

**Group Number:** [Group 4]

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**Topic:** [Techno-Firmo Intelligence Platform]

**Drive Link:** [P4\\_Group4](#)

**File 1 Link:** [SQLQuery\\_DDL\\_SP\\_VIEWS\\_Triggers\\_CheckC\\_Encryption\\_UDF\\_NCI.sql](#)

**File 1:** SQLQuery\_DDL\_SP\_VIEWS\_Triggers\_CheckC\_Encryption\_UDF\_NCI.sql

**File 1 Content:**

1. Create Statements
2. Stored Procedures
3. Views
4. Triggers
5. Check Constraints
6. Column Encryption
7. UDFS
8. Non Clustered Indexes

**File 2 Link:** [SQLQuery\\_Insert\\_Queries.sql](#)

**File 2:** SQLQuery\_Insert\_Queries.sql

**File 2 Content:** All Insert Queries

**File 3 Link:** [Visualization\\_Tableau.zip](#)

**File 3:** Visualization\_Tableau.zip

**File 3 Content:** 3 Screenshots - Visualizations using Tableau

**What's Included:**

| Object Type                        | Quantity or Yes/No | Comments             |
|------------------------------------|--------------------|----------------------|
| Tables                             | 9                  |                      |
| Views                              | 3                  |                      |
| Table Level Check Constraint       | 3                  |                      |
| Computed Column based on UDF       | Yes                |                      |
| Non-Clustered Indexes              | 3                  |                      |
| Stored Procedures                  | 3                  |                      |
| User Defined Functions (UDF)       | 3                  |                      |
| DML Triggers                       | Yes                |                      |
| Column Data Encryption             | Yes                |                      |
| BI Data Visualization              | Yes                | Screenshots Included |
| GUI for CRUD Operations (optional) | No                 | Not available for P4 |
| Other : Research - References      | Yes                |                      |

## Creating the DataBase:

```
-- Creating Database: Techno_Firmo_Intelligence_Platform
```

```
IF NOT EXISTS (SELECT * FROM SYS.databases WHERE  
name='Techno_Firmo_Intelligence_Platform') BEGIN
```

```
CREATE DATABASE Techno_Firmo_Intelligence_Platform;
```

```
END;
```

The screenshot shows a SQL query window with the following details:

- Toolbar:** Run, Cancel, Disconnect, Change, Database: sample, Estimated Plan, Enable Actual Plan, Parse.
- Code Area:** Numbered lines 1 through 8 representing the T-SQL script for creating a database.
- Messages Area:**
  - Timestamp: 18:04:07
  - Message: Started executing query at Line 3
  - Message: Commands completed successfully.
  - Message: Total execution time: 00:00:00.240

## Creating the Tables:

-- Creating required tables with respect to the ER-Diagram, business rules and constraints.

-- Table 1: User

```
CREATE TABLE [User](
```

```
    User_ID INT PRIMARY KEY,
```

```
    User_Name VARCHAR(255),
```

```
    User_Email VARCHAR(255),
```

```
    User_Contact VARCHAR(20),
```

```
    User_Region VARCHAR(50)
```

```
);
```

```
9  -- Creating the Tables:  
10 -- Creating required tables with respect to the ER-Diagram, business rules and constraints.  
11 -- Table 1: User  
12 CREATE TABLE [User](  
13     User_ID INT PRIMARY KEY,  
14     User_Name VARCHAR(255),  
15     User_Email VARCHAR(255),  
16     User_Contact VARCHAR(20),  
17     User_Region VARCHAR(50)  
18 );  
19
```

### messages

```
18:04:48      Started executing query at Line 9  
                  Commands completed successfully.  
                  Total execution time: 00:00:00.007
```

-- Table 2: User\_Search\_Activity

```

CREATE TABLE User_Search_Activity (
    User_Search_Activity_ID INT PRIMARY KEY,
    User_Searches VARCHAR(255),
    User_ID INT,
    FOREIGN KEY (User_ID) REFERENCES [User](User_ID)
);

```

```

22
23 -- Table 2: User_Search_Activity
24 CREATE TABLE User_Search_Activity (
25     User_Search_Activity_ID INT PRIMARY KEY,
26     User_Searches VARCHAR(255),
27     User_ID INT,
28     FOREIGN KEY (User_ID) REFERENCES [User](User_ID)
29 );
30

```

**Messages**

18:05:14      Started executing query at Line 23  
                   Commands completed successfully.  
                   Total execution time: 00:00:00.008

-- Table 3: Information\_platform

```

CREATE TABLE Information_platform (
    Information_Platform_ID INT PRIMARY KEY,
    Vendor_Name VARCHAR(255),
    Vendor_URL VARCHAR(255),
    Product_Company_Description TEXT,
    Parent_Category VARCHAR(100),
    Sub_Category VARCHAR(100),

```

```

User_Search_Activity_ID INT,
FOREIGN KEY (User_Search_Activity_ID) REFERENCES
User_Search_Activity(User_Search_Activity_ID)
);

```

```

53
34   -- Table 3: Information_platform
35   CREATE TABLE Information_platform (
36     Information_Platform_ID INT PRIMARY KEY,
37     Vendor_Name VARCHAR(255),
38     Vendor_URL VARCHAR(255),
39     Product_Company_Description TEXT,
40     Parent_Category VARCHAR(100),
41     Sub_Category VARCHAR(100),
42     User_Search_Activity_ID INT,
43     FOREIGN KEY (User_Search_Activity_ID) REFERENCES User_Search_Activity(User_Search_Activity_ID)
44 );
45
46
47
48
49 -- Table 4: Firmographics

```

**Messages**

18:05:43      Started executing query at Line 34  
                 Commands completed successfully.  
                 Total execution time: 00:00:00.009

#### -- Table 4: Firmographics

```

CREATE TABLE Firmographics (
Firmo_Information_Platform_ID INT PRIMARY KEY,
Vendor_Company_Count INT,
Vendor_Six_Months_Change INT,
Vendor_Rating DECIMAL(5,2),
Information_Platform_ID INT,
FOREIGN KEY (Information_Platform_ID) REFERENCES
Information_platform(Information_Platform_ID)

```

```
});
```

```
48
49  -- Table 4: Firmographics
50  CREATE TABLE Firmographics (
51    Firmo_Information_Platform_ID INT PRIMARY KEY,
52    Vendor_Company_Count INT,
53    Vendor_Six_Months_Change INT,
54    Vendor_Rating DECIMAL(5,2),
55    Information_Platform_ID INT,
56    FOREIGN KEY (Information_Platform_ID) REFERENCES Information_platform(Information_Platform_ID)
57 );
58
59
60
```

**Messages**

18:06:07      Started executing query at Line 49  
Commands completed successfully.  
Total execution time: 00:00:00.008

-- Table 5: Technographics

```
CREATE TABLE Technographics (
    techno_Information_Platform_ID INT PRIMARY KEY,
    Product_Name VARCHAR(255),
    Product_URL VARCHAR(255),
    Product_Ranking_Rating DECIMAL(5,2),
    Companies_Using INT,
    Product_Market_Share DECIMAL(5,2),
    Former_Product_Name VARCHAR(255),
    Previous_Installs INT,
    Current_Installs INT,
    Information_Platform_ID INT,
```

```

FOREIGN KEY (Information_Platform_ID) REFERENCES
Information_platform(Information_Platform_ID)

);

```

```

61   -- Table 5: Technographics
62   CREATE TABLE Technographics (
63     techno_Information_Platform_ID INT PRIMARY KEY,
64     Product_Name VARCHAR(255),
65     Product_URL VARCHAR(255),
66     Product_Ranking_Rating DECIMAL(5,2),
67     Companies_Using INT,
68     Product_Market_Share DECIMAL(5,2),
69     Former_Product_Name VARCHAR(255),
70     Previous_Installs INT,
71     Current_Installs INT,
72     Information_Platform_ID INT,
73     FOREIGN KEY (Information_Platform_ID) REFERENCES Information_platform(Information_Platform_ID)
74   );
75
76

```

**Messages**

```

18:06:34      Started executing query at Line 62
               Commands completed successfully.
               Total execution time: 00:00:00.009

```

-- Table 6: Feedback\_Platform

```

CREATE TABLE Feedback_Platform (
  Feedback_ID INT PRIMARY KEY,
  User_Rating DECIMAL(5,2),
  User_ID int
  FOREIGN KEY (User_ID) REFERENCES [User](User_ID)

);

```

```
79  
80  -- Table 6: Feedback_Platform  
81  CREATE TABLE Feedback_Platform (   
82    Feedback_ID INT PRIMARY KEY,  
83    User_Rating DECIMAL(5,2),  
84    User_ID int  
85    FOREIGN KEY (User_ID) REFERENCES [User](User_ID)  
86  );  
87
```

#### Messages

```
18:06:56      Started executing query at Line 80  
                Commands completed successfully.  
                Total execution time: 00:00:00.008
```

-- Table 7: User\_Credentials

```
CREATE TABLE User_Credentials (   
    User_Credential_ID INT PRIMARY KEY,  
    User_Backup_Email VARCHAR(255),  
    User_Password VARCHAR(255),  
    User_Security_Question VARCHAR(255),  
    User_ID INT,  
    FOREIGN KEY (User_ID) REFERENCES [User](User_ID)  
);
```

```
90  
91  |-- Table 7: User_Credentials  
92  CREATE TABLE User_Credentials (  
93    ... User_Credential_ID INT PRIMARY KEY,  
94    ... User_Backup_Email VARCHAR(255),  
95    ... User_Password VARCHAR(255),  
96    ... User_Security_Question VARCHAR(255),  
97    ... User_ID INT,  
98    ... FOREIGN KEY (User_ID) REFERENCES [User](User_ID)  
99 );  
100
```

#### Messages

18:07:28      Started executing query at Line 91  
Commands completed successfully.  
Total execution time: 00:00:00.009

-- Table 8: User\_Login\_Tracker

```
CREATE TABLE User_Login_Tracker (  
  
Login_Session_ID INT PRIMARY KEY,  
  
Login_datetime DATETIME,  
  
Login_session_end_time DATETIME,  
  
Session_Duration INT,  
  
User_ID INT,  
  
FOREIGN KEY (User_ID) REFERENCES [User](User_ID)  
  
);
```

```
103  
104  -- Table 8: User_Login_Tracker  
105  CREATE TABLE User_Login_Tracker (   
106    Login_Session_ID INT PRIMARY KEY,  
107    Login_datetime DATETIME,  
108    Login_session_end_time DATETIME,  
109    Session_Duration INT,  
110    User_ID INT,  
111    FOREIGN KEY (User_ID) REFERENCES [User](User_ID)  
112  );  
113  
114
```

#### Messages

18:07:47      Started executing query at Line 104  
Commands completed successfully.  
Total execution time: 00:00:00.008

#### -- Table 9: Invoice

```
CREATE TABLE Invoice (   
  
Invoice_ID INT PRIMARY KEY,  
  
Invoice_Amount DECIMAL(10,2),  
  
Applied_Discount DECIMAL(5,2),  
  
Invoice_Date DATE,  
  
Subscription_Duration INT,  
  
Subscription_end_date DATE,  
  
User_ID INT,  
  
FOREIGN KEY (User_ID) REFERENCES [User](User_ID)  
);
```

```

117  -- Table 9: Invoice
118  CREATE TABLE Invoice (
119    Invoice_ID INT PRIMARY KEY,
120    Invoice_Amount DECIMAL(10,2),
121    Applied_Discount DECIMAL(5,2),
122    Invoice_Date DATE,
123    Subscription_Duration INT,
124    Subscription_end_date DATE,
125    User_ID INT,
126    FOREIGN KEY (User_ID) REFERENCES [User] (User_ID)
127  );
128

```

#### Messages

18:08:05      Started executing query at Line 117  
                 Commands completed successfully.  
                 Total execution time: 00:00:00.007

### Inserting data into Tables:

-- Inserting data into the tables

-- Inserting into User table

INSERT INTO [User] (User\_ID, User\_Name, User\_Email, User\_Contact, User\_Region)

VALUES

(1, 'Alice Johnson', 'alice@example.com', '123-456-7890', 'North America'),

(2, 'Bob Smith', 'bob@example.com', '987-654-3210', 'Europe'),

(3, 'Charlie Brown', 'charlie@example.com', '456-789-0123', 'Asia'),

(4, 'Diana Rodriguez', 'diana@example.com', '789-012-3456', 'South America'),

(5, 'Eleanor Parker', 'eleanor@example.com', '321-654-9870', 'Africa'),

(6, 'Franklin Lee', 'franklin@example.com', '555-555-5555', 'Australia'),

(7, 'Grace Miller', 'grace@example.com', '777-888-9999', 'Europe'),

```

(8, 'Henry Wilson', 'henry@example.com', '111-222-3333', 'North America'),  

(9, 'Isabella Kim', 'isabella@example.com', '444-555-6666', 'Asia'),  

(10, 'Jack Thompson', 'jack@example.com', '666-777-8888', 'North America'),  

(11, 'Karen Garcia', 'karen@example.com', '999-000-1111', 'South America'),  

(12, 'Liam Davis', 'liam@example.com', '222-333-4444', 'Europe'),  

(13, 'Mia Martinez', 'mia@example.com', '333-444-5555', 'Asia'),  

(14, 'Noah Hernandez', 'noah@example.com', '444-555-6666', 'Africa'),  

(15, 'Olivia Gonzalez', 'olivia@example.com', '555-666-7777', 'Australia');

```

**SELECT \* FROM [User]**

| Results Messages |         |                 |                      |              |               |
|------------------|---------|-----------------|----------------------|--------------|---------------|
|                  | User_ID | User_Name       | User_Email           | User_Contact | User_Region   |
| 1                | 1       | Alice Johnson   | alice@example.com    | 123-456-7890 | North America |
| 2                | 2       | Bob Smith       | bob@example.com      | 987-654-3210 | Europe        |
| 3                | 3       | Charlie Brown   | charlie@example.com  | 456-789-0123 | Asia          |
| 4                | 4       | Diana Rodriguez | diana@example.com    | 789-012-3456 | South America |
| 5                | 5       | Eleanor Parker  | eleanor@example.com  | 321-654-9870 | Africa        |
| 6                | 6       | Franklin Lee    | franklin@example.com | 555-555-5555 | Australia     |
| 7                | 7       | Grace Miller    | grace@example.com    | 777-888-9999 | Europe        |
| 8                | 8       | Henry Wilson    | henry@example.com    | 111-222-3333 | North America |
| 9                | 9       | Isabella Kim    | isabella@example.com | 444-555-6666 | Asia          |
| 10               | 10      | Jack Thompson   | jack@example.com     | 666-777-8888 | North America |
| 11               | 11      | Karen Garcia    | karen@example.com    | 999-000-1111 | South America |
| 12               | 12      | Liam Davis      | liam@example.com     | 222-333-4444 | Europe        |
| 13               | 13      | Mia Martinez    | mia@example.com      | 333-444-5555 | Asia          |
| 14               | 14      | Noah Hernandez  | noah@example.com     | 444-555-6666 | Africa        |
| 15               | 15      | Olivia Gonzalez | olivia@example.com   | 555-666-7777 | Australia     |

-- Inserting into User\_Search\_Activity table

```
INSERT INTO User_Search_Activity (User_Search_Activity_ID, User_Searches)
```

```
VALUES
```

```
(1, 'SQL queries'),
```

```
(2, 'Python tutorials'),
```

```
(3, 'Data visualization tools'),
```

```
(4, 'Machine learning algorithms'),
```

```
(5, 'Web development frameworks'),
```

```
(6, 'Cloud computing services'),
```

```
(7, 'Artificial intelligence applications'),
```

```
(8, 'Cybersecurity best practices'),
```

```
(9, 'Mobile app development tools'),
```

```
(10, 'Networking fundamentals'),
```

```
(11, 'Digital marketing strategies'),
```

```
(12, 'E-commerce platforms'),
```

```
(13, 'Game development engines'),
```

```
(14, 'Blockchain technologies'),
```

```
(15, 'IoT devices and protocols');
```

```
SELECT * FROM [User_Search_Activity]
```

```
177  SELECT * FROM [User_Search_Activity]  
178  
179
```

Results Messages

|    | User_Search_Activity_ID | User_Searches                        | User_ID |
|----|-------------------------|--------------------------------------|---------|
| 1  | 1                       | SQL queries                          | NULL    |
| 2  | 2                       | Python tutorials                     | NULL    |
| 3  | 3                       | Data visualization tools             | NULL    |
| 4  | 4                       | Machine learning algorithms          | NULL    |
| 5  | 5                       | Web development frameworks           | NULL    |
| 6  | 6                       | Cloud computing services             | NULL    |
| 7  | 7                       | Artificial intelligence applications | NULL    |
| 8  | 8                       | Cybersecurity best practices         | NULL    |
| 9  | 9                       | Mobile app development tools         | NULL    |
| 10 | 10                      | Networking fundamentals              | NULL    |
| 11 | 11                      | Digital marketing strategies         | NULL    |
| 12 | 12                      | E-commerce platforms                 | NULL    |
| 13 | 13                      | Game development engines             | NULL    |
| 14 | 14                      | Blockchain technologies              | NULL    |
| 15 | 15                      | IoT devices and protocols            | NULL    |

-- Inserting into Feedback\_Platform table

```
INSERT INTO Feedback_Platform (Feedback_ID, User_Rating, User_ID)
```

VALUES

(1, 4.2, 5),

(2, 3.8, 8),

(3, 4.5, 3),

(4, 4.0, 7),

(5, 3.9, 12),

(6, 4.1, 9),

(7, 4.3, 2),

(8, 3.7, 10),

(9, 4.6, 6),

(10, 4.4, 14),

(11, 3.5, 1),

(12, 4.8, 11),

(13, 3.6, 13),

(14, 4.9, 4),

(15, 4.7, 15);

`SELECT * FROM [Feedback_Platform]`

| 199<br>200 <code>SELECT * FROM [Feedback_Platform]</code><br>201 |             |             |         |
|--|-------------|-------------|---------|
| <u>Results</u>   |             | Messages    |         |
|  | Feedback_ID | User_Rating | User_ID |
| 1  | 1           | 4.20        | 5       |
| 2  | 2           | 3.80        | 8       |
| 3  | 3           | 4.50        | 3       |
| 4  | 4           | 4.00        | 7       |
| 5  | 5           | 3.90        | 12      |
| 6  | 6           | 4.10        | 9       |
| 7  | 7           | 4.30        | 2       |
| 8  | 8           | 3.70        | 10      |
| 9  | 9           | 4.60        | 6       |
| 10   | 10          | 4.40        | 14      |
| 11   | 11          | 3.50        | 1       |
| 12   | 12          | 4.80        | 11      |
| 13   | 13          | 3.60        | 13      |
| 14   | 14          | 4.90        | 4       |
| 15   | 15          | 4.70        | 15      |

-- Inserting into Invoice table

```
INSERT INTO Invoice (Invoice_ID, Invoice_Amount, Applied_Discount, Invoice_Date,
Subscription_Duration, Subscription_end_date, User_ID)

VALUES

(1, 100.00, 10.00, '2023-01-01', 12, '2024-01-01', 1),

(2, 150.00, 15.00, '2023-02-05', 6, '2023-08-05', 2),

(3, 200.00, 20.00, '2023-03-10', 3, '2023-06-10', 3),

(4, 120.00, 12.00, '2023-04-15', 9, '2024-01-15', 4),

(5, 180.00, 18.00, '2023-05-20', 6, '2023-11-20', 5),

(6, 220.00, 22.00, '2023-06-25', 12, '2024-06-25', 6),

(7, 130.00, 13.00, '2023-07-30', 6, '2024-01-30', 7),

(8, 170.00, 17.00, '2023-08-04', 3, '2023-11-04', 8),

(9, 190.00, 19.00, '2023-09-12', 6, '2024-03-12', 9),

(10, 110.00, 11.00, '2023-10-18', 12, '2024-10-18', 10),

(11, 140.00, 14.00, '2023-11-22', 6, '2024-05-22', 11),

(12, 160.00, 16.00, '2023-12-27', 9, '2024-09-27', 12),

(13, 230.00, 23.00, '2024-01-30', 6, '2024-07-30', 13),

(14, 200.00, 20.00, '2024-02-02', 3, '2024-05-02', 14),

(15, 250.00, 25.00, '2024-03-08', 6, '2024-09-08', 15);
```

```
SELECT * FROM [Invoice]
```

|    | Invoice_ID | Invoice_Amount | Applied_Discount | Invoice_Date | Subscription_Duration | Subscription_end_date | User_ID |
|----|------------|----------------|------------------|--------------|-----------------------|-----------------------|---------|
| 1  | 1          | 100.00         | 10.00            | 2023-01-01   | 12                    | 2024-01-01            | 1       |
| 2  | 2          | 150.00         | 15.00            | 2023-02-05   | 6                     | 2023-08-05            | 2       |
| 3  | 3          | 200.00         | 20.00            | 2023-03-10   | 3                     | 2023-06-10            | 3       |
| 4  | 4          | 120.00         | 12.00            | 2023-04-15   | 9                     | 2024-01-15            | 4       |
| 5  | 5          | 180.00         | 18.00            | 2023-05-20   | 6                     | 2023-11-20            | 5       |
| 6  | 6          | 220.00         | 22.00            | 2023-06-25   | 12                    | 2024-06-25            | 6       |
| 7  | 7          | 130.00         | 13.00            | 2023-07-30   | 6                     | 2024-01-30            | 7       |
| 8  | 8          | 170.00         | 17.00            | 2023-08-04   | 3                     | 2023-11-04            | 8       |
| 9  | 9          | 190.00         | 19.00            | 2023-09-12   | 6                     | 2024-03-12            | 9       |
| 10 | 10         | 110.00         | 11.00            | 2023-10-18   | 12                    | 2024-10-18            | 10      |
| 11 | 11         | 140.00         | 14.00            | 2023-11-22   | 6                     | 2024-05-22            | 11      |
| 12 | 12         | 160.00         | 16.00            | 2023-12-27   | 9                     | 2024-09-27            | 12      |
| 13 | 13         | 230.00         | 23.00            | 2024-01-30   | 6                     | 2024-07-30            | 13      |
| 14 | 14         | 200.00         | 20.00            | 2024-02-02   | 3                     | 2024-05-02            | 14      |
| 15 | 15         | 250.00         | 25.00            | 2024-03-08   | 6                     | 2024-09-08            | 15      |

-- Inserting into User\_Login\_Tracker table

**INSERT INTO** User\_Login\_Tracker (Login\_Session\_ID, Login\_datetime, Login\_session\_end\_time, Session\_Duration, User\_ID)

**VALUES**

(1, '2023-01-01 08:00:00', '2023-01-01 09:00:00', 3600, 1),

(2, '2023-01-02 10:00:00', '2023-01-02 11:00:00', 3600, 2),

(3, '2023-01-03 12:00:00', '2023-01-03 13:00:00', 3600, 3),

(4, '2023-01-04 14:00:00', '2023-01-04 15:00:00', 3600, 4),

(5, '2023-01-05 16:00:00', '2023-01-05 17:00:00', 3600, 5),

(6, '2023-01-06 18:00:00', '2023-01-06 19:00:00', 3600, 6),

(7, '2023-01-07 20:00:00', '2023-01-07 21:00:00', 3600, 7),

(8, '2023-01-08 22:00:00', '2023-01-08 23:00:00', 3600, 8),

(9, '2023-01-09 09:00:00', '2023-01-09 10:00:00', 3600, 9),

```
(10, '2023-01-10 11:00:00', '2023-01-10 12:00:00', 3600, 10),  

(11, '2023-01-11 13:00:00', '2023-01-11 14:00:00', 3600, 11),  

(12, '2023-01-12 15:00:00', '2023-01-12 16:00:00', 3600, 12),  

(13, '2023-01-13 17:00:00', '2023-01-13 18:00:00', 3600, 13),  

(14, '2023-01-14 19:00:00', '2023-01-14 20:00:00', 3600, 14),  

(15, '2023-01-15 21:00:00', '2023-01-15 22:00:00', 3600, 15);
```

**SELECT \* FROM [User\_Login\_Tracker]**

| 245<br>246     SELECT * FROM [User_Login_Tracker] |                  |                         |                         |                  |         |
|---|------------------|-------------------------|-------------------------|------------------|---------|
| Results    Messages                               |                  |                         |                         |                  |         |
|   | Login_Session_ID | Login_datetime          | Login_session_end_time  | Session_Duration | User_ID |
| 1   | 1                | 2023-01-01 08:00:00.000 | 2023-01-01 09:00:00.000 | 3600             | 1       |
| 2   | 2                | 2023-01-02 10:00:00.000 | 2023-01-02 11:00:00.000 | 3600             | 2       |
| 3   | 3                | 2023-01-03 12:00:00.000 | 2023-01-03 13:00:00.000 | 3600             | 3       |
| 4   | 4                | 2023-01-04 14:00:00.000 | 2023-01-04 15:00:00.000 | 3600             | 4       |
| 5   | 5                | 2023-01-05 16:00:00.000 | 2023-01-05 17:00:00.000 | 3600             | 5       |
| 6   | 6                | 2023-01-06 18:00:00.000 | 2023-01-06 19:00:00.000 | 3600             | 6       |
| 7   | 7                | 2023-01-07 20:00:00.000 | 2023-01-07 21:00:00.000 | 3600             | 7       |
| 8   | 8                | 2023-01-08 22:00:00.000 | 2023-01-08 23:00:00.000 | 3600             | 8       |
| 9   | 9                | 2023-01-09 09:00:00.000 | 2023-01-09 10:00:00.000 | 3600             | 9       |
| 10  | 10               | 2023-01-10 11:00:00.000 | 2023-01-10 12:00:00.000 | 3600             | 10      |
| 11  | 11               | 2023-01-11 13:00:00.000 | 2023-01-11 14:00:00.000 | 3600             | 11      |
| 12  | 12               | 2023-01-12 15:00:00.000 | 2023-01-12 16:00:00.000 | 3600             | 12      |
| 13  | 13               | 2023-01-13 17:00:00.000 | 2023-01-13 18:00:00.000 | 3600             | 13      |
| 14  | 14               | 2023-01-14 19:00:00.000 | 2023-01-14 20:00:00.000 | 3600             | 14      |
| 15  | 15               | 2023-01-15 21:00:00.000 | 2023-01-15 22:00:00.000 | 3600             | 15      |

-- Inserting into User\_Credentials table

```
INSERT INTO User_Credentials (User_Credential_ID, User_Backup_Email, User_Password,  
User_Security_Question, User_ID)
```

```
VALUES
```

```
(1, 'backup1@example.com', 'password1', 'Question 1', 1),  
(2, 'backup2@example.com', 'password2', 'Question 2', 2),  
(3, 'backup3@example.com', 'password3', 'Question 3', 3),  
(4, 'backup4@example.com', 'password4', 'Question 4', 4),  
(5, 'backup5@example.com', 'password5', 'Question 5', 5),  
(6, 'backup6@example.com', 'password6', 'Question 6', 6),  
(7, 'backup7@example.com', 'password7', 'Question 7', 7),  
(8, 'backup8@example.com', 'password8', 'Question 8', 8),  
(9, 'backup9@example.com', 'password9', 'Question 9', 9),  
(10, 'backup10@example.com', 'password10', 'Question 10', 10),  
(11, 'backup11@example.com', 'password11', 'Question 11', 11),  
(12, 'backup12@example.com', 'password12', 'Question 12', 12),  
(13, 'backup13@example.com', 'password13', 'Question 13', 13),  
(14, 'backup14@example.com', 'password14', 'Question 14', 14),  
(15, 'backup15@example.com', 'password15', 'Question 15', 15);
```

```
SELECT * FROM [User_Credentials]
```

268  
 269    **SELECT \* FROM [User\_Credentials]**  
 270  
 271

Results   Messages

|    | User_Credential_ID | User_Backup_Email    | User_Password | User_Security_Question | User_ID |
|----|--------------------|----------------------|---------------|------------------------|---------|
| 1  | 1                  | backup1@example.com  | password1     | Question 1             | 1       |
| 2  | 2                  | backup2@example.com  | password2     | Question 2             | 2       |
| 3  | 3                  | backup3@example.com  | password3     | Question 3             | 3       |
| 4  | 4                  | backup4@example.com  | password4     | Question 4             | 4       |
| 5  | 5                  | backup5@example.com  | password5     | Question 5             | 5       |
| 6  | 6                  | backup6@example.com  | password6     | Question 6             | 6       |
| 7  | 7                  | backup7@example.com  | password7     | Question 7             | 7       |
| 8  | 8                  | backup8@example.com  | password8     | Question 8             | 8       |
| 9  | 9                  | backup9@example.com  | password9     | Question 9             | 9       |
| 10 | 10                 | backup10@example.com | password10    | Question 10            | 10      |
| 11 | 11                 | backup11@example.com | password11    | Question 11            | 11      |
| 12 | 12                 | backup12@example.com | password12    | Question 12            | 12      |
| 13 | 13                 | backup13@example.com | password13    | Question 13            | 13      |
| 14 | 14                 | backup14@example.com | password14    | Question 14            | 14      |
| 15 | 15                 | backup15@example.com | password15    | Question 15            | 15      |

-- Inserting into Information\_platform table

**INSERT INTO** Information\_platform (Information\_Platform\_ID, Vendor\_Name, Vendor\_URL, Product\_Company\_Description, Parent\_Category, Sub\_Category, User\_Search\_Activity\_ID)

**VALUES**

(1, 'Microsoft', 'www.microsoft.com', 'Microsoft provides software, hardware, and cloud services.', 'Technology', 'Software Development', 1),

(2, 'Amazon Web Services', 'www.aws.amazon.com', 'AWS offers cloud computing services.', 'Cloud Computing', 'Infrastructure as a Service', 2),

(3, 'Google Cloud', 'www.cloud.google.com', 'Google Cloud offers cloud-based solutions and machine learning services.', 'Cloud Computing', 'Machine Learning', 3),

(4, 'IBM', 'www.ibm.com', 'IBM focuses on AI, cloud computing, and IT services.', 'Technology', 'AI and Cloud Solutions', 4),

(5, 'Salesforce', 'www.salesforce.com', 'Salesforce provides CRM and cloud computing software.', 'CRM', 'Customer Relationship Management', 5),

(6, 'Oracle', 'www.oracle.com', 'Oracle specializes in database management systems and enterprise software.', 'Database', 'Enterprise Solutions', 6),

(7, 'SAP', 'www.sap.com', 'SAP offers ERP and business process solutions.', 'ERP', 'Enterprise Resource Planning', 7),

(8, 'Cisco', 'www.cisco.com', 'Cisco provides networking hardware, software, and services.', 'Networking', 'Hardware and Software', 8),

(9, 'Adobe', 'www.adobe.com', 'Adobe specializes in creative software solutions.', 'Design', 'Creative Software', 9),

(10, 'Intel', 'www.intel.com', 'Intel focuses on semiconductor chip manufacturing.', 'Technology', 'Semiconductors', 10),

(11, 'Dell', 'www.dell.com', 'Dell offers hardware, software, and IT services.', 'Technology', 'Hardware Solutions', 11),

(12, 'VMware', 'www.vmware.com', 'VMware provides virtualization and cloud infrastructure software.', 'Cloud Computing', 'Virtualization', 12),

(13, 'HP', 'www.hp.com', 'HP specializes in printers, PCs, and related solutions.', 'Technology', 'Hardware Devices', 13),

(14, 'NVIDIA', 'www.nvidia.com', 'NVIDIA focuses on GPUs and related technologies.', 'Technology', 'Graphics Processing Units', 14),

(15, 'Red Hat', 'www.redhat.com', 'Red Hat provides open-source software solutions.', 'Open Source', 'Software Development', 15);

```
SELECT * FROM [Information_platform]
```

|    | Information_Platform_ID | Vendor_Name         | Vendor_URL           | Product_Company_Description                             | Parent_Category |
|----|-------------------------|---------------------|----------------------|---|-----------------|
| 1  | 1                       | Microsoft           | www.microsoft.com    | Microsoft provides software, hardware, and cloud ser... | Technology      |
| 2  | 2                       | Amazon Web Services | www.aws.amazon.com   | AWS offers cloud computing services.                    | Cloud Computing |
| 3  | 3                       | Google Cloud        | www.cloud.google.com | Google Cloud offers cloud-based solutions and machin... | Cloud Computing |
| 4  | 4                       | IBM                 | www.ibm.com          | IBM focuses on AI, cloud computing, and IT services.    | Technology      |
| 5  | 5                       | Salesforce          | www.salesforce.com   | Salesforce provides CRM and cloud computing software.   | CRM             |
| 6  | 6                       | Oracle              | www.oracle.com       | Oracle specializes in database management systems an... | Database        |
| 7  | 7                       | SAP                 | www.sap.com          | SAP offers ERP and business process solutions.          | ERP             |
| 8  | 8                       | Cisco               | www.cisco.com        | Cisco provides networking hardware, software, and se... | Networking      |
| 9  | 9                       | Adobe               | www.adobe.com        | Adobe specializes in creative software solutions.       | Design          |
| 10 | 10                      | Intel               | www.intel.com        | Intel focuses on semiconductor chip manufacturing.      | Technology      |
| 11 | 11                      | Dell                | www.dell.com         | Dell offers hardware, software, and IT services.        | Technology      |
| 12 | 12                      | VMware              | www.vmware.com       | VMware provides virtualization and cloud infrastruct... | Cloud Computing |
| 13 | 13                      | HP                  | www.hp.com           | HP specializes in printers, PCs, and related solutio... | Technology      |
| 14 | 14                      | NVIDIA              | www.nvidia.com       | NVIDIA focuses on GPUs and related technologies.        | Technology      |
| 15 | 15                      | Red Hat             | www.redhat.com       | Red Hat provides open-source software solutions.        | Open Source     |

-- Inserting into Firmographics table

```
INSERT INTO Firmographics (Firmo_Information_Platform_ID, Vendor_Company_Count,  
Vendor_Six_Months_Change, Vendor_Rating, Information_Platform_ID)
```

VALUES

(1, 5000, 200, 4.8, 1), -- Microsoft

(2, 7500, 300, 4.5, 2), -- Amazon Web Services

(3, 3000, 150, 4.7, 3), -- Google Cloud

(4, 6000, 250, 4.6, 4), -- IBM

(5, 4500, 180, 4.9, 5), -- Salesforce

(6, 8000, 320, 4.4, 6), -- Oracle

(7, 3500, 140, 4.7, 7), -- SAP

(8, 4000, 160, 4.8, 8), -- Cisco

(9, 5500, 220, 4.5, 9), -- Adobe

(10, 7000, 280, 4.3, 10), -- Intel

(11, 6500, 260, 4.6, 11), -- Dell

(12, 9000, 360, 4.2, 12), -- VMware

(13, 4200, 170, 4.9, 13), -- HP

(14, 4800, 190, 4.8, 14), -- NVIDIA

(15, 5200, 210, 4.7, 15); -- Red Hat

**SELECT \* FROM [Firmographics]**

|    | Firmo_Information_Platform_ID | Vendor_Company_Count | Vendor_Six_Months_Change | Vendor_Rating | Information_Platform_ID |
|----|-------------------------------|----------------------|--------------------------|---------------|-------------------------|
| 1  | 1                             | 5000                 | 200                      | 4.80          | 1                       |
| 2  | 2                             | 7500                 | 300                      | 4.50          | 2                       |
| 3  | 3                             | 3000                 | 150                      | 4.70          | 3                       |
| 4  | 4                             | 6000                 | 250                      | 4.60          | 4                       |
| 5  | 5                             | 4500                 | 180                      | 4.90          | 5                       |
| 6  | 6                             | 8000                 | 320                      | 4.40          | 6                       |
| 7  | 7                             | 3500                 | 140                      | 4.70          | 7                       |
| 8  | 8                             | 4000                 | 160                      | 4.80          | 8                       |
| 9  | 9                             | 5500                 | 220                      | 4.50          | 9                       |
| 10 | 10                            | 7000                 | 280                      | 4.30          | 10                      |
| 11 | 11                            | 6500                 | 260                      | 4.60          | 11                      |
| 12 | 12                            | 9000                 | 360                      | 4.20          | 12                      |
| 13 | 13                            | 4200                 | 170                      | 4.90          | 13                      |
| 14 | 14                            | 4800                 | 190                      | 4.80          | 14                      |
| 15 | 15                            | 5200                 | 210                      | 4.70          | 15                      |

-- Inserting into Technographics table

```
INSERT INTO Technographics (techno_Information_Platform_ID, Product_Name, Product_URL,  
Product_Ranking_Rating, Companies_Using, Product_Market_Share, Former_Product_Name,  
Previous_Installs, Current_Installs, Information_Platform_ID)
```

VALUES

```
(1, 'Azure Services', 'www.azure.com', 4.7, 150, 20.5, 'Microsoft Cloud', 5000, 5200, 1),  
(2, 'AWS Lambda', 'www.aws.amazon.com/lambda', 4.5, 200, 18.2, 'Amazon EC2', 7500, 7800,  
2),  
(3, 'Google BigQuery', 'www.cloud.google.com/bigquery', 4.8, 120, 15.7, 'Google Cloud  
Datastore', 3000, 3200, 3),  
(4, 'IBM Watson', 'www.ibm.com/watson', 4.6, 180, 21.3, 'IBM DB2', 6000, 6200, 4),  
(5, 'Salesforce CRM', 'www.salesforce.com/crm', 4.9, 250, 30.5, 'Salesforce Sales Cloud', 4500,  
4700, 5),  
(6, 'Oracle Database', 'www.oracle.com/database', 4.4, 210, 27.8, 'Oracle MySQL', 8000, 8300,  
6),  
(7, 'SAP S/4HANA', 'www.sap.com/s4hana', 4.7, 160, 25.0, 'SAP ERP', 3500, 3700, 7),  
(8, 'Cisco Networking', 'www.cisco.com/networking', 4.8, 190, 22.6, 'Cisco Catalyst', 4000, 4200,  
8),  
(9, 'Adobe Creative Cloud', 'www.adobe.com/creativecloud', 4.5, 230, 29.2, 'Adobe Photoshop',  
5500, 5800, 9),  
(10, 'Intel Core Processors', 'www.intel.com/processors', 4.3, 270, 35.0, 'Intel Pentium', 7000,  
7300, 10),  
(11, 'Dell PowerEdge Servers', 'www.dell.com/servers', 4.6, 240, 31.8, 'Dell EMC PowerEdge',  
6500, 6800, 11),
```

(12, 'VMware vSphere', 'www.vmware.com/vsphere', 4.2, 200, 26.5, 'VMware ESXi', 9000, 9200, 12),

(13, 'HP Printers', 'www.hp.com/printers', 4.9, 280, 33.5, 'HP LaserJet', 4200, 4500, 13),

(14, 'NVIDIA GeForce GPUs', 'www.nvidia.com/geforce', 4.8, 260, 28.7, 'NVIDIA Quadro', 4800, 5100, 14),

(15, 'Red Hat Enterprise Linux', 'www.redhat.com/linux', 4.7, 290, 34.2, 'Red Hat Fedora', 5200, 5500, 15);

**SELECT \* FROM [Technographics]**

| 338    SELECT * FROM Technographics |         |                    |                     |                |           |             |                   |         |        |    |  |  |
|-------------------------------------|---------|--------------------|---------------------|----------------|-----------|-------------|-------------------|---------|--------|----|--|--|
| 339                                 | 340     | 341                | 342                 | Messages       |           |             |                   |         |        |    |  |  |
| Results                             |         |                    |                     |                |           |             |                   |         |        |    |  |  |
|                                     | tech... | Product_Name       | Product_URL         | Product_Ran... | Compan... | Product_... | Former_Prod...    | Prev... | Cur... |    |  |  |
| 1                                   | 1       | Azure Services     | www.azure.com       | 4.70           | 150       | 20.50       | Microsoft Cloud   | 5000    | 5200   | 1  |  |  |
| 2                                   | 2       | AWS Lambda         | www.aws.amazon.c... | 4.50           | 200       | 18.20       | Amazon EC2        | 7500    | 7800   | 2  |  |  |
| 3                                   | 3       | Google BigQuery    | www.cloud.google... | 4.80           | 120       | 15.70       | Google Cloud D... | 3000    | 3200   | 3  |  |  |
| 4                                   | 4       | IBM Watson         | www.ibm.com/wats... | 4.60           | 180       | 21.30       | IBM DB2           | 6000    | 6200   | 4  |  |  |
| 5                                   | 5       | Salesforce CRM     | www.salesforce.c... | 4.90           | 250       | 30.50       | Salesforce Sal... | 4500    | 4700   | 5  |  |  |
| 6                                   | 6       | Oracle Database    | www.oracle.com/d... | 4.40           | 210       | 27.80       | Oracle MySQL      | 8000    | 8300   | 6  |  |  |
| 7                                   | 7       | SAP S/4HANA        | www.sap.com/s4ha... | 4.70           | 160       | 25.00       | SAP ERP           | 3500    | 3700   | 7  |  |  |
| 8                                   | 8       | Cisco Networking   | www.cisco.com/ne... | 4.80           | 190       | 22.60       | Cisco Catalyst    | 4000    | 4200   | 8  |  |  |
| 9                                   | 9       | Adobe Creative ... | www.adobe.com/cr... | 4.50           | 230       | 29.20       | Adobe Photoshop   | 5500    | 5800   | 9  |  |  |
| 10                                  | 10      | Intel Core Proc... | www.intel.com/pr... | 4.30           | 270       | 35.00       | Intel Pentium     | 7000    | 7300   | 10 |  |  |
| 11                                  | 11      | Dell PowerEdge ... | www.dell.com/ser... | 4.60           | 240       | 31.80       | Dell EMC Power... | 6500    | 6800   | 11 |  |  |
| 12                                  | 12      | VMware vSphere     | www.vmware.com/v... | 4.20           | 200       | 26.50       | VMware ESXi       | 9000    | 9200   | 12 |  |  |
| 13                                  | 13      | HP Printers        | www.hp.com/print... | 4.90           | 280       | 33.50       | HP LaserJet       | 4200    | 4500   | 13 |  |  |
| 14                                  | 14      | NVIDIA GeForce ... | www.nvidia.com/g... | 4.80           | 260       | 28.70       | NVIDIA Quadro     | 4800    | 5100   | 14 |  |  |
| 15                                  | 15      | Red Hat Enterpr... | www.redhat.com/l... | 4.70           | 290       | 34.20       | Red Hat Fedora    | 5200    | 5500   | 15 |  |  |

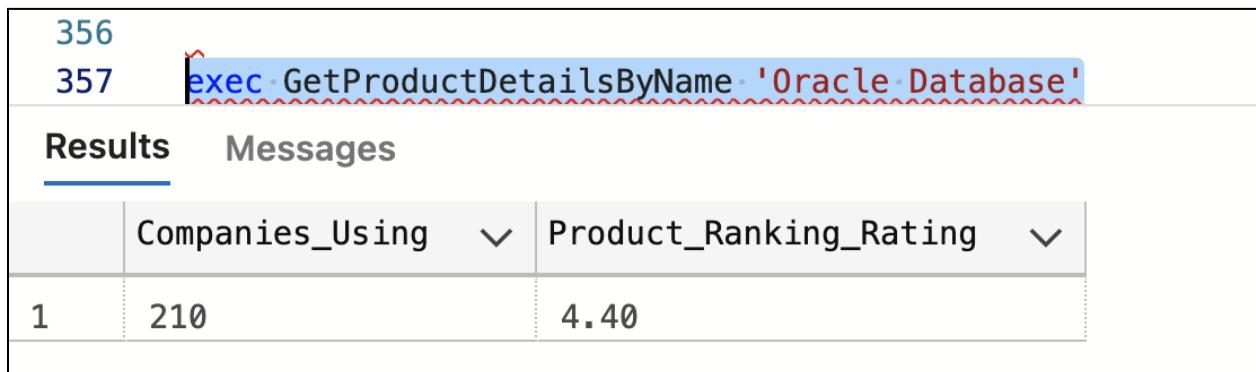
### **3 Stored Procedures:**

-- Stored Procedures

```
-- 1: GetProductDetailsByName  
  
-- Takes product name as input and provides information of the respective product, companies  
using the product, product ranking and rating.
```

```
CREATE PROCEDURE GetProductDetailsByName  
  
@ProductName NVARCHAR(255)  
  
AS  
  
BEGIN  
  
SELECT T.Companies_Using, T.Product_Ranking_Rating  
  
FROM Technographics T  
  
WHERE T.Product_Name = @ProductName  
  
END
```

```
exec GetProductDetailsByName 'Oracle Database'
```



The screenshot shows a SQL query results window. At the top, there are two status indicators: '356' and '357'. Below them is a redacted command line. The interface has tabs for 'Results' and 'Messages', with 'Results' being the active tab. The results table has two columns: 'Companies\_Using' and 'Product\_Ranking\_Rating'. A single row is displayed, showing '210' in the first column and '4.40' in the second column.

|   | Companies_Using | Product_Ranking_Rating |
|---|-----------------|------------------------|
| 1 | 210             | 4.40                   |

```
-- 2: GetUserInfoByEmail
```

```
-- Takes user email as input and gives user's name, contact and region as an output.
```

```
CREATE PROCEDURE GetUserInfoByEmail
```

```
@UserEmail NVARCHAR(255)
```

```
AS
```

```
BEGIN
```

```
SELECT
```

```
User_Name AS UserName,
```

```
User_Contact AS UserContact,
```

```
User_Region AS UserRegion
```

```
FROM [User]
```

```
WHERE User_Email = @UserEmail
```

```
END
```

```
EXEC GetUserInfoByEmail 'alice@example.com'
```

| 375                        | EXEC GetUserInfoByEmail 'alice@example.com'   |              |               |              |             |   |               |              |               |
|----------------------------|---|--------------|---------------|--------------|-------------|---|---------------|--------------|---------------|
| 376                        | ~   |              |               |              |             |   |               |              |               |
| 377                        | ~   |              |               |              |             |   |               |              |               |
| 378                        | ~   |              |               |              |             |   |               |              |               |
| <b>Results    Messages</b> |   |              |               |              |             |   |               |              |               |
|                            | <table border="1"><thead><tr><th></th><th>User Name</th><th>User Contact</th><th>User Region</th></tr></thead><tbody><tr><td>1</td><td>Alice Johnson</td><td>123-456-7890</td><td>North America</td></tr></tbody></table> |              | User Name     | User Contact | User Region | 1 | Alice Johnson | 123-456-7890 | North America |
|                            | User Name   | User Contact | User Region   |              |             |   |               |              |               |
| 1                          | Alice Johnson   | 123-456-7890 | North America |              |             |   |               |              |               |

```
-- 3: GetVendorDetails
```

```
-- Takes Vendor Name as an input and provides vendor url, and product/company description.
```

```
CREATE PROCEDURE GetVendorDetails
    @VendorName NVARCHAR(255)
AS
BEGIN
    DECLARE @VendorURL NVARCHAR(255),
            @CompanyDescription NVARCHAR(MAX)

    SELECT @VendorURL = Vendor_URL,
           @CompanyDescription = CONVERT(NVARCHAR(MAX), Product_Company_Description)
    FROM Information_platform
    WHERE Vendor_Name = @VendorName

    IF (@VendorURL IS NULL AND @CompanyDescription IS NULL)
        BEGIN
            SELECT 'Invalid Name' AS Result
        END
    ELSE
        BEGIN
            SELECT @VendorURL AS VendorURL,
                   @CompanyDescription AS CompanyDescription
        END
END
```

```
exec GetVendorDetails 'Microsoft'
```

|     |                                   |
|-----|-----------------------------------|
| 414 | exec GetVendorDetails 'Microsoft' |
| 415 | ~                                 |
| 416 | ~                                 |
| 417 | ~                                 |
| 418 | ~                                 |
| 419 | ~                                 |

**Results**   [Messages](#)

|   | VendorURL         | CompanyDescription                                      |
|---|-------------------|---|
| 1 | www.microsoft.com | Microsoft provides software, hardware, and cloud ser... |

### 3 Views :

-- views

-- 1: VendorDetailsView

-- Provides all the related information from Information platform:

```
CREATE VIEW VendorDetailsView AS
```

```
SELECT
```

```
IP.Information_Platform_ID,
```

```
IP.Vendor_Name,
```

```
IP.Vendor_URL,
```

```
IP.Product_Company_Description,
```

```

IP.Parent_Category,
IP.Sub_Category,
FG.Vendor_Company_Count,
FG.Vendor_Six_Months_Change,
FG.Vendor_Rating
FROM Information_platform IP
LEFT JOIN Firmographics FG ON IP.Information_Platform_ID = FG.Information_Platform_ID;

```

`select * from VendorDetailsView`

|    | Information_Platform_ID | Vendor_Name         | Vendor_URL           | Product_Company_Description                             | Parent_Category |
|----|-------------------------|---------------------|----------------------|---|-----------------|
| 1  | 1                       | Microsoft           | www.microsoft.com    | Microsoft provides software, hardware, and cloud ser... | Technology      |
| 2  | 2                       | Amazon Web Services | www.aws.amazon.com   | AWS offers cloud computing services.                    | Cloud Computing |
| 3  | 3                       | Google Cloud        | www.cloud.google.com | Google Cloud offers cloud-based solutions and machin... | Cloud Computing |
| 4  | 4                       | IBM                 | www.ibm.com          | IBM focuses on AI, cloud computing, and IT services.    | Technology      |
| 5  | 5                       | Salesforce          | www.salesforce.com   | Salesforce provides CRM and cloud computing software.   | CRM             |
| 6  | 6                       | Oracle              | www.oracle.com       | Oracle specializes in database management systems an... | Database        |
| 7  | 7                       | SAP                 | www.sap.com          | SAP offers ERP and business process solutions.          | ERP             |
| 8  | 8                       | Cisco               | www.cisco.com        | Cisco provides networking hardware, software, and se... | Networking      |
| 9  | 9                       | Adobe               | www.adobe.com        | Adobe specializes in creative software solutions.       | Design          |
| 10 | 10                      | Intel               | www.intel.com        | Intel focuses on semiconductor chip manufacturing.      | Technology      |
| 11 | 11                      | Dell                | www.dell.com         | Dell offers hardware, software, and IT services.        | Technology      |
| 12 | 12                      | VMware              | www.vmware.com       | VMware provides virtualization and cloud infrastruct... | Cloud Computing |
| 13 | 13                      | HP                  | www.hp.com           | HP specializes in printers, PCs, and related solutio... | Technology      |
| 14 | 14                      | NVIDIA              | www.nvidia.com       | NVIDIA focuses on GPUs and related technologies.        | Technology      |

-- 2: UserInvoiceView

-- Provides the Invoice for a particular desired user

`CREATE VIEW UserInvoiceView AS`

**SELECT**

U.User\_ID,  
U.User\_Name,  
U.User\_Email,  
U.User\_Contact,  
U.User\_Region,  
I.Invoice\_ID,  
I.Invoice\_Amount,  
I.Applied\_Discount,  
I.Invoice\_Date,  
I.Subscription\_Duration,  
I.Subscription\_end\_date

**FROM** [User] U

**INNER JOIN** Invoice I **ON** U.User\_ID = I.User\_ID;

**select \* from** UserInvoiceView

| 468 | select * from UserInvoiceView |                 |                      |              |               |            |                |                  |
|-----|-------------------------------|-----------------|----------------------|--------------|---------------|------------|----------------|------------------|
| 469 | ~                             |                 |                      |              |               |            |                |                  |
| 470 | ~                             |                 |                      |              |               |            |                |                  |
| 471 |                               |                 |                      |              |               |            |                |                  |
|     | Results Messages              |                 |                      |              |               |            |                |                  |
|     | User_ID                       | User_Name       | User_Email           | User_Contact | User_Region   | Invoice_ID | Invoice_Amount | Applied_Discount |
| 1   | 1                             | Alice Johnson   | alice@example.com    | 123-456-7890 | North America | 1          | 100.00         | 10.00            |
| 2   | 2                             | Bob Smith       | bob@example.com      | 987-654-3210 | Europe        | 2          | 150.00         | 15.00            |
| 3   | 3                             | Charlie Brown   | charlie@example.com  | 456-789-0123 | Asia          | 3          | 200.00         | 20.00            |
| 4   | 4                             | Diana Rodriguez | diana@example.com    | 789-012-3456 | South America | 4          | 120.00         | 12.00            |
| 5   | 5                             | Eleanor Parker  | eleanor@example.com  | 321-654-9870 | Africa        | 5          | 180.00         | 18.00            |
| 6   | 6                             | Franklin Lee    | franklin@example.com | 555-555-5555 | Australia     | 6          | 220.00         | 22.00            |
| 7   | 7                             | Grace Miller    | grace@example.com    | 777-888-9999 | Europe        | 7          | 130.00         | 13.00            |
| 8   | 8                             | Henry Wilson    | henry@example.com    | 111-222-3333 | North America | 8          | 170.00         | 17.00            |
| 9   | 9                             | Isabella Kim    | isabella@example.com | 444-555-6666 | Asia          | 9          | 190.00         | 19.00            |
| 10  | 10                            | Jack Thompson   | jack@example.com     | 666-777-8888 | North America | 10         | 110.00         | 11.00            |
| 11  | 11                            | Karen Garcia    | karen@example.com    | 999-000-1111 | South America | 11         | 140.00         | 14.00            |
| 12  | 12                            | Liam Davis      | liam@example.com     | 222-333-4444 | Europe        | 12         | 160.00         | 16.00            |
| 13  | 13                            | Mia Martinez    | mia@example.com      | 333-444-5555 | Asia          | 13         | 230.00         | 23.00            |
| 14  | 14                            | Noah Hernandez  | noah@example.com     | 444-555-6666 | Africa        | 14         | 200.00         | 20.00            |
| 15  | 15                            | Olivia Gonzalez | olivia@example.com   | 555-666-7777 | Australia     | 15         | 250.00         | 25.00            |

### --3: FirmographicsView

-- Provides corresponding Firmographics information along with data selected from Information Platform.

CREATE VIEW FirmographicsView AS

SELECT

F.Firmo\_Information\_Platform\_ID,

F.Vendor\_Company\_Count,

F.Vendor\_Six\_Months\_Change,

F.Vendor\_Rating,

I.Vendor\_Name,

I.Vendor\_URL,

I.Product\_Company\_Description,

I.Parent\_Category,

I.Sub\_Category

```
FROM Firmographics F  
JOIN Information_platform I ON F.Information_Platform_ID = I.Information_Platform_ID;
```

```
select * from FirmographicsView
```

|    | Firmo_Information_Platform_ID | Vendor_Company_Count | Vendor_Six_Months_Change | Vendor_Rating | Vendor_Name         | Vendor_URL           |
|----|-------------------------------|----------------------|--------------------------|---------------|---------------------|----------------------|
| 1  | 1                             | 5000                 | 200                      | 4.80          | Microsoft           | www.microsoft.com    |
| 2  | 2                             | 7500                 | 300                      | 4.50          | Amazon Web Services | www.aws.amazon.com   |
| 3  | 3                             | 3000                 | 150                      | 4.70          | Google Cloud        | www.cloud.google.com |
| 4  | 4                             | 6000                 | 250                      | 4.60          | IBM                 | www.ibm.com          |
| 5  | 5                             | 4500                 | 180                      | 4.90          | Salesforce          | www.salesforce.com   |
| 6  | 6                             | 8000                 | 320                      | 4.40          | Oracle              | www.oracle.com       |
| 7  | 7                             | 3500                 | 140                      | 4.70          | SAP                 | www.sap.com          |
| 8  | 8                             | 4000                 | 160                      | 4.80          | Cisco               | www.cisco.com        |
| 9  | 9                             | 5500                 | 220                      | 4.50          | Adobe               | www.adobe.com        |
| 10 | 10                            | 7000                 | 280                      | 4.30          | Intel               | www.intel.com        |
| 11 | 11                            | 6500                 | 260                      | 4.60          | Dell                | www.dell.com         |
| 12 | 12                            | 9000                 | 360                      | 4.20          | VMware              | www.vmware.com       |
| 13 | 13                            | 4200                 | 170                      | 4.90          | HP                  | www.hp.com           |
| 14 | 14                            | 4800                 | 190                      | 4.80          | NVIDIA              | www.nvidia.com       |
| 15 | 15                            | 5200                 | 210                      | 4.70          | Red Hat             | www.redhat.com       |

### DML Trigger:

```
-- DML trigger
```

-- If there are any updates made to the original Information platform table, this trigger will add all the original data to a seperate table so that the logs of pre-change can be preserved.

```
CREATE TRIGGER trgInformationPlatformHistory
```

```
ON Information_platform
```

```
AFTER UPDATE
```

```
AS
```

```
BEGIN
```

```
    INSERT INTO InformationPlatform_History (Information_Platform_ID, Vendor_Name,  
    Vendor_URL, Parent_Category, Sub_Category, UpdateDateTime)
```

```
        SELECT d.Information_Platform_ID, d.Vendor_Name, d.Vendor_URL, d.Parent_Category,  
        d.Sub_Category, GETDATE()
```

```
    FROM deleted d;
```

```
END;
```

```
501 DML Trigger:  
502 -- DML_trigger  
503 If there are any updates made to the original Information platform table, this trigger will add all the original data to a seperate table so that t  
504 CREATE TRIGGER trgInformationPlatformHistory  
505 ON Information_platform  
506 AFTER UPDATE  
507 AS  
508 BEGIN  
509     INSERT INTO InformationPlatform_History (Information_Platform_ID, Vendor_Name, Vendor_URL, Parent_Category, Sub_Category, UpdateDateTime)  
510     SELECT d.Information_Platform_ID, d.Vendor_Name, d.Vendor_URL, d.Parent_Category, d.Sub_Category, GETDATE()  
511     FROM deleted d;  
512 END;  
513 ~  
514 ~  
515 ~
```

Messages

18:21:52 Started executing query at Line 502  
Commands completed successfully.  
Total execution time: 00:00:00.006

### 3 Table level CHECK Constraints:

-- Table-level CHECK Constraints

--1:

-- This CHECK Constraints check if the User Rating is between 1 and 5, when there are any inserts or changes made to the data.

```
ALTER TABLE Feedback_Platform
```

```
ADD CONSTRAINT CHK_User_Rating
```

```
CHECK (User_Rating BETWEEN 1 AND 5);
```

The screenshot shows a SQL query window with two sections: 'Text' and 'Messages'. In the 'Text' section, lines 521 through 527 are displayed. Line 521 contains a comment '--1:'. Lines 522 through 527 show the SQL command to alter the 'Feedback\_Platform' table, add a constraint named 'CHK\_User\_Rating', and define it with a CHECK clause that restricts the 'User\_Rating' column to values between 1 and 5. In the 'Messages' section, the timestamp '18:22:34' is followed by the message 'Started executing query at Line 522', 'Commands completed successfully.', and 'Total execution time: 00:00:00.010'.

```
521 --1:  
522 -- This CHECK Constraints check if the User Rating is between 1 and 5, when there are any inserts or changes made to the data.  
523 ALTER TABLE Feedback_Platform  
524 ADD CONSTRAINT CHK_User_Rating  
525 CHECK (User_Rating BETWEEN 1 AND 5);  
526  
527
```

Messages

18:22:34 Started executing query at Line 522  
Commands completed successfully.  
Total execution time: 00:00:00.010

--2:

-- This CHECK Constraints check if the Invoice Amount entered is greater than value 1.

ALTER TABLE Invoice

ADD CONSTRAINT CHK\_Invoice\_Amount

CHECK (Invoice\_Amount > 1);

```
530 --2:  
531 -- This CHECK Constraints check if the Invoice Amount entered is greater than value 1.  
532 ALTER TABLE Invoice  
533 ADD CONSTRAINT CHK_Invoice_Amount  
534 CHECK (Invoice_Amount > 1);  
535  
536
```

Messages

18:23:03 Started executing query at Line 532  
Commands completed successfully.  
Total execution time: 00:00:00.010

--3:

-- This CHECK Constraints will make sure that the length of password selected is greater than eight characters.

ALTER TABLE User\_Credentials

ADD CONSTRAINT CHK\_User\_Password\_Length

CHECK (LEN(User\_Password) >= 8);

```
537 --3:  
538 -- This CHECK Constraints will make sure that the length of password selected is greater than eight characters.  
539 ALTER TABLE User_Credentials  
540 ADD CONSTRAINT CHK_User_Password_Length  
541 CHECK (LEN(User_Password) >= 8);  
542  
543  
544  
545
```

Messages

18:23:24 Started executing query at Line 539  
Commands completed successfully.  
Total execution time: 00:00:00.013

## User Defined Function (UDF):

-- user defined function (UDF)

-- This UDF calculates TAX for a provided Invoice Amount, Formula: Tax = Amount \* 0.1.

```
CREATE FUNCTION dbo.CalculateTax(@Amount DECIMAL(18,2))
```

```
RETURNS DECIMAL(18,2)
```

```
AS
```

```
BEGIN
```

```
DECLARE @Tax DECIMAL(18,2)
```

-- Perform tax calculation logic based on the amount

-- Replace this with your actual tax calculation logic

```
SET @Tax = @Amount * 0.1; -- Example: Tax rate is 10%
```

```
RETURN @Tax;
```

```
END;
```

```
ALTER TABLE Invoice
```

```
ADD TaxAmount AS dbo.CalculateTax(Invoice_Amount); -- Assuming Invoice_Amount is used for  
tax calculation
```

```
select * from Invoice
```

The screenshot shows a SQL query results window. At the top, there are three lines of SQL code: '571 select \* from Invoice', '572', and '573'. Below this is a 'Results' tab and a 'Messages' tab. The 'Results' tab displays a table with 10 rows of data. The columns are labeled: e\_ID, Invoice\_Amount, Applied\_Discount, Invoice\_Date, Subscription\_Duration, Subscription\_end\_date, User\_ID, and TaxAmount. The data is as follows:

| e_ID   | Invoice_Amount | Applied_Discount | Invoice_Date | Subscription_Duration | Subscription_end_date | User_ID | TaxAmount |
|--------|----------------|------------------|--------------|-----------------------|-----------------------|---------|-----------|
| 150.00 | 15.00          | 2023-02-05       | 6            | 2023-08-05            | 2                     | 15.00   |           |
| 200.00 | 20.00          | 2023-03-10       | 3            | 2023-06-10            | 3                     | 20.00   |           |
| 120.00 | 12.00          | 2023-04-15       | 9            | 2024-01-15            | 4                     | 12.00   |           |
| 180.00 | 18.00          | 2023-05-20       | 6            | 2023-11-20            | 5                     | 18.00   |           |
| 220.00 | 22.00          | 2023-06-25       | 12           | 2024-06-25            | 6                     | 22.00   |           |
| 130.00 | 13.00          | 2023-07-30       | 6            | 2024-01-30            | 7                     | 13.00   |           |
| 170.00 | 17.00          | 2023-08-04       | 3            | 2023-11-04            | 8                     | 17.00   |           |
| 190.00 | 19.00          | 2023-09-12       | 6            | 2024-03-12            | 9                     | 19.00   |           |
| 110.00 | 11.00          | 2023-10-18       | 12           | 2024-10-18            | 10                    | 11.00   |           |

### Column Data Encryption:

-- Column Data Encryption

-- This will encrypt the column where the user passwords are stored and creates a new column with the encrypted column.

USE Techno\_Firmo\_Intelligence\_Platform;

CREATE MASTER KEY ENCRYPTION BY PASSWORD = 'projectpassword';

CREATE CERTIFICATE ChinmayCertificate

WITH SUBJECT = 'User\_Password Encryption Certificate';

CREATE SYMMETRIC KEY SymmetricKey

WITH ALGORITHM = AES\_256

ENCRYPTION BY CERTIFICATE ChinmayCertificate;

```
ALTER TABLE User_Credentials
```

```
ADD Encrypted_Password VARBINARY(MAX); --altering table first to add encrypted_password column
```

```
OPEN SYMMETRIC KEY SymmetricKey
```

```
DECRYPTION BY CERTIFICATE ChinmayCertificate;
```

```
UPDATE User_Credentials
```

```
SET Encrypted_Password = ENCRYPTBYKEY(KEY_GUID('SymmetricKey'), User_Password);
```

```
CLOSE SYMMETRIC KEY SymmetricKey;
```

```
SELECT User_Password, Encrypted_Password
```

```
FROM User_Credentials;
```

|    | User_Password | Encrypted_Password                                   |
|----|---------------|--|
| 1  | Password1     | 0x00B0EE3E4743184F845F715904068F21020000004D8D068... |
| 2  | Password2     | 0x00B0EE3E4743184F845F715904068F210200000047650C5... |
| 3  | Password3     | 0x00B0EE3E4743184F845F715904068F2102000000999D2EC... |
| 4  | Password4     | 0x00B0EE3E4743184F845F715904068F2102000000E9315SF... |
| 5  | Password5     | 0x00B0EE3E4743184F845F715904068F21020000009BF9BF2... |
| 6  | Password6     | 0x00B0EE3E4743184F845F715904068F210200000013112E9... |
| 7  | Password7     | 0x00B0EE3E4743184F845F715904068F21020000007238121... |
| 8  | Password8     | 0x00B0EE3E4743184F845F715904068F210200000011526BE... |
| 9  | Password9     | 0x00B0EE3E4743184F845F715904068F2102000000AB7B1E...  |
| 10 | Password10    | 0x00B0EE3E4743184F845F715904068F2102000000B0D7CC...  |
| 11 | Password11    | 0x00B0EE3E4743184F845F715904068F2102000000CCA0429... |
| 12 | Password12    | 0x00B0EE3E4743184F845F715904068F21020000002768797... |
| 13 | Password13    | 0x00B0EE3E4743184F845F715904068F210200000046950D5... |
| 14 | Password14    | 0x00B0EE3E4743184F845F715904068F2102000000F325949... |
| 15 | Password15    | 0x00B0EE3E4743184F845F715904068F21020000004620913... |

## Non - Clustered Indexes:

-- non-clustered indexes

-- 1

-- This index can enhance search performance when querying based on the User\_Region column in the User table.

```
CREATE NONCLUSTERED INDEX IX_User_Region ON [User] (User_Region);
```

-- 2

-- This index can improve search efficiency when filtering or searching by the Vendor\_Name column in the Information\_platform table.

```
CREATE NONCLUSTERED INDEX IX_Vendor_Name ON Information_platform (Vendor_Name);
```

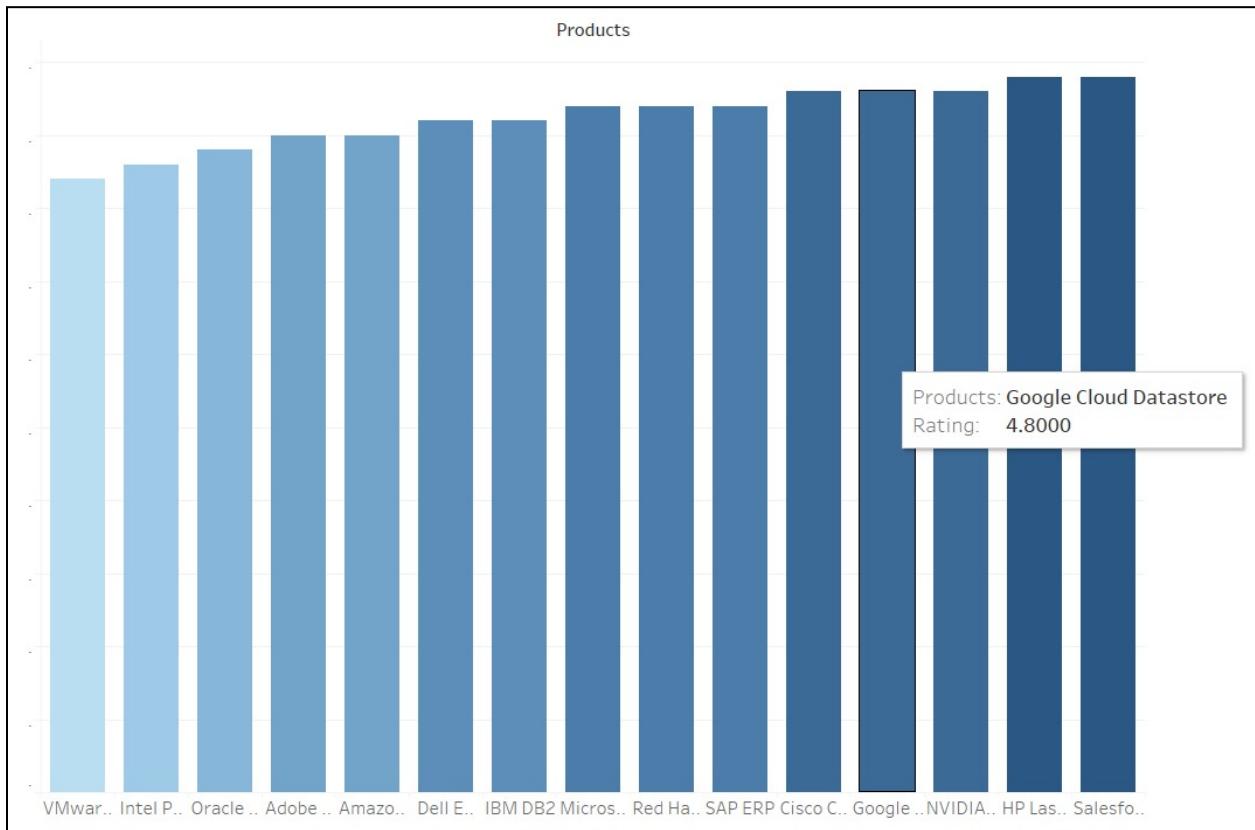
-- 3

-- This index can boost query performance when querying by the Product\_Name column in the Technographics table.

```
CREATE NONCLUSTERED INDEX IX_Product_Name ON Technographics (Product_Name);
```

### Visualization using Tableau:

This bar chart represents Products and the corresponding ratings given by users.

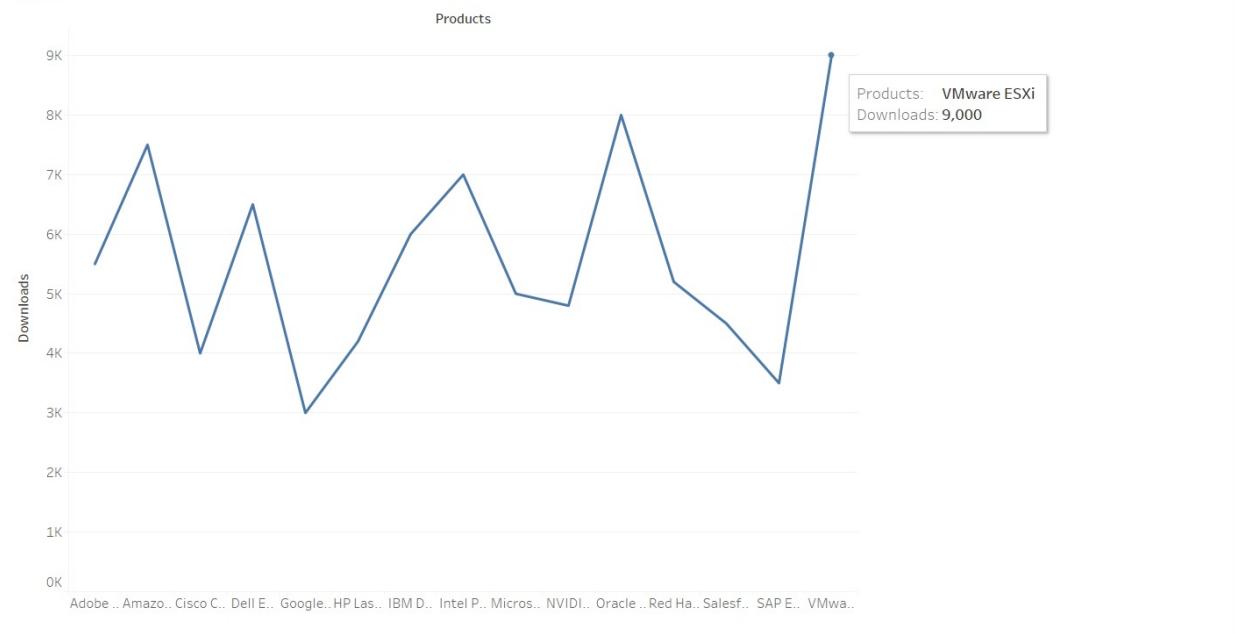


This Pie Chart shows the number of employees working for a specific Vendor.



This Line Graph shows the surge in downloads of a specific Product and compares it to the other available products.

Sheet 3



**Thank You**