

MSA Data Dictionary

Capstone Project by
Group A

	Team Members
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Agenda

01 Introduction & Problem Statement

02 Our Challenges & Decision-Making Journey

03 Technology Roadmap

04 Process Flow Documentation

05 Future Work



MSA Professional Services

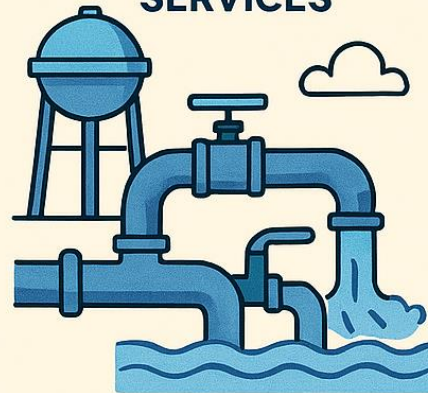
AGRICULTURAL SERVICE PLANNING



CONSTRUCTION MANAGEMENT



WATER DISTRIBUTION SERVICES



PARKS & REC



Who are Mid-State Associates? They are data-driven solution experts leading sustainable development.

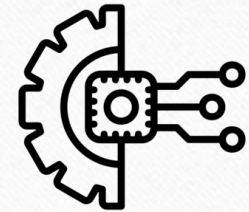
Pain Points – A real need for business intelligence



Scattered ERP Data



Missing Column/Table definitions



Unreaped business value from
AI and automation



Missing Metadata Documentation



Overworked Analysts due to data ambiguity

Problem Statements:

1. How can we extract metadata out of existing data, and automate future documentation?

2. How can we enrich the metadata with business definitions, costing minimum effort to knowledge owners?

Challenges For Us

- No access to client system and technology
- Synthesized data led to reduced semantic awareness about business definitions
- Understanding the intersect of data engineering and automation tools
- Learning from scratch tools like Fabric, Copilot Studio, Power Automate
- Constraints due to “trial” versions and limited access to complete tool features
- Ambiguity in dictionary end-point made metadata visualization harder

What shaped our decisions

1. Knowing the starting point of raw ERP data – a Fabric Lakehouse.
2. Partner wanted pure SQL data types for columns – which are readily extracted within a Fabric Warehouse.
3. Knowing the end point of data dictionary – FreshService ticketing platform.
4. We needed a universal distribution point to visualize our metadata outside of Fabric – a Fabric SQL Database.
5. Our biggest challenge – get knowledge owners to fill in missing business definitions.

Questions we asked ourselves

1. We can build an ETL (Extract-Transform-Load data) pipeline in Fabric that can build a semi-complete data dictionary, but even the partner can do that easily. Is that the real problem we are solving here?
2. As a busy knowledge owner, why would I spend my time looking at lengthy forms and spreadsheets just to contribute to a documentation process I know little about?

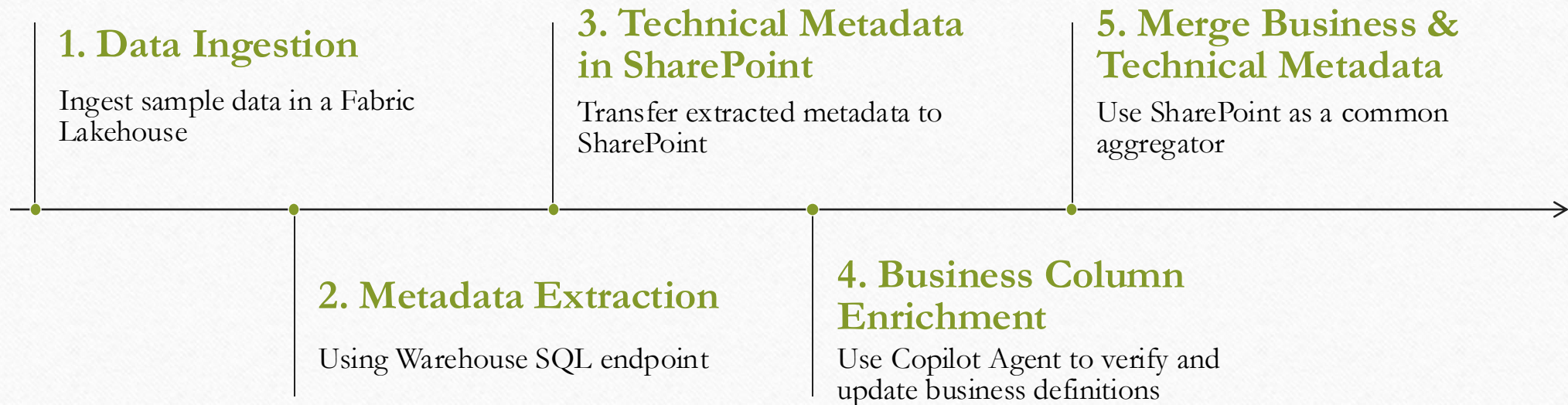
Questions we asked ourselves

3. We can build a simple Microsoft Forms using Power Apps to visualize the metadata and gather business definitions, but where is the innovation in that?
4. Do we focus on building an app that somewhat appeals to knowledge owners, or we build them a knowledge assistant - an AI agent - that will smartly do the heavy lifting for them?
5. If we want to set ourselves apart from bringing a generic solution, should we stop because of a few technological barriers?
6. What are we ultimately learning from this capstone?

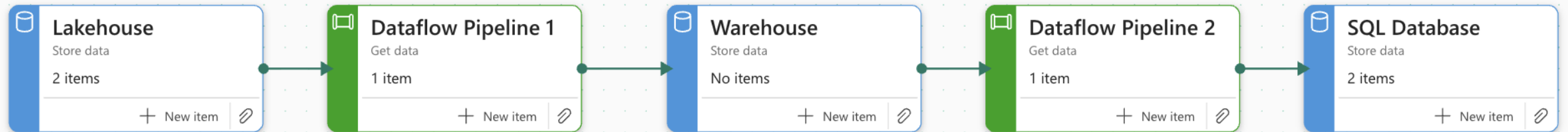
Technology Roadmap

- **Microsoft Fabric** – to extract, transform, and load technical (SQL) metadata
- **Microsoft Copilot Studio** – to build a semantic agent for business definition enrichment
- **Power Automate** – to orchestrate flow between Fabric and our AI agent
- **SharePoint** – to combine technical and business metadata forming a complete data dictionary

Process Flow Documentation



1. Microsoft Fabric



The complete data flow within Fabric.

Lakehouse (Raw Data) ➡ Warehouse (Clean Metadata) ➡ SQL Database (Distribution point)

Fabric

Warehouse

SQL Database

Lakehouse

Dataflow 1

Search

Trials activated: 10 days left

Power Query

Search (Alt + Q)

Home

Transform

Add column

View

Help

Save & run

Check validation

Recent runs

Get data

Recent sources

Enter data

Manage connections

Default data destination

Options

Manage parameters

Query

Manage columns

Reduce rows

Sort

Transform

Combine

Copilot

Export template

Share

Queries [44]

vw_actualsales

vw_actualdata

vw_actualsales (2)

vw_annualdirectwages

vw_annualrevenue

vw_budget

vw_budgetsales

vw_cashreceipts

vw_ceodashboarddata

vw_clientdata

vw_clientiason

vw_contractagreement

vw_customer

vw_customertransactions

vw_customertransactionsettlement

vw_dataarea

vw_datefinancial

vw_employeeelabor

vw_financialdimension

1 let

2 Source = Lakehouse.Contents(null),

3 Navigation = Source[workspaceId = "1faab650-f75a-43fb-b795-55aa4ad03b07"]{Data},

4 #"Navigation 1" = Navigation[lakehouseId = "ccf36406-ec1c-419c-ad32-3754206e8921"]{Data},

5 #"Navigation 2" = #"Navigation 1">{Id = "vw_actualsales", ItemKind = "Table"}{Data}

	PKFactTActualSales	FKActivity	FKDataArea	FKProject	FKDateFinancial	FKProjectFundin
1	acy 0421927239	jxs 3	rrv	nxk D18509599.09.114...	otr 84918710	wvz 5036423991
2	xbw 2735836992	jxs 3	rrv	oqr X99855799.94.00...	otr 84918710	wvz 5036423991
3	wkv 0053831149	jxs 3	rrv	cmb C32855548.84.3...	otr 84918710	wvz 5036423991
4	dyl 2832005408	jxs 3	rrv	dnu O55018069.29.06...	otr 84918710	wvz 5036423991
5	dpl 2597241143	jxs 3	rrv	tge X36456904.24.15...	otr 84918710	wvz 5036423991

Query settings

Properties

Name

vw_actualsales

Applied steps

Source

Navigation

Navigation 1

Navigation 2

Data destination

Warehouse

Fabric lets you create dataflow channels with smart transformation tools to move data between a lakehouse, a warehouse, and a SQL database. You just have to ensure there is a source, and a destination for your data.

Fabric

Warehouse

SQL Database

Lakehouse

Dataflow 1

Search

Trials activated: 10 days left

Home

Management

Help

Get data

New SQL query

SQL templates

Query activity

New semantic model

Download SQL database project

Open in

New API for GraphQL

Explorer

Warehouses

Warehouse

Schemas

DataDictionary

Tables

ColumnMetadata

Stg_ColumnMetadataSrc

Stg_TableMetadataSrc

TableMetadata

Views

Functions

Stored Procedures

RefreshColumnMetadata

RefreshTableMetadata

Refresh Metadata

ColumnMetadata

TableMetadata

Run

Save as view

Explain query

Fix query errors

1 EXEC DataDictionary.RefreshTableMetadata;

2 EXEC DataDictionary.RefreshColumnMetadata;

We created “stored procedures” within our Fabric Warehouse, that let you refresh your entire metadata at a single click – Just run the above query to ingest any new metadata while keeping the previously documented data intact.

SQL

Refresh Metadata

ColumnMetadata

×

TableMetadata

Data preview - ColumnMetadata

Showing 1000 rows

Search

<div></div>	ABC_schema_name	ABC_table_name	ABC_column_name	ABC_column_defi...	ABC_data_type	ABC_is_nullable	ABC_column_defa...	ABC_notes
1	dbo	vw_generalledger	FKFinancialDimen...	NULL	bigint	YES	NULL	NULL
2	dbo	vw_salesmanager	PKSalesManager	NULL	bigint	YES	NULL	NULL
3	dbo	vw_generalledger	FKMainAccount	NULL	bigint	YES	NULL	NULL
4	dbo	vw_generalledger	MainAccount	NULL	bigint	YES	NULL	NULL
5	dbo	vw_fnbihcmempl...	Recid_	NULL	bigint	YES	NULL	NULL

A semi-complete data dictionary is ready, with just the column definitions and table definitions remaining to be filled.

SQL Refresh Metadata

ColumnMetadata

TableMetadata

Data preview - TableMetadata

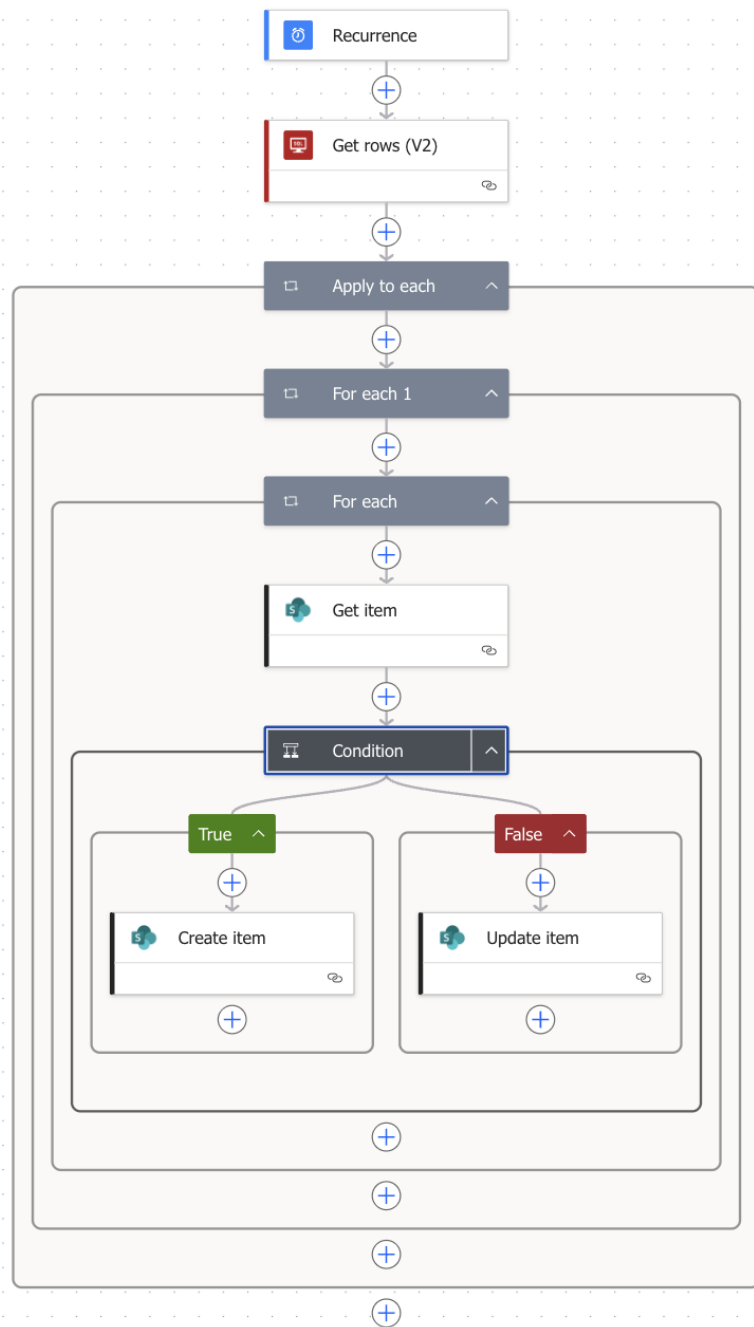
Showing 1000 rows

Search

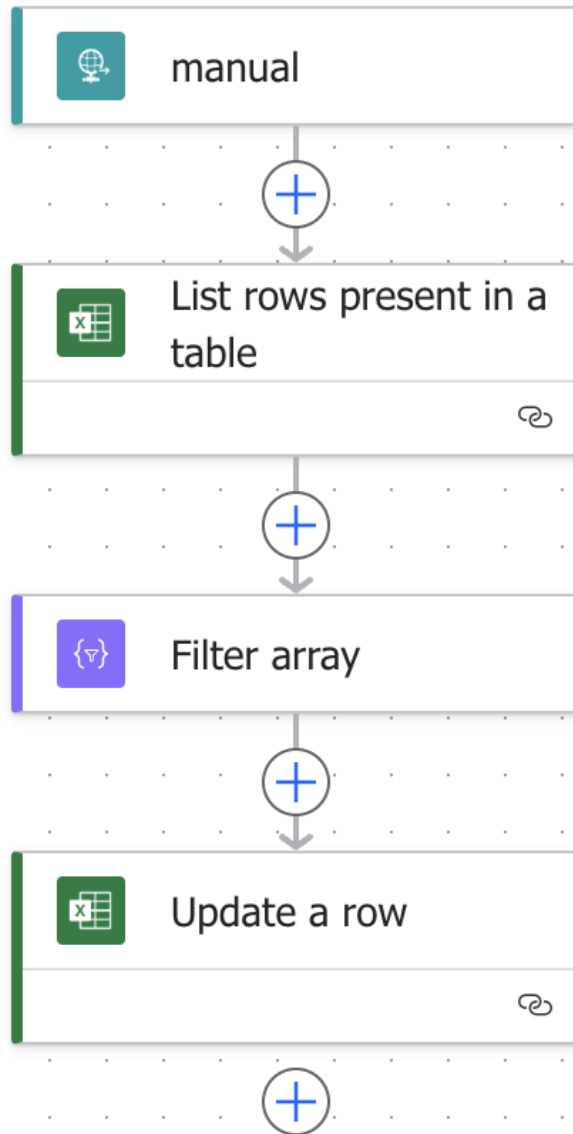
	ABC schema_name	ABC table_name	ABC table_definition	ABC notes
1	dbo	vw_employeelabor	NULL	NULL
2	dbo	vw_fnbihcmemployment	NULL	NULL
3	dbo	vw_unapprovedtimesheetlines	NULL	NULL
4	dbo	vw_projectmanager	NULL	NULL
5	dbo	vw_project	NULL	NULL

2. Power Automate

- Power Automate lets you create data flows to internally form a chain of command between different Microsoft 365 tools.
- We needed two Power Automate flows:
 1. Fabric to SharePoint - Runs on a schedule, pulls from Fabric, and **only updates technical fields** for matching rows or creates them if they don't exist yet.
 2. Copilot Agent to SharePoint - Triggered by "When an item is created/modified" in the list, writing **business** columns (definitions, notes) based on Copilot input.



- Flow #1: Fabric to SharePoint
- Lets you set an automatic recurrence based on your desired frequency and business needs
- Allows connecting SQL Database to SharePoint list
- Allows conditioning to add/modify new or existing rows



- Flow #2: Copilot Agent to SharePoint
- Lets the agent trigger the flow on command (here we have set a manual trigger, because we still couldn't get permission to integrate Copilot agent with other Microsoft apps while using the .wisc domain)

3. Copilot Studio Agent

- We built a fully functioning Copilot Studio Agent that lets users:
 - Ask for table/column definitions within the chat
 - Update said definitions from the same chat
- There is no need to scroll through a form.
- This agent can be integrated in any of the partner's Microsoft channels. Users can access it at a single click whether they are in MS Teams, or Outlook, or any other platform.

m365.cloud.microsoft/chat/?auth=2&home=1

☆ | R | New Chrome available

M365 Copilot

Search

Chat

Agents

Metadata Documentatio...

Snowflake Cortex Agents

All agents

Create agent

Conversations

Library

Create

Apps

RG Rohith Gowda Rangan...

...

Copilot Chat ⓘ

Copilot Studio

My agents > Metadata Documentation Agent ▾

Last updated December 5, 2025 at 3:22:13 AM



Update

Share

...

Describe

Configure




Name

Metadata Documentation Agent

Description ⓘ

Helps employees look up and update column definitions.


Instructions ⓘ

 Metadata Documentation Assistant — Smart & Trusted Behavior

Instructions

Primary Purpose:
Help employees find and update metadata stored in the MetadataDictionary SharePoint List, with focus on definition updates.

◆ Main Workflow


 When the user enters a column name (even misspelled or unclear):

Automatically interpret the intended column

Perform fuzzy matching only within MetadataDictionary values

Match to real existina column names — never invented ones

Agent preview



New chat

Metadata Documentation Agent


Helps employees look up and update column definitions.

- One simply needs to assign the agent instructions in natural language – Prompt Engineering
- Allows you to link the source i.e., the SharePoint list containing business definitions for read/write operations via Power Automate

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Hi

 Metadata Documentation Agent

Hello! 🙌 How can I assist you today? Are you looking up a column definition or planning to update one?



look up column definition for actual sales amount

 Metadata Documentation Agent

The closest match in the DataDictionary for “**actual sales amount**” is:

Column Name: ActualSalesAmount

Current Definition: *“Represents the total sales amount recorded for a given transaction or reporting period.”*

Table Name: SalesSummary

Would you like to **update this information?**

yes, update the definition

show more details for ActualSalesAmount



Message Copilot



Future Work

1. Create and Integrate Copilot Agent into Microsoft 365 Ecosystem
2. Configure Power Automate triggers with agent
3. Encourage stakeholders to use Data Dictionary chatbot by showcasing ease of use
4. Bring aggregated SharePoint file to FreshService as a ground-truth source
5. Provide feedback/difficulties in actual implementation

Thank You

It was a pleasure working with you.