



IBM Developer
SKILLS NETWORK

Hands-on Lab: Analyzing DB2 Data With Cognos Analytics

Objective for Exercise:

- To create a dashboard with Billing data on DB2 using Cognos Analytics and analyze the regionwise spend.

Prerequisites

Prior to starting this lab please ensure you have completed the previous labs to:

- [Create an IBM Cloud Account](#)
- [Provision an instance of DB2 on Cloud](#)
- [Provision an instance of Cognos Analytics](#)

Task 1- Load the data in DB2

If you have service credentails created, skip steps 1 and 2.

1. Click on **Service Credentials** and create new credentials.

The screenshot shows the IBM Cloud Service Credentials interface. At the top, it displays the resource name 'Db2-4y' with an 'Active' status and an 'Add tags' button. To the right are 'Details' and 'Actions...' buttons. On the left, there's a navigation menu with options: 'Manage', 'Getting started', **Service credentials** (which is highlighted with a blue border), and 'Connections'. The main content area is titled 'Service credentials' and contains a description: 'You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service.' It includes a 'Learn more' link and a search bar at the bottom with placeholder text 'Search credentials...'. To the right of the search bar are 'New credential' and a '+' button.

2. Give the credential a name and **Manager** privilege and add it.

Create credential

X

Name:

Service credentials-1

Role: ⓘ

Manager



Advanced options ▾

Cancel

Add

3. Click on the down arrow next to the credential. You will see the credential details. Make a note of the username, password and jdbc connection url. These will be used in later part of the lab to connect from Cognos.

Service credentials

You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service. [Learn more](#)

Key name	Date created
Service credentials-1	2021-09-20 12:30 PM

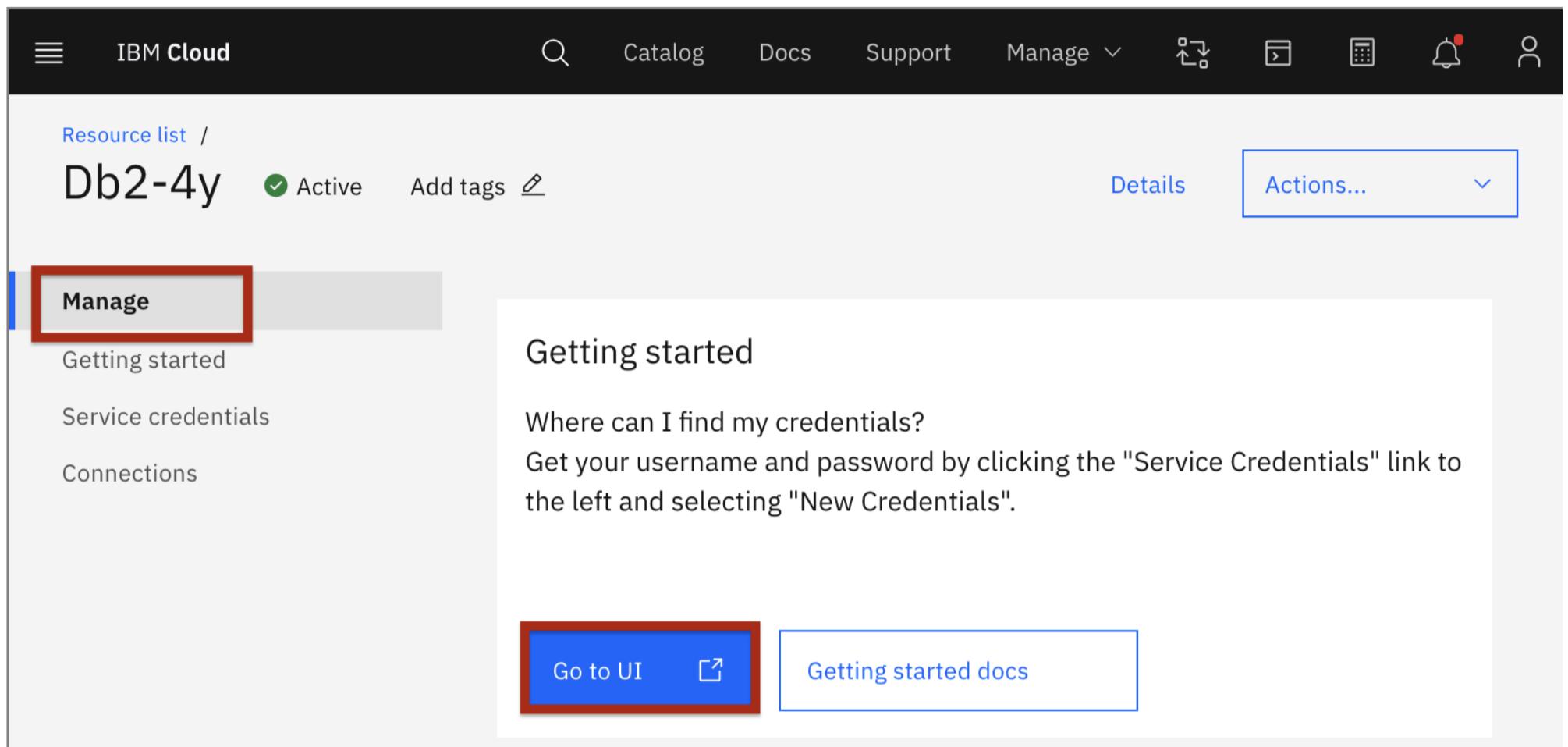
Search credentials... ⟳ New credential +

```
"db2": {
  "authentication": {
    "method": "direct",
    "password": "REDACTED",
    "username": "REDACTED"
  },
  "certificate": {
    "certificate_base64": "LS0tLS1CRUdJTibDRVJUSUZJQ0FURS0tLS0tCk1JSURFakNDQWZxZ0F3SUJBZ01KQVA1S0R3ZTNCTkxiTUEwR0NTcUdTSWiZRFFFQkN3VUFN0jR4SFRBYUJnT1YK0kFNTUIjhENIUU0JFYkc5MVnD0kV7WFJnWW1Ge1pYTXdTaGN0TWhBd01aSTVNRF5TVRBeVdoY05NekF3TwNJMgpnNRFF5TVRBeVda0WVNInd3R2dZRFZRUUREQk5KUWswZ1EyeHZkV1FnUkdGMF1XSmhjM1Z6TU1JQk1qQU5CZ2txCmhraUc5dzBCQVFFRkFBTONBUTHBTU1JQkNnS0NBUVBdXUvbitpWW9xdkdGNU8xSGpEalpsK25iYjE4UkR4ZGwKTzRUL3FoUGMxMTREY1FUK0p1RXdhdG13aG1jTGxaQnF2QWFMb1hrbmhqSVFOMG01L0x5YzdBY291VNmSGR0QwpDVGcrSuxbjBrdDMrTHM3d1dTakxqVE96N3M3M1ZUSU5yYmx3cnRIRU1vM1JWTKv6SkNHYW5LSXdZMWZVSUtrCldNM1R0SD15cnFsSGN0Z2pIu1FmRkVTRml1YaHJiODhSQmd0anIva0xtVGpCaTFBeEVadWNobWZ2QVRmNEN0Y3EKY21QcHNqdDBPTnI0YnhJMVRyUwxEemNiN1hMSFBrWW91SuPrdnVzMUzvaTEySmRNM1MrK3labFZPMUZmZkU3bwpKMjhUdGJoZ3JG0Gt1U0NMSkJvTTFSZ3FPZG90Vm5Q0C9E0WZhamNNN01Wd2V4a01sOTNKR1FJREFRQUJvMU13C1VUQWRCZ05WSFE0RUZnUVV1Q3JZanFJQzc1VUpxVmZEMDh1ZWdqedZ1UmN3ShdZRFZSMGpCQmd3Rm9BVWVDb1kKanFJQzc1VUpxVmZEMDh1ZWdqedZ1UmN3RhZRFZSMFRBUUgvQkFvd0F3RU1vekFOQndrcWhraUc5dzBCQVfzRgpBQU9DQVFFQukyRTBU0t3M1N3RjJ2MXBqaHV4M01kWWV2SGFVsKrMboPd0hSrnf0HgxZ2dRcGVEcFBnMk5SCkx3R08yeK85SWZUMmhLaWd1d2oWnJ5SGxxchlxQ0pL0HJEU28xZUVPeK1yWmE2S1YrQTvscEttMwdjV3VHYzMKK1UzVTFzTDd1Ujd3ZFFUvJu0TVU4aErVNi9sVHRMRVB2Mnc3V1NPS1FDK013ejgczTFJMdjVHSW5BN1OySWNhKwozM0wxNnB4ZEttd1pLYThWcnBnMXJ3QzRnY3d1YUhYMUNEWE42K0J1bzhvWG5YWh6UG91c1dYS1BoaGdXZ2J5CkNDcUdIK0NWNnQ1eFg3b05NS3VNSUNqRVZndnNLWnRqeTQ5VW5iNVZZbHQ0b1J3dTf1bGdzRDNjeKitbj1LREQKNHB1REFvYTzyMktZZE4xVkxuN3F3VG1TbD1TU05RPT0KLS0tLS1FTkQgQ0VSVE1GSUNBVEutLS0tLQo=",
    "name": "1cbbb1b6-3a1a-4d49-9262-3102a8f7a7c8"
  },
  "composed": [
    "db2://lfn96733:d10xxWy1FwKzIe0Y@fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud:32731/bludb?authSource=admin&replicaSet=replset"
  ],
  "database": "bludb",
  "host_ress": [
    "fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud:32670"
  ],
  "hosts": [
    {
      "hostname": "fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud",
      "port": 32731
    }
  ],
  "jdbc_url": [
    "jdbc:db2://fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud:32731/bludb:user=<userid>;password=<your_password>;sslConnection=true;"
  ]
}
```

*Note: You have to replace the placeholder for username and password in the jdbc url string with actual username and password.
Remove the angle brackets.

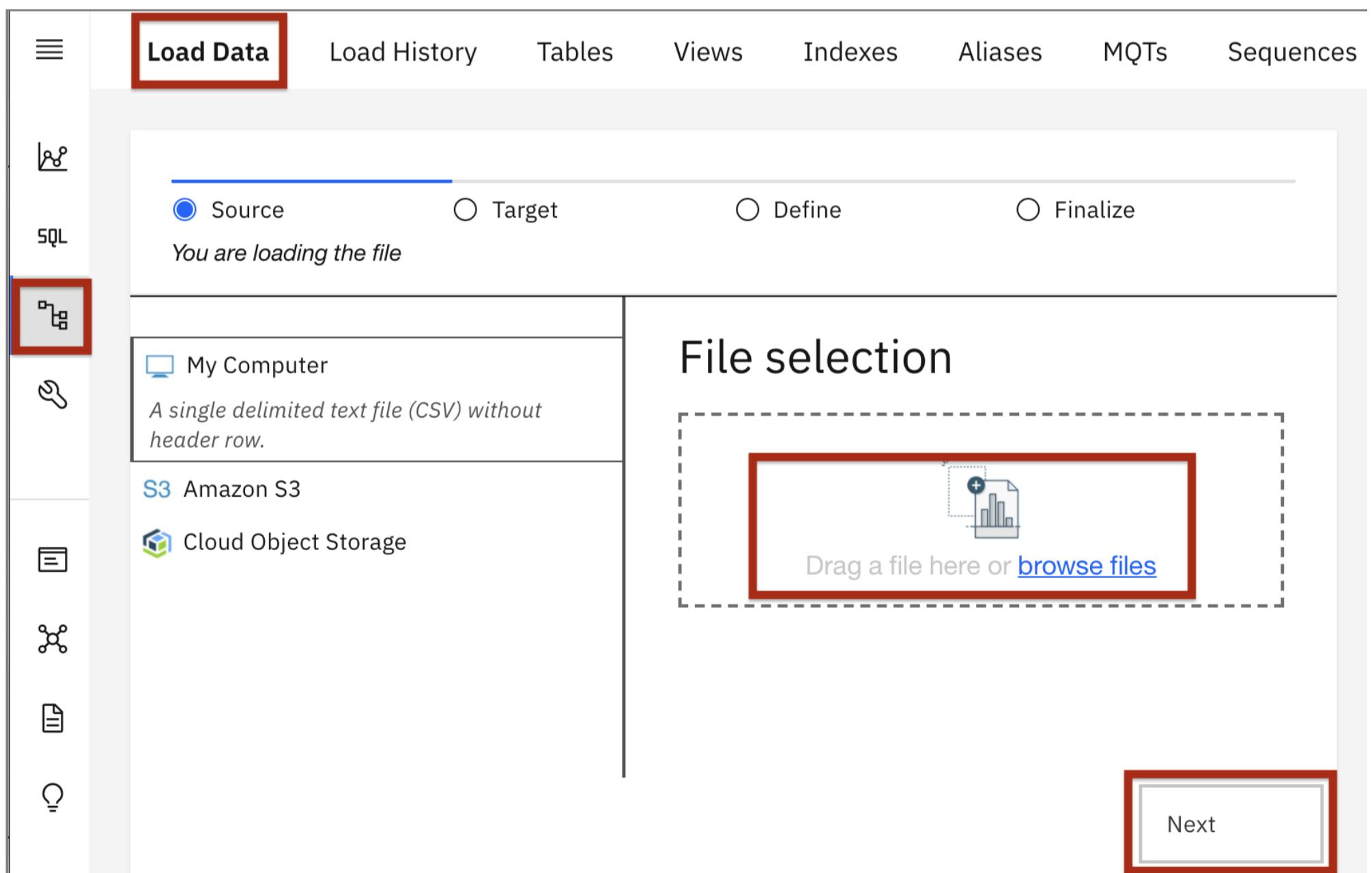
4. Go to the [data link](#). Right-click and choose **Save AS....** Save the file in your local system as **cloud-billing-dataset.csv**.

5. Once the instance is created from the db2 instance page, choose **Manage** from the left menu and click on **Go to UI**.



The screenshot shows the IBM Cloud Resource list interface. At the top, there's a navigation bar with links for Catalog, Docs, Support, Manage, and other account-related options. Below the bar, the resource name "Db2-4y" is displayed, with "Active" status and "Add tags" option. To the right of the resource name are "Details" and "Actions..." buttons. On the left side, there's a sidebar with a "Manage" button highlighted by a red box. The main content area has a "Getting started" section with instructions on finding credentials and a "Go to UI" button. There's also a "Getting started docs" link.

6. Click on the **Data** icon on the left menu, choose **Load Data** and browse and select the file, **cloud-billing-dataset.csv** which you saved in your local system.



The screenshot shows the "Load Data" interface within the IBM Cloud DB2 instance. The top navigation bar includes "Load History", "Tables", "Views", "Indexes", "Aliases", "MQTs", and "Sequences". On the left, there's a vertical sidebar with icons for Data (highlighted with a red box), SQL, and other management options. The main area starts with a "Source" configuration section. Below it, there's a "File selection" area with a "My Computer" section (highlighted with a red box) and a "Cloud Object Storage" section. A dashed box highlights the "File selection" area, which contains a "Drag a file here or [browse files](#)" input field. At the bottom right, there's a "Next" button highlighted with a red box.

7. Choose the **Schema**, click on **New Table +** and create a new table with the name **BillingData** and click on Create.

Source

Target

Define

Finalize

You are loading the file **cloud-billing-dataset.csv**

Select a load target

[Refresh](#)

Schema

Find schemas

XQR63068

Table

[New table +](#)

Find tables in XQR63068

No entries found.

Create a new table

BillingData

[Create](#)

[Back](#)

[Next](#)

8. You will see the table is added to the schema. Click on **Next** to load the data from the file.

Source

Target

Define

Finalize

You are loading the file **cloud-billing-dataset.csv** into **XQR63068.BILLINGDATA**

Select a load target

[Refresh](#)

Schema

Find schemas

XQR63068

Table

[New table +](#)

Find tables in XQR63068

BILLINGDATA

[Back](#)

[Next](#)

9. The table is loaded. You will see that each column has data type and column width auto generated based on the content. Edit column attributes by clicking on the pencil icon next to the respective attributes to change the width of **country** column to varchar of 30 and **month** column to varchar of 7.

Source Target Define FinalizeYou are loading the file **cloud-billing-dataset.csv** into **XQR63068.BILLINGDATA**

Code page (character encoding): 1208 (UTF-8) ▾ Separator: , Header in first row: Time & date format:

	CUSTOMERID SMALLINT	CATEGORY VARCHAR(10)	COUNTRY VARCHAR(22)	INDUSTRY VARCHAR(24)	MONTH VARCHAR(6)	BILLEDAMOUNT SMALLINT
1	1	Individual	Indonesia	Engineering	2009-1	5060
2	614	Individual	United States	Product Management	2009-1	9638
3	615	Individual	China	Services	2009-1	11573
4	616	Individual	Russia	Accounting	2009-1	18697
5	617	Individual	Chile	Business Development	2009-1	944
6	618	Individual	Nicaragua	Human Resources	2009-1	3539
7	41	Company	Brazil	Marketing	2009-1	6591
8	619	Individual	Russia	Business Development	2009-1	16061
9	620	Individual	China	Business Development	2009-1	1250
10	956	Individual	Peru	Research and Development	2009-1	15105

month
VARCHAR(6)

2009-1

2009-1

2009-1

2009-1

2009-1

Edit column data type

Data type

VARCHAR ▾

Maximum number of characters
(1 - 32592)

7|

Edit column data type

Data type: VARCHAR

Maximum number of characters (1 - 32592): 30

Close OK

10. Once the column attributes are changed, check to see if it reflects and then click on **Next**

CUSTOMERID	CATEGORY	COUNTRY	INDUSTRY	MONTH	BILLEDAMOUNT
1	Individual	Indonesia	Engineering	2009-1	5060
2	Individual	United States	Product Management	2009-1	9638
3	Individual	China	Services	2009-1	11573
4	Individual	Russia	Accounting	2009-1	18697
5	Individual	Chile	Business Development	2009-1	944
6	Individual	Nicaragua	Human Resources	2009-1	3539
7	Company	Brazil	Marketing	2009-1	6591
8	Individual	Russia	Business Development	2009-1	16061
9	Individual	China	Business Development	2009-1	1250
10	Individual	Peru	Research and Development	2009-1	15105

Back Next

11. Review the settings and click on **Begin Load** to load the data.

Source Target Define Finalize

You are loading the file **cloud-billing-dataset.csv** into **XQR63068.BILLINGDATA**

Review settings

Summary

Code page:	1208 (Default)
Separator:	,
Time format:	HH:MM:SS (Default)
Date format:	YYYY-MM-DD (Default)
Timestamp format:	YYYY-MM-DD HH:MM:SS (Default)
String delimiter:	(Default)

Option

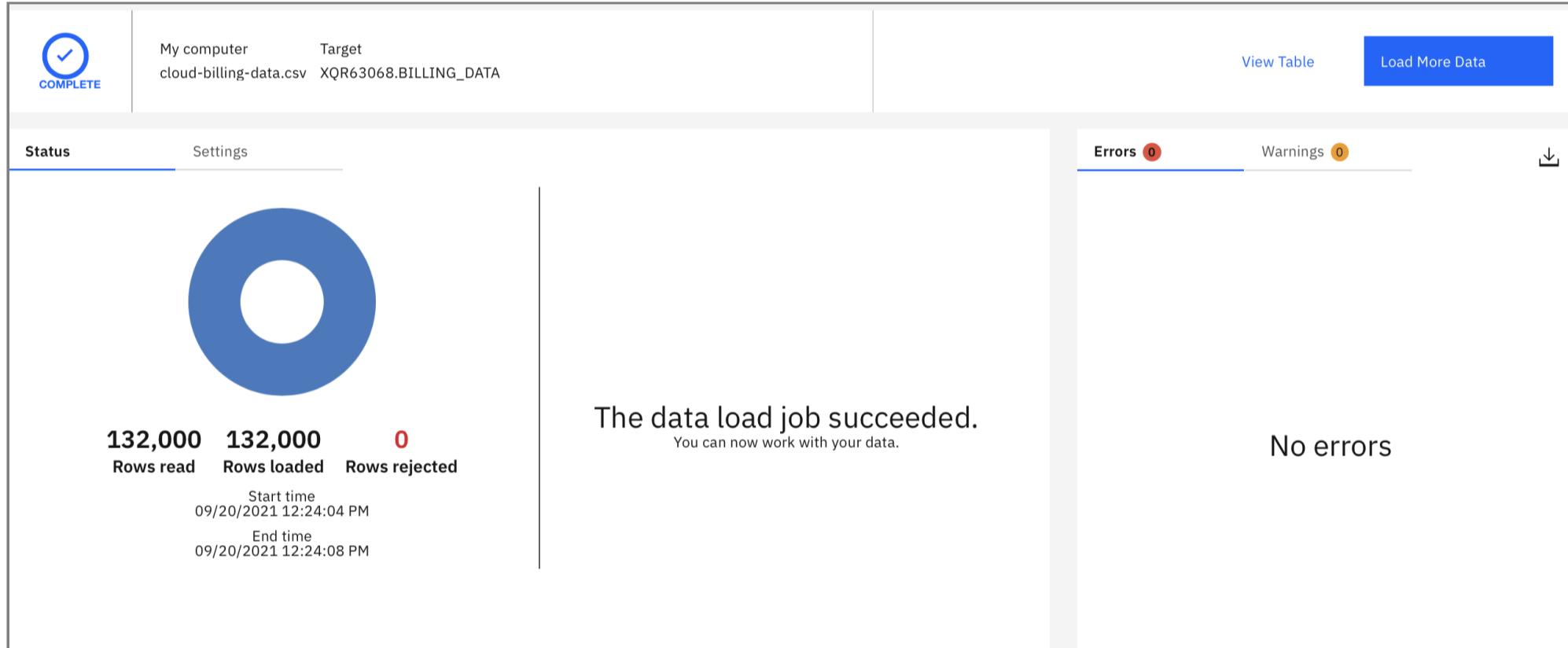
Maximum number of warnings

1000

Back

Begin Load

12. If the data is successfully loaded, you get a message on the screen indicating the number of rows that have been loaded.



Task 2 - Connect Cognos to DB2

1. Go to myibm.ibm.com, login with your IBM Cloud credentials and launch Cognos Analytics.



My IBM Profile Billing

Products

Trials

2 Offerings

IBM Cloud Active Launch Manage	IBM Cognos Analytics on Cloud - Trial Active Expires on 16 Oct 2021 Launch Manage
--	--

2. Choose the hamburger menu on the upper left and select **Manage**.

The image shows the mobile interface of IBM Cognos Analytics. At the top, there is a dark header with the IBM Cognos Analytics logo and a hamburger menu icon. Below the header, the word "Home" is displayed next to a house icon. There are three main navigation items: "+ New", "Upload files", and "Content". Under "Content", there is a "Recent" section with a clock icon and a "Manage" button. The "Manage" button is highlighted with a red rectangular border.

3. Choose the **Data Server Connection**.

IBM Cognos Analytics

People

Create and manage accounts and contacts

Data server connections

Create and manage connections

Customization

Manage themes and extensions

Collaboration

Manage collaboration settings

Secure Gateways

Create and manage Secure Gateways

4. Click on + to add a data server and choose IBM DB2 from the list shown.

Data server connections



Name

Modified

Weather Company

25/05/2021
8:57 PM

Select a type



Amazon Athena

Amazon Redshift

Cloudera Impala

Hive

IBM Big SQL

IBM Db2

IBM Db2 for i

IBM Db2 Warehouse

IBM Informix Dynamic Server

IBM Netezza

IBM Planning Analytics

5. Choose to **Connect Anonymously** and enter the jdbc url with your db2 user name and password that you copied earlier in Task 1. Click on **Test** to test the connection.

The screenshot shows the 'New data server connection' screen in IBM Cognos Analytics. On the left, there's a sidebar with 'Owner Unknown' and 'Type: Connection'. Below it are tabs: General (selected), Settings, Schemas (with a red error icon), and Permissions. Under 'Connection details', there's an 'Edit >' link. The 'Authentication method' section has four options: 'Connect anonymously' (selected), 'Prompt for the user ID and password', 'Use an external namespace', and 'Use the following signon:'. A 'Test' button is present. To its right, it says 'Not tested'. Below the test button is a 'Save' button. On the right, the 'Edit IBM Db2 connection' panel is open, showing the 'JDBC URL' field with a long URL, which is also highlighted with a red box. Other fields include 'Driver class name: com.ibm.db2.jcc.DB2Driver', a 'Restore' button, an 'Example URL' dropdown, and a 'Close' button.

6. If the test succeeded and Cognos managed to connect to the Db2 instance, you will see **Success** with a green tick next to it. Click on the pencil icon, give the connection a name, **MyDB2**, and save it.

The screenshot shows the 'MyDB2' connection page. The top bar has an 'Edit' button with a red box around it. Below it, the connection details show 'Owner Unknown' and 'Type: Connection'. The 'Settings' tab is selected. The 'Connection details' section has an 'Edit >' link. The 'Authentication method' section is identical to the previous screenshot. The 'Test' button is followed by a 'Success' button with a green checkmark, which is also highlighted with a red box. Below the 'Success' button is a 'Save' button, which is also highlighted with a red box. The 'Edit IBM Db2 connection' panel on the right is identical to the one in the first screenshot, showing the JDBC URL and other configuration options.

7. Go to the **Schema** and click on the '...' next to the schema name. Choose **Load Metadata** from the menu that appears.

MyDB2

Owner Sriram ... 39657) Created: 16/09/2021 3:20 AM Modified: 16/09/2021 7:48 AM Type: Connection

General Settings Schemas **Schemas** Permissions

Status	Schema name	Tables loaded
<input type="radio"/>	AUDIT	
<input type="radio"/>	DB2INST1	
<input type="radio"/>	ERRORSCHEMA	
<input type="radio"/>	LFN96733	

Load metadata

Load options

8. Once the metadata is loaded you will see a green check mark next to the schema name and it will also indicate how many tables are available in the schema for analysis.

MyDB2

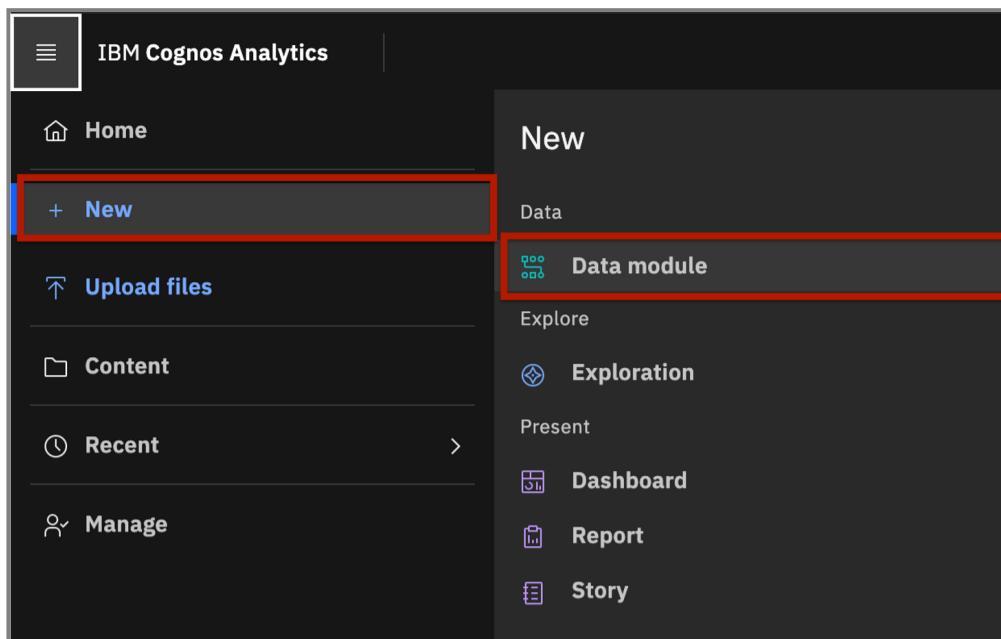
Owner Sriram ... 39657) Created: 16/09/2021 3:20 AM Modified: 16/09/2021 7:48 AM Type: Connection

General Settings Schemas **Schemas** Permissions

Status	Schema name	Tables loaded
<input type="radio"/>	AUDIT	
<input type="radio"/>	DB2INST1	
<input type="radio"/>	ERRORSCHEMA	
<input checked="" type="radio"/>	LFN96733	2 / 2

Task 3 - Create Data Module in Cognos

1. From the menu, choose **New** and then from the submenu choose **Data Module**.



2. Click the **Data servers** icon and choose the **MyDB2** connection that we created in the previous task.

A screenshot of the 'Select sources' screen in IBM Cognos Analytics. On the left is a vertical toolbar with icons for search, folder, user, clock, and database. The main area is titled 'Data servers'. It features a search bar with the placeholder 'Type any text to filter items in this folder'. Below the search bar, two data server connections are listed: 'MyDB2' (created on 9/16/2021 at 3:20 AM) and 'Weather Company' (created on 5/25/2021 at 8:57 PM).

Select sources

Q Data servers

Folder

User

Clock

Database

Up

Type any text to filter items in this folder

MyDB2
9/16/2021 3:20 AM

Weather Company
5/25/2021 8:57 PM

3. Choose the schema from where you want to load data.

Select sources

← Data servers / MyDB2

Type any text to filter items in this folder

LFN96733
9/16/2021 3:52 AM

Cancel OK

4. Choose the **Select Tables** option and click **OK**.

Add tables

Specify how to add tables to your data module.

Select tables

Select the tables that you want to include in your data module, and create the data module manually.

Discover related tables

Engage the system to recommend related tables for your data module and create the data module for you.

Cancel Next

5. It will list the tables available in the schema. For this lab, we will use the **Billing data** table. Choose the table and click on **OK**. If you want to view the data you may click on **Refresh**.

Select tables

Customerid Category Country Industry Month Billedamount

Data will appear here

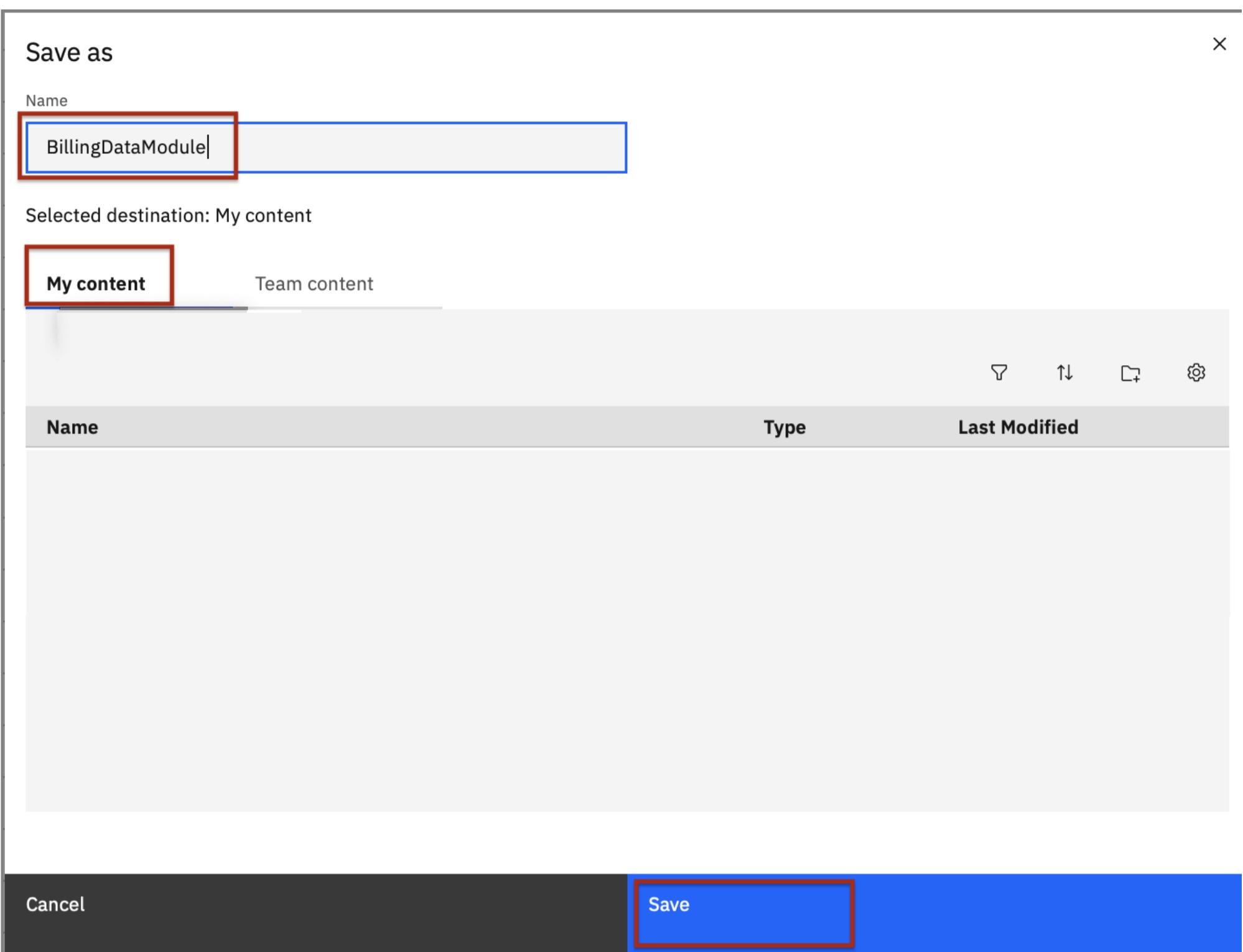
Refresh

Previous Cancel OK

6. The **Data module** loaded with the data appears. Click on **Save**, once you see that the data is correctly loaded.

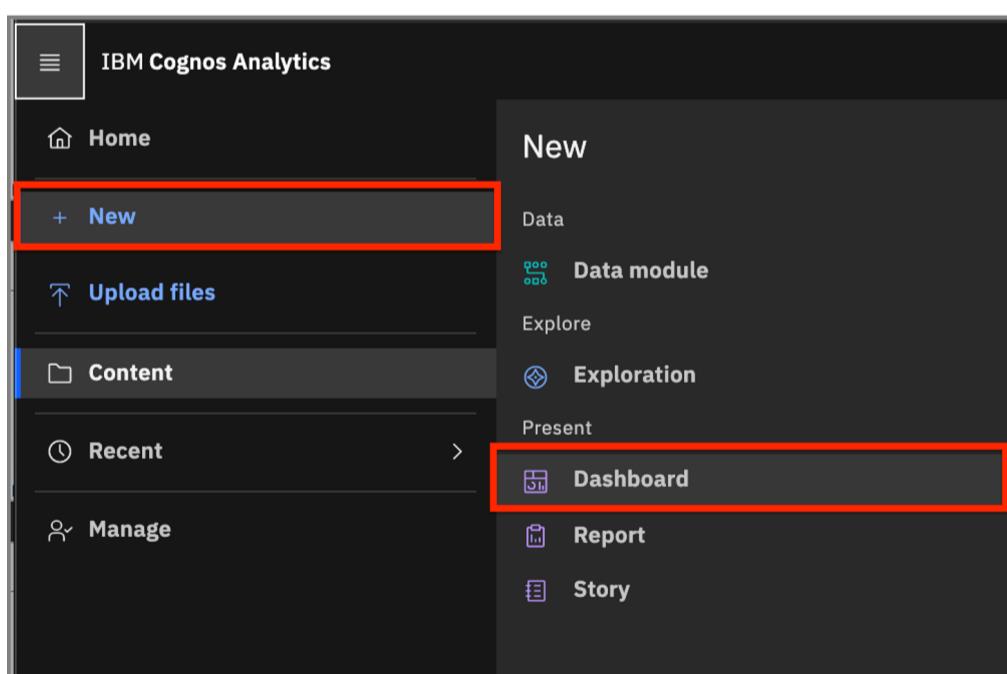
Customerid	Category	Country	Industry	Month	Billedamount
1	Individual	Indonesia	Engineering	2009-1	5060
614	Individual	United States	Product Management	2009-1	9638
615	Individual	China	Services	2009-1	11573
616	Individual	Russia	Accounting	2009-1	18697
617	Individual	Chile	Business Development	2009-1	944
618	Individual	Nicaragua	Human Resources	2009-1	3539
41	Company	Brazil	Marketing	2009-1	6591
619	Individual	Russia	Business Development	2009-1	16061
620	Individual	China	Business Development	2009-1	1250
956	Individual	Peru	Research and Development	2009-1	15105
621	Individual	Angola	Services	2009-1	6644

7. You can now save it with an appropriate name under **My Content**.



Task 4 - Create Dashboard

1. From the IBM Cognos menu, choose, **New** and click on **Dashboard**.



2. Choose the **Tabbed** as shown in the following image.

Create a dashboard

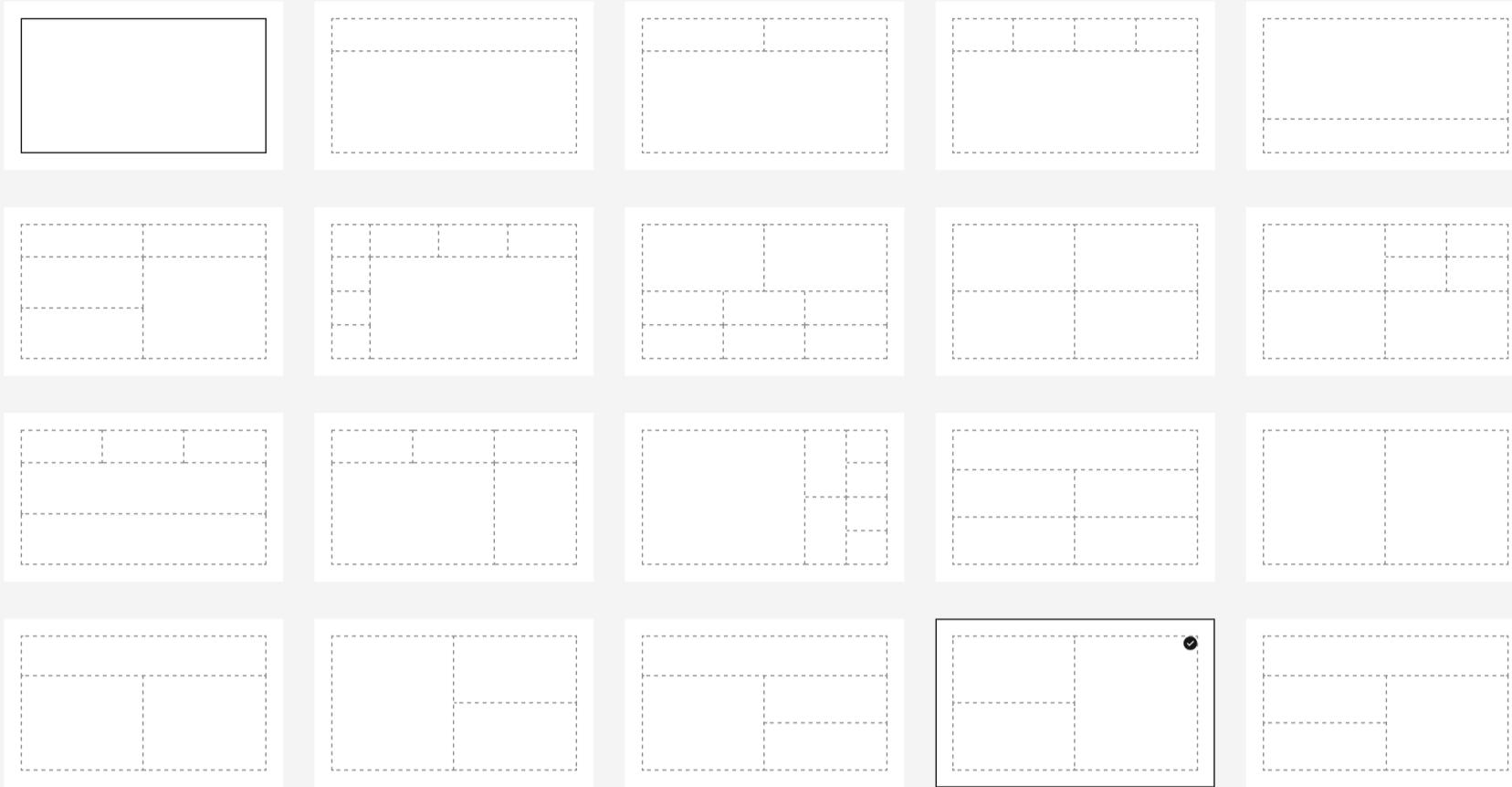
Select a template for your dashboard

Cancel

Create

Tabbed

Infographic



3. Click on **Select Source** to choose the source for the template.

The screenshot shows the IBM Cognos Analytics interface. At the top, there's a navigation bar with the title "IBM Cognos Analytics" and a "New dashboard *" tab. Below the navigation bar is a toolbar with various icons: a speech bubble, a green "Edit" button, a save icon, a share icon, and search icons. On the left side, there's a sidebar with icons for Data, Report, Scorecard, and Model. The main workspace is divided into sections: "Data" (which contains a large "Select a source" button), "All tabs" (which contains a "Tab 1" tab with a grid placeholder), and a central area with a "Drag and drop data here..." placeholder. The overall interface is clean and modern, designed for dashboard creation.

4. From the list, choose the data module we just created and click on **Add**.

Select a source

X

My content Team content

Name	Type	Last Modified
BillingDataModule	Data module	20/09/2021 4:18 AM

Cancel Add

Task 5 - Visualization

You will now see the table listed on the left panel with all the attributes.

1. Drag and drop the **Billed Amount** on the template.

The screenshot shows the IBM Cognos Analytics dashboard editor interface. On the left, there is a navigation pane with icons for selected sources, search, and various filters. Below this is a tree view of data structures under 'BillingDataModule' with nodes like 'Customerid', 'Category', 'Country', 'Industry', and 'Month'. A specific node, 'Billedamount', is highlighted with a blue border. The main workspace is titled 'New dashboard *' and contains a tab labeled 'Tab 1'. Inside the tab, there is a table structure with a single row and two columns. The first column contains the text 'Billedamount' with a small icon above it. The second column contains a small icon with a double-headed arrow. A tooltip 'Drop here to maximize' is visible near the second column. At the top of the workspace, there are tabs for 'Filters', 'Fields', and 'Properties'. The top right corner of the screen shows a user profile icon with a red notification badge.

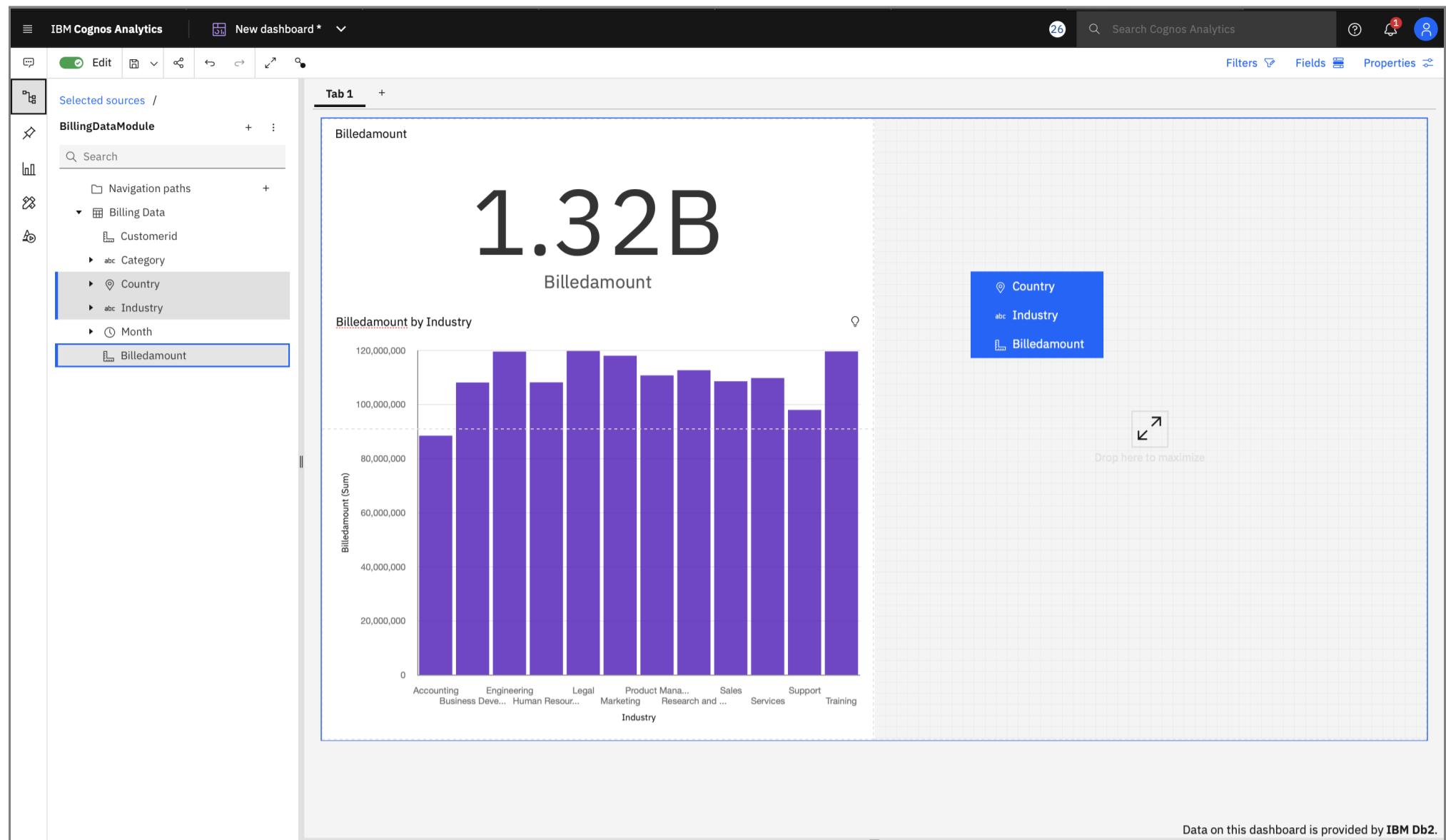
2. The total billed amount will now appear on the Dashboard. The size and position can be adjusted as per requirement and the text display can be edited and formatted by double-clicking on it.

The screenshot shows the IBM Cognos Analytics interface with a 'New dashboard *' tab selected. On the left, the 'Selected sources /' pane shows a 'BillingDataModule' with a tree view of 'Navigation paths', 'Billing Data' (selected), and categories like 'Customerid', 'Category', 'Country', 'Industry', 'Month', and 'Billedamount'. The main workspace contains a large, bold text visualization reading '1.32B' with the label 'Billedamount' below it. A red arrow points to the text 'Billedamount' with the instruction: 'Double click on this to edit or format the text'. The status bar at the bottom right indicates 'Data on this dashboard is provided by IBM Db2.'

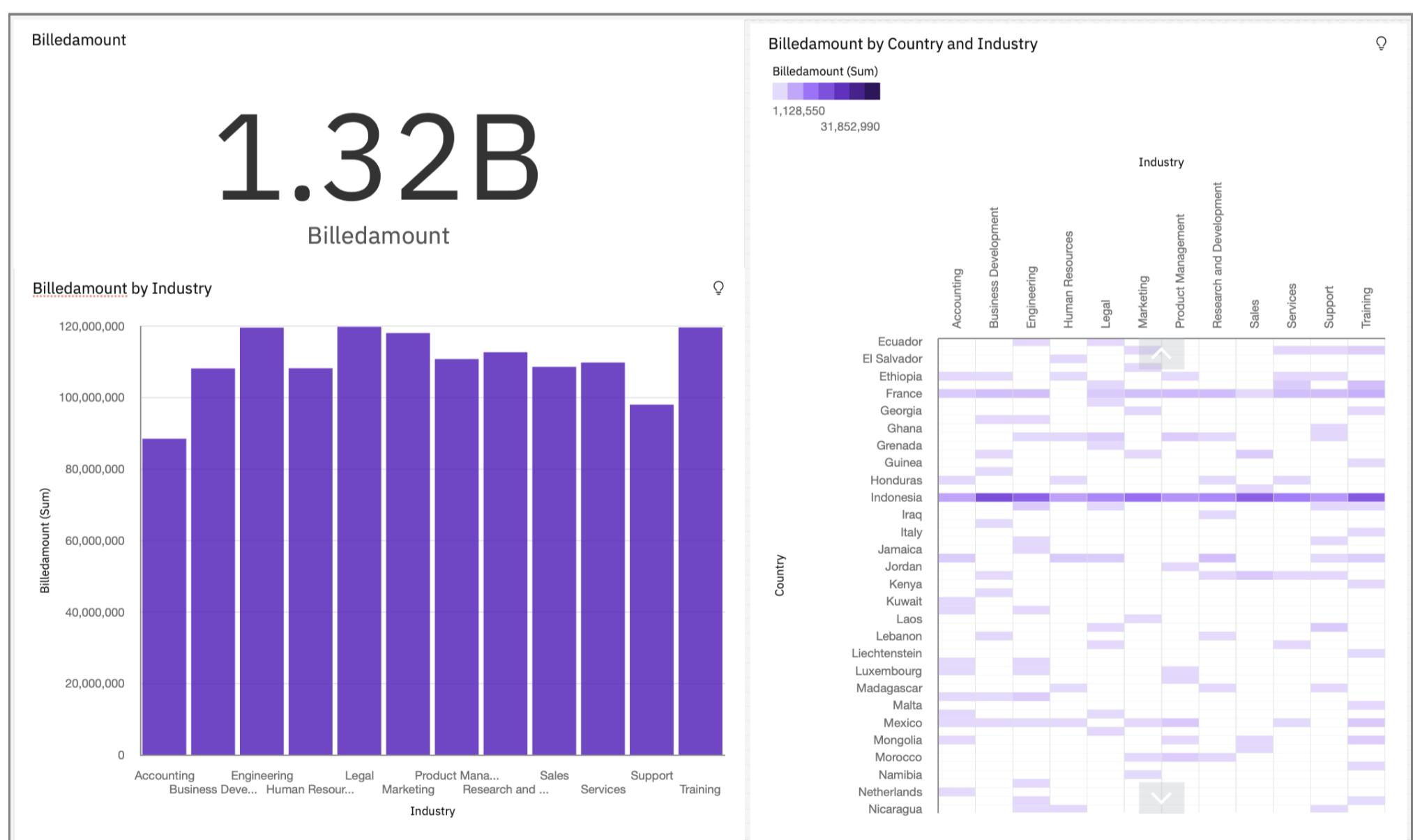
3. Drag and drop **Billed Amount** and **Industry** onto the dashboard as shown in the following image. With this, we can visualize the build amount per industry.

The screenshot shows the same IBM Cognos Analytics interface. The 'Selected sources /' pane now highlights 'Industry' under 'Billing Data'. The main workspace features a large text visualization '1.32B' and a new area below it containing a blue box with 'Billedamount' and 'Industry' labels, accompanied by a small icon and a 'Drop here to maximize' placeholder. The status bar at the bottom right indicates 'Data on this dashboard is provided by IBM Db2.'

4. Drag and drop **Billed Amount**, **Country** and **Industry** onto the dashboard as shown in the following image. This will generate a heat map of spending by country and by industry.



5. The finished dashboard will appear as in the following image.



6. Optionally, try to change the properties and settings to see how the dashboard changes. You can also observe the billed amount changing as you click on a region on the heat map or the bar graph.

Author(s)

[Lavanya T S](#)

Changelog

Date	Version	Changed by	Change Description
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Date	Version	Changed by	Change Description
2020-09-20	1.0	Lavanya	Created the lab
2021-10-7	1.1	Steve Hord	Copy Edit lab

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