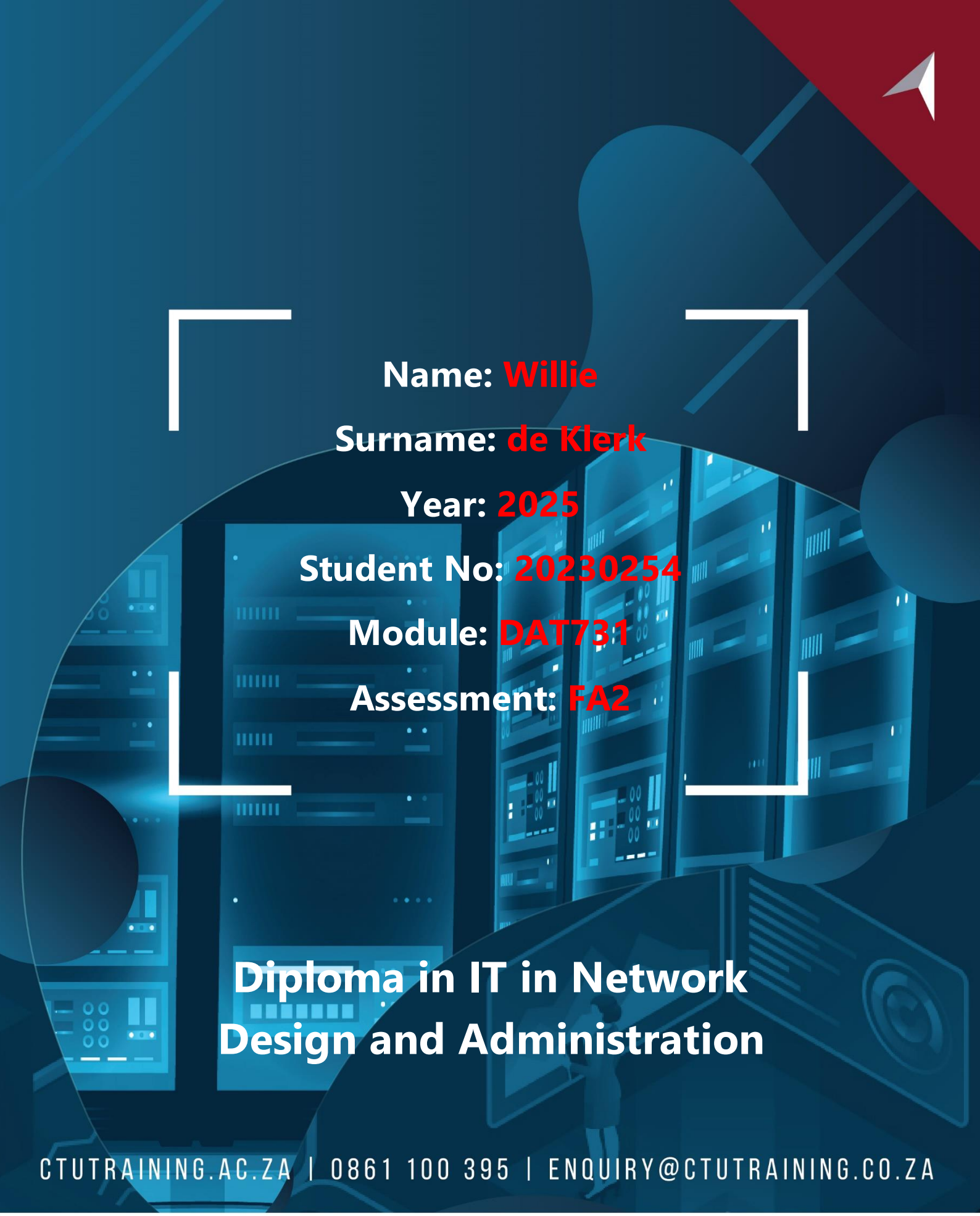

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Assessment: FA2

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A critical aspect of any assignment is *authenticity*. Because you are completing much of the work for the assignments *unsupervised*, the examiner must be convinced that it is all your work. For this reason, you must complete the *Declaration of Authenticity* provided in the study guide and have it counter-signed by your manager, mentor, or lecturer.

NB	The declaration of authenticity is a legal document, and if found that you have made a false declaration, then not only will your results be declared null and void, but you could also have criminal charges brought against you. It is not worth taking the risk!

s

Please complete the declaration of authenticity below for all assignments:

DECLARATION OF AUTHENTICITY

I _____(Willie de Klerk)_____ hereby

declare that the contents of this assignment are entirely my work except for the following documents: (List the documents and page numbers of work in this portfolio that were generated in a group)

Activity	Date
Formative Assessment [2]	

2025/04/27

X 

20230254
student
Signed by: 7e38ac48-8902-42d6-b32e-8740bcbddb0d

Signature: _____ _____ **Date:** **_____2025/04/27_____**

Contents

2. Introduction

Microsoft SQL Server provides a comprehensive suite of tools for advanced data modelling and data analysis and reporting.

As per Section A of my DAT731 FA2 Formative Assignment I am required to conduct research with regards to the following and produce a report:

A. You are tasked with creating a sales performance report for your company using SQL Server Reporting Services (SRSS). Describe the steps you would take to design, deploy, and manage this report. Include details on data sources, report design, and deployment strategies. [15]
B. You are required to store customer data in JSON format within SQL Server. Write a SQL query to insert a JSON object into a table and another query to extract specific fields from the JSON data. Additionally, describe how you would use SQL Server Graph Databases to model and query relationships between customers and their transactions. [15]

3. Methods

3.1 Research platforms used

On my journey to understanding the various concepts required for producing the report I have made use of our prescribed textbooks outlined in our study guide for this module. Additionally, I may have made use of more books, also used official documentation, and tools from Microsoft to perform the tasks presented in my results.

3.2 Documentation methods, processes and tools used

My report follows the format of an academic report. To produce my references I have made use of the Harvard Angilia 2008 citation style. Tools used include the Microsoft SQL Server Management studio 20, with SQL Shades (SQL Shades, n.d.) (Reference explains why my query results screenshot is dark mode and not normal light mode.) , I made use of an Evaluation edition of Microsoft Report Server v16.0.1117.32 Report Builder v15.0.20283.0

4. Results

4.1 Creating a sales performance report using SQL Server Reporting Services (SRSS).

In my example, I will be utilizing the WideWorldImporters database.

Downloading the Microsoft WideWorldImporters Database: (microsoft, 2025)

Downloading Microsoft SQL Server 2022 Reporting Services at the referenced site: (microsoft, 2025)

Downloading Report Builder: (microsoft, 2025)

In reality, my design would depend on the environment that I am in and what our requirements are, what data we are working with and performance considerations. After all, having a query that consumes a bunch of processing time might not be in the best interest of the company if we have client transactions that would be better suited towards taking on the processing time.

4.1.1 Adding my SQL Server as a data source.

On the Web Portal URL configured within my Report Server Configuration manager, I would login using my windows username and password. After successful logon, I would then navigate +New Fold down menu. I would then select New Data source.

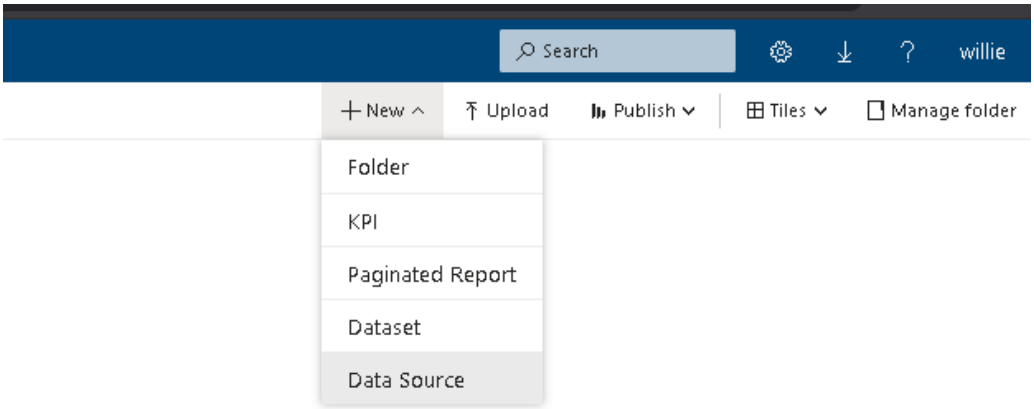

Figure 1 Navigating through the +New dropdown menu and selecting Data Source to create a new data source via the web portal URL configured in Report Server Configuration Manager.

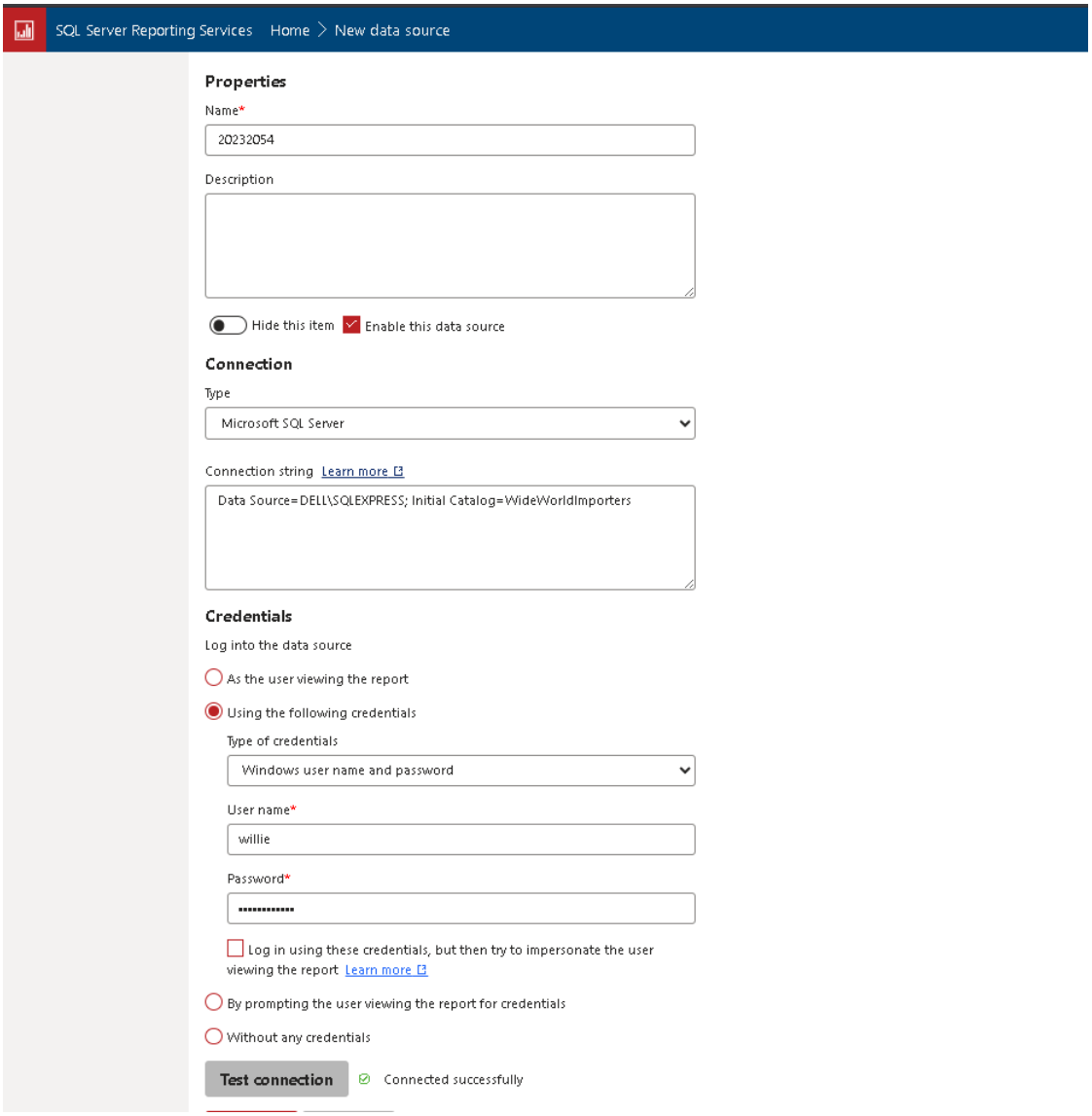

Figure 2 Adding my new Microsoft SQL Server Data source to SQL Server Reporting Services, utilizing windows authentication with my username and password. Connection was also tested, and it the test indicated a successful connection.

4.1.2 Creating my Report.

In the pursuit of creating my report, I designed a basic report within the Report Builder for a paginated report. This report contains an SQL string that queries the database of the fictional company WideWorldImporters.

I retrieve the top 5 most valuable clients; this may be realistic of expectations in a corporate working environment. Keeping the top clients keen an interested through stakeholder engagement is a keyway in keeping businesses thriving.

	Customer	Total Sales
1	Wingtip Toys (Head Office)	97053.58
2	Tailspin Toys (Head Office)	56435.84
3	Kumar Naicker	13212.12
4	Linh Dao	6728.65
5	Rodrigo Figueiredo	5975.40

```
/*
Willie de Klerk 20230254@ctucareer.co.za

DAT731 FA2 Section A Question A.

*/
Use WideWorldImporters;

SELECT TOP 5 Customers.CustomerName as Customer ,
SUM(Sales.CustomerTransactions.TransactionAmount) as 'Total Sales'  FROM
Sales.CustomerTransactions
            JOIN Sales.Customers  ON Sales.CustomerTransactions.CustomerID =
Sales.Customers.CustomerID GROUP BY Sales.Customers.CustomerName ORDER BY
SUM(TransactionAmount) DESC;
```

With this in mind, lets proceed with he creation of my paginated report, with the procedure being described in the following pages.

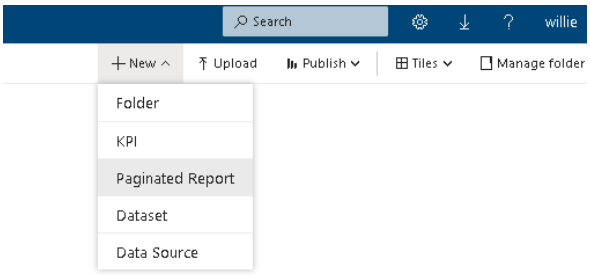

Figure 3 Navigating through the +New dropdown menu and selecting Paginated Report to create a report. It will then open the report builder. Screenshot from the web portal URL configured in Report Server Configuration Manager.

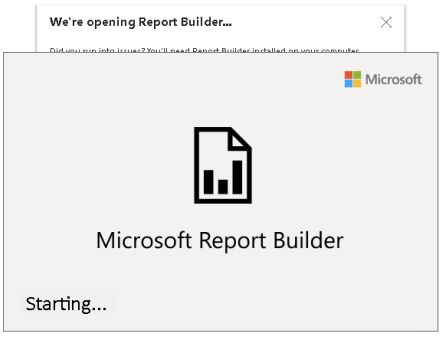

Figure 4 Opening Report Builder.

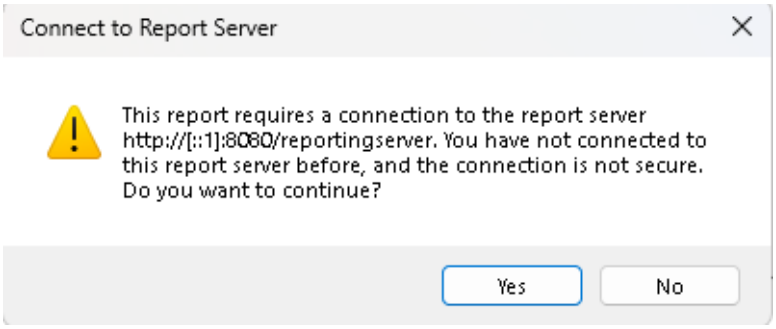

Figure 5 Clicking Yes on the warning about the connection being to a new report server that is on http instead of https.

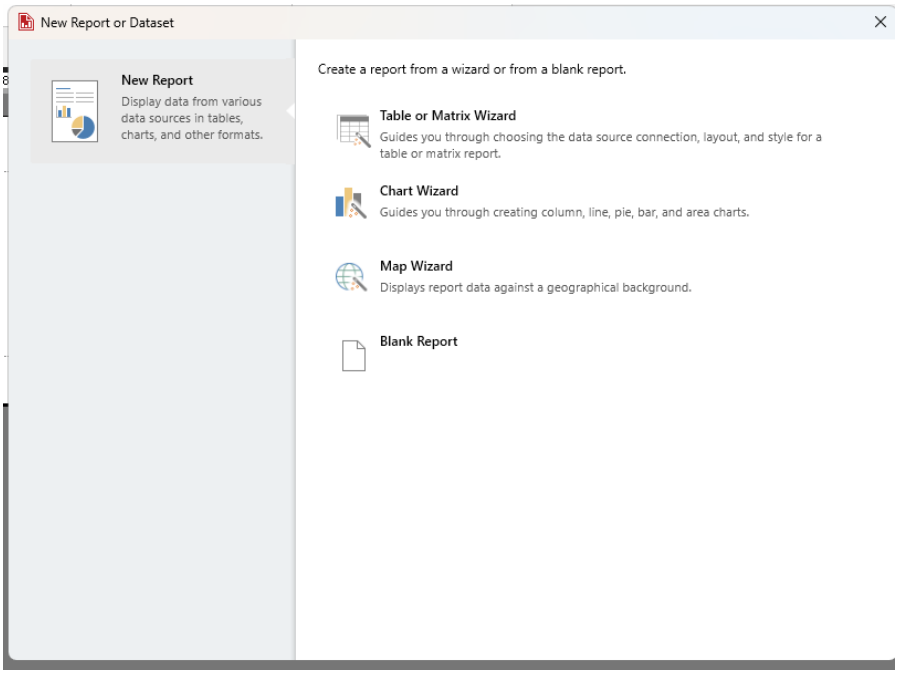

Figure 6 Creating a new report, selecting to start a new blank report.

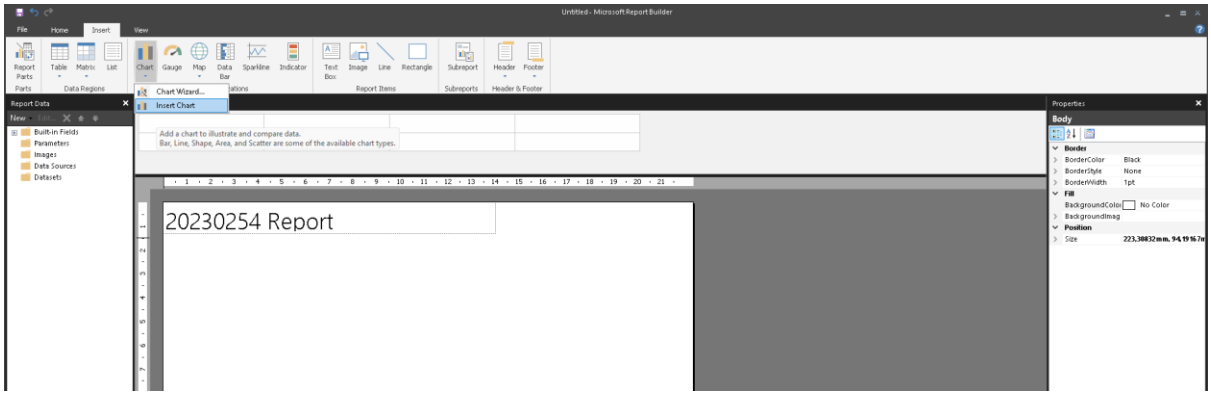

Figure 7 After changing the default title, I am inserting a chart.

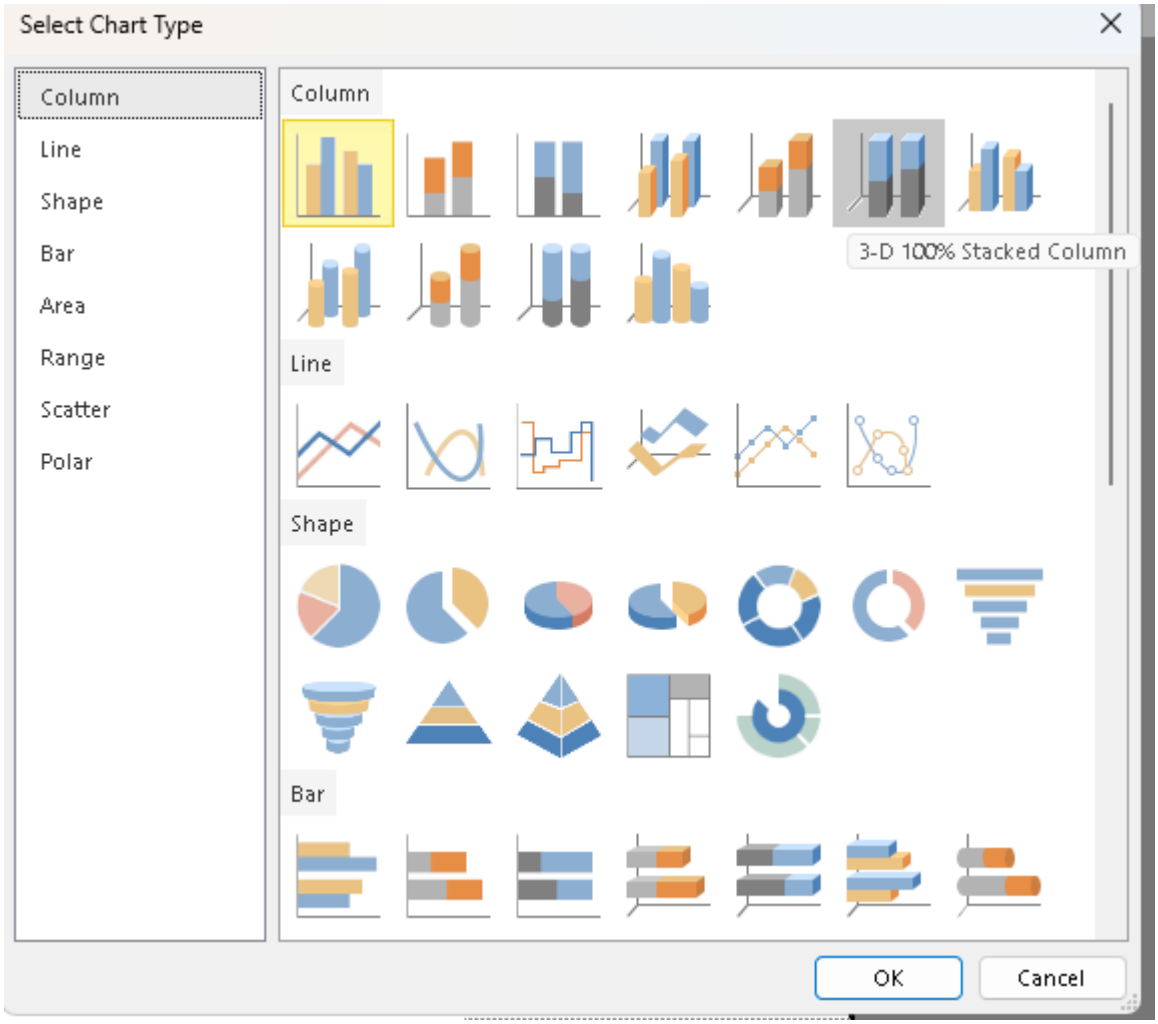

Figure 8 Choosing a Column Chart

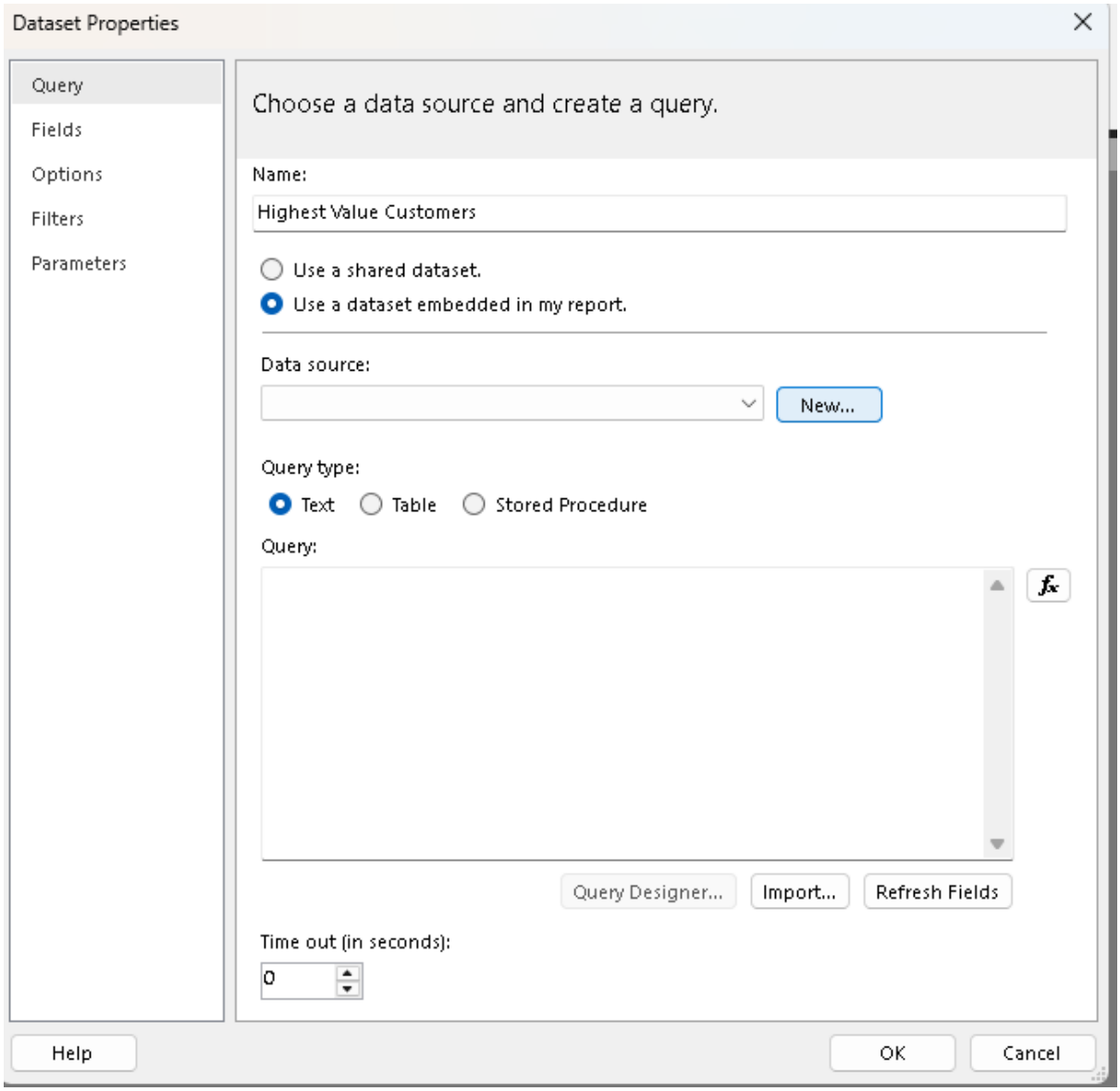

Figure 9 Next popup window after making the choice of the chart in figure 8. I now have to create my data source.

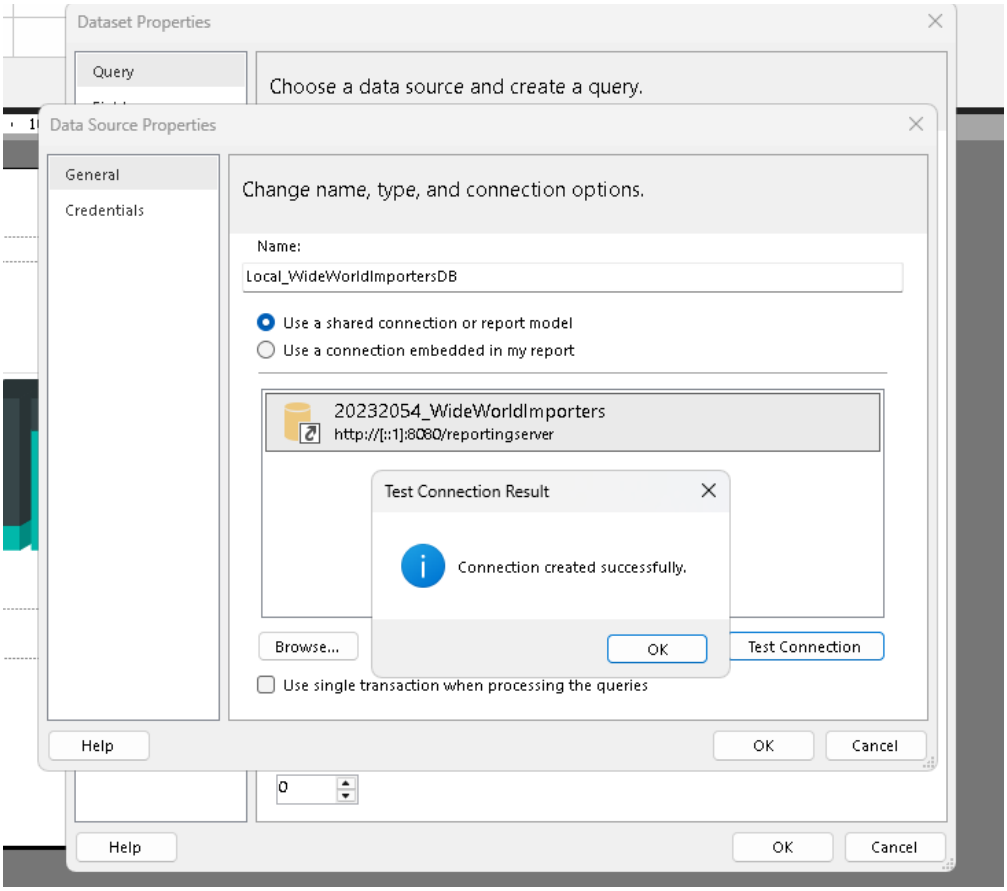

Figure 10 Next window after figure 9, where I have to define the properties of my data source. This includes giving it a name and selecting between using a shared connection or report model or using a connection embedded in my repot.

I went with the Use a shared connection or report model option. After which I saw my data source that I defined in *4.4.1 Adding my SQL Server as a Data Source*. I performed a connection test. The result indicated that the connection was created successfully.

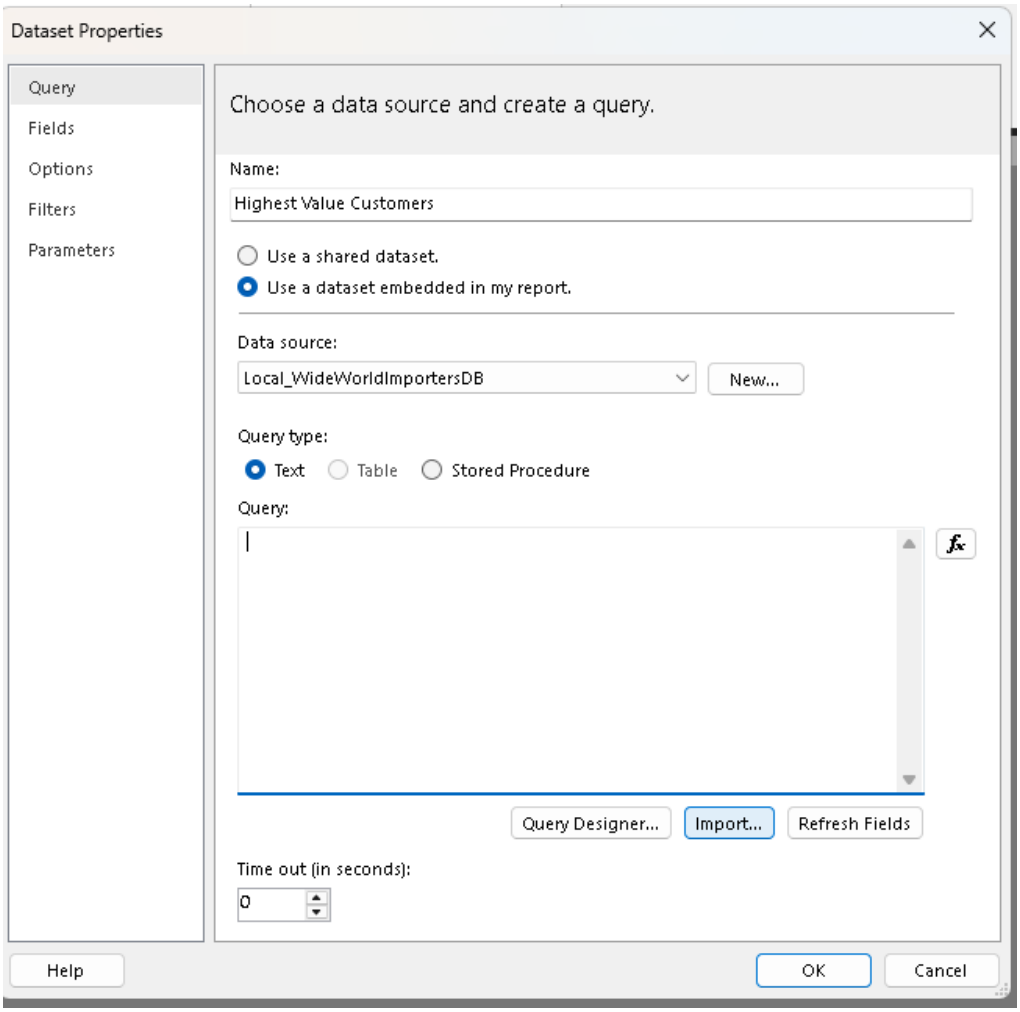

Figure 11 Clicking to import my query.

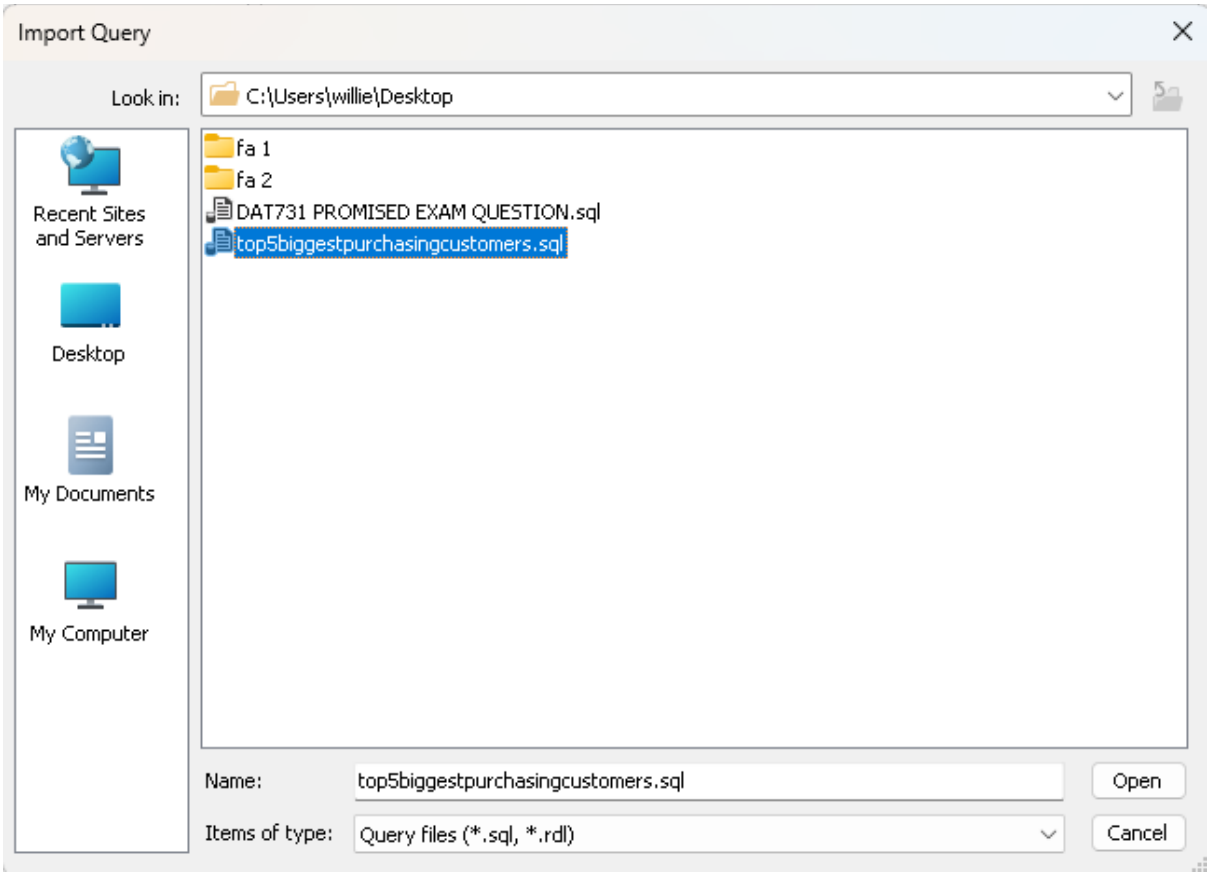

Figure 12 Selecting the .sql file that contains my query.

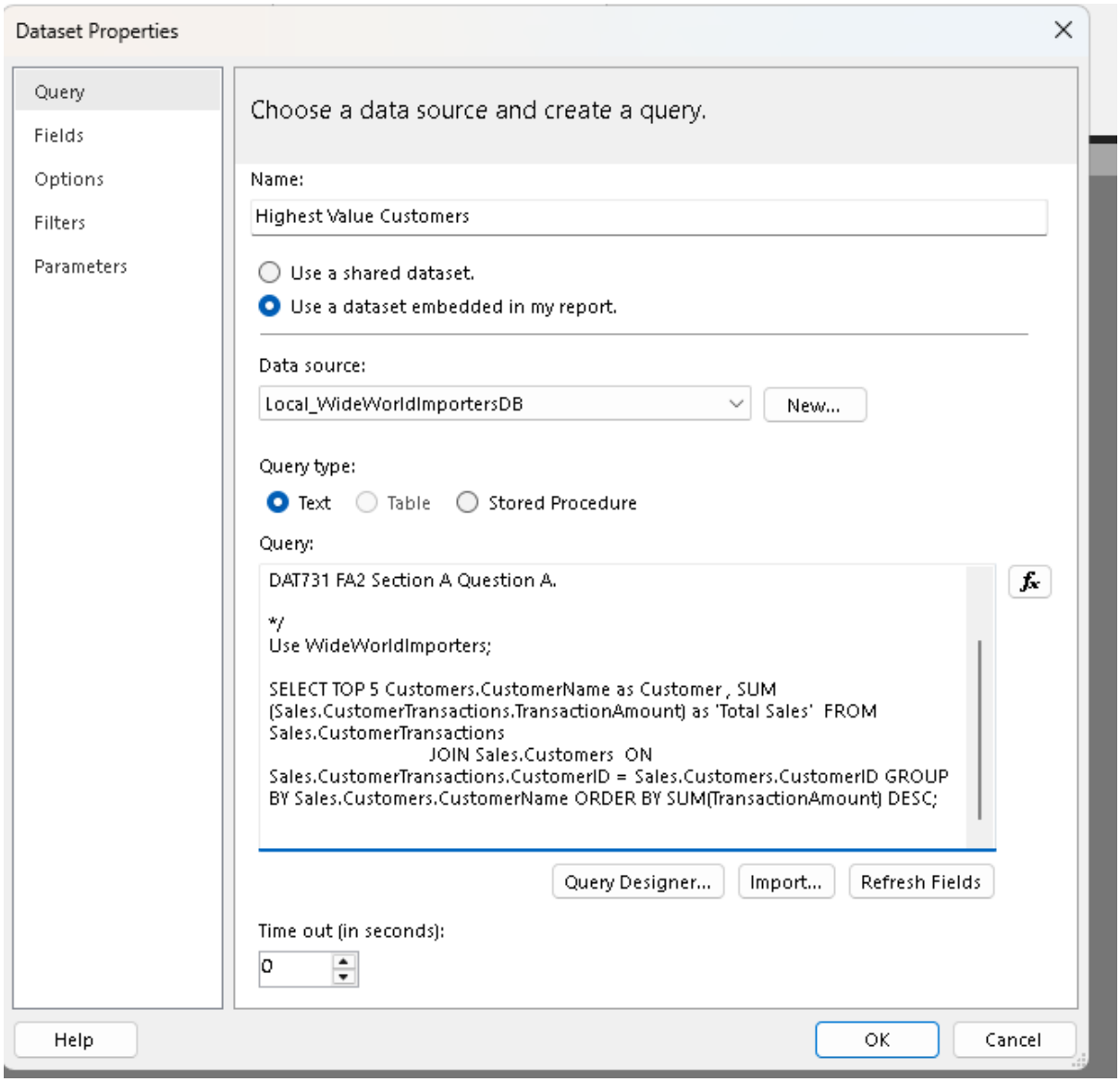

Figure 13 Displaying my imported query

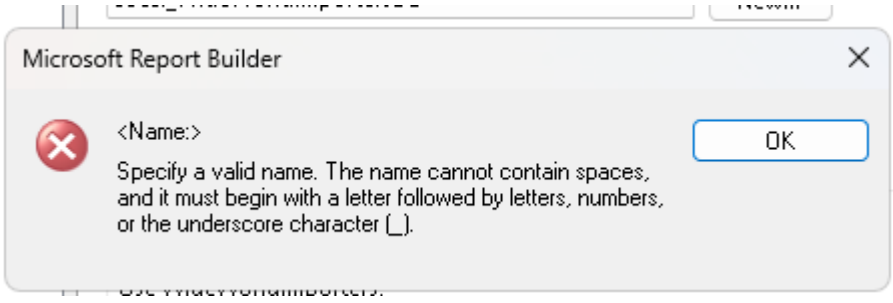

Figure 14 I had an error due to how I named it

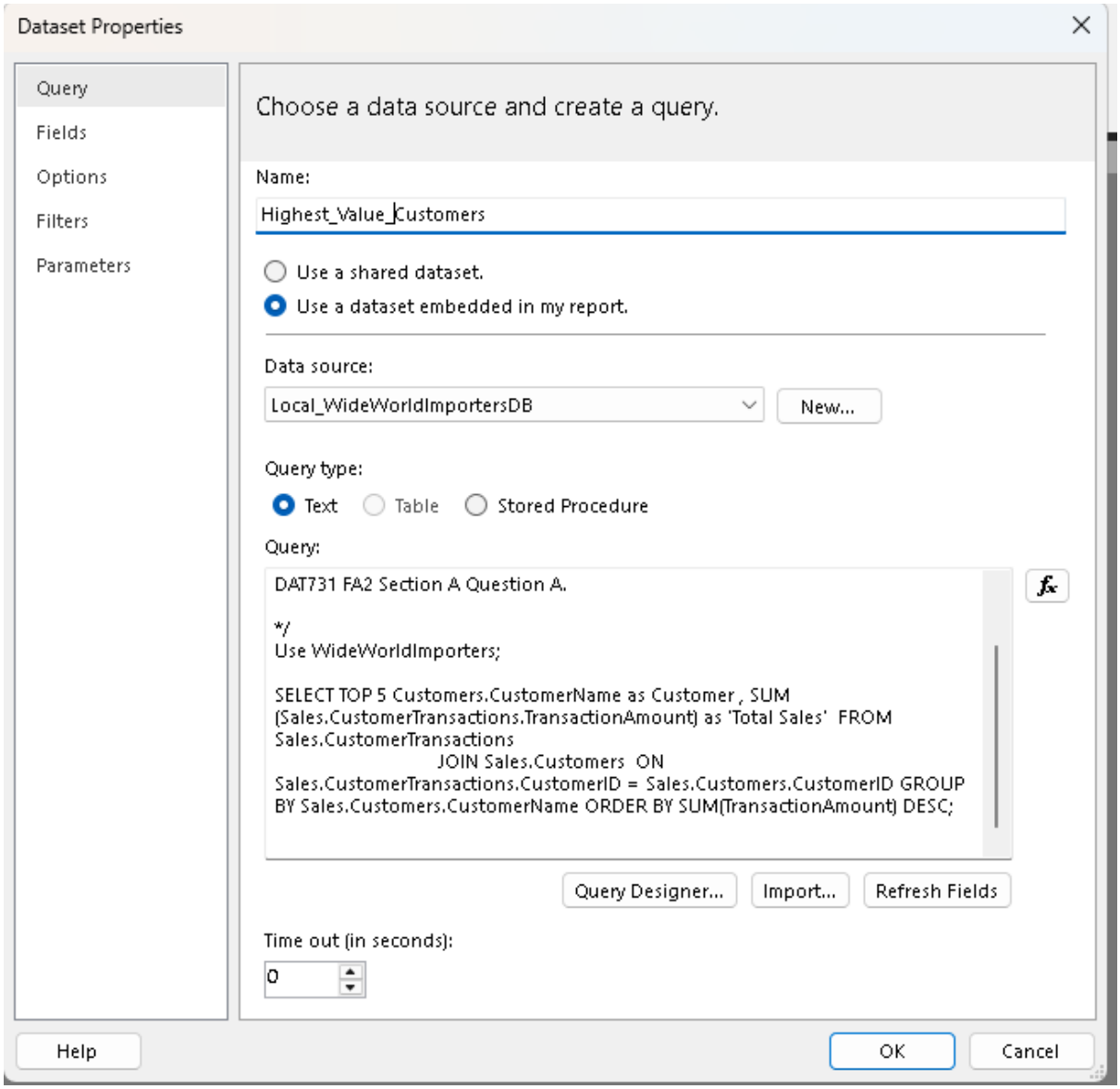

Figure 15 Fixing how I named it

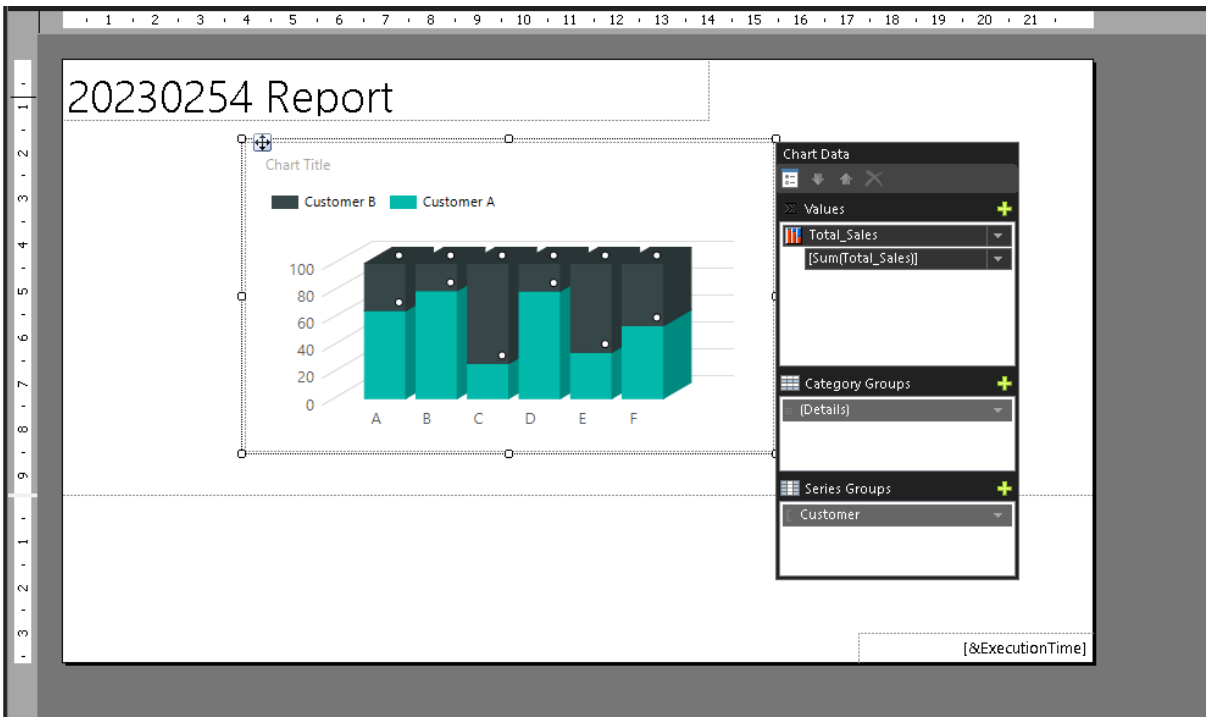

Figure 16 Defining the Chart data

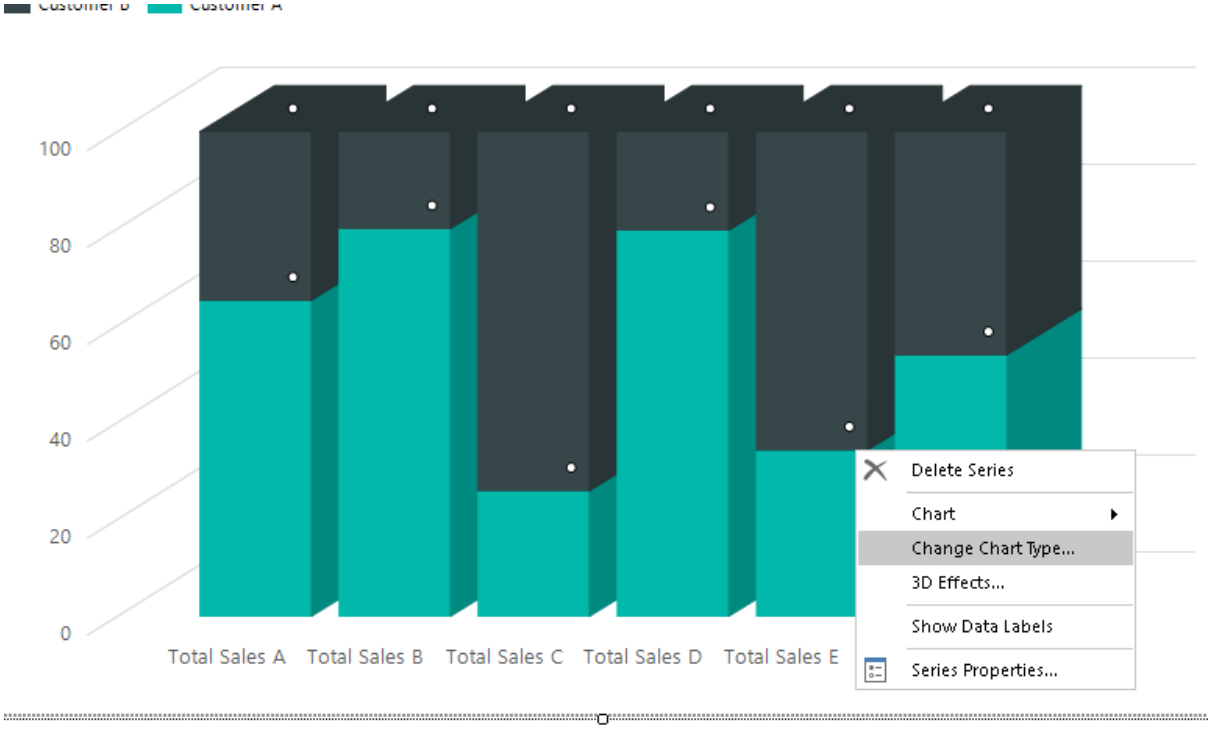

Figure 17 Right click to change chart type.

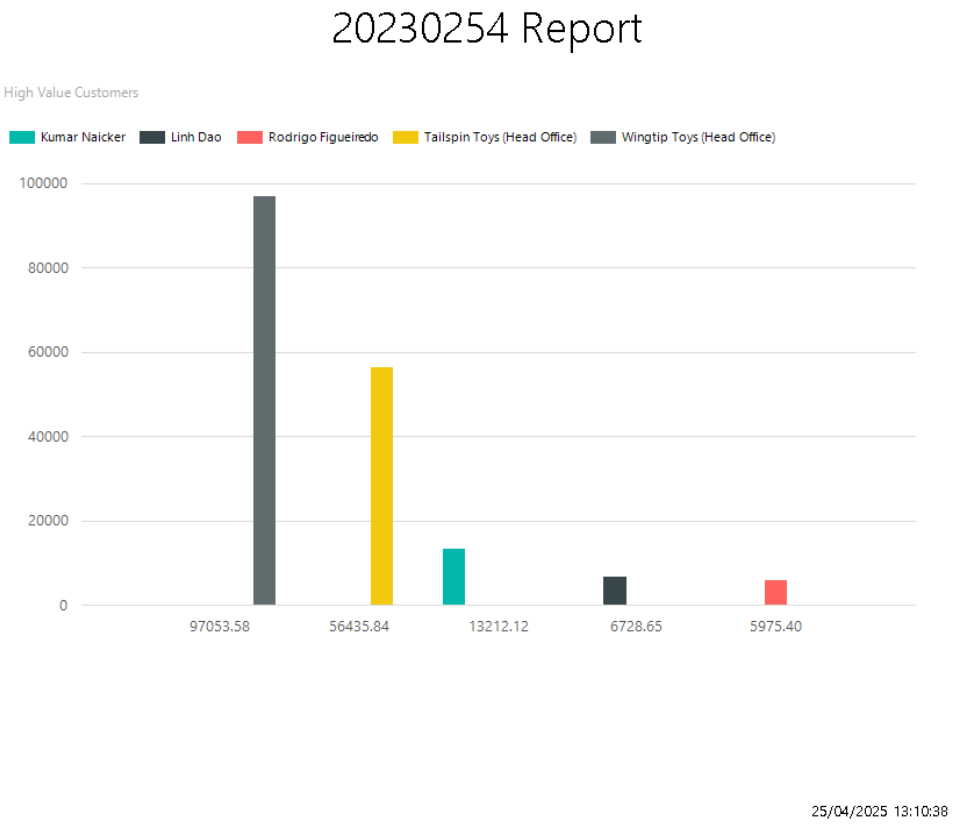

Figure 18 Result of Running my query to obtain my report

4.1.3 Publishing my report

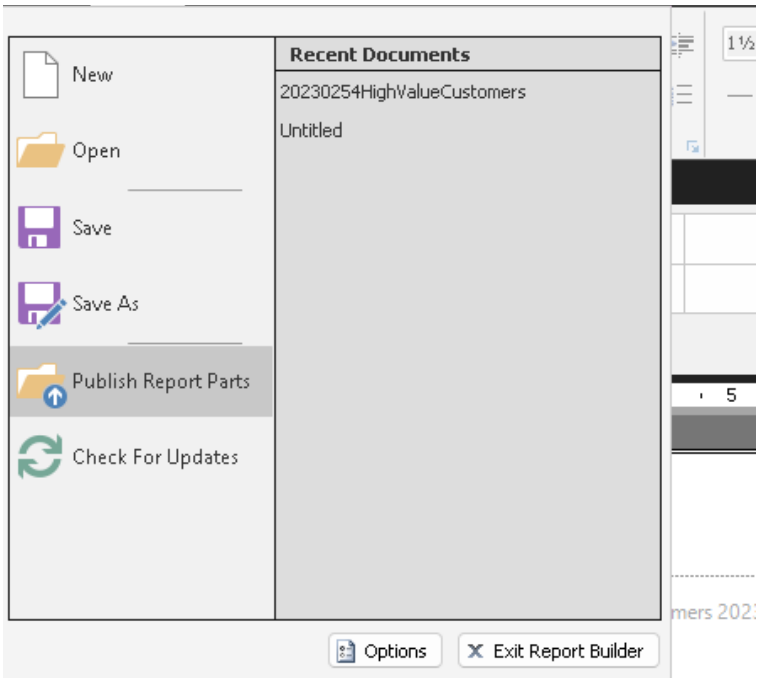

Figure 19 Starting Publishing process

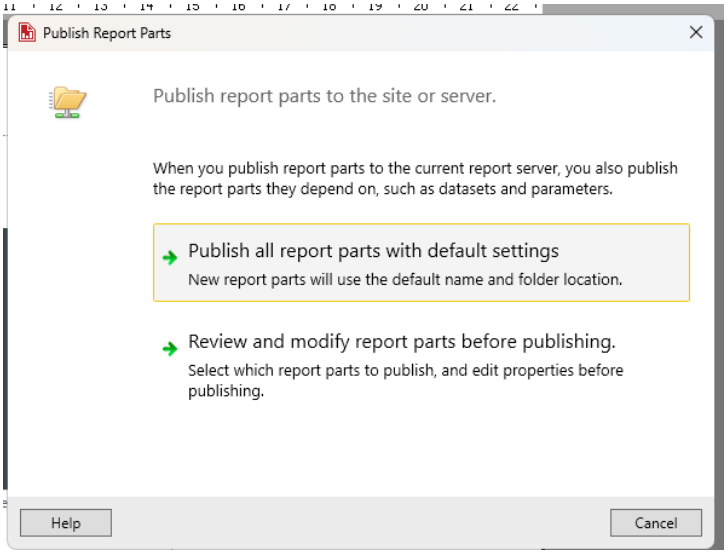

Figure 20 Publishing all report parts with default settings.

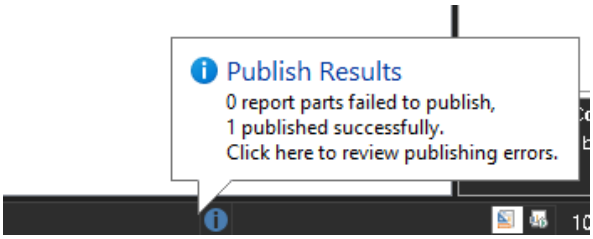

Figure 21 Information bubble indicating that there is no errors and that the report has been published successfully.

Figure 22 Navigating in my browser to the URL configured within Report Server Configuration manager as the Web Service URL

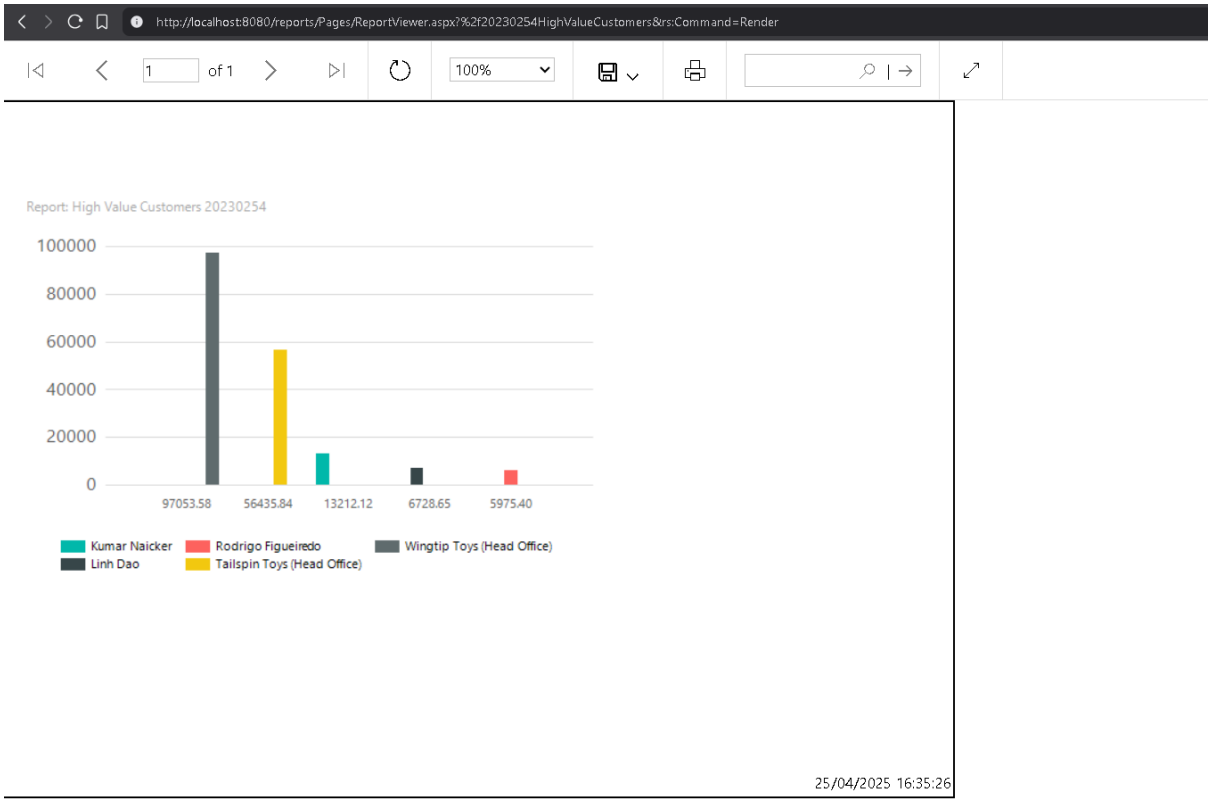

Figure 23 Finally Rendering my Deployed Published report

4.1.4 Production Deployment Strategy

In a production deployment strategy, I would consider the following:

1. Having a Licence for Microsoft SQL Server
2. Having a License for Microsoft SQL Server Report Server
3. Having firewall rules in place to limit who can access my report server.
4. Having valid ssl certificates to allow for https connectivity.
5. Having network-based authentication instead of local authentication.

4.2 Working with JSON objects in SQL Server and Working with the Graph Database Model.

4.2.1 Writing an SQL query to store customer data in JSON format within SQL Server.

-- This is my json data

{

"id": 1,

"email": "jgiriardelli0@netscape.com",

"login_password": "pmd8urni",

```
 "first_name": "Jeannette",
 "last_name": "Giriardelli",
 "address_line1": "24951 Vermont Avenue",
 "address_line2": "PO Box 59034",
 "postal_code": null,
 "credit_card_type": "jcb",
 "credit_card_number": "3569666654048599",
 "phone_number": "174-607-3702"
}
```

```
USE master;
go
DROP DATABASE IF EXISTS cos731_fa2_db;
CREATE DATABASE cos731_fa2_db;

USE cos731_fa2_db;

CREATE TABLE customers_tbl_json(id INT PRIMARY KEY, JSON NVARCHAR(MAX));

CREATE TABLE customers_tbl(
       id INT PRIMARY KEY
       , email NVARCHAR(128)
       , login_password NVARCHAR(128)
       , first_name NVARCHAR(128)
       , last_name NVARCHAR(128)
       , address_line1 NVARCHAR(256)
       , address_line2 NVARCHAR(256)
       , postal_code NVARCHAR(16)
       , credit_card_type NVARCHAR(32)
       , credit_card_number NVARCHAR(16)
       , phone_number NVARCHAR(12)
       );

DECLARE @customer_json NVARCHAR(MAX); --This is where I am declaring my variable for
importing customer json data from file;
SELECT @customer_json = BulkColumn FROM OPENROWSET(BULK
'C:\Users\willie\Desktop\DAT731\SECTION B\customer_json.json', SINGLE_CLOB) as j; --
this is the file that I am making use of.


INSERT INTO customers_tbl_json VALUES (1, @customer_json); - this is me inserting the
customer record as a raw json object. This is what I understand the question is
expecting from me.

-- This is me inserting the customer record, but not raw it is a much better practice
to do this. The specific application will differ depending on the database engine we
are using and what data it is.

INSERT INTO customers_tbl
 SELECT * FROM OPENJSON(@customer_json) WITH (
```

```
        id INT 'strict $.id'
        , email NVARCHAR(128) '$.email'
        , login_password NVARCHAR(128) '$.login_password'
        , first_name NVARCHAR(128) '$.first_name'
        , last_name NVARCHAR(128) '$.last_name'
        , address_line1 NVARCHAR(256) '$.address_line1'
        , address_line2 NVARCHAR(256) '$.address_line2'
        , postal_code NVARCHAR(16) '$.postal_code'
        , credit_card_type NVARCHAR(32) '$.credit_card_type'
        , credit_card_number NVARCHAR(16) '$.credit_card_number'
        , phone_number NVARCHAR(12) '$.phone_number'
);
```

4.2.2 Writing an SQL query to extract specific fields from the JSON data.

```
SELECT CONCAT('Our customer, ', JSON_VALUE(dbo.customers_tbl_json.JSON,
'$.first_name'), JSON_VALUE(dbo.customers_tbl_json.JSON, '$.last_name'), ' needs their
goods delivered to ' ,JSON_VALUE(dbo.customers_tbl_json.JSON, '$.address_line1'),'
',JSON_VALUE(dbo.customers_tbl_json.JSON,'$.address_line2'))
            FROM dbo.customers_tbl_json WHERE
JSON_VALUE(dbo.customers_tbl_json.JSON, '$.email') = 'jgiriardelli0@netscape.com';
```

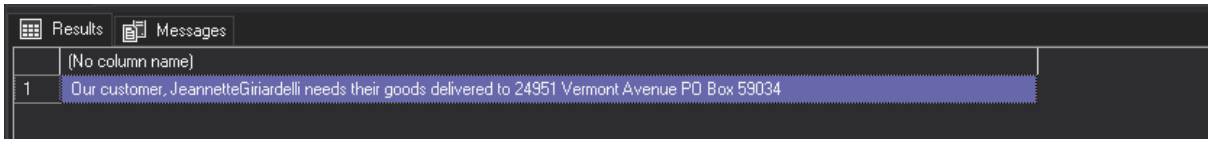

Figure 24 Result of running my sql query to extract json fields
(w3schools, n.d.)

TODO: (Anon., n.d.)

Additionally, describe how you would use SQL Server Graph Databases to model and query relationships between customers and their transactions.

(microsoft, 2024)

5. Discussion

My findings were made to the best of my knowledge and abilities to perform the instructed research tasks. Through this research that I have conducted I have gained vital insight into the components that contribute and allow for storing JSON data in an sql database, setting up and deploying reporting server, creating a paginated report.

Additionally, I have gained some insight into the use of graph databases. It is unfortunate that I was unable to grasp the concept at this time however it has sparked my interest, and I see the potential. I included a reference to what I planned on implementing, but could not understand.

6. Conclusion

Microsoft SQL Server can be used to write queries, however tools such as Microsoft query builder allows us to create neatly formatted reports that can be shared and deployed through the use of SQL Server Reporting Services (SRSS).

The implementation of Graph Databases may help us scale, and create new relationships as it is a relationship first, focused model. It is implemented by large social media platforms, allowing them to gain performance benefits.

7. Table of Figures

8. References

Anon., n.d. *Github Graph Query Example Customers who got this also got this.* [Online]
Available at: https://github.com/microsoft/sql-server-samples/blob/master/samples/features/sql-graph/customers_who_bought_this_also_bought.sql
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Available at: https://www.w3schools.com/sql/func_sqlserver_concat.asp
[Accessed 27 04 2025].