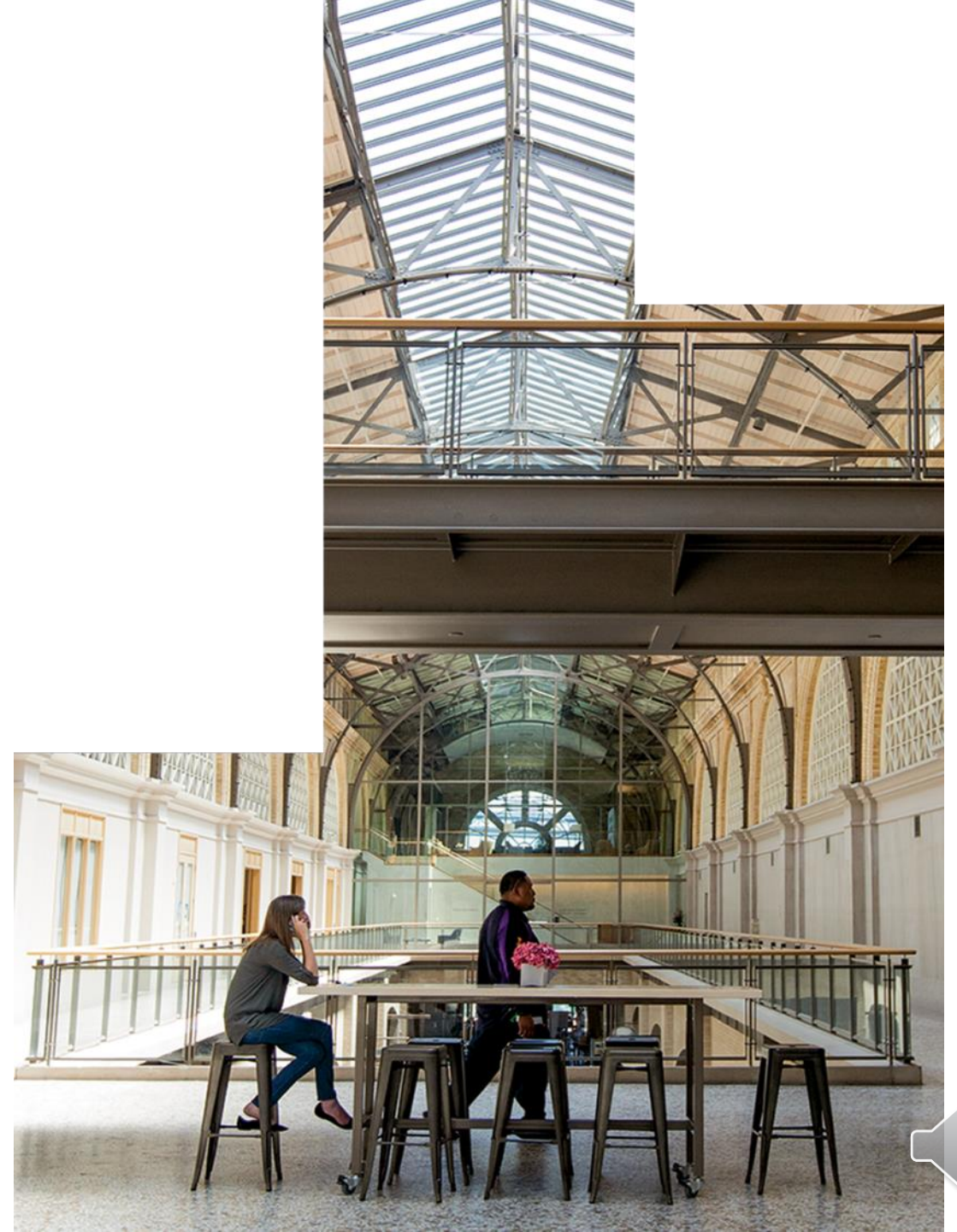


# Integration Patterns

Dynamics 365 FastTrack Architecture Insights

Antoan Hristov



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# Agenda

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Integration Patterns Overview

Components, Technologies and Patterns

Event-driven Architecture

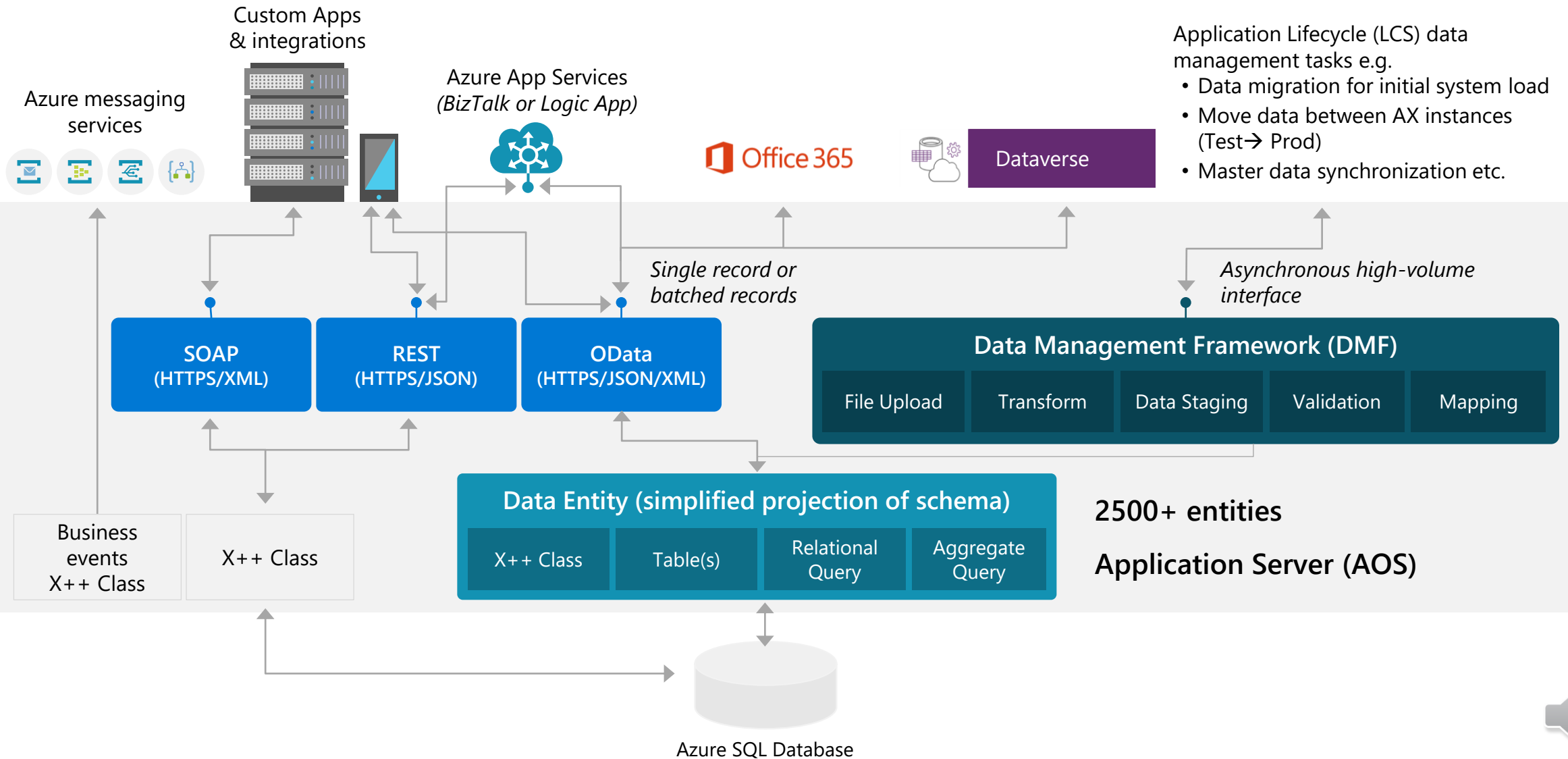
Data Analytics Extracts



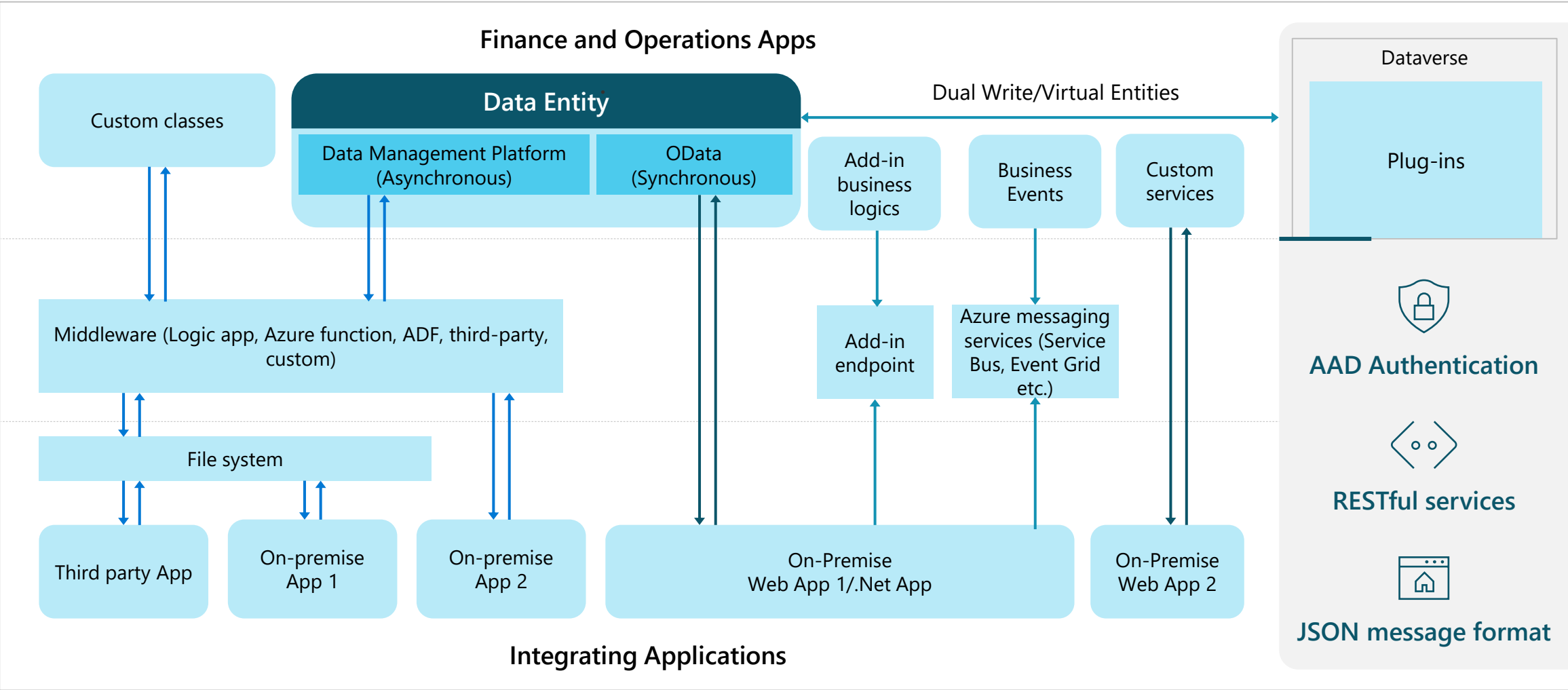
# Integration Patterns Overview



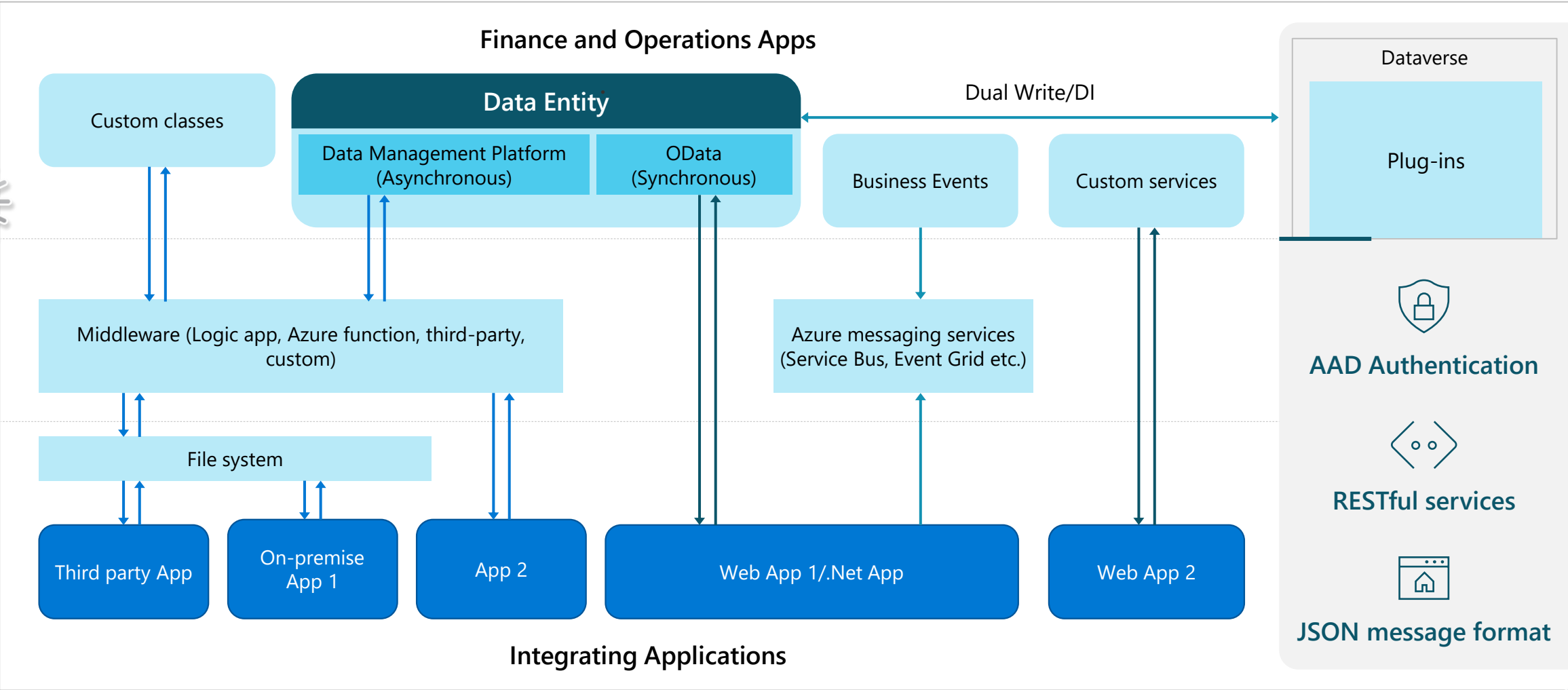
# Architecture: Integration Components



# Finance And Operations apps Integration Technologies



# Finance And Operations apps Integration Technologies



# Main patterns for Dynamics 365 for Finance and Operations Apps



## Real-Time Integration

- Exchange data **synchronously** and **invoke actions** via services
- Keep payloads & logic small enough to complete calls in <1s for high frequency / latency sensitive scenarios, no more than 5-10s otherwise
- Performance depends on underlying entity
- Usually implies tight coupling
- Ex mobile application, editing data in excel

OData V4 (REST API)  
Custom Services  
Dual-write (Real-time)

Finance and Operations apps are usually part of an ecosystem.

Consider the best patterns to use in that larger context.

## Asynchronous Integration

- Setup **periodic & unattended** exchange of data with external systems
- Often best choice for **high volumes**
- Can be near real-time
- Loose coupling of systems is very desirable
- Ex: Nightly credit card data file, Weekly export of general ledger summary, business event triggering retrieval of packing slip details

Data import/export (Recurring & API based)  
Business Events  
Data Lake Integration (preview)



# Factors to consider when choosing a pattern



## Latency

- **Synchronous:** Integration is triggered with an immediate response required.
- **Asynchronous:** Integration is triggered with a delayed response required.
  - **Near Real-Time:** Minimal latency (<1 min) is allowed between trigger and transmission.
  - **Scheduled Batch:** Integration will occur on a scheduled basis with a pre-determined recurrence.



## Frequency

- Integration request can be classified into following frequencies:
- **High:** seconds or minutes  
**Medium:** Hours or Days  
**Low:** Weeks or Months



## Message Routing

- **Point-to-Point:** Dynamics 365 to Legacy System
- **Enterprise Service Bus:** BizTalk Server etc.
- **Broker, Hub & Spoke, or Extract, Transform, Load (ETL):** e.g. SQL Server Integration Services



## Trigger

- **On-Demand/Manual:** Integration is manually initiated by either an End User or IT User.
- **Event Triggered:** Integration is triggered based on an event or condition in the source or destination system.
- **Time/Date Scheduled:** Integration is triggered based on a pre-determined schedule.



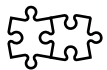


# Factors to consider when choosing a pattern



## Interaction/Operation

- **Create:** Record will be created in the destination system.
- **Read:** Integration will query the source and return a specifically requested piece of data.
- **Update:** Integration will update an existing record in the destination system.
- **Delete:** Results in the deletion of a record in the destination system.
- **Action:** Integration will trigger a system event. E.g. Calculate sales order price.



## Volume

- **Number of records per batched request:**
  - Low / Medium / High Volume



## Batching

- **Un-batched:** Individual records are sent in the integration request.
- **Batched:** Records are consolidated for transmission through the integration request.



## Transport Protocol

- Windows File Service, FTP/SFTP
- HTTP/HTTPS, WCF Web Service, SOAP Web Service
- ODBC, Direct SQL Query



# Factors to consider when choosing a pattern

## File formats & Schema/Data Dictionary

- **File Formats:** Flat file, .NET TCP, XML etc.
- **Message/API Schema:** XSD / WSDL / OpenAPI (Swagger)

## Transformation and Translation Point

- **ESB/Broker:** Occurs in the broker system during the integration process. (if no logic is required)
- **Destination:** Occurs in the destination system (if business logic is required for the transformation).
- **Source:** Occurs in the source system before the data is transmitted. (if logic is required).

## Data Mapping/Meta Data Definition






- **Canonical model:** Integration is mapped to a standardized model in a broker or ESB.
- **Application specific format:** Direct mapping between the source and destination systems.

## Error Handling & Reconciliation

- **Notifications:** Email, Dashboard, SMS etc.
- **Reconciliation Point:** Application, Middleware, Monitoring Utility etc.
- **Reconciliation tools:** Data quality services, reports, queries etc.



# Integration Strategy

 <b>Integration Technology</b>	 <b>Integration Type</b>	 <b>Integration Pattern</b>	 <b>Best Suited for</b>
OData	Inbound/Outbound	Synchronous	Low to medium volume, a real-time, system to system integration
Custom services	Inbound/Outbound	Synchronous	Low to medium volume, a real-time, system to system integration
DMF Recurring Integration Package API	Inbound/Outbound	 Asynchronous	High volume asynchronous import/ export
Business events	Outbound	Asynchronous	High volume status event notification, workflows, and outbound integrations
Dual-write	Inbound/Outbound	Synchronous	Integration with Dynamics 365 Apps
Virtual Entities	Inbound/Outbound	Synchronous	Medium/Low volume native integration with Dataverse (no data exchange)
Data lake integration*	Outbound	Asynchronous	High volume data integration for Analytics

\*upcoming



# Business events



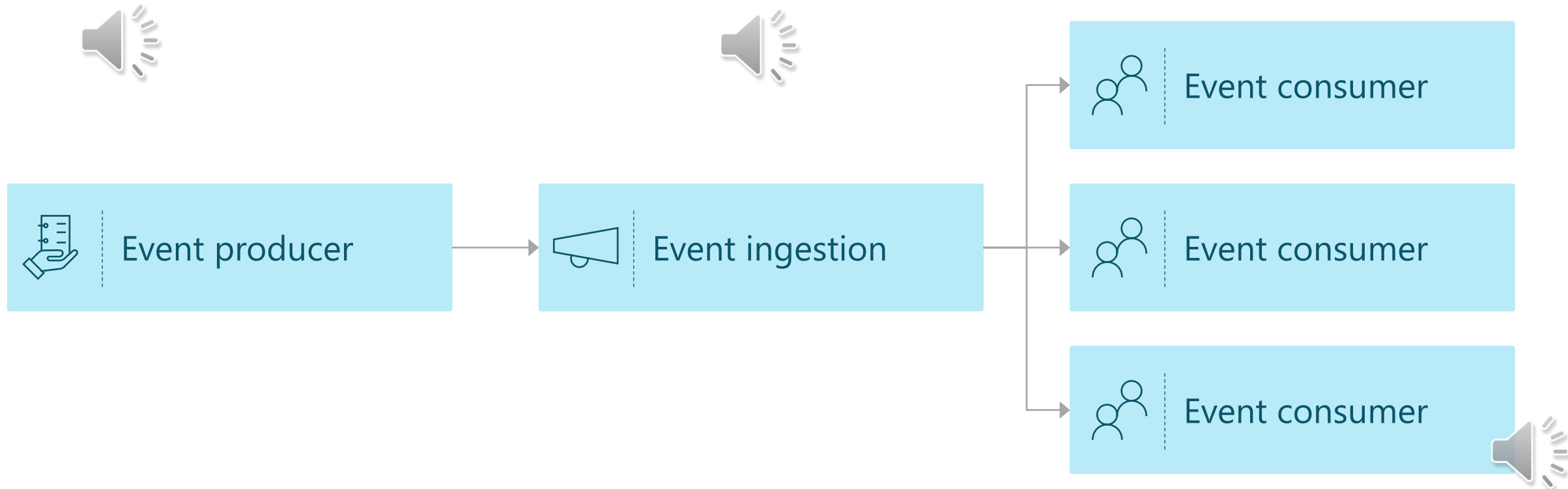
# Event-driven architecture

Events produced in near real-time so that consumers can respond to events as soon as they occur.

Event producers and consumers are decoupled.

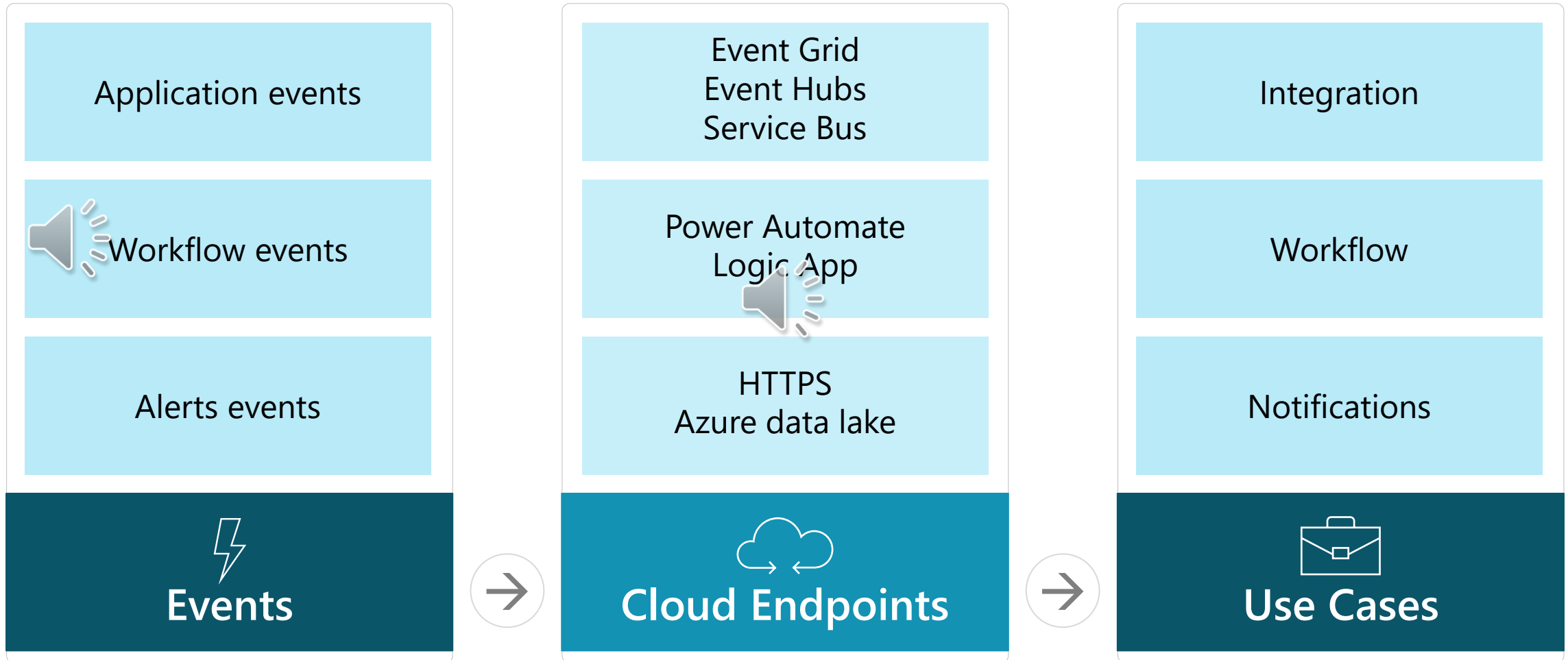
There's no point-to point-integration. It's easy to add new consumers to the system.

Highly scalable and distributed.



# Business events

**Business events** to enable business process integrations between F&SCM and external systems in a decoupled fashion



- Small and nimble messages that have just enough information about the event
- Primarily defined at the level of a process step

[Compare Azure messaging services - Azure Event Grid | Microsoft Docs](#)

- App driven construct
- Configurable
- Customizable



# Business events – Out-of-the box



## APPLICATION EVENTS

### Procure to Pay

- Vendor invoice matched
- Vendor invoice posted
- Vendor payment posted
- Invoice register journal posted
- Invoice journal posted
- Invoice approval journal posted
- Purchase order confirmed
- Purchase order received



### Quote to Cash

- Invoice is created from a sales order
- Free text invoice posted
- Payment posted
- Transaction is written off
- Collection status of a transaction changed
- Interest note posted
- Collection letter created



## WORKFLOW EVENTS

Workflow events on every workflow Configuration in Finance and Operations App. This can be used to trigger workflow notification and approval with external system such Power Automate



## ALERT AS BUSINESS EVENTS

Finance and Operations alerts can be Sent externally using the business event and can be used for notification using Power Automate

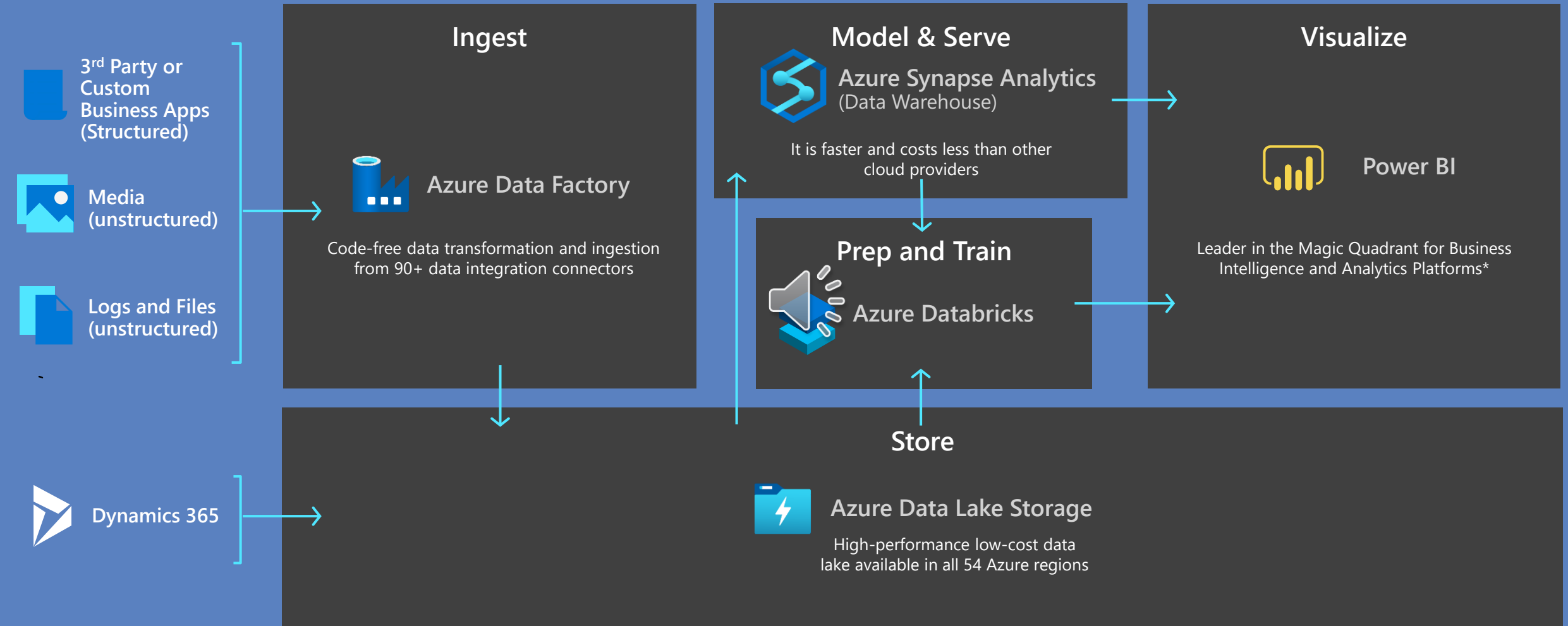


# Data Analytics





# The Modern Data Warehouse



# Q & A



Thank you !

