Microsoft

Activate Your Data and Analytics for AI Innovation

Frankie Lai
Technical Specialist, Data & AI | Microsoft
Aaron Chan
Assoicate Director | LPS TSG Data Managment & AI
Jantzen Ho
Senior Customer Engagement Consultant | LPS TSG CRM

Agenda

Today's digital transformation landscape

Creating next generation AI with Fabric
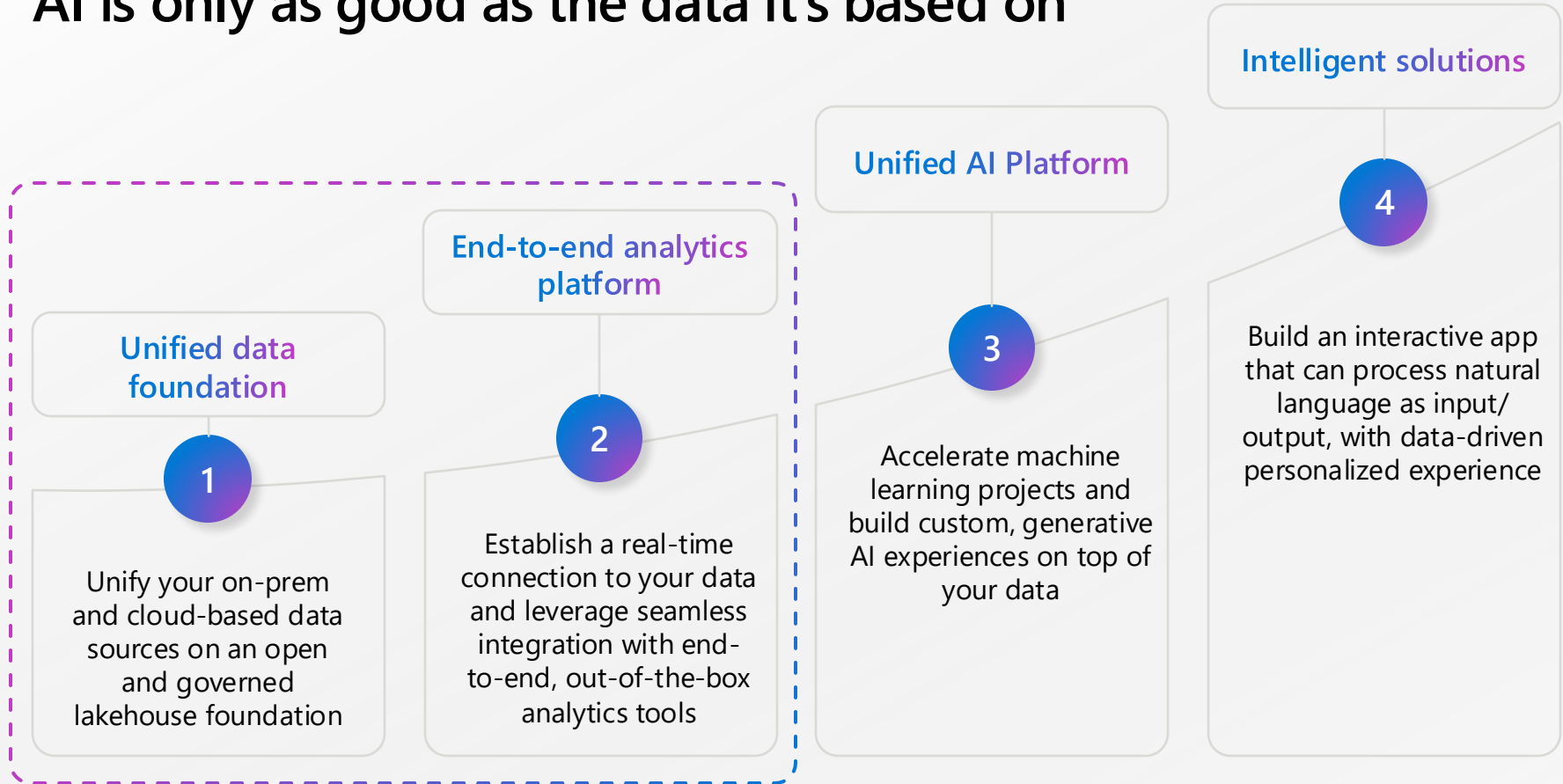
Use Cases Sharing

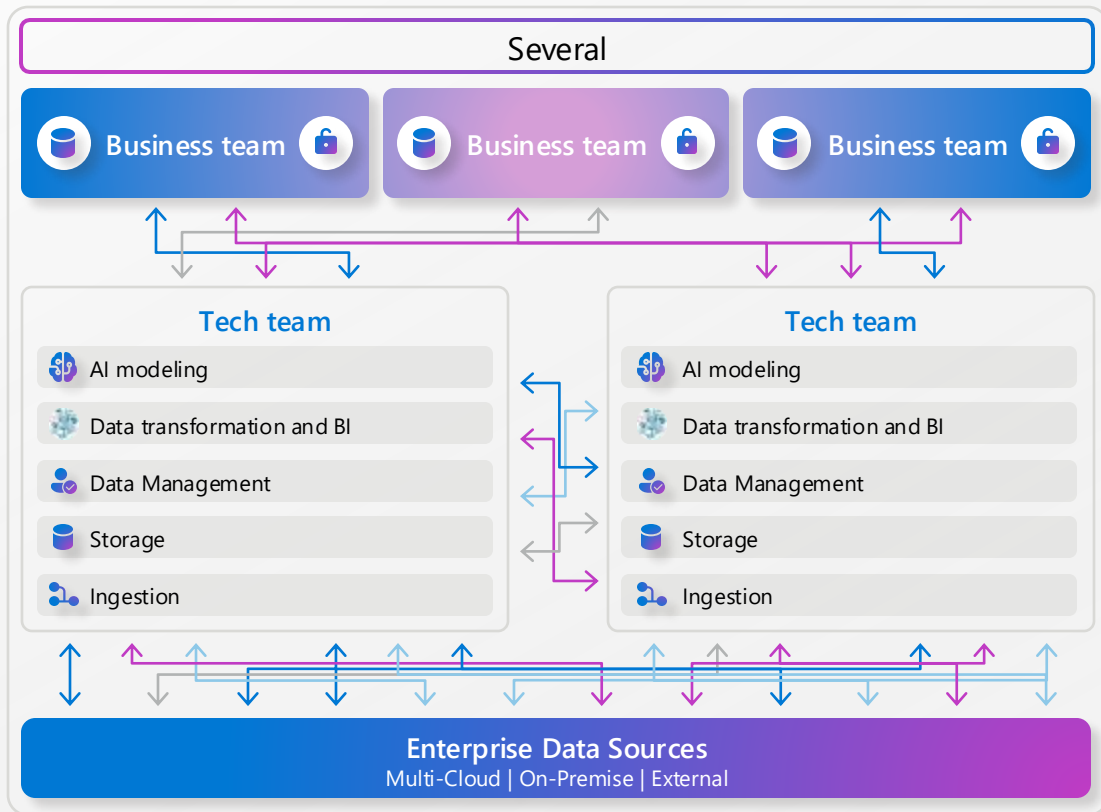Next steps

AI is shifting business today

Every
individual

Every
team

Every
industry

AI is only as good as the data it's based on

Intelligent solutions

4

Build an interactive app that can process natural language as input/ output, with data-driven personalized experience

Unified AI Platform

3

Accelerate machine learning projects and build custom, generative AI experiences on top of your data

End-to-end analytics platform

2

Establish a real-time connection to your data and leverage seamless integration with end-to-end, out-of-the-box analytics tools

Unified data foundation

1

Unify your on-prem and cloud-based data sources on an open and governed lakehouse foundation

The starting line: A complex, organically evolved data estate

Microsoft Fabric

The data platform for the era of AI

Complete analytics platform

Everything, unified

SaaS-ified

Secure and governed

Lake centric and open

OneLake

One Copy

Open at every tier

Empower every business user

Familiar and intuitive

Built into Microsoft 365

Insight to action

AI-powered experiences

Copilot accelerated

ChatGPT on your data

AI driven insights

Unify your analytics on a complete platform

Give your data teams all the tools they need in a unified, governed, and secure experience that reduces the cost and effort of integration

Empower data engineers, data scientists, analysts, and business users with role-specific tools in a SaaS platform built for collaboration

Gain industry-leading, end-to-end security, governance, compliance, and visibility across the unified platform

Simplify billing and reduce costs with a single pool of capacity and storage that can be used for every workload

Establish a trusted data foundation

Integrate data from anywhere into a single, multi-cloud data lake for the entire organization, and work from the same copy of data across analytics engines

Easily connect to data across clouds using "Shortcuts" to virtualize data in OneLake without having to move or duplicate the data

Create, integrate, manage, and operate data lakes standardized on Delta Parquet format; the same open data format as Azure Databricks

Intuitively organize your data in Microsoft Fabric's data lake – OneLake – for central data discovery, sharing, governance, and compliance

Microsoft

Use Case – Centralized One Lake Solution Fabric on Azure

Background

The client is a prominent construction and engineering company, undertaking large-scale projects across different sectors. They are encountering significant pain point in report validation due to data latency between upstream and downstream systems, as well as the complexities arising from multiple systems and manual data entry.

Requirement

Common Data Model: Identify data usage scenarios and business processes to re-design the data model Reduce data silos by promoting consistency, collaboration and integration
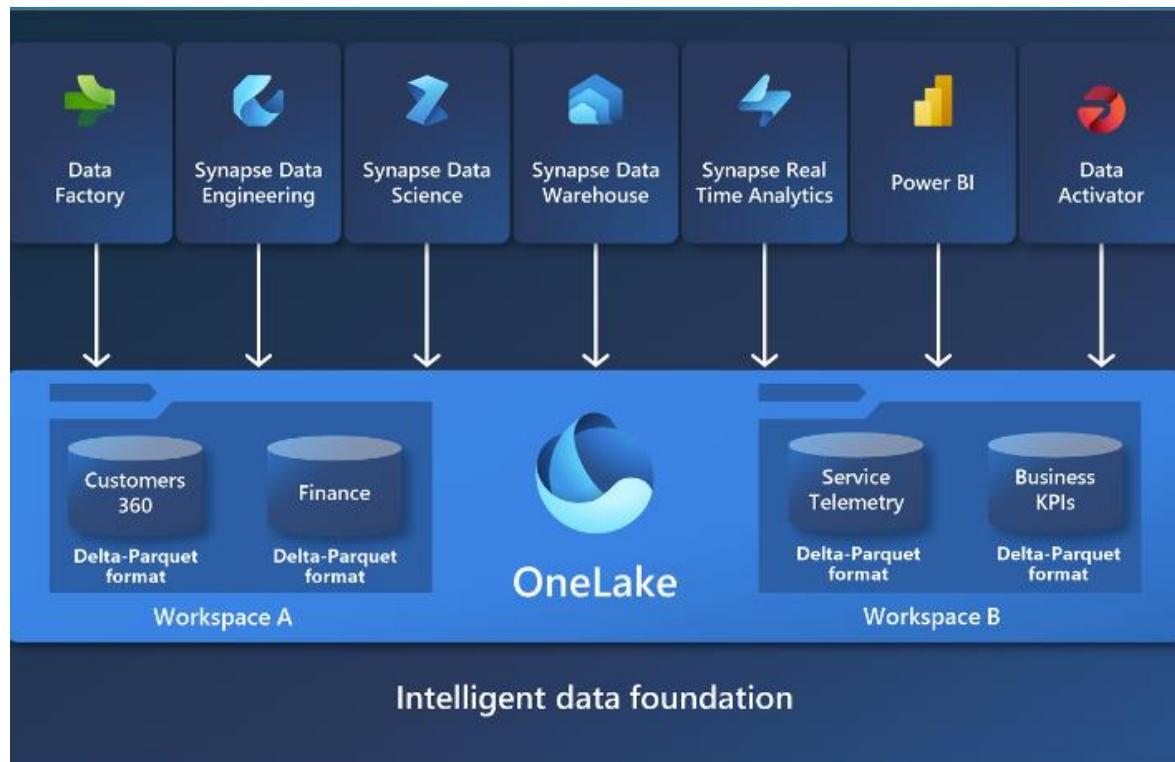
**Data Platform:** Unified system to ingest data from multiple systems and flat files in share drives

Near Real Time Dashboards: Low data latency in synchronization from source to reports

Centralized Data Storage with OneLake

OneLake is a single, unified, logical data lake that is automatically provisioned with every Fabric tenant, which is best suited for data warehouse and analytics workloads where data governance, performance and integration other Fabric components

3-tier Medallion Lakehouse Architecture
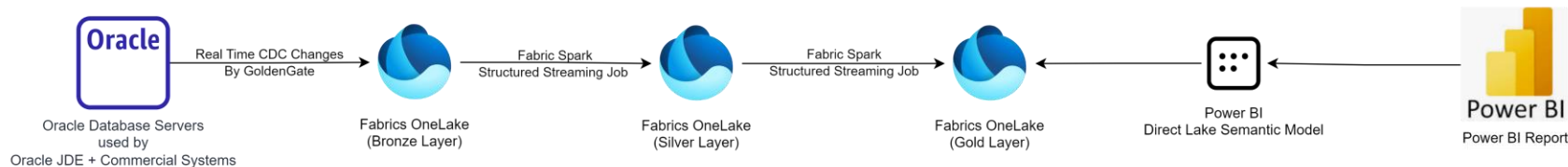
Bronze

Raw ingested data

Original format

Historical archive

Silver

Cleansed data

Delta lake format

Gold

Transformed and aggregated data

Business rules applied

OneLake can handling all types of data (structured, semi-structured, unstructured) in a single location throughout data processing

Tabular data are stored as **Parquet** format which offers ACID transactions, schema enforcement and time travel capabilities

Data Consumption on PowerBI Using Direct Lake
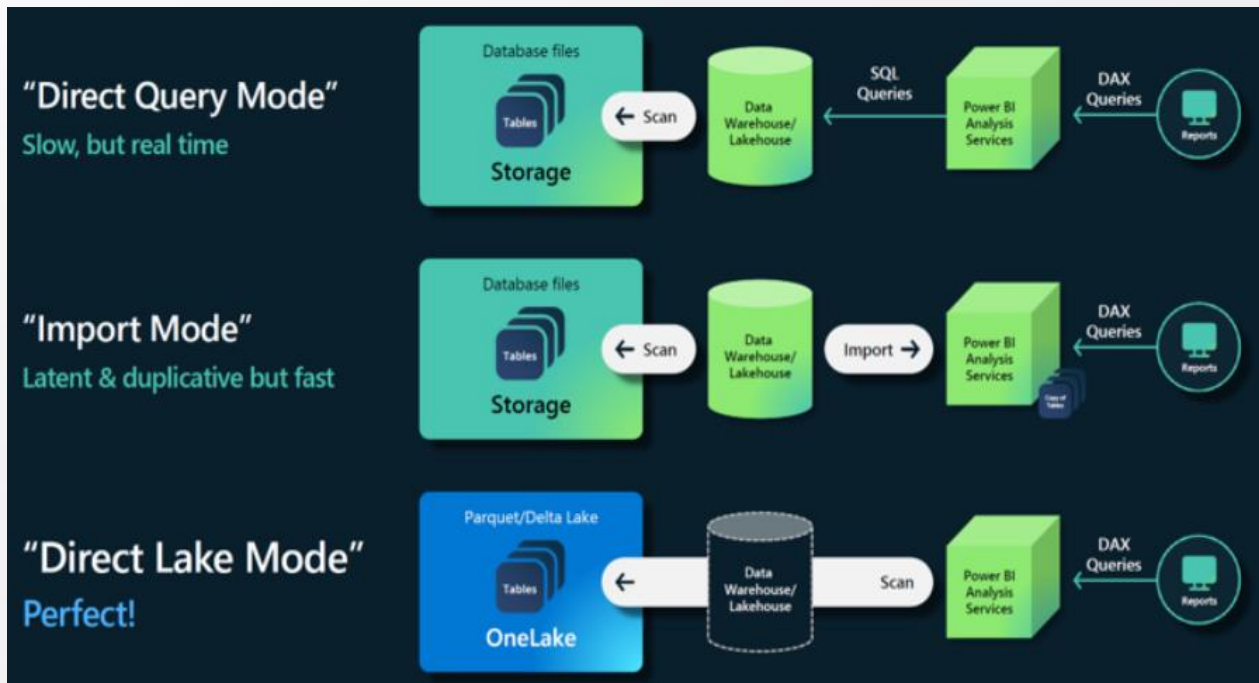
Parquet format is already optimized for analytic workloads

Power BI can use parquet files directly instead of data warehouse query service

Direct lake mode are suitable for consuming streaming data

Microsoft

Use Case – AI Powered Fabric Solution for Maintenance / Field Services

Background

The client is a leading public transport provider, operating an extensive network of rail and bus services that connect various parts of the city. With a strong focus on efficiency and reliability, it plays a crucial role in facilitating daily commuting for millions of residents and visitors.

Requirement

LLM Chatbot usage:
Major focus on internal usage, target on employee or manager
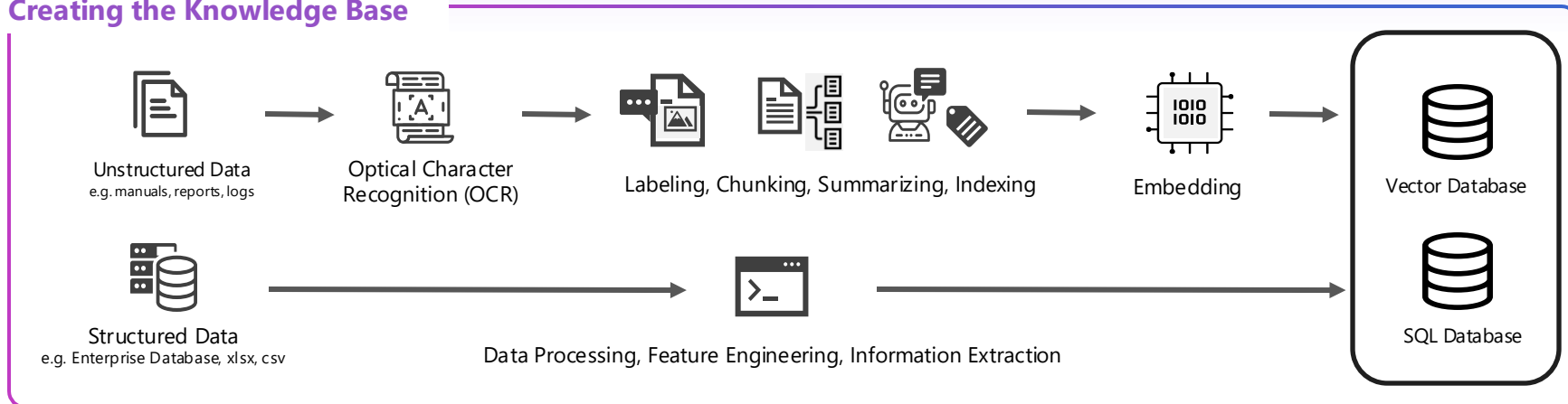Monthly 100 people regular use, each people 30 chat input asking
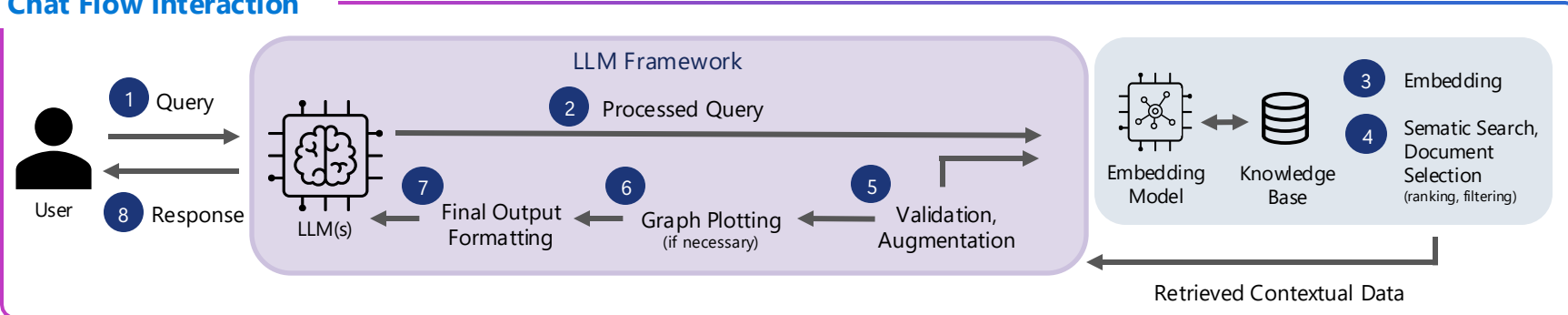
Source Document Refreshment:
Allow monthly refresh 1,000 document in pdf, doc and txt format, each around 10 pages.

From Inquiry to Insight:
The Journey of an LLM-Based Chatbot
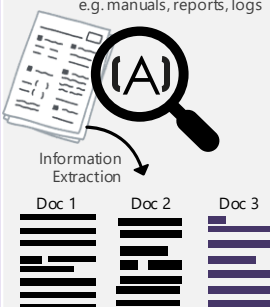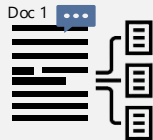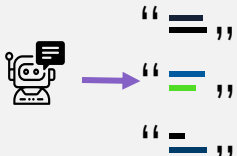
Creating the Knowledge Base

Unstructured Data
e.g. manuals, reports, logs

Optical Character
Recognition (OCR)

Labeling, Chunking, Summarizing, Indexing

Embedding

Vector Database

Structured Data
e.g. Enterprise Database, xlsx, csv

Data Processing, Feature Engineering, Information Extraction

SQL Database

Chat Flow Interaction

LLM Framework

User

1 Query

2 Processed Query

3 Embedding

4 Sematic Search,
Document
Selection
(ranking, filtering)

8 Response

7 Final Output
Formatting

6 Graph Plotting
(if necessary)

5 Validation,
Augmentation

LLM(s)

Embedding
Model

Knowledge
Base

Retrieved Contextual Data

Strategies for Enhance Knowledge Base Understanding in LLMs

OCR	Labeling	Chunking	Summarizing	Indexing	Embedding

Converts scanned documents/images into machine-readable text

Essential for digitizing physical documents

Assigns meaningful tags to data for easier retrieval and understanding

Improves the accuracy of information retrieval

Breaks down large texts into smaller, manageable pieces (chunks)

Facilitates processing and comprehension by the model

Condenses information from chunks to highlight key points

Enhances efficiency the model needs to process

Creates a structured index for quick access to information

Supports efficient search capabilities within the knowledge base

Transforms text into a numerical format (vectors) that captures semantic meaning

Enables the model to understand context and relationships between words

Different Personas in Transportation Maintenance and Asset Management Overcoming Daily Challenges

Trainee Technician
New to rail maintenance

Goals:
- Quickly learn maintenance procedures and protocols
- Gain confidence in handling real-life scenarios

Challenges:
- Overwhelmed by extensive manuals; finds it hard to locate relevant information
- Needs an engaging way to learn and understand complex topics

Maintenance Manager
15 years in asset management, with a focus on rail systems

Goals:
- Efficiently review and compare maintenance records
- Make informed decisions based on data insights

Challenges:
- Struggles to access and analyze large volumes of maintenance data quickly
- Needs to train new staff on case studies but lacks a streamlined reference system

Senior Technician
10 years in rail maintenance; experienced but often busy with urgent tasks.

Goals:
- Respond quickly to defect reports with accurate information
- Leverage historical data to inform current actions

Challenges:
- Needs timely access to manuals and past case data during emergencies
- Balances multiple tasks and requires efficient support to avoid delays

Empower every business user

Empower everyone to uncover insights with the data they need, easy-to-use tools, and visuals embedded in the Microsoft 365 apps they use everyday

Quickly go from data in a lakehouse to insights in the hands of your business users
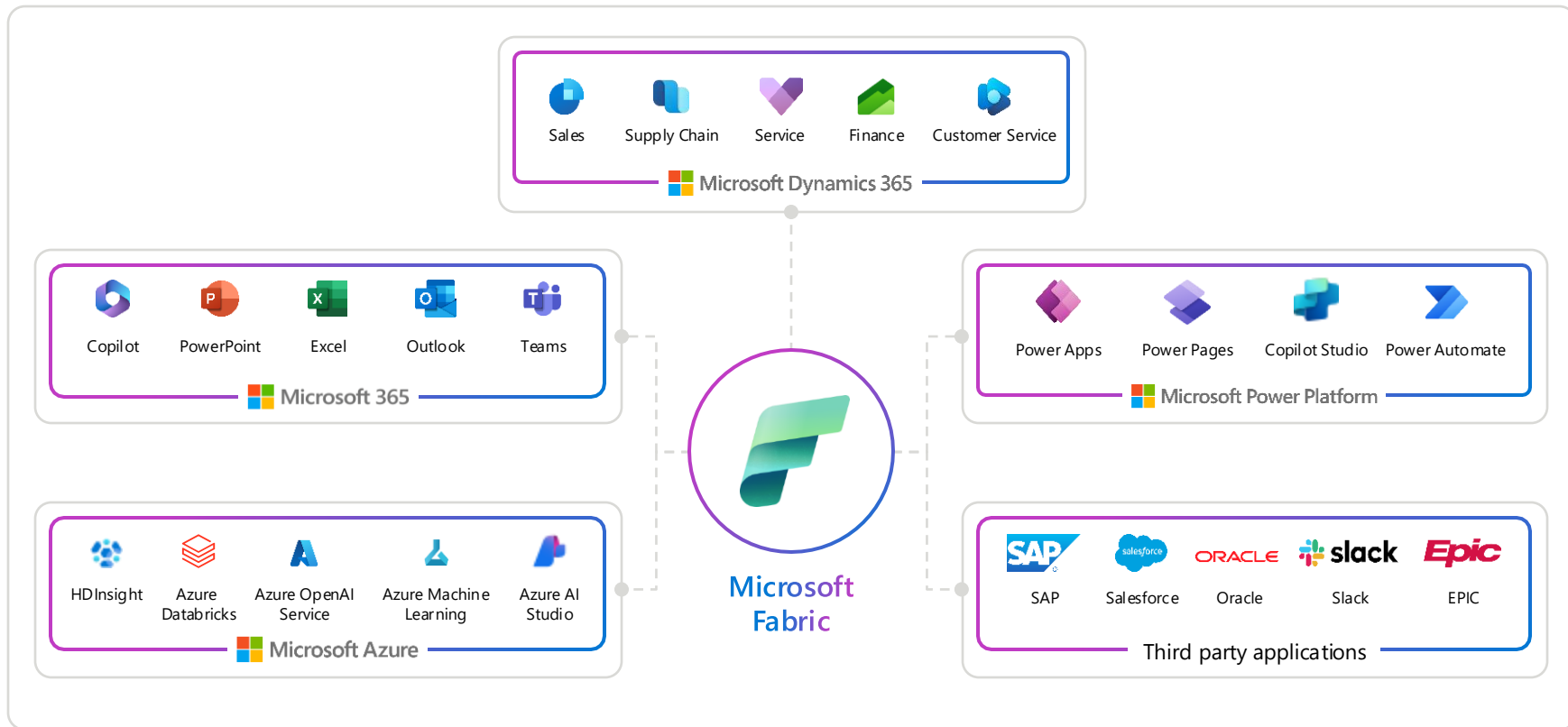
Save time for analysts and provide up-to-date insights with Direct Lake mode, a blazing fast, real-time connection to your data in OneLake

Foster a data-driven culture by seamlessly and securely embedded insights into Teams, Excel, PowerPoint, Outlook, and more with native integration

Put your insights into the hands of your people

ML Visualization with Fabric
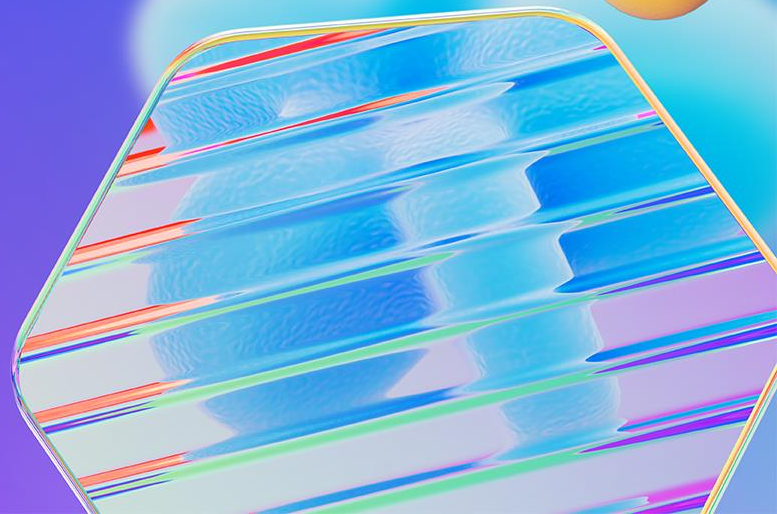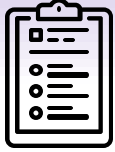
Architecture

Unlike Azure, where each tool has separate pricing, Microsoft Fabric simplifies this by Compute Capacity

A single compute capacity can support all functionalities concurrently, which can be shared across multiple projects and users without any limitations on the number of workspaces utilizing it. You do not need to select capacities individually for Data Factory, Synapse Data Warehousing, and other Fabric experiences.

DATA SOURCE — Lakehouse & Data Warehouse

CLEAN & PREPARE — Notebooks

STORE — Lakehouse(s)

EXPOSE ANALYSIS & INSIGHTS — PBI

TRAIN, TEST & APPLY — Models, Experiments

Lake Warehouse
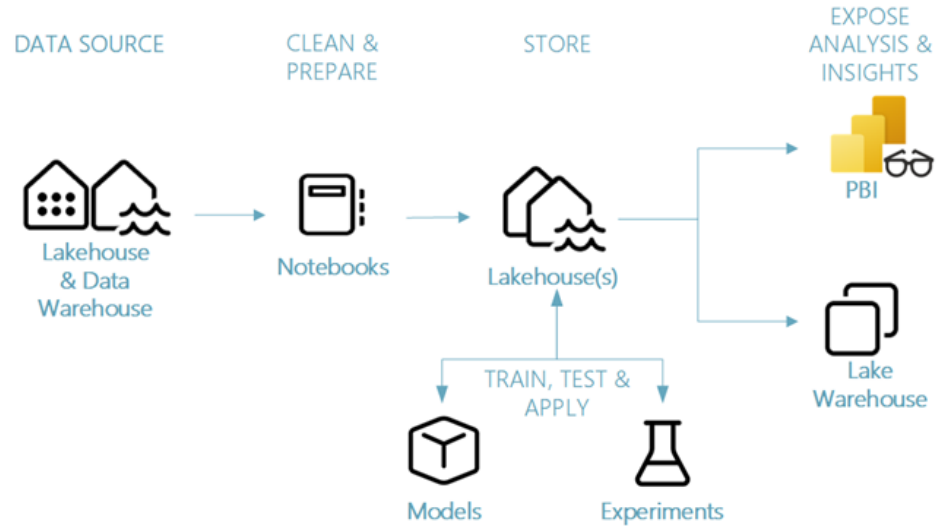
Data Science in Fabric

Important elements to Timeseries Forecast

- Weekday Calendar

Seasonality

Calendar

- Holiday calendar and their corresponding encoded information
- Campaign calendar and their corresponding encoded information
- Nearby-location-event calendar

Demand Forecast

Other Data

- Weather
- Social media data
- Search rate
- Economic index

Historical History

- Historical data in lowest granularity
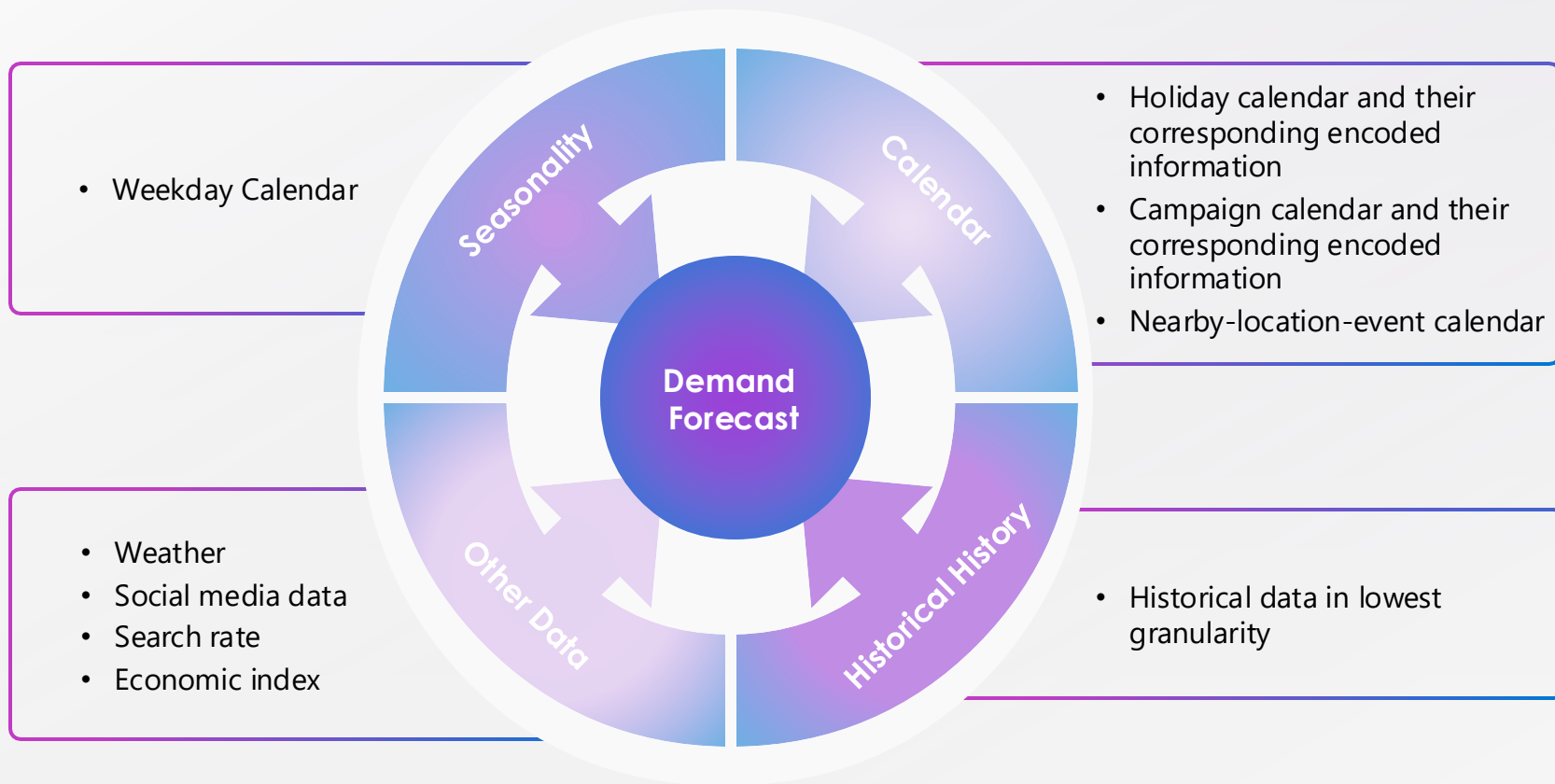
Enhancing Predictions with Dedicated Models

Sum of Value by YearMonth (True vs Azure ML)

History

Future

ML Prediction

Actual

Sum of value by YearMonth (Power BI)

PowerBI Built-in ML

Bundling ML Services with Power BI

Exploring the machine learning results with PowerBI, turn numbers into actionable insights, and let this visualization guide your understanding of machine learning outcomes

- **Improved prediction precision** over default capabilities by customized ML models .
- **Anticipate seasonal peaks and troughs** to optimize inventory and staffing.
- **Identify growth opportunities** by analyzing emerging trends.
- **Stay ahead of the competition** by leveraging data-driven revenue forecasts.

Comprehensive Customer Overview
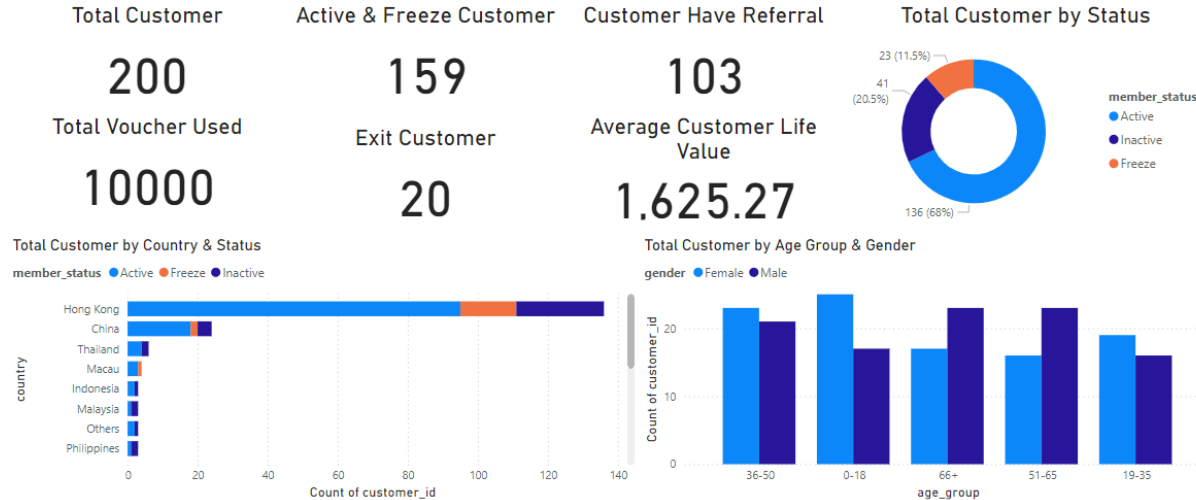
Key Metrics:

- **Total Customers**: with active/frozen and referrals nature.
- **Average Customer Lifetime Value (CLV)**: reflecting the strong value brings to the mall
- **Exit Customer**: this metric identifies opportunities to reduce churn.
- **Voucher Usage**: A total of vouchers have been redeemed, highlighting customer engagement in promotional activities

In today's dynamic marketplace, **knowing your customers** is more crucial than ever. By analyzing the number of customers across various dimensions, you can uncover invaluable trends and identify key customer groups that drive your business forward.

Membership Registration & Exit Trend

New Customer Register Trend
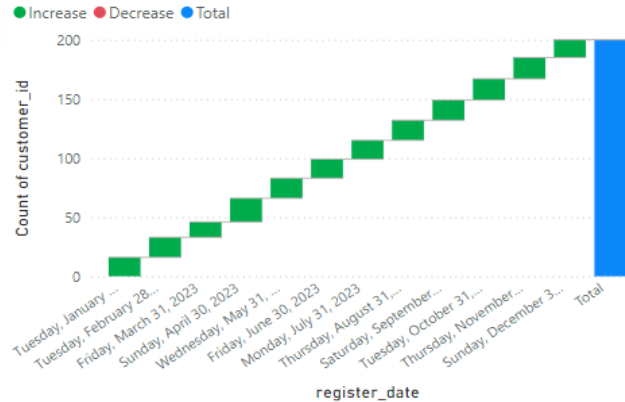
Total Customer by Exit Reason
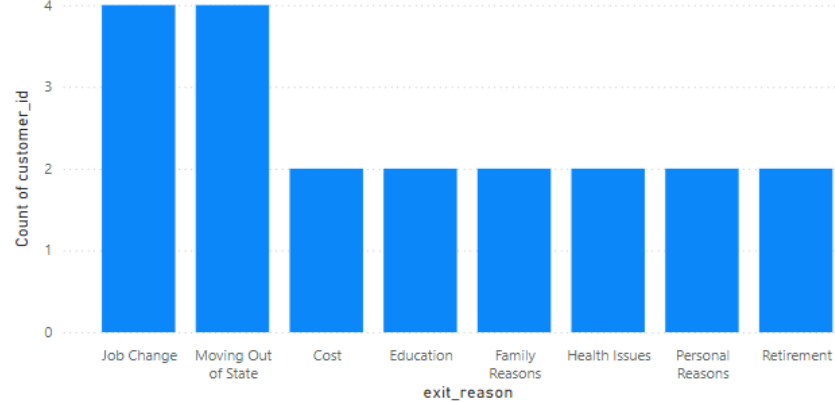
Total Customer Count
By Gender, Age_Group & Kids

gender	0	1	Total
⊟ **Female**	**49**	**51**	**100**
0-18	13	12	**25**
19-35	8	11	**19**
36-50	10	13	**23**
51-65	8	8	**16**
66+	10	7	**17**
⊟ **Male**	**48**	**52**	**100**
0-18	10	7	**17**
19-35	6	10	**16**
36-50	12	9	**21**
51-65	11	12	**23**
66+	9	14	**23**
Total	**97**	**103**	**200**

Understanding Membership Trends: Registration and Exit Analysis
This part analyses the trends in customer registration and exit. By understanding **why members join** and **why they leave**, you can **refine your offerings** and **improve retention** with a detailed breakdown of customer number that highlights these trends.

Taking Actions with Customer Insights

Preparing the foundation for Hyper-Personalization with AI

Customer Engagements (transactional, behavioral, etc)

Workflow Systems (Operational, event, process)

IoT Devices (sensor, telemetry, location)

Unstructured Data (text: emals, document, social media, multimedia, etc)

Ingestion

Processing

Discovery

Microsoft Fabric

Modeling

Demographics

Behavioral Data

Transaction History

Sentiment Analysis

Interactive Data

Loyalty

Conversion rate

Satisfaction

Engagement

Churn Rate

CRM, AI and Analytics

Microsoft Dynamics 365 Customer Insights

Customer Analytics Pre-built AI model and AI recommendation

Customer Segmentation

Customer Lifetime Value

Personalized Recommendation

New Revenue

Capture data across all your customer touchpoints, e.g. Online Booking, Travel Agencies, Portals, Check In data

Collect and stitch structured and unstructured data across all touch points to form a unified profile Customer 360

Analyze business behavior to enable data-driven hyper-personalization for future value

From One-Size-Fits-All to Tailored Experiences with Hyper-Personalization
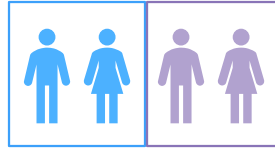
No Personalization:
General Offers for Mass Market

Customized Personalization
by Group Segmentation

Hyper-Personalization
with Unique Individual Offer

First and last name

Purchase history

Title

Demographic data

Organization

Detailed search and purchase history

Time spent

Active time

Preferred channels

Prediction

Hyper-Personalization Strategy (Sample)

Customer Lifecycles	Customer Groups				
	Default (None)	**Trendsetters**	**Bargain Hunters**	**Selective Shoppers**	**Comfort Shoppers**
Conversion	Buy X Get X	**Latest & Greatest**			
Onboarding	How to use / Benefits / Membership/ Why Buy Direct				
Active	All New	**All New**	All New Discounted	All New	All New Discounted
Advocate	Surprise and Delight	**Less / No discount**	Surprise and Delight	Exclusives	Bulk Buy Deals
At Risk	Standard Discount	**Standard Discount with comparisons**	Highest Discount	Bulk Buy Deals	Bulk Buy Deals
Reactivation	Sneak Peak (New Launches)	**Sneak Peak (New Launches)**	First Discounts Offered	Sneak Peak (New Launches)	First Discounts Offered
Win Back	Re-Opt in Campaign Advertising Studio	**SMS Advertising Studio**	SMS Advertising Studio	Transactional - Points Reminder Advertising Studio	

Highest Discount   **Standard Discount**

What would it look like? (Sample)

Generic birthday card
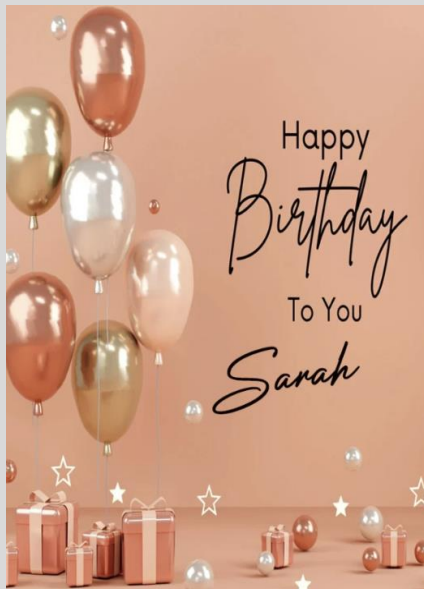
Personalization

Sarah's favorite flowers

Sarah's favorite color
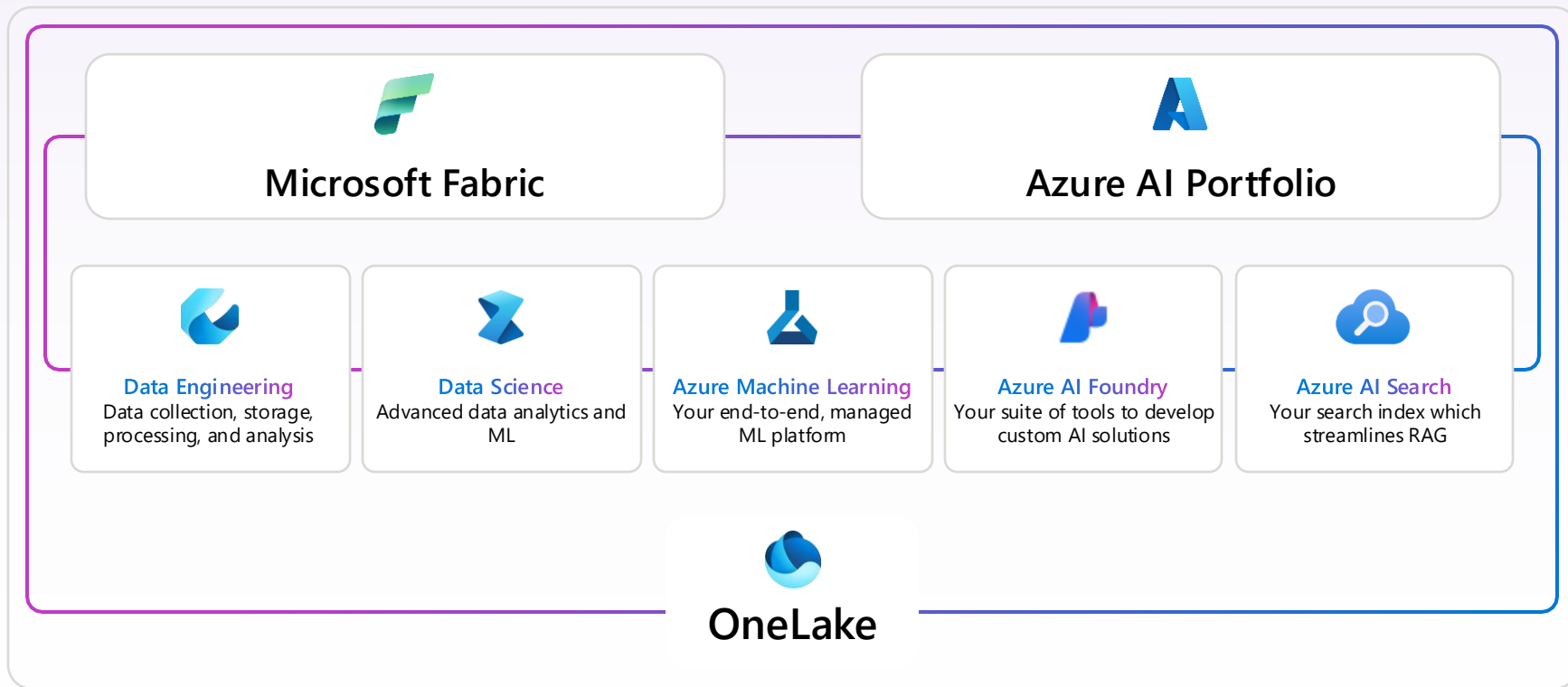
Most liked photo on Social Media

Hyper- Personalization

Achieve more with Microsoft Fabric and Azure AI Portfolio

Microsoft Fabric

Azure AI Portfolio

Data Engineering
Data collection, storage, processing, and analysis

Data Science
Advanced data analytics and ML

Azure Machine Learning
Your end-to-end, managed ML platform

Azure AI Foundry
Your suite of tools to develop custom AI solutions

Azure AI Search
Your search index which streamlines RAG

OneLake

Unify data and analytics to streamline data transformation, business intelligence, and generative AI
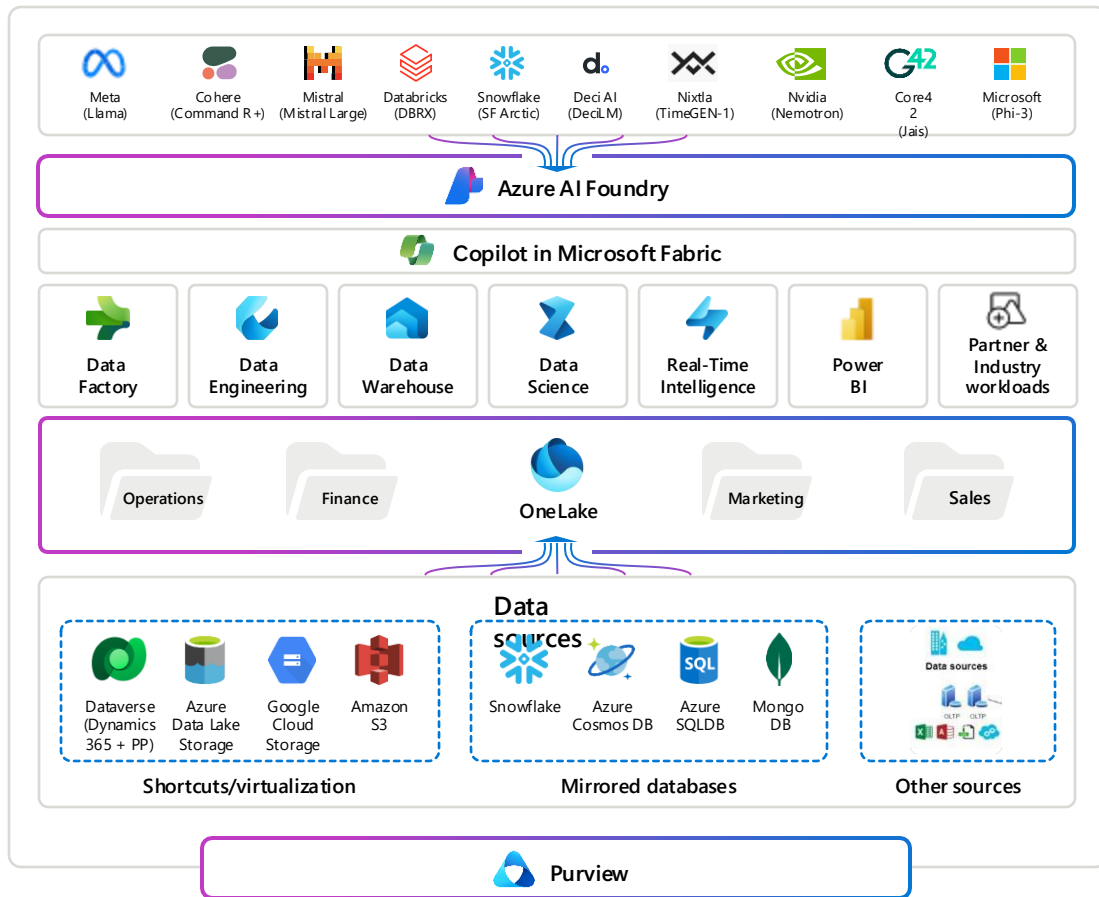
Get started today

Try Microsoft Fabric for free:
https://aka.ms/try-fabric

Watch "Integrating Azure AI and Microsoft Fabric for next-gen AI solutions" Build session

Learn more about Fabric:
https://aka.ms/Fabric-Blog

Discuss with your MS partner or team about Azure Innovate: https://aka.ms/Azure-Inn

Learn more from our recent Build content:
https://build.microsoft.com

Microsoft

Thank you