior Detection
OOB	Out-of-the-Box

2   About Oracle Financial Services Investigation Hub

This chapter provides a brief overview of the OFS Investigation Hub application.

2.1   Introduction

OFS Investigation Hub is an application built on OFS Compliance Studio that allows investigators to rapidly view enhanced cases within OFS Enterprise Case Management, both with and without a graphical view of the case.

The narrative (non-graph) Investigation Hub notebooks provide analysts with a pre-defined natural language narrative of the case and its entities, as well as highlighting risk factors and red flags within the case to enhance decision making.

The graphical Investigation Hub notebooks additionally have the case graph loaded, allowing for the graph's expansion and further investigation of the entities relationships by expanding the graph.

The notebooks are built on the Financial Crime Graph Model Schema which is configurable within OFS Compliance Studio and optionally provides the capability for matching to third-party sources of data like ICIJ and well as linking internal similar internal parties. OFS Investigation Hub accelerates investigations by bringing relevant information sources together (including external API calls to sources such as Quantifind), and preventing the need for the manual collation of information from disparate sources (where data is not available in OFS Enterprise Case Management). OFS Investigation Hub automatically generates case narratives and insights, highlights risk factors, and red flags that are meaningful to the investigation, and recommends actions based on the scoring algorithms of required.

2.1.1   Key Features

- Pre-built notebooks for case investigation and special investigation
- Configurable red flags and risk factors to highlight key areas for investigation
- Case summary in narrative format and case recommendation
- Exploration of the financial crimes global-graph using an interactive and visual Graph Explorer tool.
- Integrates fully with FCDM (data can be loaded directly from Behavior Detection (AML) or ECM instance) and ICIJ data sources. It can be enhanced to support other data sources such as watchlist and company hierarchy data
- It is built on OFS Compliance Studio, which includes a highly scalable in-memory Oracle Graph Analytics Engine (PGX), AI, and machine learning.
- Integrated with Quantifind API for additional information on case entities.

3 Access the Investigation Hub Notebook

Users can select cases from the case list page and then access Investigation Hub for the case in ECM.

To access the Investigation Hub tab from ECM, follow these steps:

1. Log in to the OFS ECM application.
2. Search for a case.
3. Click the desired Case ID.
4. Go to the Investigation Hub tab.

   The Notebook with Case ID will open, and the user can start the investigation.

   > **NOTE**
   > - Based on the user role mapping, the notebook will be opened.
   > - The Investigation Hub tab is enabled for the AML Case Type.

4 About Investigation Hub Notebooks

Users can access following notebooks in the Investigation Hub:

- ECM Integration L1 Notebook
- ECM Case Narrative Notebook
- Special Investigation (SI) Notebook

4.1 ECM Integration L1 Notebook

Enable Level 1 case Investigators to access additional rich information about a case such as a case summary, a detailed narrative about case entities, a graph view of a case, and so on. Allows the investigator to explore a case, including graphs, risk factors, and red flags.

> **NOTE**   Administrators can disable graph-based analysis. If disabled, the user will get the result till the **Entity Summary Risk Report** paragraph. For more information on configuration changes, see the Oracle Financial Services Investigation Hub Administration and Configuration Guide.

The paragraphs in the ECM_Integration_L1 are as follows:

- Viewing Case Details
- Starting the Investigation
- Searching for Non-Case Entities
- Viewing the Initial Screening Results
- Viewing the Entity Summary Risk Report
- Viewing the All Transactions for Focal Entity(s)
- Viewing the Case Graph (and Searched Entities)
- Viewing the Reference Data Sources
- Viewing the Countries
- Viewing the Risk Factors
- Viewing the Red Flags
- Viewing the Network Disposition Score
- Viewing the Network Disposition Score Breakdown
- Exporting Investigation Detail to PDF Format

4.1.1 Viewing Case Details

This Paragraph contains Case ID where an investigator can investigate. This Case ID will be populated automatically when a notebook is opened from ECM Case.

Figure 1: Case Details Paragraph
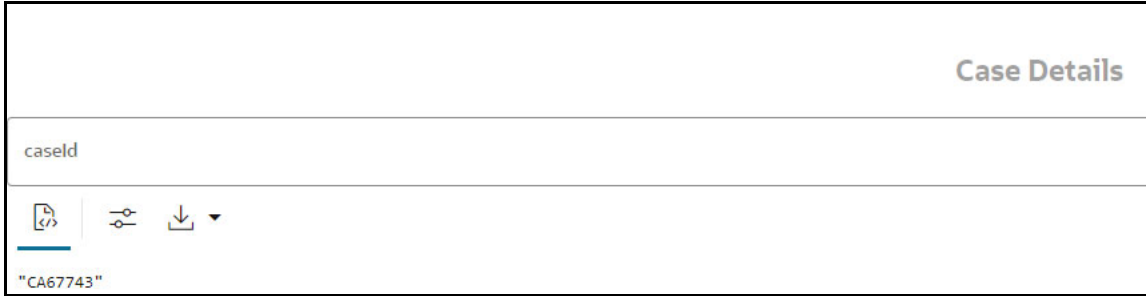
4.1.2 Starting the Investigation

You can directly start the investigation by executing this paragraph.

By default, it initializes the investigation process, configurations and displays the Initialization successful message.

To execute the paragraph, follow these steps:

1. Navigate to the ECM_Integration_L1 notebook that is assigned for a particular user role.

2. Execute **Click to Start Investigation** paragraph to start the investigation process.

   The initialization successful message is displayed.

Figure 2: Start Investigation Paragraph

4.1.3 Searching for Non-Case Entities

Execute this paragraph to search additional entities based on "Tax Id", "Name", "Address", and "Date" to consider them as part of the investigation of the case.

To search the non-case entities, follow these steps:

1. Navigate to the Search for Non-Case Entities paragraph.

Figure 3: Search for Non-Case Entities Paragraph

2. Enter the search criteria in the Search for Non-Case Entities paragraph as described in the Table 4.

Table 4: Search for Non-Case Entities Paragraph Details

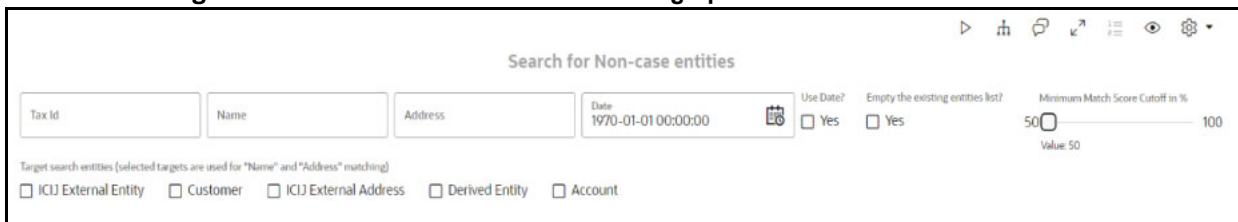| Field	Description
Tax Id	Tax ID of the entity that needs to be searched. (For example, customer's tax id). You must enter the complete Tax ID to get the exact search result.
Name	Name of the entity that needs to be searched. This filters name of the entity that matches the search criteria.
Address	Address of the entity that needs to be searched. This filters address of the entity that matches the search criteria.
Date	This filters entities based on the following conditions: ● Customer's add date ● Account open date ● Derived Entity's last activity date
Use Date	Allows user to enable or disable the Date field. If user uses Date field for search then select the Use Date? check box. By default, it is deselected.
Empty the Existing Entities List	This is used to remove the already searched records and adds only new records to search. If user wants to remove old searched records then select the Empty the existing entities list? check box. By default, it is deselected.
Minimum Match Score Cutoff in %	User can set the cutoff value to define the matching criteria. The records that match (equivalent or more than) the configured cutoff score value will be displayed in the search results with the score. **NOTE:** The Default value is 50% and Maximum value is 100%.
Target search entities (selected targets are used for "Name" and "Address" matching)	If user searches using a Name or Address, Target entities to search should be selected for searching only in those target entities. For example: Searching for Name of Customer then target entity Customer, and Account can be selected. **NOTE:** Searching for Name/Address at least one target entity should be selected.

| NOTE	● User can add combinations of four fields (Tax_id, Name, Address, and Date). ● User can add multiple records to search.

4.1.4　Viewing the Initial Screening Results

This paragraph allows you to define the conditions based on which the initial screening results are filtered and fetched. Result will be table of top critical matches generated from search results.

Table 5 describes the conditions to be defined based on which initial screening results are displayed.

Table 5: Initial Screening Results

Field	Description
Top Critical Matches	The value to decide how many matches you want to view in the search result output for each search condition. **NOTE:** The default value is 3.
Number of Hops to Pre-Fetch	The number of hops that the search result graph can be expanded. **NOTE:** The default number is 5.
Number of Hops to Display	The number to decide how many hops must be displayed in the search result graph. **NOTE:** The default number is 3.

Figure 4: Initial Screening Results Paragraph
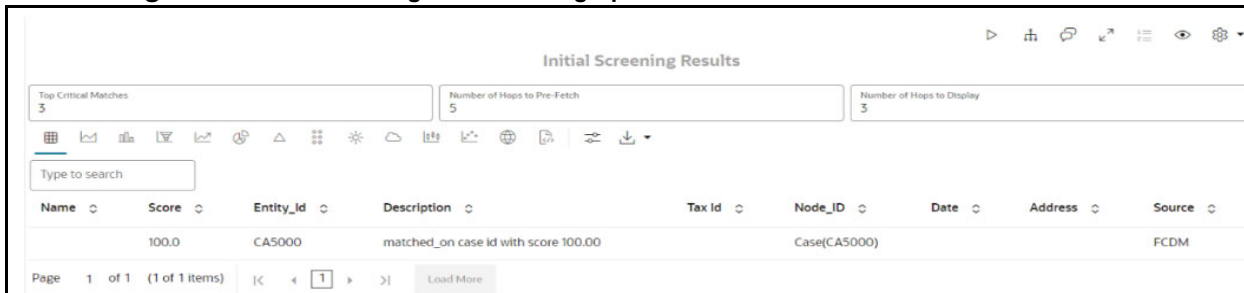
4.1.5　Viewing the Entity Summary Risk Report

This paragraph gives the summary report of the focal entities related to the case.

The Entity Summary Risk Report paragraph allows you to view the historical summary (in text format) of the case. This information includes the Customer Summary, Account Summary, Compliance Summary, Risk Factor & Red Flags.

Users can add non-case entities (from the search results) to the Risk Report by adding Entity Id in the **Additional Entity Ids** field.

You can add multiple entity IDs separated by a comma(,).

The result will be a summary of Case details with additional searched entities.

To view the risk summary of an entity, navigate to Entity Summary Risk Report paragraph. The following figure shows a sample of the risk summary of an entity.

Figure 5: Entity Summary Risk Report
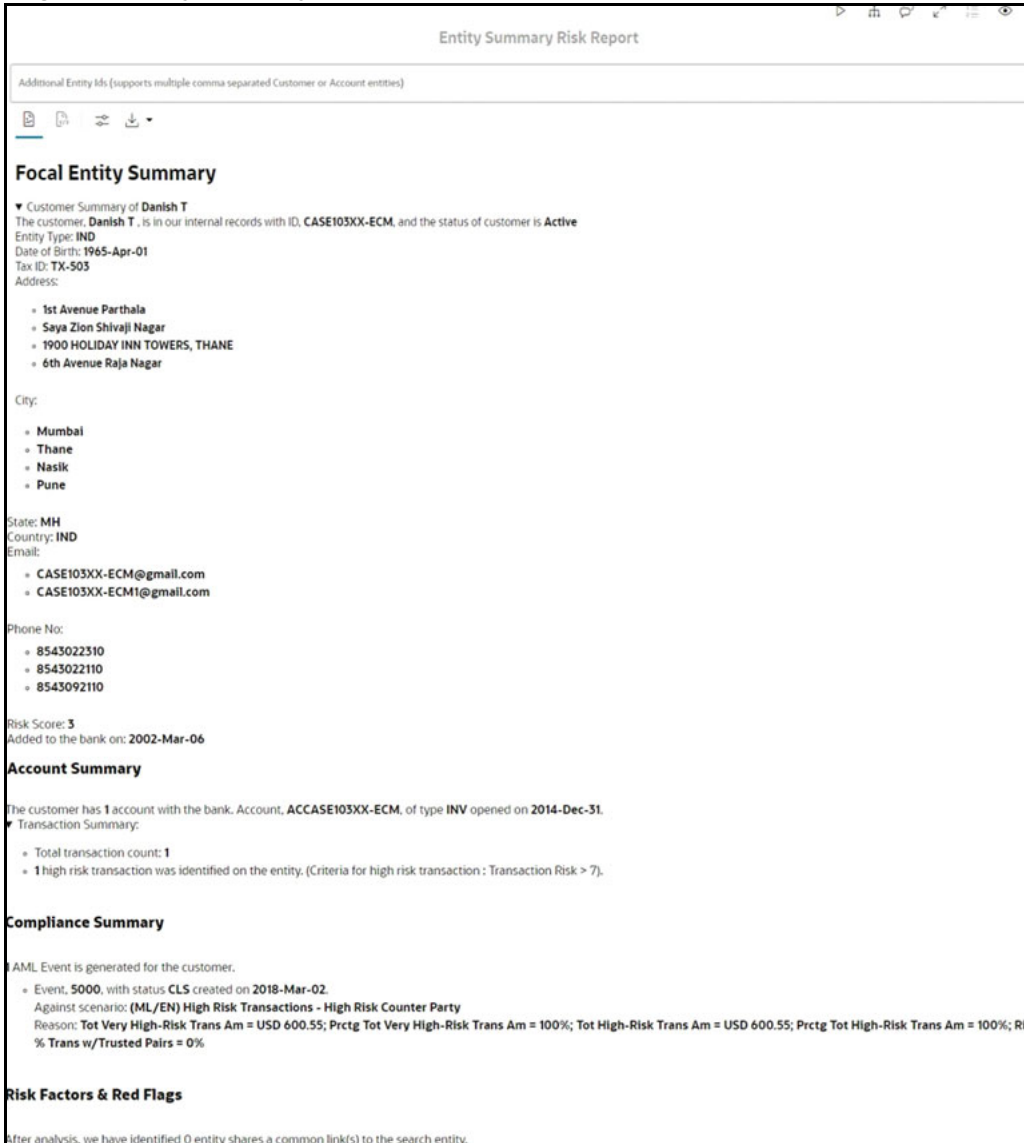
4.1.6 Viewing the All Transactions for Focal Entity(s)

This paragraph shows all transactions related to focal entities of a case from **Result Graph**. In addition, you can filter the transaction details based on the transaction amount specified in the following fields:

- **Minimum Transaction Amount**: The user can enter the minimum transaction amount from which transactions will be shown. The default value is 0.

- **Maximum Transaction Amount**: The user can enter the maximum transaction amount to which transactions will be shown. The default value is 1000000.

The result will be the table of all the transactions related to the case entities. To view the transaction details, navigate to the Transaction Analysis paragraph.

You can view these transactions in the table format as shown below.

Figure 6: All Transactions for Focal Entity(s) Paragraph (Table Format)
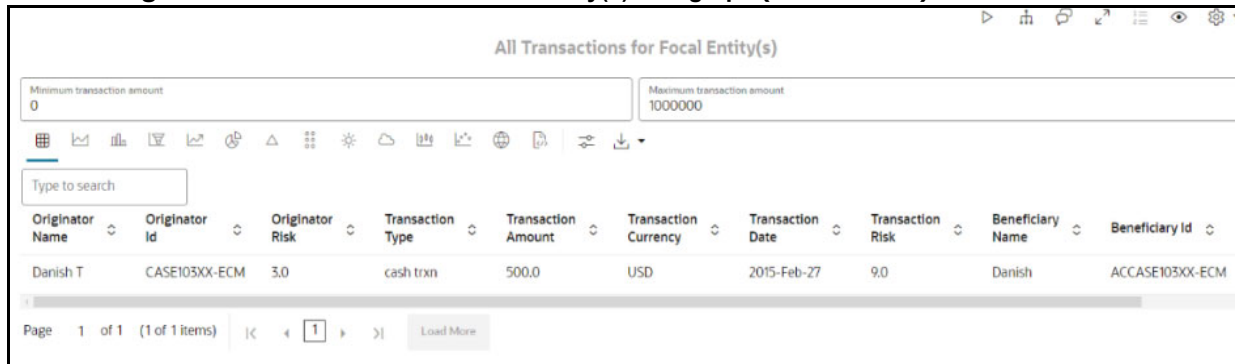
If you want to view in bar chart, click **Bar Chart** and view these transactions as shown below.

Figure 7: All Transactions for Focal Entity(s) Paragraph (Bar Chart Format)

For more information on various formats, see Data Visualization section.

4.1.7 Viewing the Case Graph (and Searched Entities)

This paragraph allows you to view the network graphical representation of the case and its associated entities. This paragraph displays the case graph along with the graph for the non-case entities searched in the Input Search Results paragraph.
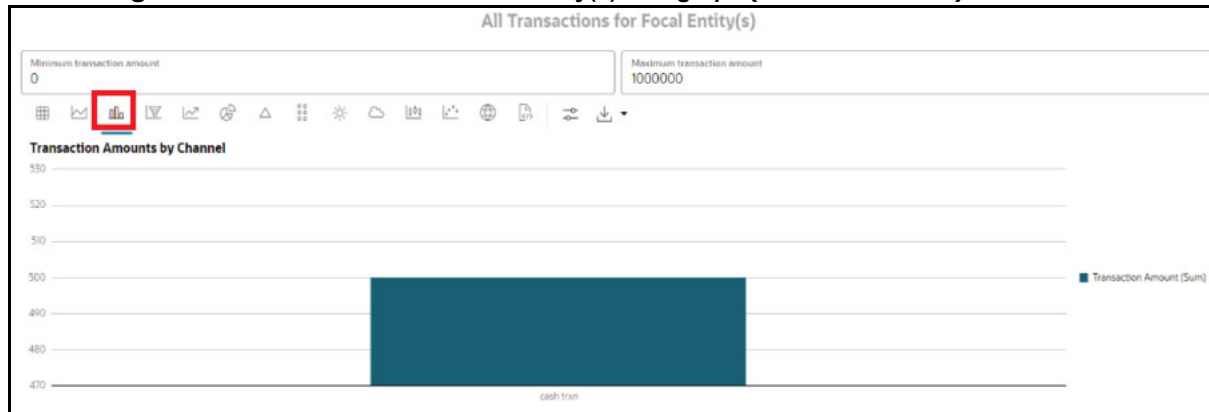
A typical network graph shows nodes and edges. Nodes are entities such as a customer or account. Each node can join to zero, one or many other nodes via a link called an edge which represent relationships between edges, transactions or connecting nodes via similarity edges created by matching. Each type of node is associated with a specific icon on the graph. Table 10 describes the icon displayed on the graph for each type of node.

When the Investigation Hub tab is opened for the first time, it displays the following details:

- The case node and five hops from the case node to include all the events, customers, derived entities, accounts, and transactions that are the focal entities and impact the case.

- Additional nodes and edges that provide case context such as relationship and similarity edges to include external data sources.

- If the user searches for additional entities in the above paragraph, the graph will show the matched entities and connected nodes and edges.

- The user is then able to manipulate the graph by expanding any high-risk entities or parties on unusual transactions to obtain better understanding of the context and risk associated with the case. The analyst can also remove entities and transactions which are not pertinent to the case to provide a snapshot of only the pertinent information.

When a graph shows the relevant information, the case narrative and other paragraphs can be re-run to provide updated summary information. The following figure shows the sample graph.

Figure 8: Graph Result of Entity Search
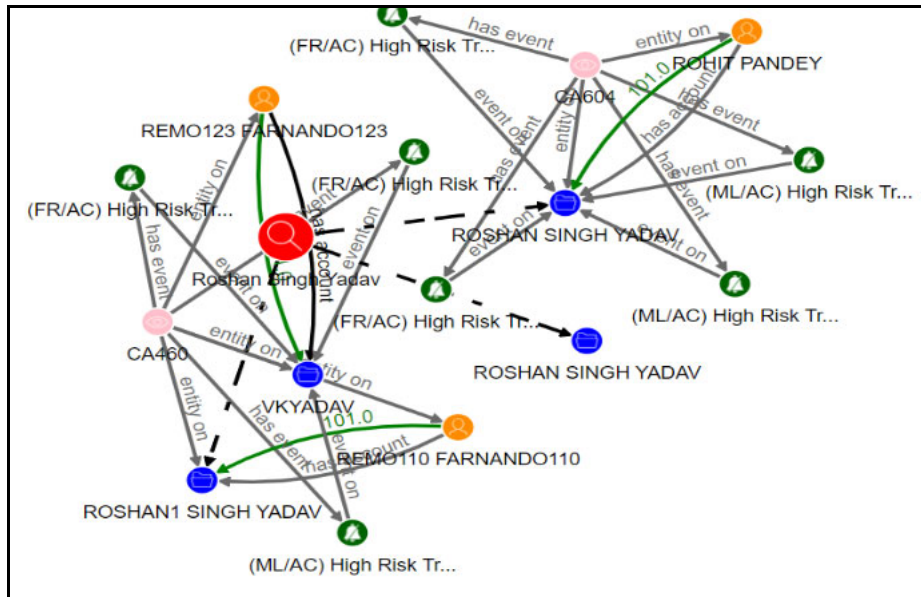
Figure 9: Edges
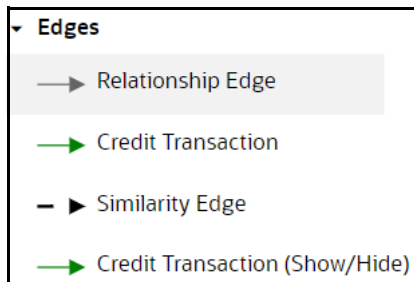
You can perform many actions on a graph. For more information, see the Graph Details section.

NOTE	You must re-execute the paragraph after any modification to view the results in the subsequent paragraphs.

4.1.7.1   Network Evolution Settings

Network Evolution helps to visualize evolution of the network graph based on numeric or date-based properties.

The following figure shows the sample graph.

Figure 10: Sample Graph
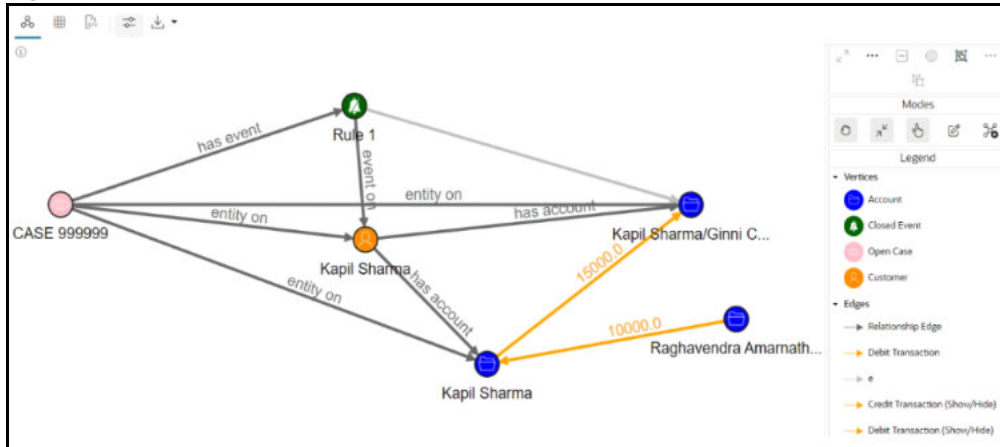
To enable network evolution, follow these steps:

1. Click **Settings** icon to view the setting options.

Figure 11: Graph Result
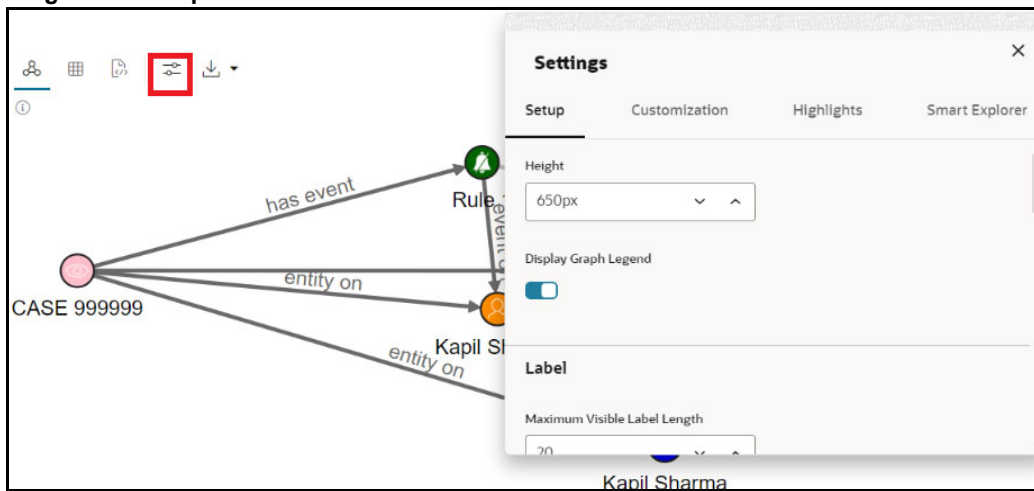
2. Click **Customization** tab and navigate to the **Network Evolution** option.

Figure 12: Customization Tab
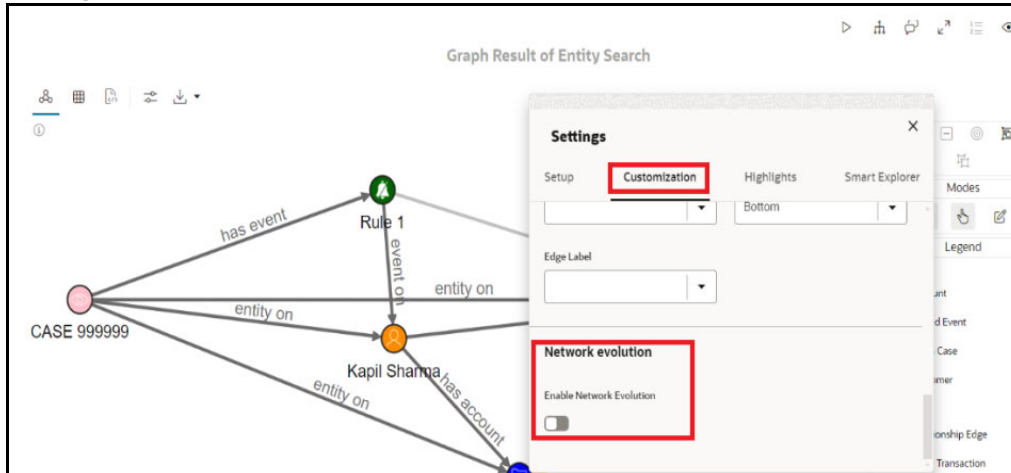
3. Move the toggle switch to the right to enable the Network Evolution setting. The Network Evolution window is displayed.

Figure 13: Network Evolution

Network Evolution provides the customization options as mentioned in the Table 6.

Table 6: Field Description for Network Evolution

Field	Description
Based On	Select a type from the drop-down list based on which network evolution is to be performed. The available options are Vertices, Edges, Vertices and Edges.
Edge Start Property	Name of the property to use for the edge filtering; the timeframe has to be shown after the Edge Start property.
Edge End Property	Name of the property to use for the edge filtering; the timeframe has to be shown before the Edge End property.

Table 6: Field Description for Network Evolution

| Field	Description
Data Type of the Property	Select the data type property. **NOTE**: Network Evolution currently supports Date and Integer datatypes.
Values to Exclude	Multi-Select for graph values that should not be visualized in overview or general. This option provides an easy way to filter vertices or edges.
Behavior of Excluded Values	Excluded values can be either excluded from both the graph and the overview or hidden on the overview but always rendered on the graph, even if the selected time frame excludes them
Increment	The aggregate step is used for the overview chart.
Time Unit	Unit of time for the Increment when the property's Data Type is a date. The available options are Second, Minute, Hour, Day, Week, Month, and Year
Chart Type	The type of chart used for the overview of the network evolution.
Height	The height of the chart on the bottom for network evolution.
Milliseconds Between Steps	How often does the playback advance in ms (minimal value 500).
Number of Items per Step	How many steps are taken per timeout during playback

4. Click **Play Network Evolution** ▷ to view the network evolution in the graph.

5. Click **Reset Network Evolution** ☐ to reset the network evolution of the graph.

4.1.8   Viewing the Reference Data Sources

This paragraph shows reference data sources of the entities present in the Visible Graph.
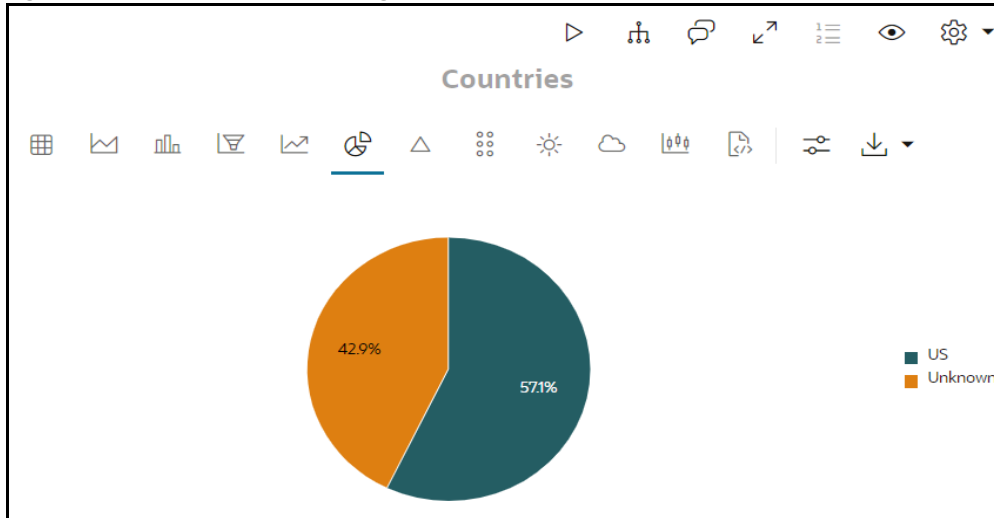
Figure 14: Reference Data Source Paragraph
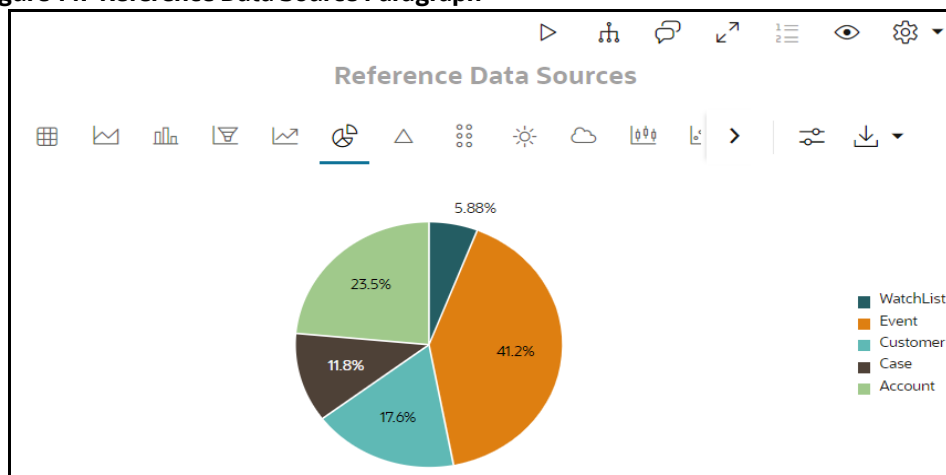
You can view these transactions in various formats. For more information on formats, see the Data Visualization section.

For more information on Visible Graph, see Graph Types.

4.1.9 Viewing the Countries

This paragraph shows countries of entities present in the Visible Graph.

Figure 15: Countries Details Paragraph

You can view these transactions in various formats. For more information on formats, see the Data Visualization section.

For more information on Visible Graph, see Graph Types.

4.1.10 Viewing the Risk Factors

This paragraph shows the risk factor details of entities present in the Visible Graph.

To view the risk factor details, navigate to the Risk Factor paragraph. The following figure shows the sample risk factor details.

- **Hits (Initial)**: It fetches the information from **Result Graph** for each item in the Risk Factors.

- **Hits (Investigator)**: It fetches the information from the **Visible Graph** for each item in the Risk Factors.

Figure 16: Risk Factors Paragraph

You can view these transactions in various formats. For more information on formats, see the Data Visualization section.

For more information on Visible Graph, see Graph Types.

4.1.11   Viewing the Red Flags

This paragraph shows the red flag details of entities present in the Visible Graph.

To view the red flag details, navigate to the Red Flags paragraph. The following figure shows the sample red flag details.

- **Hits (Initial)**: It fetches the information from **Result Graph** for each item in the Red Flags.

- **Hits (Investigator)**: It fetches the information from the **Visible Graph** paragraph for each item in the Red Flags.

Figure 17: Red Flags Paragraph

You can view these transactions in various formats. For more information on formats, see the Data Visualization section.
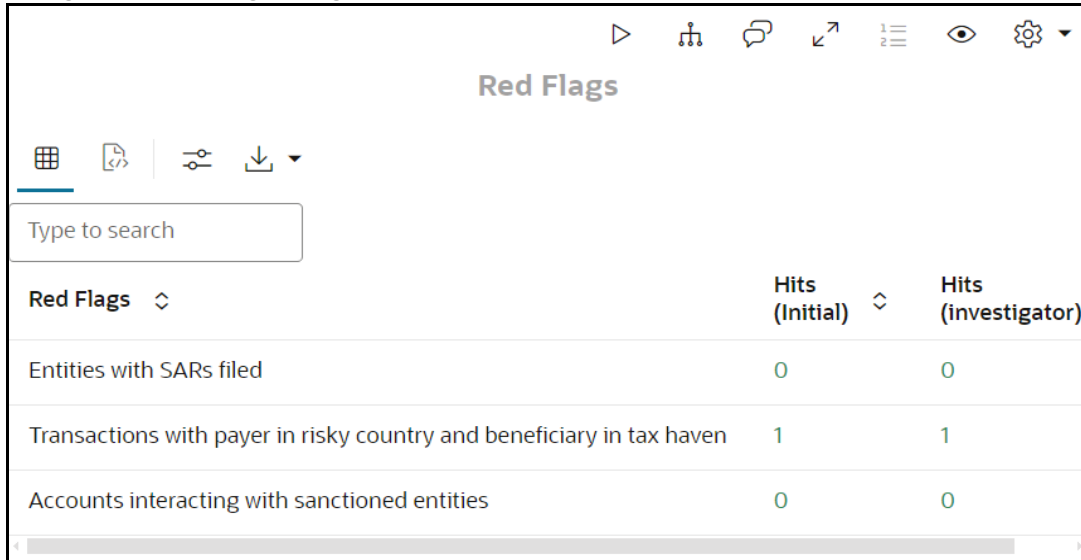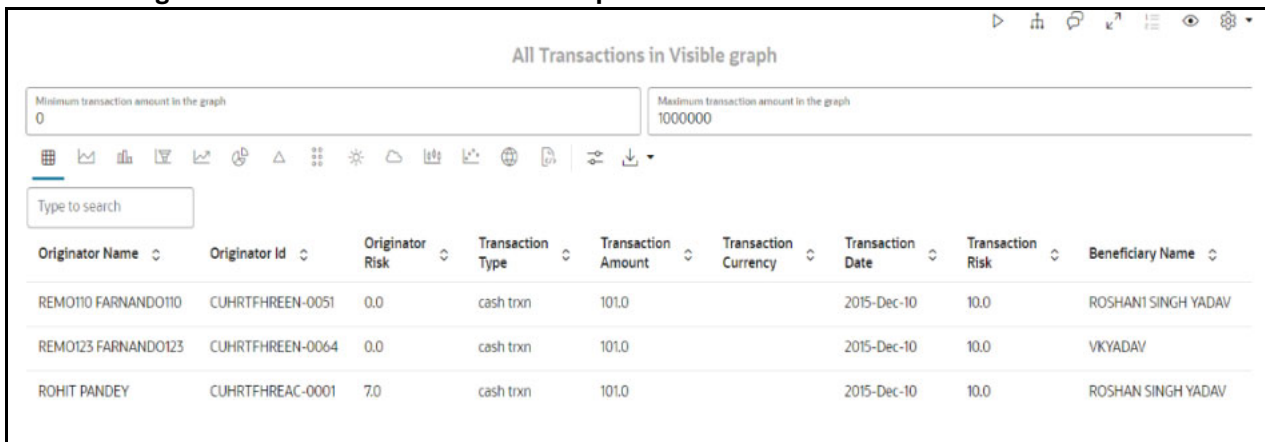
For more information on Visible Graph, see Graph Types.

4.1.12   Viewing the All Transactions in Visible Graph

This paragraph displays information on transactions that are available in Visible Graph.

The following figure shows all transactions in the visible graph.

Figure 18: All Transactions in Visible Graph

4.1.13   Viewing the Network Disposition Score

This paragraph shows the network disposition score of entities present in the Visible Graph.

To view the network disposition score, navigate to the Network Disposition Score paragraph.

For more information on Visible Graph, see Graph Types.

Figure 19: Network Disposition Score Paragraph Details
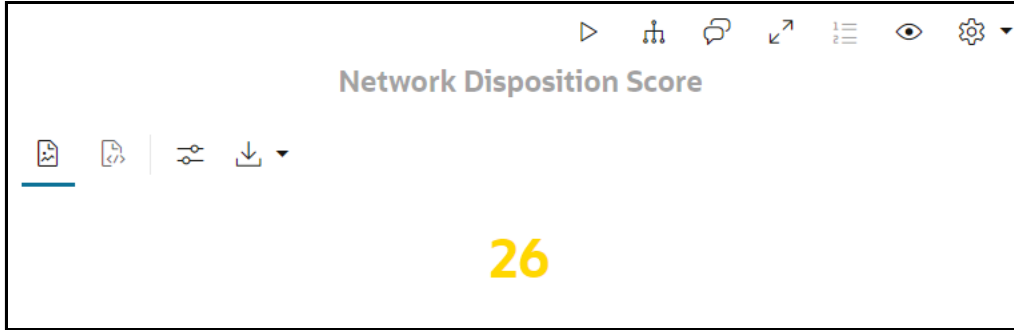
4.1.14 Viewing the Network Disposition Score Breakdown

This paragraph shows the details of the network disposition score of entities present in the Visible Graph.

To view the network disposition score breakdown, navigate to Network Disposition Score Breakdown paragraph.

Figure 20: Network Disposition Score Breakdown Paragraph
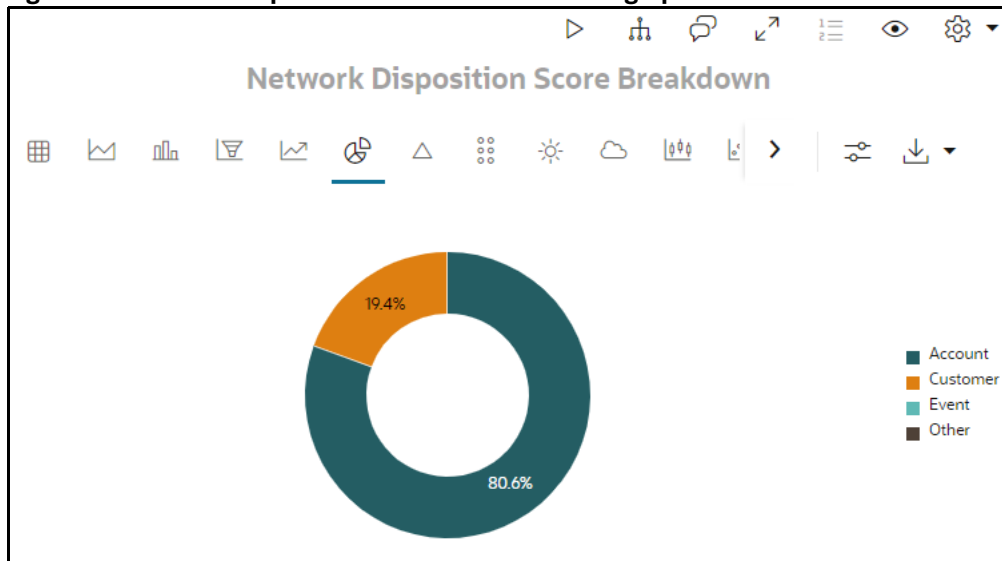
4.1.15 Exporting Investigation Detail to PDF Format

Use the **Export to PDF** option to save the notebook. For more information, see Exporting a Notebook to PDF.

4.2 ECM Case Narrative Notebook

Users can view the summary report of the focal entities related to the case without using the L1 Case Notebook with graph.

The paragraphs in the ECM Case Narrative notebook are as follows:

- Viewing Case Details
- Viewing the Entity Summary Risk Report

- Exporting Investigation Detail to PDF format

4.2.1 Viewing Case Details

This Paragraph contains Case ID where an investigator can investigate. This Case ID will be populated automatically when a notebook is opened from Case.

For more information, see the Viewing Case Details section for the L1 Notebook which has the same functionality.

4.2.2 Viewing the Entity Summary Risk Report

This paragraph gives the summary report of the focal entities related to the case.

For more information, see the Viewing the Entity Summary Risk Report section for the L1 Notebook which has the same functionality.

4.2.3 Exporting Investigation Detail to PDF format

Use the **Export to PDF** option to save the notebook.

For more information, see the Exporting a Notebook to PDF section for the L1 Notebook which has the same functionality.

4.3 Special Investigation (SI) Notebook

Special Investigation notebook enables the investigator to search for one or multiple names and/or addresses to examine the network, red flags, and risk factors without using a case as the starting point.

NOTE	Administrators can disable graph-based analysis. If disabled, the user will get the result till the **Entity Summary Risk Report** paragraph. For more information on configuration changes, see the Oracle Financial Services Investigation Hub Administration and Configuration Guide.

The paragraphs in the Special Investigation (SI) notebook are as follows:

- Starting the Investigation
- Searching for Input Results
- Viewing the Initial Screening Results
- Viewing the Entity Summary Historical Report
- Viewing the Transactions Analysis
- Viewing the Graph Result of the Entity Search
- Viewing the Reference Data Sources
- Viewing the Countries
- Viewing the Risk Factors
- Viewing the Red Flags
- Viewing the All Transactions in Visible Graph
- Viewing the Network Disposition Score

- Viewing the Network Disposition Score Breakdown
- Viewing the Investigation Recommendation
- Exporting Investigation Detail to PDF format

4.3.1 Starting the Investigation

This paragraph should be executed to initialize the investigation process and configurations.

4.3.2 Searching for Input Results

Execute this paragraph to search additional entities based on "Tax Id", "Name", "Address", and "Date" to consider them as part of the investigation.

For more information on this paragraph, see the Searching for Non-Case Entities section for the L1 Notebook which has the same functionality.

4.3.3 Viewing the Initial Screening Results

This paragraph allows you to define the conditions based on which the initial screening results are filtered and fetched. Result will be table of top critical matches generated from search results.

For more information on this paragraph, see the Viewing the Initial Screening Results section for the L1 Notebook which has the same functionality.

4.3.4 Viewing the Entity Summary Historical Report

Users can view the summary of an entity using entity id. Users can get the entity id from the output result of the Initial Screening Results paragraph by searching for required inputs in the Input Search Results. The result will be a summary of additional searched entities.

For more information on this paragraph, see the Viewing the Entity Summary Risk Report section for the L1 Notebook which has the same functionality.

4.3.5 Viewing the Transactions Analysis

This paragraph shows all transactions related to the searched entity.

For more information on this paragraph, see the Viewing the All Transactions for Focal Entity(s) section for the L1 Notebook which has the same functionality.

4.3.6 Viewing the Graph Result of the Entity Search

This paragraph allows user to view the network graphical representation of the searched entity that was displayed in the Entity Search paragraph.

For more information on this paragraph, see the Viewing the Case Graph (and Searched Entities) section for the L1 Notebook which has the same functionality.

4.3.7 Viewing the Reference Data Sources

This paragraph shows the reference data sources of the entities present in the Visible Graph.

For more information, see the Viewing the Reference Data Sources section for the L1 Notebook which has the same functionality.

4.3.8 Viewing the Countries

This paragraph shows the countries of entities present in the Visible Graph.

For more information, see the Viewing the Countries section for the L1 Notebook which has the same functionality.

4.3.9 Viewing the Risk Factors

This paragraph shows the risk factor details of entities present in the Visible Graph. You can search for a specific risk factor.

For more information, see the Viewing the Risk Factors section for the L1 Notebook which has the same functionality.

4.3.10 Viewing the Red Flags

This paragraph shows the red flag details of entities present in the Visible Graph. You can search for a specific risk flag.

For more information, see the Viewing the Red Flags section for the L1 Notebook which has the same functionality.

4.3.11 Viewing the All Transactions in Visible Graph

This paragraph displays information on transactions that are available in **Visible Graph**.

For more information, see the Viewing the All Transactions in Visible Graph section for the L1 Notebook which has the same functionality.

4.3.12 Viewing the Network Disposition Score

This paragraph shows the network disposition score of entities present in the Visible Graph.

For more information, see the Viewing the Network Disposition Score section for the L1 Notebook which has the same functionality.

4.3.13 Viewing the Network Disposition Score Breakdown

This paragraph shows the details of the network disposition score breakdown of entities present in Visible Graph.

For more information, see the Viewing the Network Disposition Score Breakdown section for the L1 Notebook which has the same functionality.

4.3.14 Viewing the Investigation Recommendation

This paragraph displays the recommendation for the searched entity to the user based on the scores.

The Investigator can investigate the case details and take further action.

To view the investigation recommendation, navigate to the Recommendation paragraph.

Figure 21: Viewing the Investigation Recommendation

An Investigator can print or save the notebook after viewing the investigation recommendation.

4.3.15   Exporting Investigation Detail to PDF format

Use the **Export to PDF** option to save the notebook.

For more information, see Exporting a Notebook to PDF section for the L1 Notebook which has the same functionality.

5 Investigation Process Flow using Investigation Hub Notebooks

This section describes the investigation process flow based on Investigation Hub notebooks.

> **NOTE** The investigation process flow depends on the notebook mapped for the investigator's role and case type.

Topics:

- Based on ECM Integration L1 Notebook
- Based on ECM Case Narrative Notebook
- Updating a Case with Entities
- Based on Special Investigation Notebook

5.1 Based on ECM Integration L1 Notebook

As soon as a case is investigated, the case ID is populated, and the paragraphs below are triggered for auto-execution.

To investigate ECM Integration L1 notebook, follow these steps:

1. To re-run the investigation, execute the **Case Details** paragraph. It will automatically execute all other dependency paragraphs (Search for Non-Case Entities, Initial Screening Results, Entity Summary Risk Report, All Transactions for Focal Entities, Graph Result of the Entity Search) until the graph is visible. The user can investigate the results of all dependent paragraphs if they do not have any other entities to search.

   Figure 22: Case Details

2. Enter required details in the **Search for Non-Case Entities** paragraph and execute to search for any additional entity.

3. **Initial Screening Results** paragraph will show the details of matched entities (case and searched entities). Re-execute to update configurations like "Top Critical Matches", "No. of pre-hops to load", etc.

4. **Entity Summary Risk Report** paragraph will show the summary of focal entities related to the case. To get a summary of additional entities, enter comma-separated entity id and re-execute the paragraph.

5. **All Transactions for Focal Entity(s)** paragraph shows the transaction related to the Case's focal entity. Users can visualize the result in multiple charts to analyze it. To update the minimum and maximum amount, update the values and re-execute the paragraph.

6. **Graph Result of the Entity Search** paragraph displays the case and additional entities graph till configured no. of hops. The graph on the screen is referred to as a visible graph.

Users can then manipulate the graph by expanding any high-risk entities or parties on unusual transactions to better understand the context and associated risk.

> **NOTE** After updating any input in the paragraph, execute/re-execute the paragraph and execute all the below paragraphs.

7. Users can execute all the following paragraphs to get a better understanding which helps for investigation.

    — Reference Data Sources

    — Countries

    — Risk Factors

    — Red Flags

    — All Transactions in Visible Graph

    — Network Disposition Score

    — Network Disposition Score Breakdown

> **NOTE** Re-execute the **Reference Data Sources** paragraph to update the results of these paragraphs after changes in the visible graph in the **Graph Result of the Entity Search** paragraph.

5.2 Based on ECM Case Narrative Notebook

As soon as a case is investigated, the case ID is populated, and the paragraphs below are triggered for auto-execution.

To investigate ECM Case Narrative notebook, follow these steps:

1. Execute the **Case Details** paragraph. It will automatically execute the Entity Summary Risk Report paragraph.

Figure 23: Case Details

2. **Entity Summary Risk Report** paragraph will show the summary of focal entities related to the case. To get a summary of additional entities, enter comma-separated entity id and re-execute the paragraph.
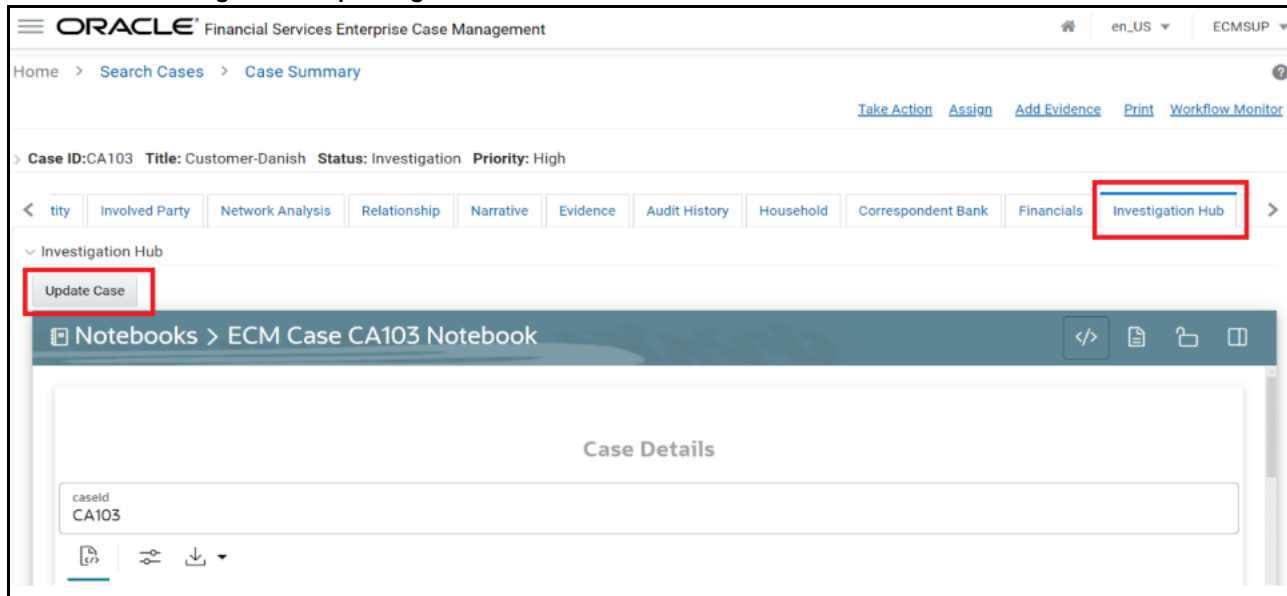
5.3 Updating a Case with Entities

Updating a case enables investigators to add entity which is not linked to case from the graph.

To update a case, follow these steps:

1. Navigate to the Investigation Hub tab in a case.

2. Add entities by expanding any entity or delete entities by dropping from the visible graph.

3. Click **Update Case** to add the account, customer, transaction, and external entities.

Figure 24: Updating a Case

NOTE	On updating a case, all the customers, accounts, derived entities, and transactions that are part of the visible graph and are not already part of the case are added to the case.

5.4 Based on Special Investigation Notebook

To investigate Special Investigation notebook, follow these steps:

1. Execute the **Click to Start Investigation** paragraph.

2. Enter required details to investigate in the **Input Search Results** paragraph and execute it.

3. **Initial Screening Results** paragraph will show the detail of matched entities. Re-execute to update configurations like "Top Critical Matches", "No. of pre-hops to load", etc.

4. **Entity Summary Risk Report** paragraph is used to get summary of searched entity enter comma-separated entity id and re-execute the paragraph.

5. **Transaction Analysis** paragraph shows the transaction related to searched entities. User can visualize the result in multiple charts to analyze it. To update the minimum and maximum amount, update the values and re-execute the paragraph.

6. **Graph Result of the Entity Search** displays the searched entities graph till configured no. of hops. The graph on the screen is referred to as visible graph.

   Users can then manipulate the graph by expanding any high-risk entities or parties on unusual transactions to better understanding of the context and associated risk.

NOTE	After updating any input in the paragraph, execute/re-execute the paragraph and execute all the below paragraphs.

7. Users can execute all the following paragraphs to get a better understanding which helps for investigation.

— Reference Data Sources

— Countries

— Risk Factors

— Red Flags

— All Transactions in Visible Graph

— Network Disposition Score

— Network Disposition Score Breakdown

— Recommendation

NOTE	Re-execute the **Reference Data Sources** paragraph to update the results of these paragraphs after changes in visible graph in the **Graph Result of the Entity Search** paragraph.

6   Common Features

Topics:

- Managing the Notebooks
- Managing the Paragraphs
- Managing the Results
- Graph Details

6.1   Managing the Notebooks

A notebook acts as a frame for Paragraphs.

Topics:

- Common Screen Elements in Notebooks
- Exporting a Notebook
- Invalidating Session
- Deleting a Notebook

6.1.1   Common Screen Elements in Notebooks

Table 7 describes the common screen elements in a notebook that can be used to perform various actions on a notebook.

> **NOTE**   Some icons may not be visible as the visibility is controlled based on configurable.

Table 7: Common Screen Elements in Notebooks

Button	Icon	Action/Description
Modify Notebook		Click this button to modify the details of a notebook such as name, description, and/or tags.
Hide Code		Click this button to hide or show the Code Section in all the paragraphs in a notebook.
Show Result		Click this button to hide or show the Results Section in all the paragraphs in a Notebook.
Read Only		Click this button to set the notebook to Read-only mode. **NOTE:** The notebook is protected from edit, clear result, delete, reset session, run paragraphs, and share in Read-only mode.

Table 7: Common Screen Elements in Notebooks

Write		Click this button to set the notebook to Write mode.
Show Panel		Click this button to show or hide the Paragraph Settings Bar Commands, Results Toolbar, and Settings Dialog for a selected paragraph in a panel to the right of the notebook.
Run Paragraphs		Click this button to execute all the paragraphs in a notebook in sequential order. For more information, see Run All Notebook Paragraphs section. You can view the results in various formats. For more information, see Managing the Results section.
Invalidate Session		Click this button to reset any connection or code executed in a notebook.
Delete Notebook		Click this button to delete a notebook.
Clear Result		Click this button to clear results for all the paragraphs in a notebook. **Warning:** This action clears all the results. You must run the paragraphs again to view the results.
Clear Paragraph Dependencies		Click this button to remove all defined paragraph dependencies.
Open as Embedded Window		Click this button to open a notebook in Embedded window. This allows a notebook to be embedded inside another webpage.

Table 7: Common Screen Elements in Notebooks

Share Notebook		Click this button to share a notebook with another user, user group, or role.
Clone Notebook		Click this button to create a copy of a notebook. All paragraphs in the current notebook are replicated in the new notebook. The cloned notebook is created with the default name, Copy of <Current Notebook Name>.
Export Notebooks		Click this button to export a notebook to your computer as a DNSB file.
Print Notebook		Click this button to print a notebook in the PDF format and save it in your local machine.
Layout	Zeppelin	Click this button to set the preferred layout, Zeppelin, or Jupyter.
Default Template	Default	Click this button to apply the overall look and feel of the notebook using the default template.
Default View	Default	Click this button to switch between Default, Simple, and Report views.
Versioning	Versioning	You can use this option to create versions for your notebook, which helps you analyze the changes based on the version control.

Table 7: Common Screen Elements in Notebooks

Attach Credentials		You can use this option to attach credentials (a wallet and a password) to the notebook to enable secure data access.

6.1.2 Exporting a Notebook

The Export notebook feature enables you to export notebooks available in the OFS Investigation Hub to your local machine. Notebooks are exported in the OFS IH Notebook (*.dsnb) file format, which can be saved and shared.

6.1.2.1 Exporting a Notebook to PDF

Users can export individual notebooks into a pdf format.

To export individual Notebooks, follow these steps:

1. Click the Notebook that you want to export. The selected Notebook is opened.
2. Run **Export to PDF** paragraph.
3. Click on **Export to PDF**. The Notebook is downloaded to your local machine in.pdf format.

6.1.3 Invalidating Session

To invalidate session, follow these steps:

1. Open the notebook.
2. Click **Invalidate Session** icon. This will invalidate/reset the session.

6.1.4 Deleting a Notebook

To delete the notebook, follow these steps:

1. Open the notebook.
2. Click . The Delete notebook? confirmation dialog box is displayed.
3. Click **Confirm**. The selected notebook will be deleted.

6.2 Managing the Paragraphs

Topics:

- Common Screen Elements in Paragraph
- Paragraph Dependencies
- Run All Notebook Paragraphs

6.2.1 Common Screen Elements in Paragraph

A paragraph is a piece of code that can be executed to obtain the result. In OFS Investigation Hub, paragraph offers a workbench to author code or a query using various interpreter friendly scripting languages supported in OFS Investigation Hub.

Table 8 describes the elements in the Paragraph Settings Bar that can be used to perform various actions on individual paragraphs in a notebook.

Table 8: Elements in Paragraph Settings Bar

Button/Icon	Action/Description
Run Paragraph	Click this button to execute the code or query in a paragraph.
	After execution, you can view the result in various formats. For more information, see Managing the Results section.
Enter Dependency Mode	Click this button to add or remove dependent paragraphs.
	Paragraphs with dependent paragraphs are executed in the dependency order.
	For more information, see Paragraph Dependencies section.
Comments	Click this button to add comments to a paragraph.
Expand	Click this button to expand a paragraph and view the paragraph in full-screen mode.
Show/Hide Line Numbers	Click this button to show or hide line numbers in the code in a paragraph.
	NOTE: This button is applicable only to the code section.
Visibility	Click this button to manage the visibility settings in a paragraph. It controls how a paragraph may be viewed by the author and other users who have access to the notebook.
Settings	Click this button to perform the following actions:
	● Resize the width of a paragraph.
	● Change the order of placement of the paragraphs by moving them up or down.
	● Clear the paragraph result.
	● Open the notebook in Embedded window.
	● Clone the paragraph.
	● Delete a paragraph.

6.2.2   Paragraph Dependencies

The Paragraph Dependencies feature allows you to add dependencies between paragraphs. The dependents of a paragraph are automatically executed after the original paragraph itself or any graph manipulation on the original paragraph is executed.

To create paragraph dependencies, follow these steps:

1. Click the **Dependency** icon in the Paragraph Settings Bar of a paragraph. The Dependency Mode window is displayed.

2. Select or deselect paragraphs to add or remove them as dependents.

   The order in which the paragraphs are selected appears as a number over the selected paragraphs. The number indicates the order in which the dependent paragraphs will be executed.

3. Click **Save**.

   The changes are saved. Every time a paragraph is executed or graph actions are applied, its dependent paragraphs will be executed automatically.

6.2.3   Run All Notebook Paragraphs

A paragraph is a piece of code that can be executed to obtain the result. Notebook execution includes the execution of all paragraphs.

To run all the paragraphs in a notebook, follow these steps:

1. Click **Run Paragraphs** in the Notebook Toolbar.

Figure 25: Run Paragraphs

All the paragraphs will execute in order from top to bottom. If a paragraph was deleted during the Run Paragraphs job execution, it is ignored and paragraph execution continues for the rest of the paragraphs.

6.3   Managing the Results

After executing a paragraph, the result is displayed in the Results section.

Figure 26: Paragraph Results Section
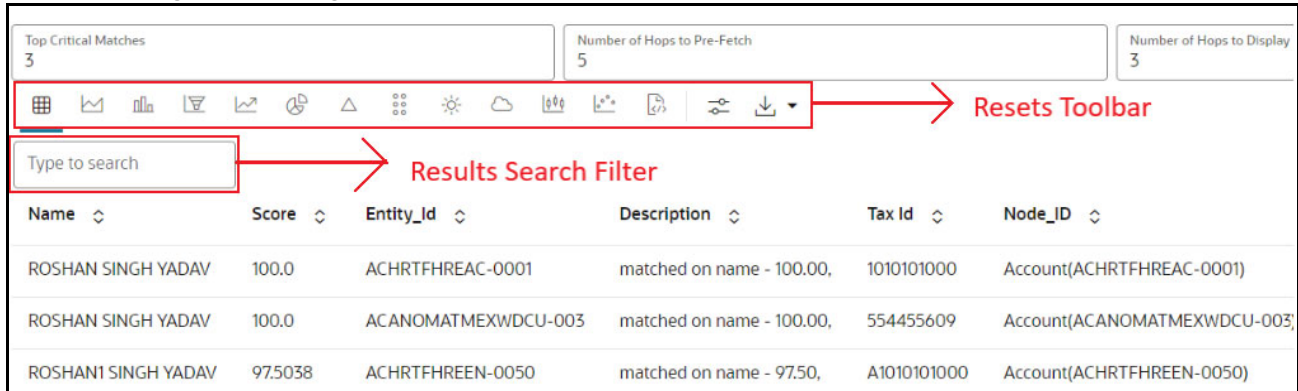

Topics:

- Results Search Filter
- Data Visualization
- Customizing Result Settings

Table 9 describes the various result formats supported in OFS Investigation Hub.

Table 9: Result Formats in Studio

Chart	Button/Icon	Action/Description
Table Chart	⊞	Click this button to view results in tabular format.
Area Chart	⌁	Click this button to view results in the area chart format.
Bar Chart	⬚	Click this button to view the results in bar chart format.
Funnel Chart	⛢	Click this button to view the results in the funnel chart format.
Line Chart	⌇	Click this button to view the results in line chart format.
Pie Chart	◔	Click this button to view the results in pie chart format.
Pyramid Chart	△	Click this button to view the results in pyramid chart format.
TreeMap Chart	⊙⊙	Click this button to view the results in tree map format.
Sunburst Chart	☼	Click this button to view the results in sunburst chart format.

Table 9: Result Formats in Studio

Tag Cloud Chart	☁	Click this button to view the results in tag cloud chart format.
Box Plot Chart	⬛	Click this button to view the results in the plot chart format.
Text	📄	Click this button to view the results in text format.
Settings	⚙	Click this button to customize the results based on the selected format. Enter the required values for the General, Visualization, and Text settings.
Download As	⬇ ▼	Click this button to download the result in the following format: Raw: Available for all formats. SVG Format: Available for Graph and Visualization formats.

6.3.1 Results Search Filter

The Results Search Filter is available only in Table Format. This feature instantly searches for an entered value in the results.

6.3.2 Data Visualization

You can view the transactions in the following formats:

- Table
- Area Chart
- Bar Chart
- Funnel Chart
- Line Chart
- Pie Chart
- Pyramid Chart
- Treemap Diagram
- Sunburst Diagram
- Tag Cloud
- Box Plot
- Scatter Plot
- Map Visualizer
- Text

6.3.2.1   Table

OFS Investigation Hub allows you to visualize your data in the form of a Table Diagram. The table can be sorted by column in ascending or descending order. Additionally, the table can be filtered for a specific search term. Rows that do not contain this term are hidden from view and the remaining rows highlight the location of the search term within the row.
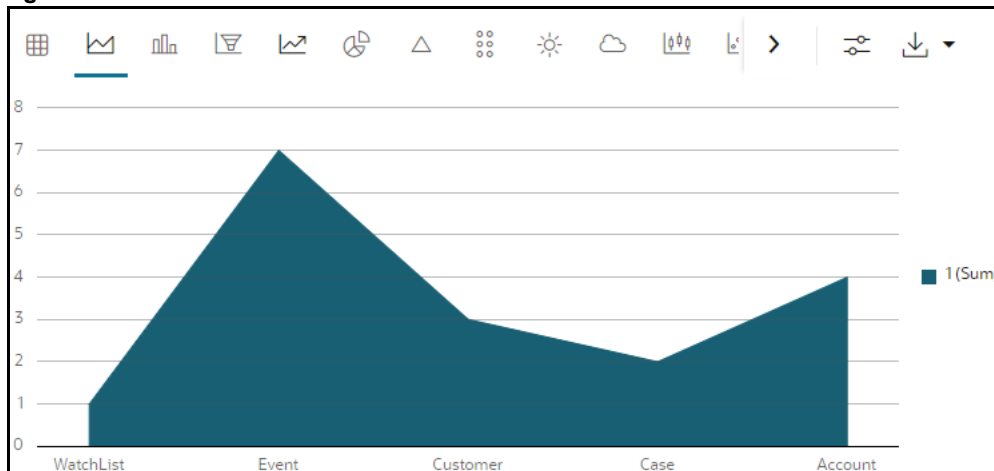
Figure 27: Table Format

6.3.2.2   Area Chart

OFS Investigation Hub allows you to visualize your data in the form of an Area Chart.
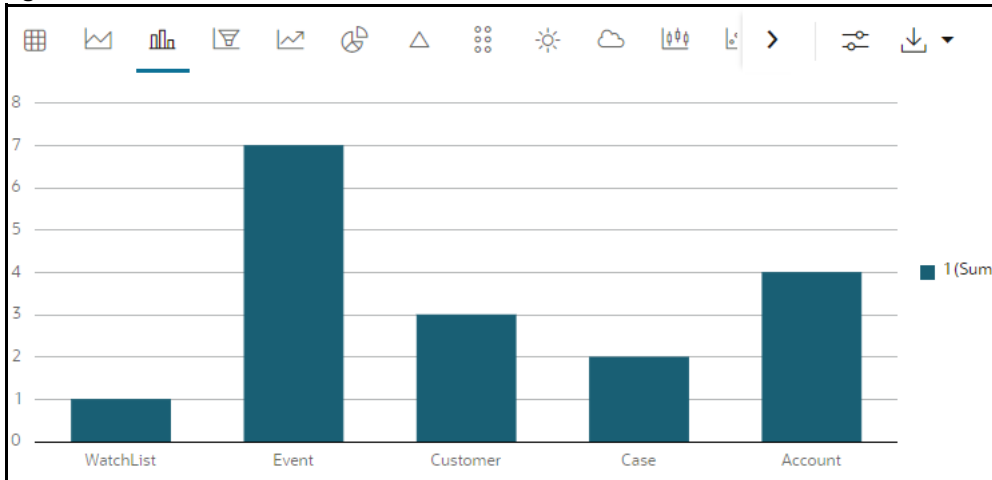
Figure 28: Area Chart

6.3.2.3 Bar Chart

OFS Investigation Hub allows you to visualize your data in the form of a Bar Chart.
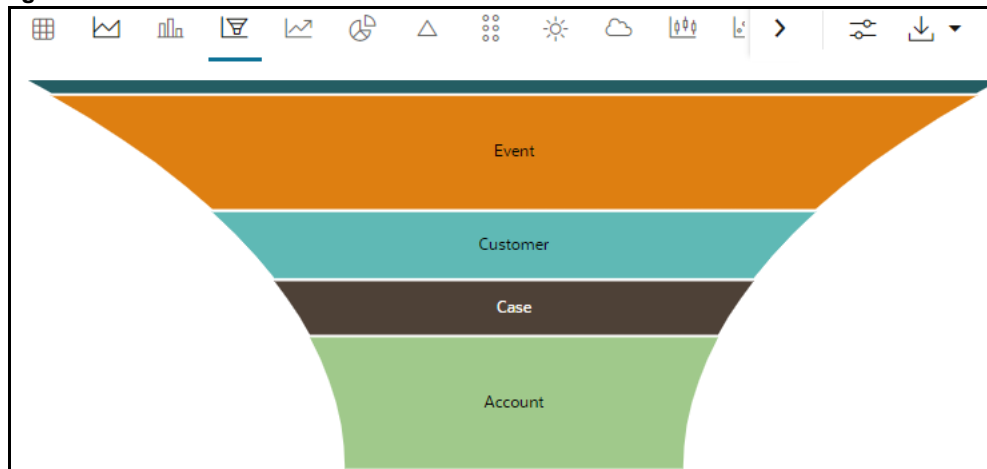
Figure 29: Bar Chart

6.3.2.4 Funnel Chart

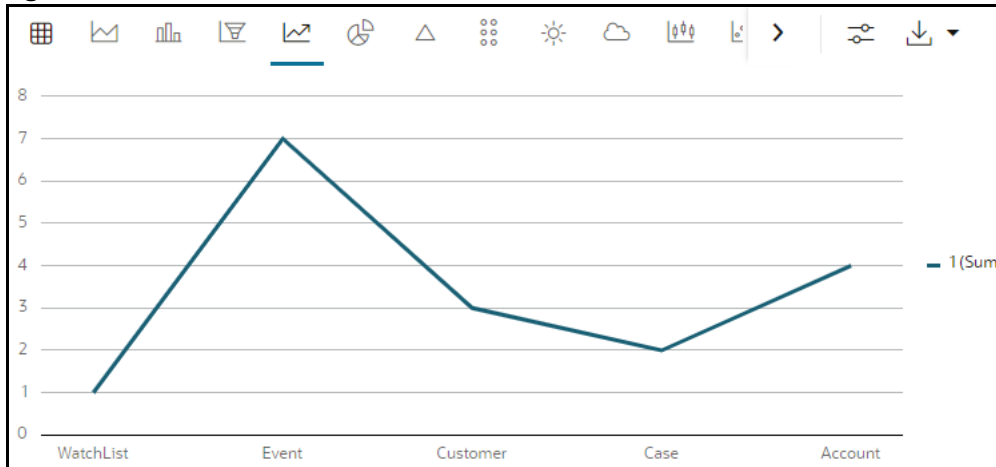OFS Investigation Hub allows you to visualize your data in the form of a Funnel Chart.

Figure 30: Funnel Chart

6.3.2.5 Line Chart

OFS Investigation Hub allows you to visualize your data in the form of a Line Chart.
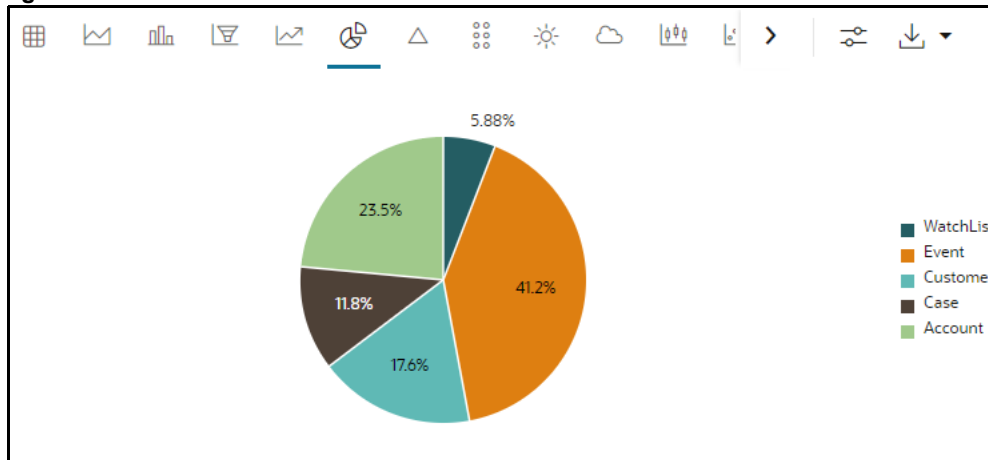
Figure 31: Line Chart

6.3.2.6 Pie Chart

OFS Investigation Hub allows you to visualize your data in the form of a Pie Chart.
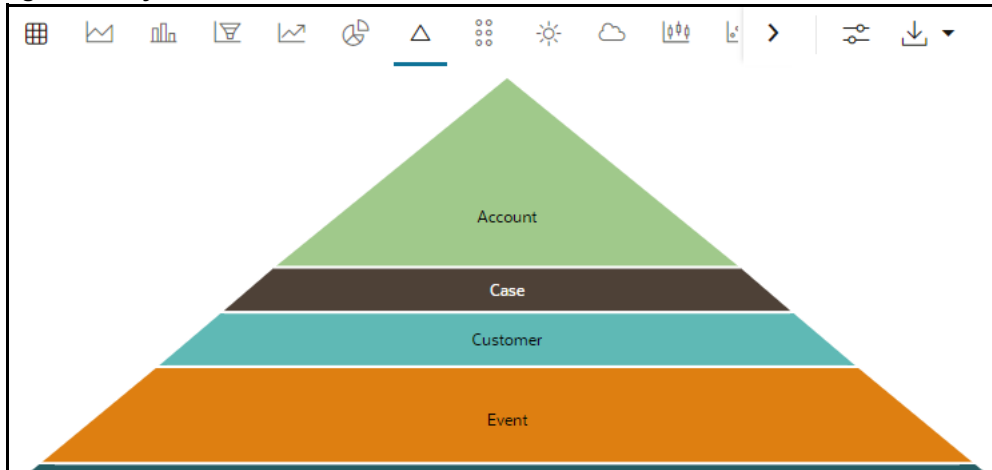
Figure 32: Pie Chart

6.3.2.7 Pyramid Chart

OFS Investigation Hub allows you to visualize your data in the form of a Pyramid Chart.
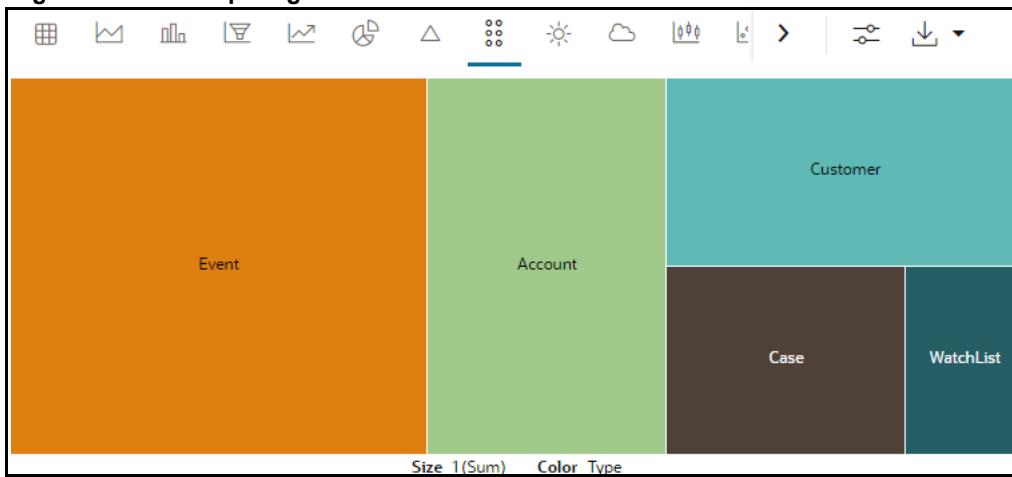
Figure 33: Pyramid Chart

6.3.2.8 Tree Map Diagram

OFS Investigation Hub allows you to visualize your data in the form of a Tree Map Diagram.
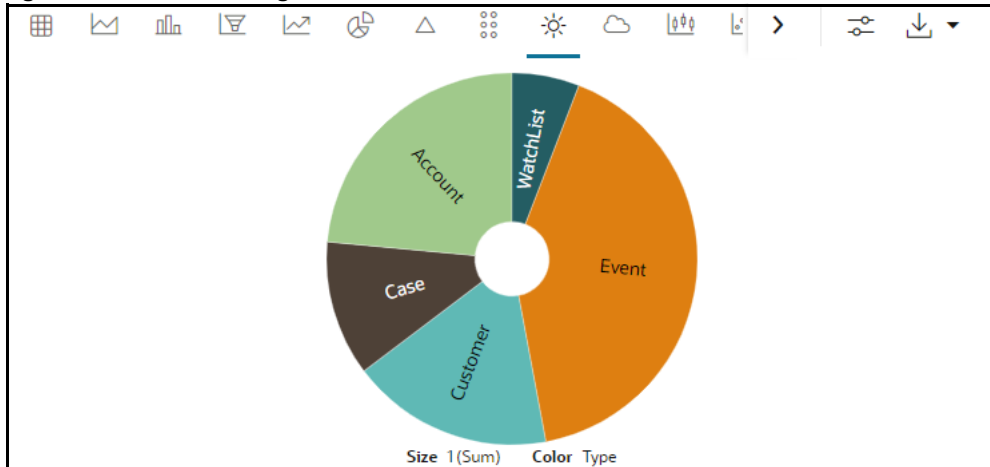
Figure 34: Tree Map Diagram

6.3.2.9   Sunburst Diagram

OFS Investigation Hub allows you to visualize your data in the form of a Sunburst Diagram.
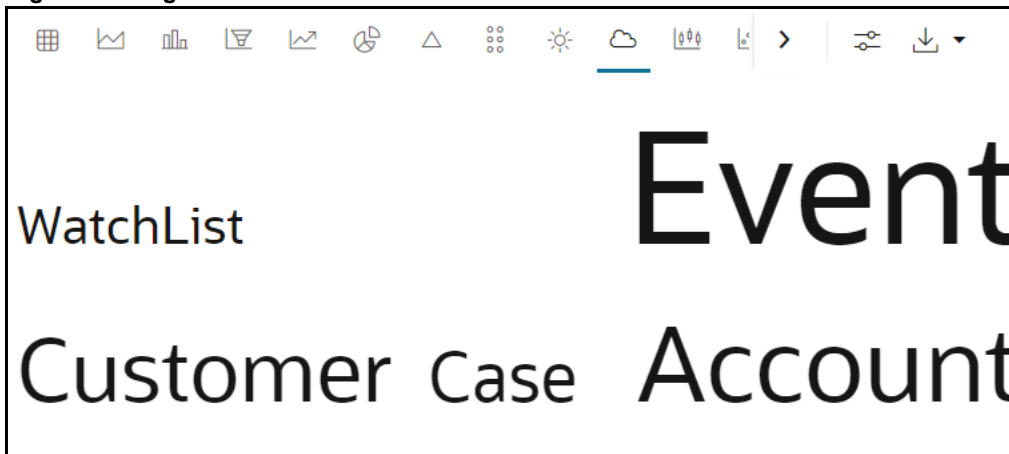
Figure 35: Sunburst Diagram

6.3.2.10   Tag Cloud

OFS Investigation Hub allows you to visualize your data in the form of tags. The tag cloud operation is used to identify the spots where there are more flags.

Figure 36: Tag Cloud

6.3.2.11 Box Plot

OFS Investigation Hub allows you to visualize your data in the form of a Box Plot.

Figure 37: Box Plot

6.3.2.12 Scatter Plot

OFS Investigation Hub allows you to visualize your data in the form of a Scatter Plot.

Figure 38: Scatter Plot

6.3.2.13 Map Visualizer

OFS Investigation Hub allows you to visualize your data on top of a Map.

6.3.3 Customizing Result Settings

To customize the result format, follow these steps:

1. Navigate to the Notebooks page.

2. Click the required result format for a paragraph in the Result section and then click Settings. The Settings window is displayed and contains the following category:

   - General

   - Visualization

   - Text

3. Select a category and enter the required values for that category. The result is customized as per the entered values.

6.4   Graph Details

This chapter provides information on the graph details such as the action performed on a graph, nodes in a graph, and so on.

6.4.1   Graph Types

- **Result Graph**: The graph is generated/created with nodes and edges related to Case_id or searched entity or both Case_id and searched entity according to the number of hops provided in the Number of Hops to Pre-Fetch field in the Initial Screening Results paragraph.

- **Visible Graph**: The graph is visible to the user in the Graph Result of Entity Search paragraph result. The visible graph changes as per the user's actions. If the user drops/expands a node or edge, the visible graph will be updated with nodes and edges.

6.4.2   Graph Highlights

The default template is FCGM template. For more information, see the **Managing Template** section in the Oracle Financial Services Compliance Studio User Guide.

Table 10 describes highlights in the graph as follows:

Table 10: Graph Highlights

Button/Icon	Action/Description
	Click this icon to search entity.
	Click this button to view customers.
	Click this icon to view closed events.
	Click this icon to view open events.
	Click this icon to view accounts.
	Click this icon to view open cases.
	Click this icon to view institutions.

6.4.3   Working with Graph Nodes

- Repositioning Nodes
- Collapsing and Expanding Nodes

- Viewing the Node Details
- Deleting a Node
- Removing an Edge
- Hiding an Edge

6.4.3.1 Repositioning Nodes

The Network Graph page allows you to move nodes around the screen, using the drag and drop feature, to reposition them.

To reposition nodes, follow these steps:

1. Navigate to the Network Graph in a notebook.
2. Select a node to reposition and click it.
3. Drag and Drop the node to the required position.

NOTE	The graph only uses a specific portion of the browser window to display the graph. Dragging a node beyond a certain point towards the right side of the browser hides the portion of the graph dragged beyond that point. However, you can use the Zoom Out feature on the Graph Toolbar to view the hidden portion again.

6.4.3.2 Collapsing and Expanding Nodes

This option allows you to hide all outgoing links and nodes to which these outgoing links are connected from the node being collapsed. The collapsed node remains on the graph and the node icon changes to indicate that the node is in a collapsed state. To collapse nodes, follow these steps.

1. Navigate to the Network Graph in a notebook.
2. Select a node to collapse and right-click the node. An option menu is displayed.
3. Select the Collapse option from the menu. The outgoing links are hidden on the page.

NOTE	• If any child node has at least one incoming link from any other node, the child node and its child network are not collapsed. But the link from the collapsed node to the child node is hidden and the icon of the collapsed node changes to indicate that the node is in a collapsed state.
	• On the Node menu of a collapsed node, the Collapse option changes to Expand. If the user collapses a node but has no impact on the graph (that is, if no part of the graph is hidden), the Node menu remains unchanged. There is no restriction on how many nodes can be collapsed on a graph.

To expand the node, select Expand from the menu. The outgoing links are then restored on the page.

NOTE	The Collapse option does not appear for outer nodes. Outer nodes are nodes that do not have any outgoing links.

6.4.3.3 Viewing the Node Details

This section allows you to view the current information associated with the selected node.

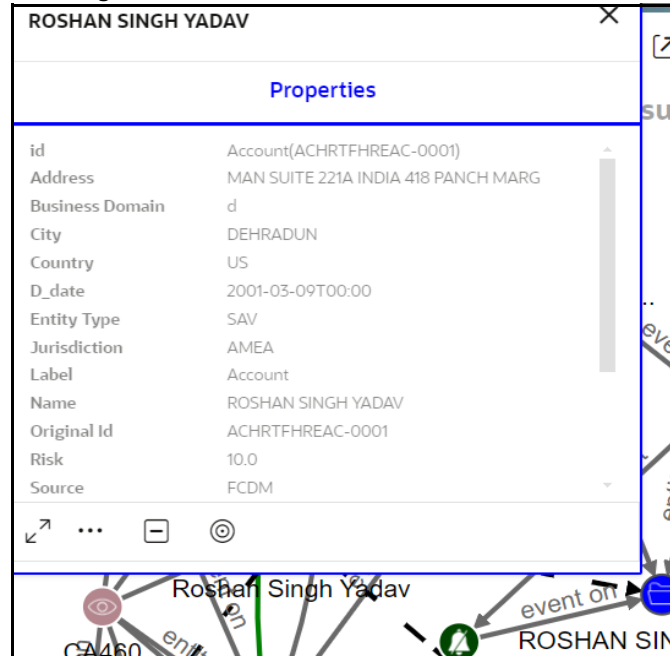To view the node details, follow these steps:

1. Navigate to the Network Graph in a notebook.

2. Select a node and right-click. An option menu is displayed. The Node Details window is displayed with the current information associated with the selected node. This includes the Properties and Risk details of the node.

6.4.3.4 Deleting a Node

You can drop a node to from a network graph view the result on On-screen data. To delete a node, follow these steps:

1. Navigate to the Network Graph in a notebook.

2. Right- click on any node as shown in the following figure and click Drop - Delete selected vertices.
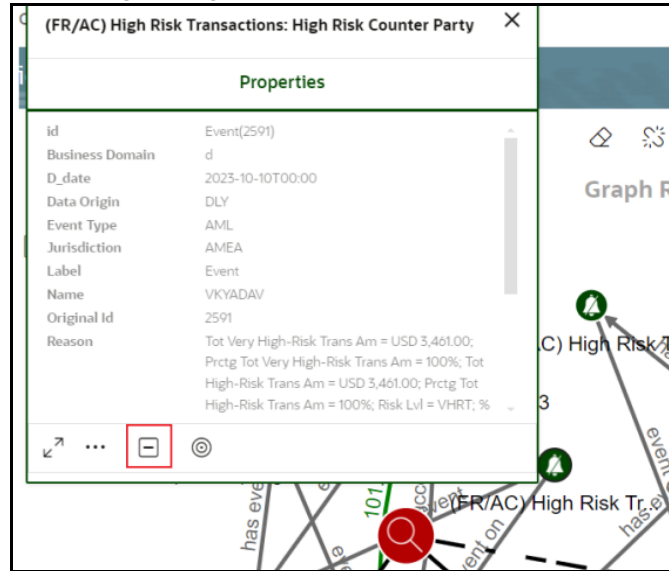
Figure 39: Deleting a Node

6.4.3.5 Removing an Edge

You can remove and edge from a network graph to view the result on On-screen data. To remove an edge, follow these steps:

1. Navigate to the Network Graph in a notebook.

2. Right- click on any edge and click Drop - Delete selected vertices.

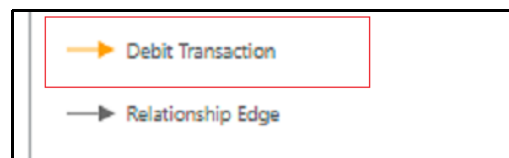**Figure 40: Removing an Edge**

6.4.3.6   Hiding an Edge

You can hide an edge from a network graph to view the result on On-screen data. To hide an edge, follow these steps:

1. Navigate to the Network Graph in a notebook.

2. Click on any edge. The edge highlights is enable. Click on the same edge to disable.
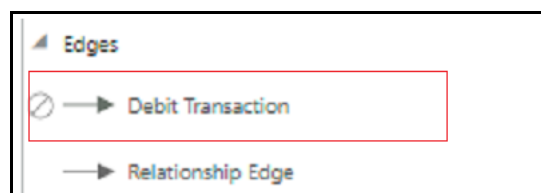
   For example,

   ■ Enabled

   Figure 41: Enabled Transaction
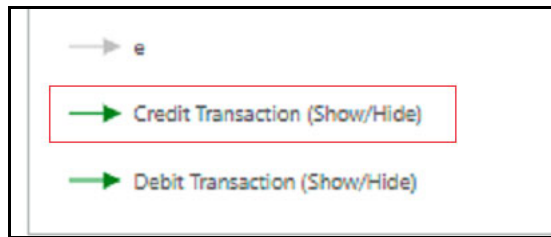

   ■ Disabled

   Figure 42: Disabled Transaction

In addition, you can perform **Show/Hide** for the Transactions in the same way.
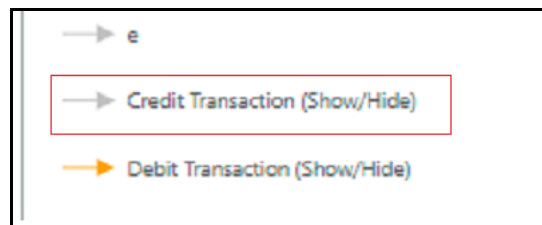
   ■ Show

Figure 43: Show Transaction

■   Hide

Figure 44: Hide Transaction

OFSAA Support

Raise a Service Request (SR) in My Oracle Support (MOS) for queries related to OFSAA applications.

Send Us Your Comments

Oracle welcomes your comments and suggestions on the quality and usefulness of this publication. Your input is an important part of the information used for revision.

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