



Dynamics 365 FastTrack

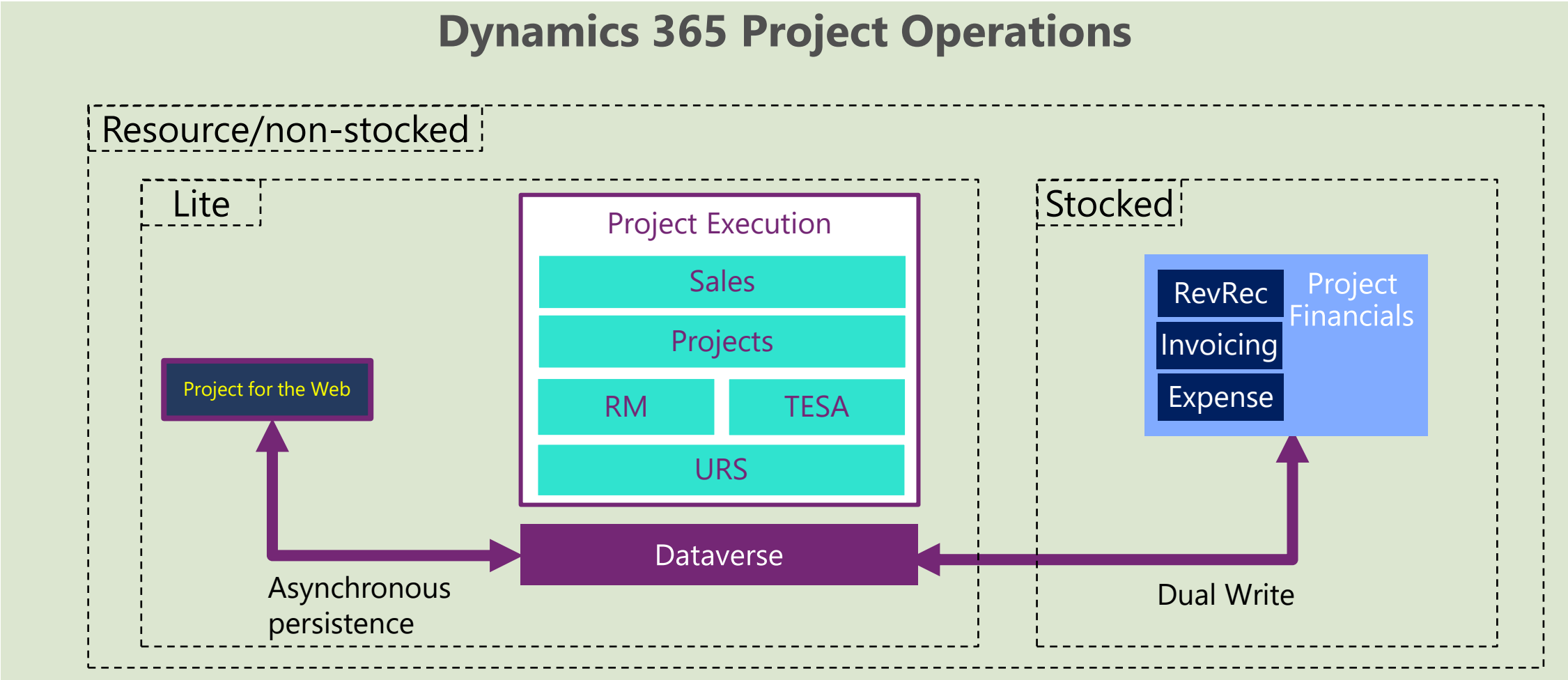
Project Operations
Data Migration

Marc De Deygere
Veselina Eneva
Martin Walker

Agenda

- 1) Data ALM
- 2) Master Data
- 3) Opening Balances & Transactions

Architecture



Key

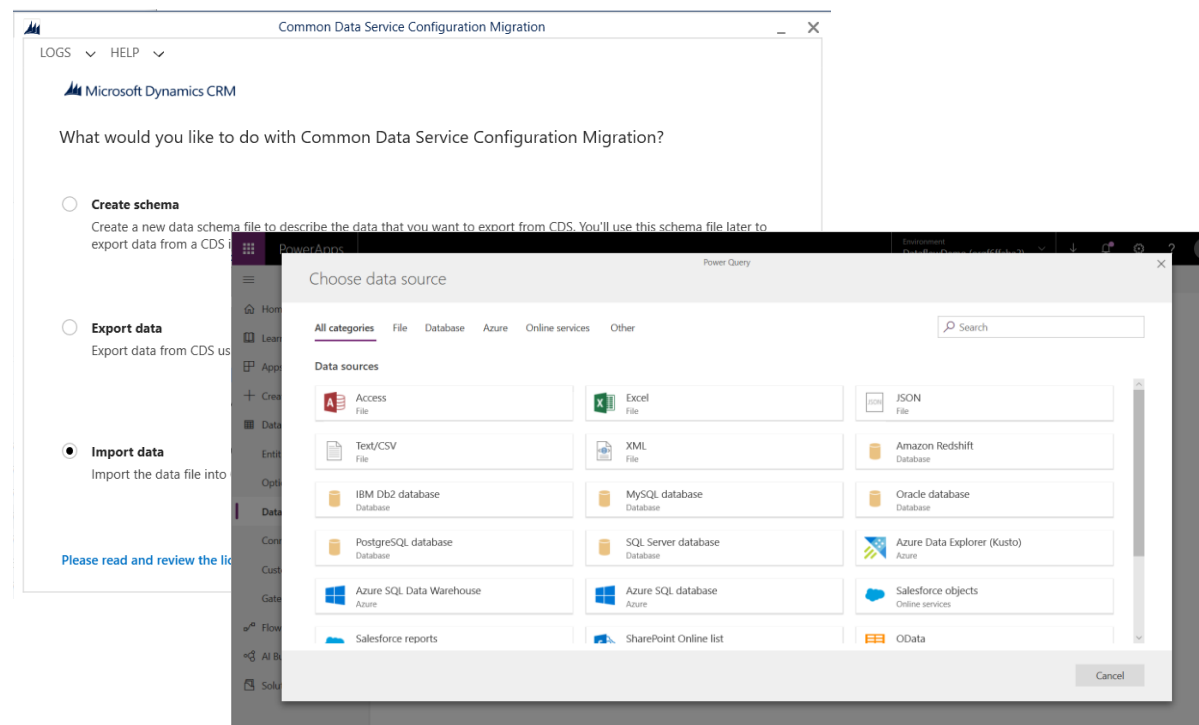
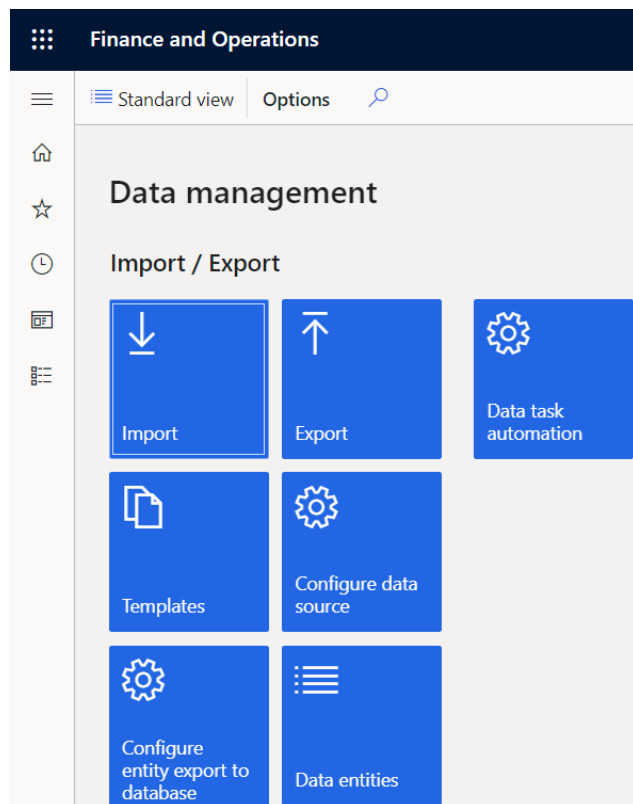
M365 Services	D365 CE App
Dataverse	D365 F&O App

RM = Resource Management
TESA = Time, Expense, Status, Approvals
URS = Universal Resource Scheduling
RevRec = Revenue Recognition



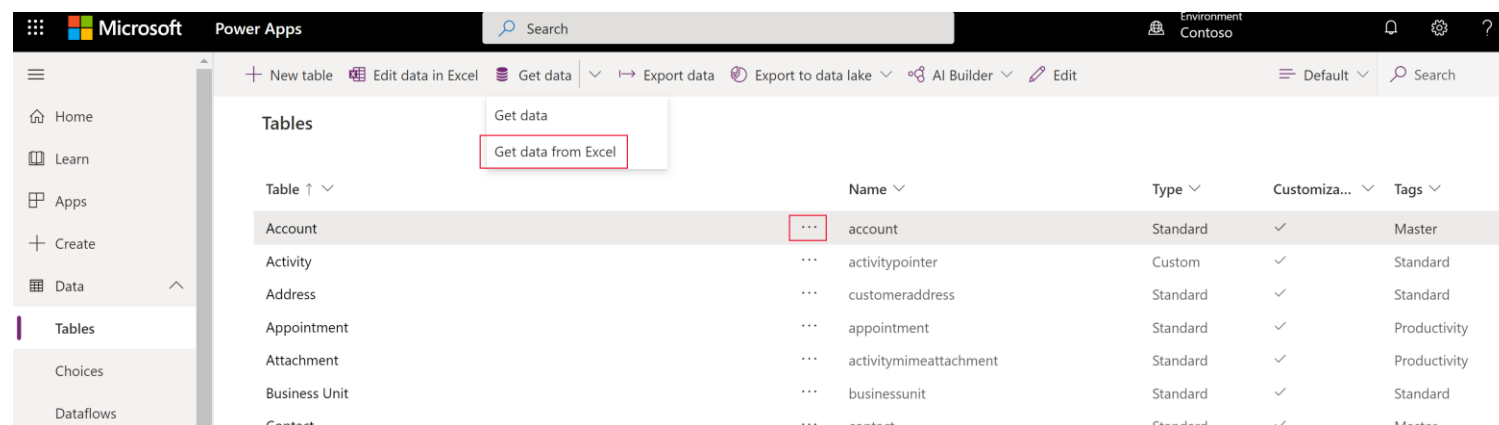
Data ALM

Data ALM - tools

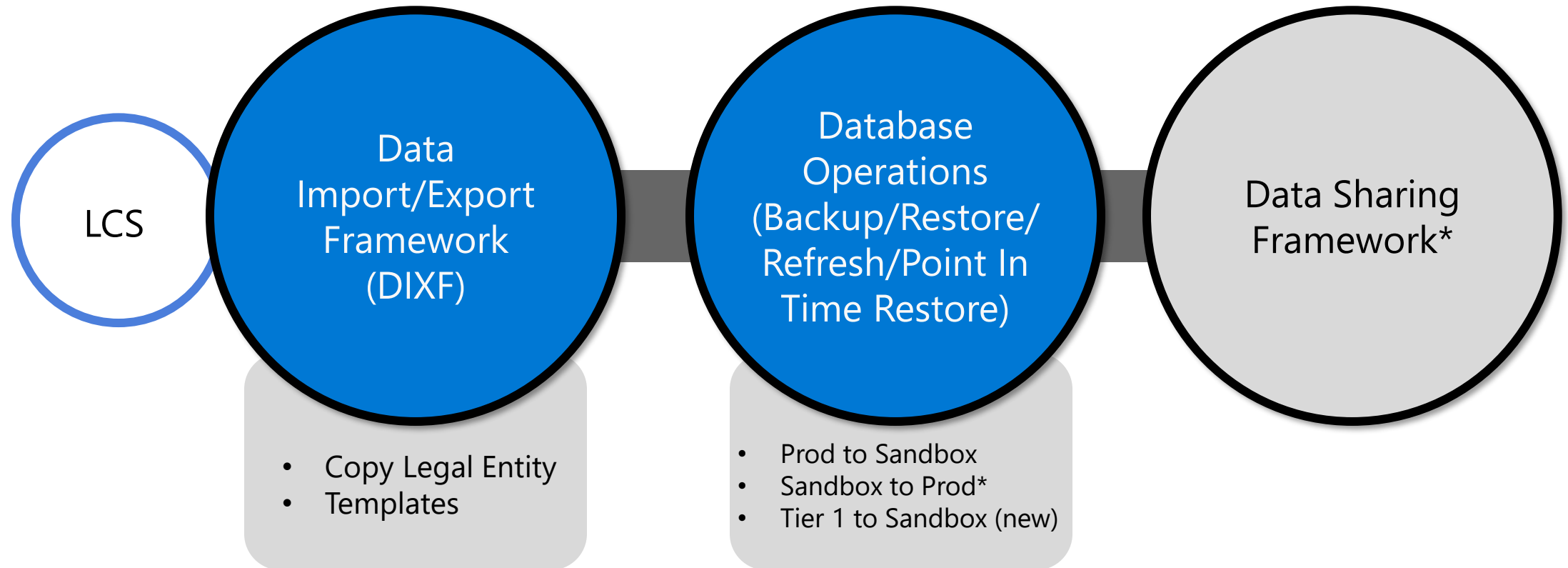


Project Scheduling API

- Projects
- Tasks
- Task Dependency
- Resource Assignment
- Project Team Member
- Project Bucket



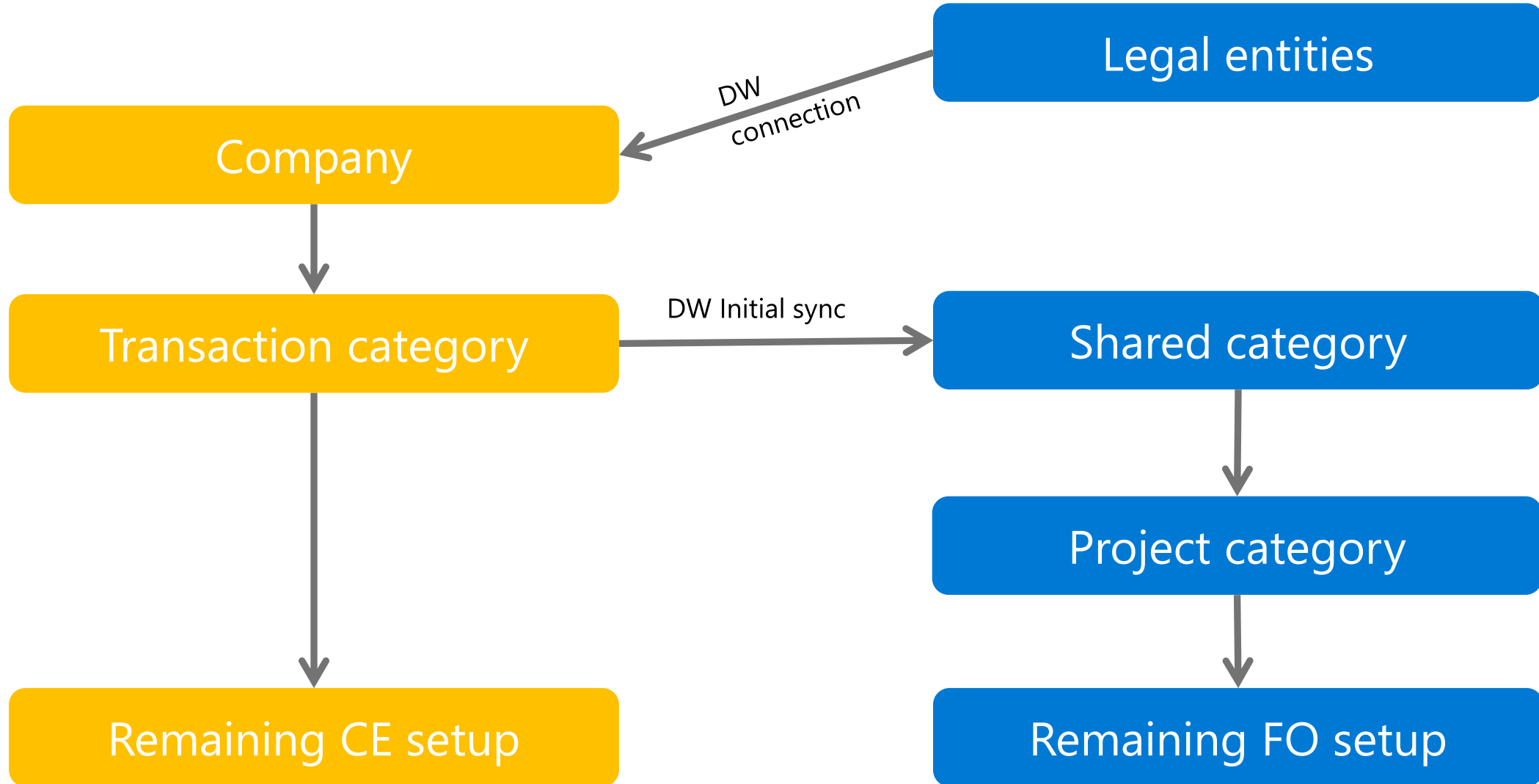
F&O Data Management Toolsets



Getting started with Gold Configuration

CE

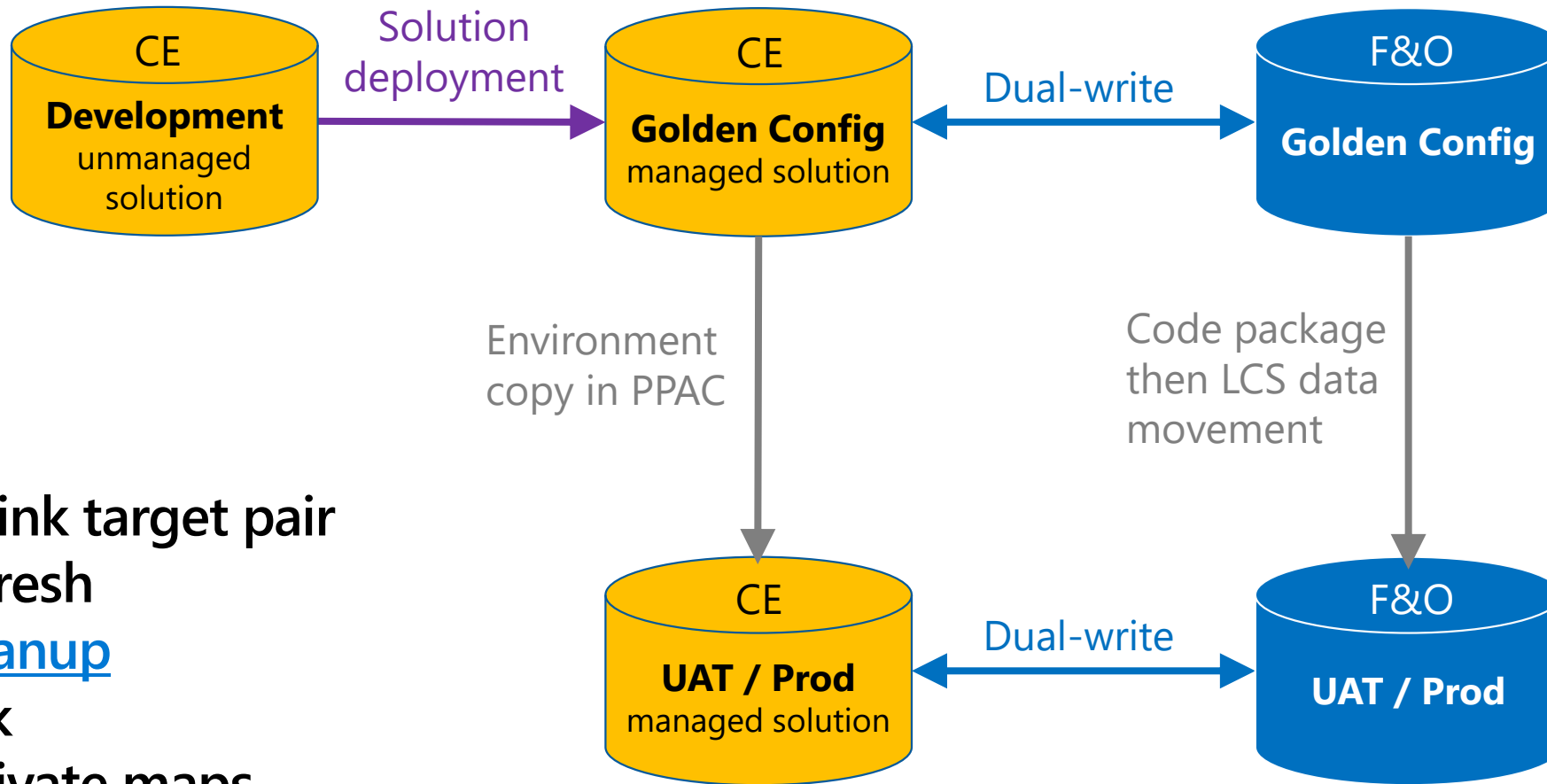
F&O



Data ALM - Environment copy/refresh

CE

F&O



1. Unlink target pair
2. Refresh
3. Cleanup
4. Link
5. Activate maps
6. Convert target CE to production

Dynamics 365 Data Import Wizard

Recommended for moving small batches of records.

Included in Dynamics 365 CE

Choosing your data source

Can only import a single file 8MB or less at a time. File types allowed include: XML Spreadsheet 2003 (.xml), .csv, .txt, and .zip

Linking records together

Can link records that have a 1:N relationship, where the lookup field exists on the entity you are importing data for. **Can't populate lookups using more than one field as the identifier.**

Updating existing records in D365

In order to update records using the tool, you must either have an alternate key defined, or first export them from a view or Advanced Find.. You can then manually add the changes to the exported file and reimport into D365.

Mapping entities and fields

Can only apply basic mapping to fields. Cannot apply calculations/logic to the mappings. You can manually map the fields or have the tool map automatically using a saved mapping file.

Duplicates

Can utilize native duplicate detection rules to prevent duplicate records from importing.

The screenshot displays the Dynamics 365 Data Import Wizard interface, specifically the 'Map Record Types' and 'Map Fields' steps.

Map Record Types: This step shows a table mapping source data files to target Microsoft Dynamics CRM record types. A green checkmark indicates that the data files have been successfully mapped.

Source Data Files	Microsoft Dynamics CRM Record Types
Account	Account
Contact	Contact
Event	Appointment
Lead	Lead
Note	Note
Opportunity	
Task	
Task2	

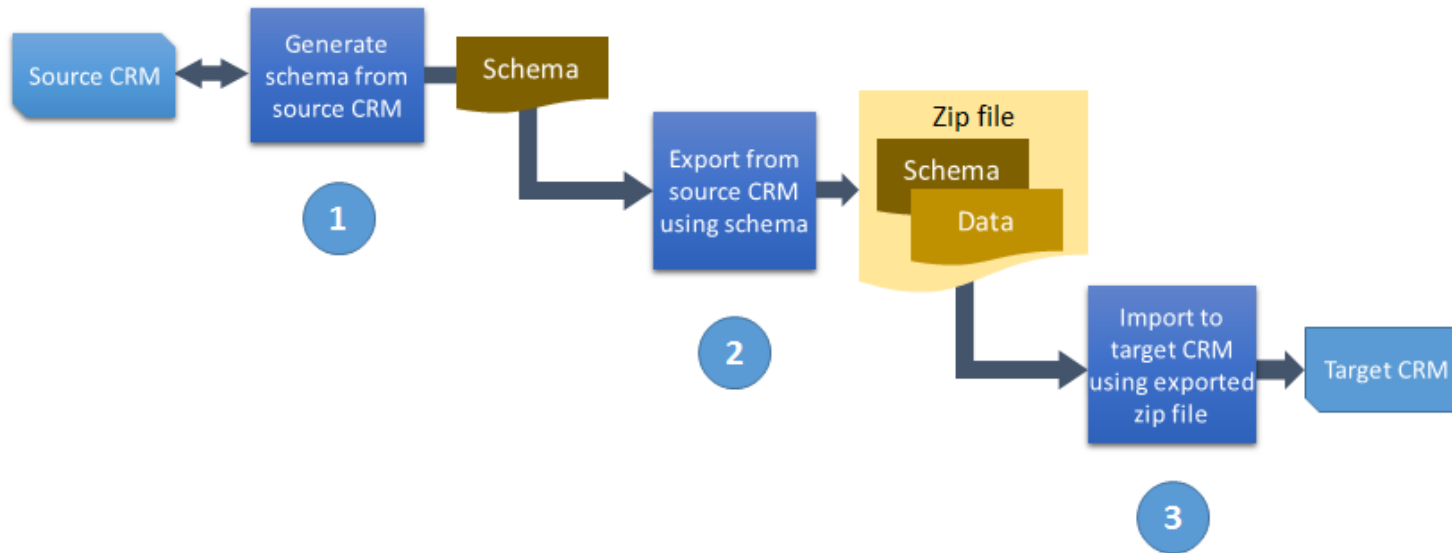
Map Fields: This step shows the mapping of source fields to target Microsoft Dynamics CRM fields. A green checkmark indicates that all the record types with fields have been successfully mapped.

CRM Record Types	Source Fields	CRM Fields
Account	Required Fields	Account Name
	Not Mapped (Use Default)	Relationship with xRM (Option...)
	Optional Fields	Account Number
		Account Type
	Address 1: Address Type	Address 1: Address Type (C)
	Address 1: City	Address 1: City
	Address 1: Country/Region	Address 1: Country/Region
	Address 1: Freight Terms	Address 1: Freight Terms (C)
	Address 1: Name	Address 1: Name
	Address 1: Shipping Method	Address 1: Shipping Methc
	Address 1: Extra Dimensions	Address 1: Extra Dimensions

D365 Configuration Migration Utility

Recommended for moving configuration entities between environments.

How does the Configuration Migration tool work?



Included in Dynamics 365 SDK

The Configuration Migration tool enables you to move configuration data across Microsoft Dynamics 365 instances and organizations

1. Define the schema of the source data to be exported

The schema file (.xml) contains information about the data that you want to export such as the entities, attributes, relationships, definition of uniqueness of the data, and whether the plug-ins should be disabled before exporting the data

2. Use the schema to export data

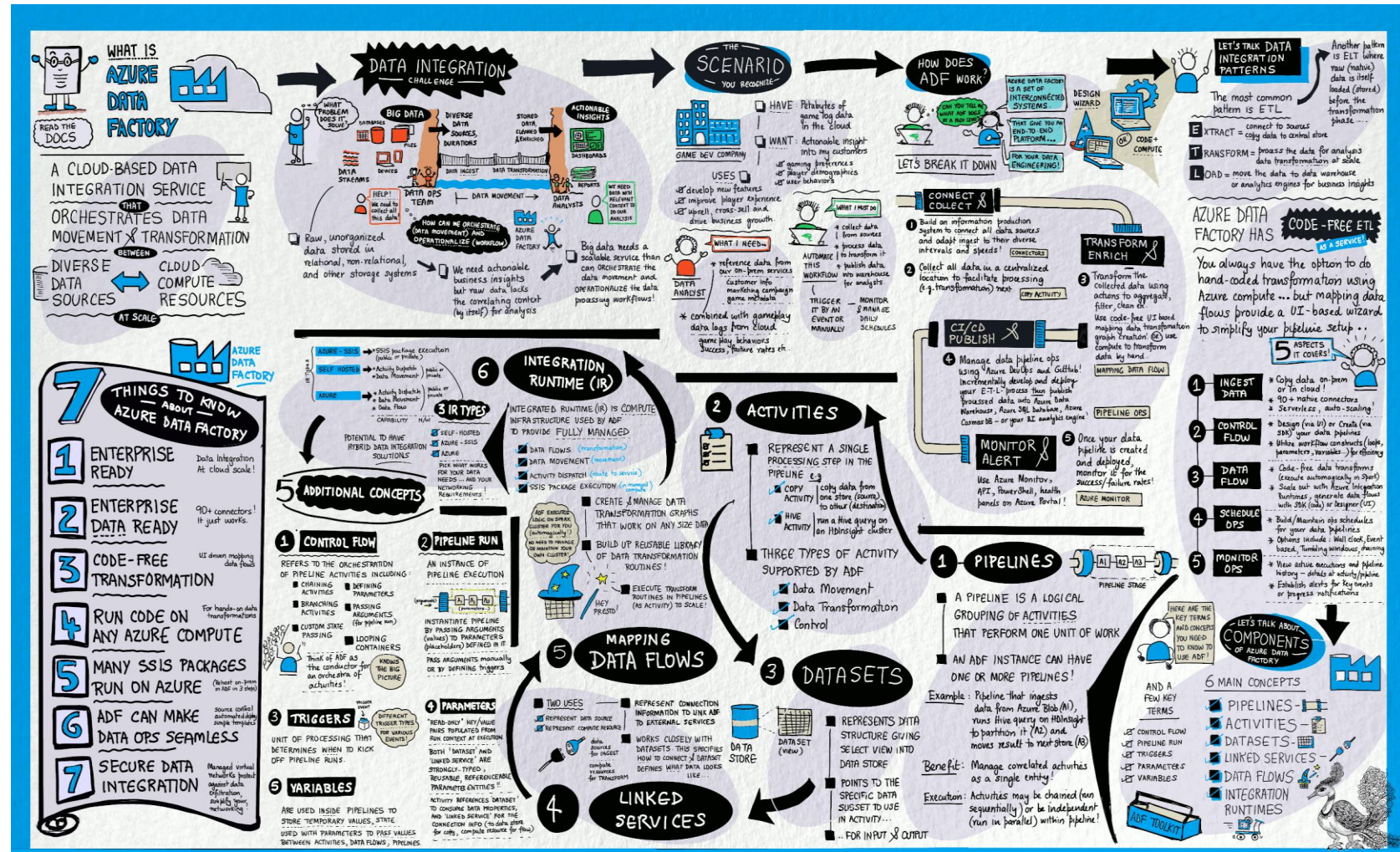
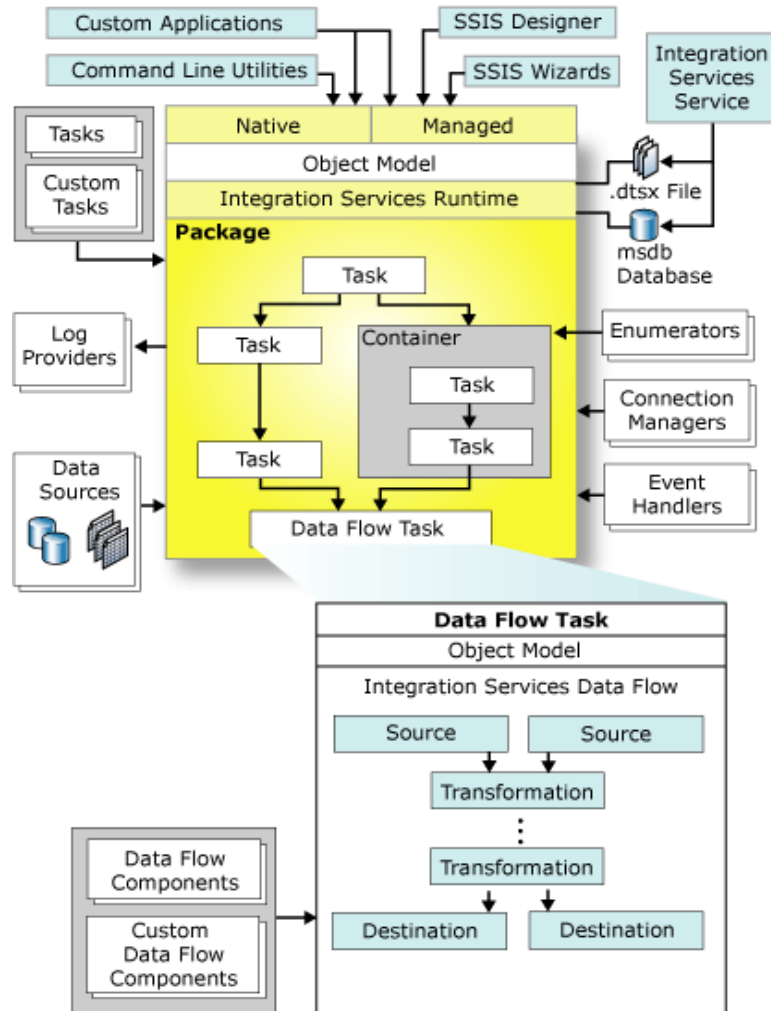
Use the schema file to export the data into a .zip file that contains the data and the schema of the exported data.

3. Import the exported data

Use the exported data (.zip file) to import into the target Dynamics 365 instance. The data import is done in multiple passes to first import the foundation data while queuing up the dependent data, and then import the dependent data in the subsequent passes to handle any data dependencies or linkages. This ensures clean data import.

SQL Server Integration Services (SSIS) or Azure Data Factory (ADF)

For migrating tremendous amount of data, using the Dataverse OData API and parallel operations



Learn | <https://aka.ms/visual/azure-data-factory>

Follow | @sketchthedocs <https://sketchthedocs.dev>

<https://docs.microsoft.com/en-us/azure/data-factory/connector-dynamics-crm-office-365>

*plus a D365 adapter

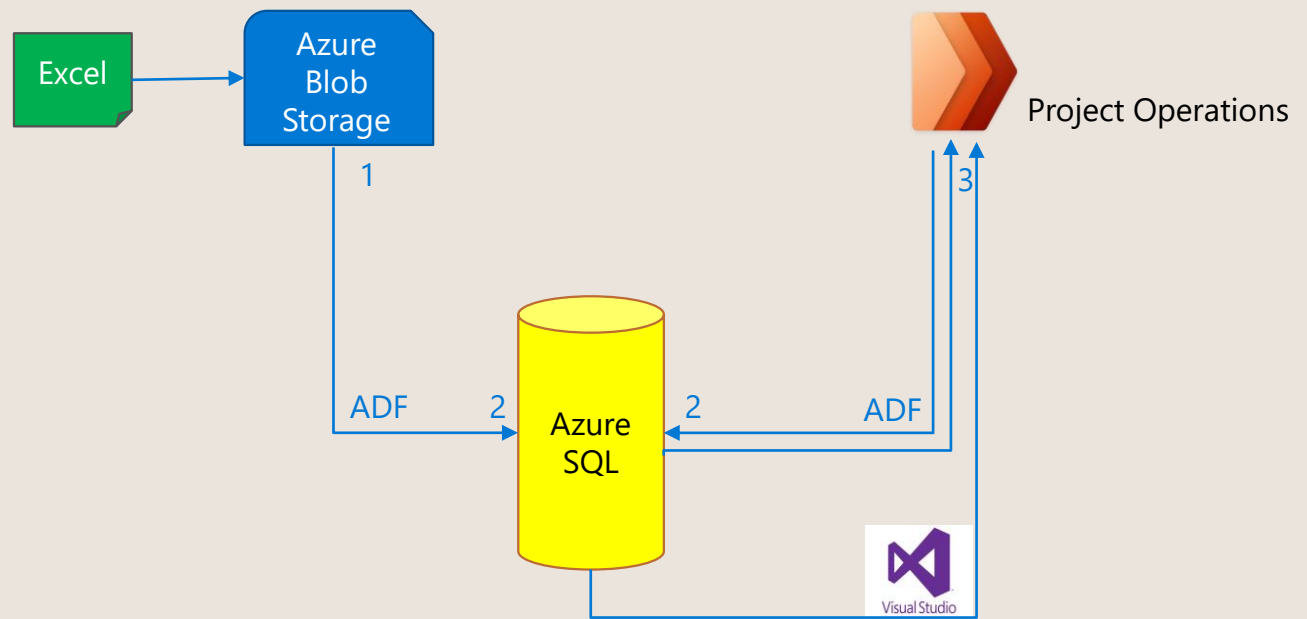
Additional considerations

- 3rd party commercial solutions, e.g. TIBCO Cloud™ Integration (Scribe)
- Custom code - [sample](#) demonstrating use of CrmServiceClient & TPL to maximize throughput
- Remember [Service protection limits](#)
- [2018 Tech Talk](#) still has relevant guidance
- For entities existing in F&O and Dataverse consider disabling Dual/Write for bulk uploads

A close-up, low-key photograph of a mechanical dial with numbers and a circuit board with electronic components. The dial is in the foreground, slightly out of focus, showing numbers like 4, 5, 6, 7, 8, 9, 0, 1, 2, 3. The circuit board is in the background, showing various electronic components like resistors and capacitors. The lighting is dramatic, with strong highlights and deep shadows.

Master / Reference data

Demo



Azure Data Factory : Customers

Azure Data Factory allows you to configure a Git repository with either Azure DevOps or GitHub. Git is a version control system that allows for easier change tracking and collaboration. [Learn more](#)

[Set up code repository](#)

Data factory

PO-DataMigration-US

New



Ingest

Copy data at scale once or on a schedule.



Orchestrate

Code-free data pipelines.



Transform data

Transform your data using data flows.



Configure SSIS

Manage & run your SSIS packages in the cloud.

Discover more



[Browse partners \(preview\)](#)



[Pipeline templates](#)

Recent resources

	Name	Type	Last opened by you
	1 - Excel Upload	Pipeline	8 minutes ago
	0 - Download	Pipeline	9 minutes ago

[Show more](#)

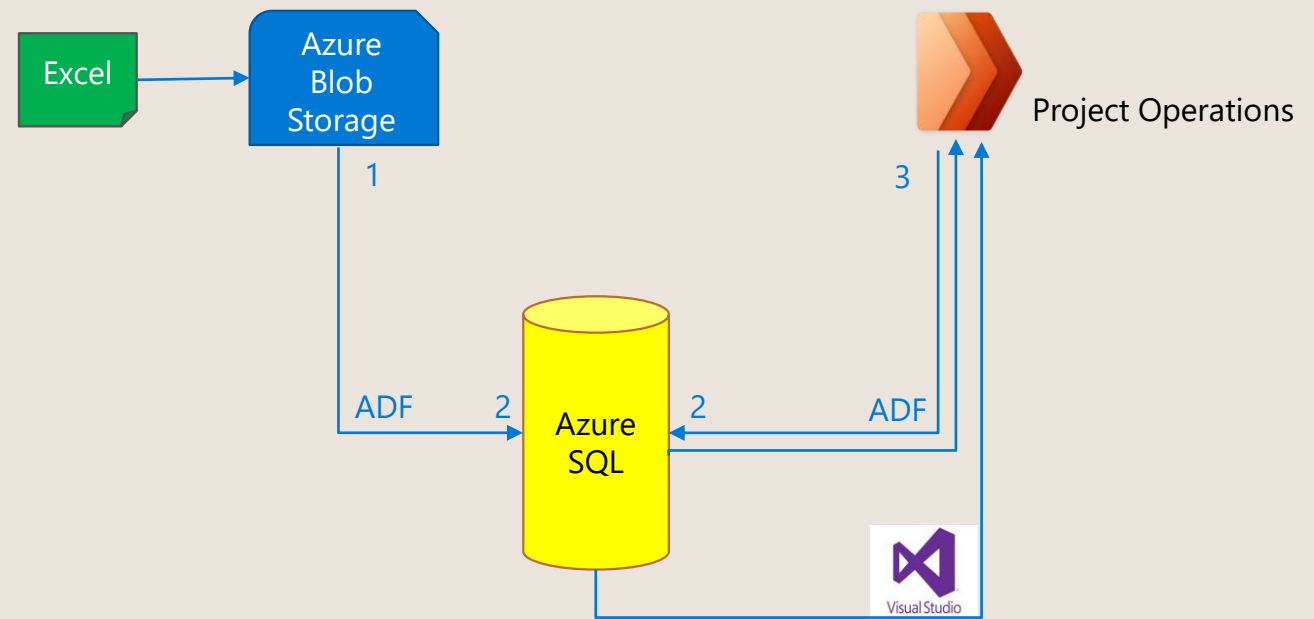
Feature showcase



Integrate Azure Purview with Azure Data Factory

Connect a data factory to Azure Purview to discover trusted and accurate data across your hybrid environment.

Demo



Visual Studio : Projects & Tasks

Home

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My Work

Dashboards

Time Entries

Expenses

Approvals

Material Usage

Projects

Projects

Schedule Board

Resource Utilization

Resources

Roles

My Active Projects

Project ID

Name

Customer

Start Date

Finish Date

Actual Start

Actual Finish

Effort (Hours)

Effort Complet...

% Complete

Estimated Total...

Actual Total Cost

Cost Consumpt...

No data available.

Project Schedule API – Overview

- msdyn_CreateProjectV1
- msdyn_CopyProjectV3 – Copies an existing project.

Documentation: <https://docs.microsoft.com/en-us/dynamics365/project-operations/project-management/dev-copy-project>

Create target project with a status reason: Project Copying

- msdyn_CopyProjectV2 API will set the status reason to: Active when copy is complete.
 - Custom logic should NOT make any update to project or project task records while the project has a status of Project Copying.
- msdyn_GetProjectSaveStatusV1 – Check if there is data synchronizing between Project for the Web and dataverse

Currently not documented, was released with version: 4.25.0.91

Sample Code:

```
public static bool IsSavingFromPSS(Guid projectId, IOrganizationService organizationService)
{
    OrganizationRequest getProjectSaveStatusRequest = new OrganizationRequest("msdyn_GetProjectSaveStatusV1");
    getProjectSaveStatusRequest["ProjectId"] = projectId.ToString();
    OrganizationResponse response = organizationService.Execute(getProjectSaveStatusRequest);
    var isSavingFromPSS = (bool)response["IsSaving"];
    return isSavingFromPSS;
}
```

- ☰
- 🏠 Home

🕒 Recent

📌 Pinned

My Work

📊 Dashboards

📅 Time Entries

📄 Expenses

📄 Approvals

📦 Material Usage

Projects

📅 Projects

📅 Schedule Board

🗨️ Resource Utilization

📄 Resources

👤 Roles

← 📊 Show Chart + New Project 🗑️ Delete | ↺ Refresh 🗨️ Collaborate 📧 Email a Link | ⚙️ Flow 📄 Excel Templates 📄 Export to Excel | 📄 Import | 📄 Create view

My Active Projects

🔍 🔍 Search this view 🔍

✓ | Project ID | Name | Customer | Start Date | Finish Date | Actual Start | Actual Finish | Effort (Hours) | Effort Complet... | % Complete | Estimated Total... | Actual Total Cost | Cost Consumpt...

Data Migration

Environment

Connect Exit

Projects

Create Add Tasks Add Estimates

Project Contracts

Add project to contract line

Journals

Post Mark ready to invoice

Invoices

Create Post

Time Entries

Process

Status

created new project DM-Project-0003

📄

No data available.

All # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

P Projects 0 - 0 of 0

CDS

OPERATION SET

2. OperationSet entry is created

1. API Call to start OperationSet, Returns an OperationSetId

3. User's 4 API calls with the same OperationSet handle are received and validated

Create Task A in Project B

Update Start date of Task B in Project B

Update resource assignments in Project B

Update a project bucket

Error/exception is returned to the User

SYNCHRONOUS METADATA VALIDATION OF API INPUTS

- Data types
- Field lengths
- Referential integrity checks

Validation passed ?

No

Yes

4b. API operations are batched based on OperationSet ID

4a. User calls the Execute OperationSet API

ExecuteOperationSetV1

ACCEPT

Operation Set

Create Task A in Project B

Update Start date of Task B in Project B

Update resource assignments in Project B

Update a project bucket

4c. PSS batch API is invoked

PSS (Project Session)

Error/exception is returned to the User

End of flow

OperationSet status, duration and timestamps are updated

Yes

All changes are committed

All CDS operations pass?

No

End of flow

Failures are recorded with durations and timestamps in the OperationSet

All changes across all APIs are rolled back

Asynchronously persist to CDS

CDS-specific business logic is triggered

5. CDS Persist Stage starts in DB transaction scope

Yes

SAVE SERVICE ACTOR INSTANCE

PERSIST

No

All operations accepted?

CALCULATION SERVICE ACTOR INSTANCE

PSS Batch

PSS creates task A in Project B in memory

Update resource assignments in Project B in memory

Update resource assignments in Project B in memory

Update a project bucket in memory

Project Schedule API – Overview (continued)

1. Create Operation Set

```
OrganizationRequest operationSetRequest = new OrganizationRequest("msdyn_CreateOperationSetV1");
operationSetRequest["ProjectId"] = projectId;
operationSetRequest["Description"] = description;
OrganizationResponse response = OrganizationService.Execute(operationSetRequest);
return response["OperationSetId"].ToString();
```

2. Create task

```
OrganizationRequest operationSetRequest = new OrganizationRequest("msdyn_PssCreateV1");
operationSetRequest["Entity"] = entity; //msdyn_projecttask entity
operationSetRequest["OperationSetId"] = operationSetId;
OrganizationResponse response = OrganizationService.Execute(operationSetRequest);
```

3. ExecuteCallExecute

```
OrganizationRequest operationSetRequest = new OrganizationRequest("msdyn_ExecuteOperationSetV1");
operationSetRequest["OperationSetId"] = operationSetId;
OrganizationResponse response = organizationService.Execute(operationSetRequest)
```

[Use Project schedule APIs to perform operations with Scheduling entities | Microsoft Docs](https://docs.microsoft.com/en-us/dynamics365/project-operations/project-management/schedule-api-preview)

<https://docs.microsoft.com/en-us/dynamics365/project-operations/project-management/schedule-api-preview>
[Dynamics-365-FastTrack-Implementation-Assets/ScheduleAPI](#)

HomeRecentPinnedMy WorkDashboardsTime EntriesExpensesApprovalsMaterial UsageProjectsProjectsSchedule BoardResource UtilizationResourcesRoles

My Active Projects

Search this view

Project ID	Name	Customer	Start Date	Finish Date	Actual Start	Actual Finish	Effort (Hours)	Effort Complet...	% Complete	Estimated Total...	Actual Total Cost	Cost Consumpt...
P-001039-Y	DM-Project-0003	DM-Customer-000	3/25/2022	---	---	---	0.00	0.00	0.00	\$0.00	\$0.00	---

Data Migration

Environment

ConnectExit

Projects

CreateAdd TasksAdd Estimates

Project Contracts

Add project to contract line

Journals

PostMark ready to invoice

Invoices

CreatePost

Time Entries

Process

Status

created tasks for project DM-Project-0003

Project Schedule API – Lessons Learned

Plugins & Classic Workflows

- Avoid synchronous plugins and workflows
 - This is critical for Project & Project Task – create & update message
- Calling Schedule APIs from plugins
 - It will be a challenge to call the schedule APIs from plugins due to the 2-minute timeout
 - The response from execute call to run an operationset does not indicate “complete”. You need to monitor the status of the operationset

Throttling

- All operations from Project for the Web to Dataverse run as a single user (Microsoft Project)
- Data migrations can run into Service Protection Limits against the Microsoft Project user

Error Handling

- Monitor the status of the operationset. If it fails, how will you deal with the operation details that were part of the transaction
- Users may see the tasks show up on the WBS and then disappear from the WBS.

Project Schedule API – Lessons Learned

PSS Error Log

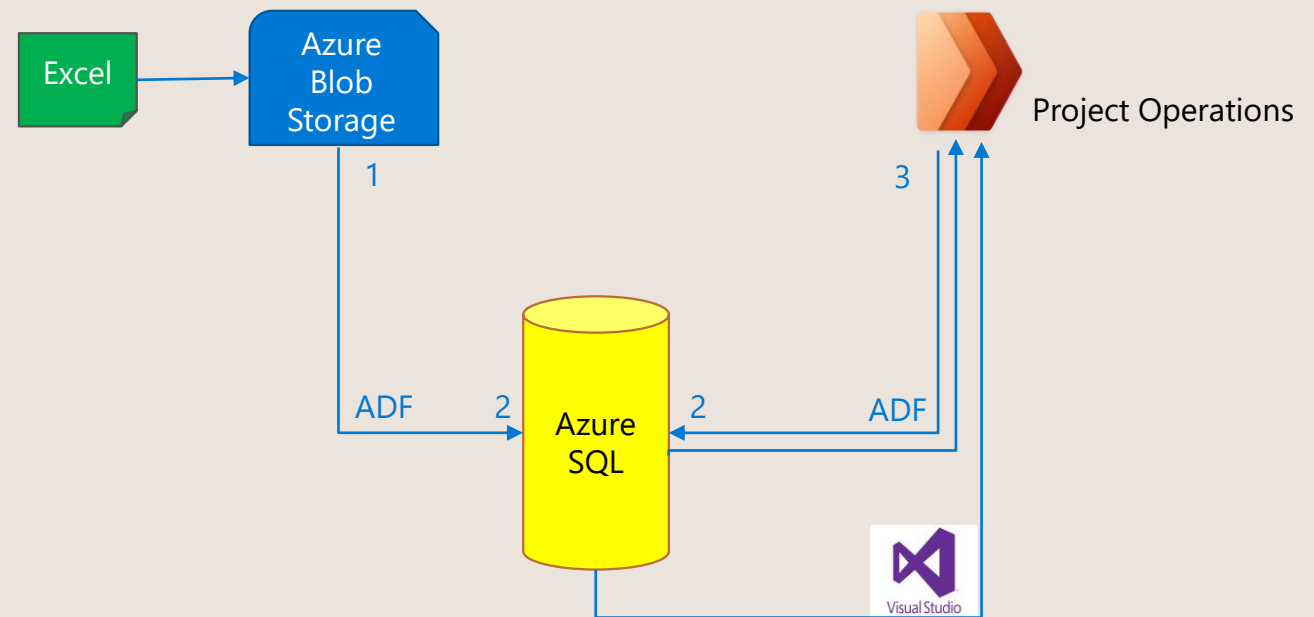
- Shows details of why an operationset transaction failed.
- Can be used to provide feedback to end user.
- Plugins that throw exceptions will not have the error message shown to the end user during the Project for the Web to Dataverse sync.

Load Balancing

- 10 “open” operationsets per user
- 100 operations per operationset
 - Depending on the operations in the operationset and custom business logic the number could be less
- Using multiple users during data migration
 - While this can allow you to have more than 10 open operationsets you can run into Service Protection Limits
- Large Projects
 - Projects with large number of project tasks require additional planning.



Demo



ADF : Project Contracts

VS: Add Projects

Orders My Project Contracts - D

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https://d365rsatlab.crm.dynamics.com/main.aspx?appid=4001f4a3-d921-ec11-b6e5-000d3a99d491&pagetype=entitylist&etn=salesorder&viewid=bc29f750-12a0-4eb5-ac08-698ef528f921&viewType=1039

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InPrivate (2)

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📁 RSAT

📁 Microsoft

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Dynamics 365

Project Operations

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Home

Recent

Pinned

Customers

Customers

Contacts

Price Lists

Sales

Leads

Opportunities

Quotes

Project Contracts

Transactions

Approved Time

Approved Expenses

Journals

Actuals

Billing

Fixed Price Milestones

Retainers and Advan...

Time and Material Bil...

Available Retainers a...

Invoices

←

Show Chart

+ New

🗑️ Delete

↺ Refresh

👥 Collaborate

📧 Email a Link

🔗 Flow

📊 Run Report

📄 Excel Templates

📄 Export to Excel

📄 Import from Excel

⋮

My Project Contracts

🔍

🔍 Search this view

✓ Sales Order Number

Name

Status Reason

Total Amount

Customer

Email (Customer)

ORD-01018-N5L2P7

DM-ProjectContract-0001

New

\$1,250.00

DM-Customer-0001

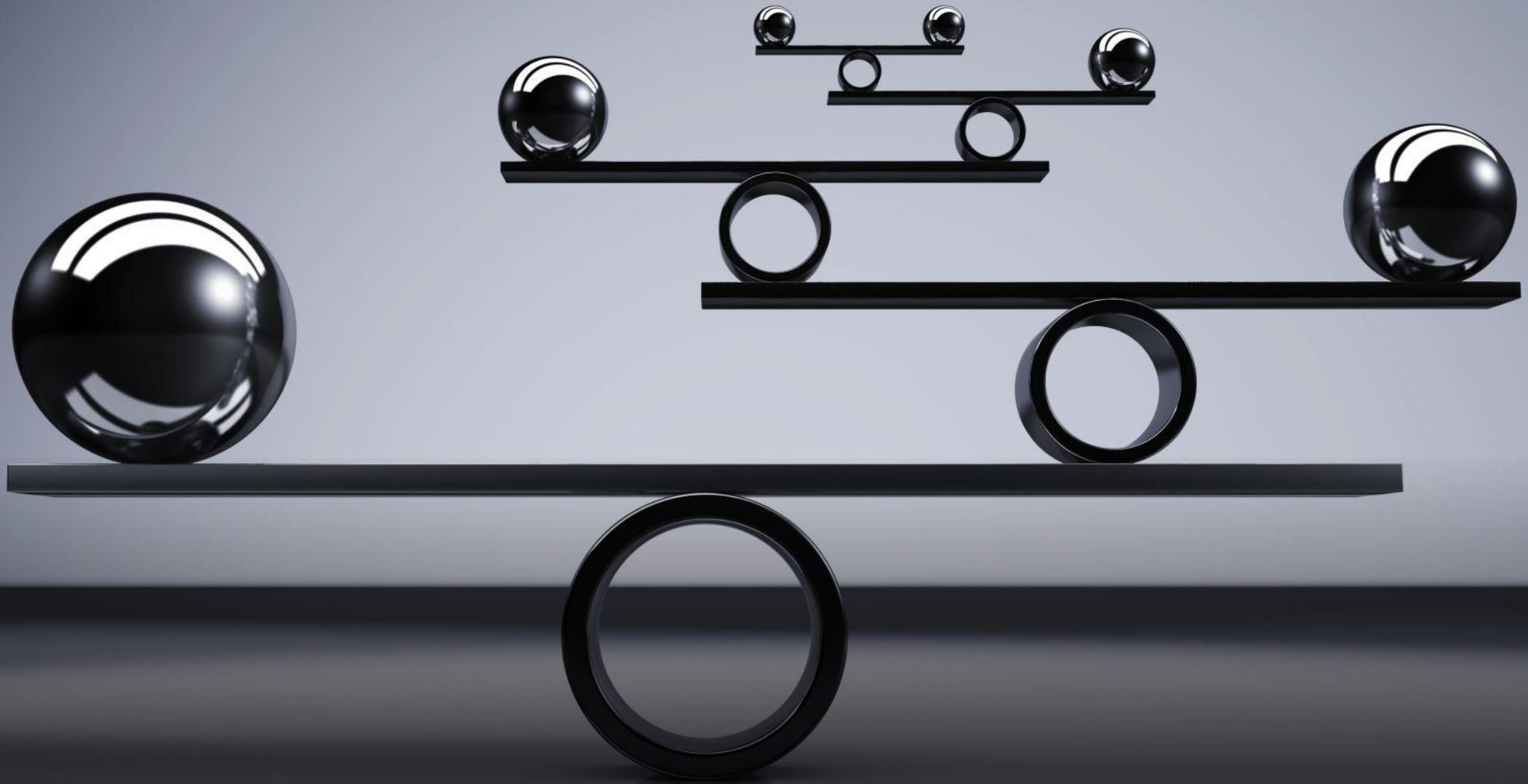
ORD-01036-N6F2M7

DM-ProjectContract-0002

New

\$1,500.00

DM-Customer-0001



Opening balances & Transactions

Data migration approach options

1) Only upload master data and open transaction

All master data and open transactions (not posted in legacy system) are uploaded to the projects

New transactions will be posted in Project Operations

- How
 - Create in Dataverse all project, tasks, contracts, milestones that are still open
 - Create opening balances in F&O for other subledgers (e.g. AR / AP) and general ledger depending on your data migration strategy (use data migration clearing account)
 - Non-Posted Transaction
 - Upload status Draft and use UI or logic to move to next stage submitted
- Possible business scenarios
 - Maybe considered in cases where exporting data from legacy is too complex
- Pros
 - Easy data migration
- Cons
 - Need to create customized reporting on DWH for statement of project
 - No revenue recognition

Data migration approach options

2) Upload master data, open transactions and opening balances

All transactions already posted in legacy system on open projects will be additionally uploaded

New transactions will be posted in Project Operations

- How
 - Create in Dataverse all project, tasks, contracts, milestones that are still open
 - Create opening balances in F&O for other subledgers (e.g. AR / AP) and general ledger depending on your data migration strategy (use data migration clearing account)
 - **Posted Transactions : e.g Time, Expense, Material, Milestones, use journal for aggregated amount, when posting either reverse or use data migration clearing account**
 - Non-Posted Transaction
 - Upload status Draft and use UI or logic to move to next stage submitted
- Possible business scenarios
 - Usual approach for data migration of projects which are not closed on cut-over date
- Pros
 - Full project statement for all ongoing projects
- Cons
 - Logic needs to applied either manually or via customization

Upload Costs / Sales posted in Legacy system

- Upload Dataverse journal with aggregate amounts / project
 - Journal Type Entry
 - Line with Transaction Type Cost - for FP and T&M
 - Line with Transaction Type Unbilled Sales - for T&M
 - Transaction Class Time, Expense or Material as needed
 - Other fields as needed (e.g. Role)
- Confirm the journal, resulting in project actuals
- Mark unbilled sales actuals as ready to invoice
- Generate and confirm invoice

Dashboard -- Finance and Oper...

Journals Active Journals - Dyna...

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https://d365rsatlab.crm.dynamics.com/main.aspx?appid=4001f4a3-d921-ec11-b6e5-000d3a99d491&forceUCI=1&pagetype=entitylist&etn=msdyn_journal&viewid=dbbbecc8-a157-4da2-8ae7-64f548dc7459&viewType=1039

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📁 PO

📁 RSAT

📁 Microsoft

📁 Home

📁 Other favori...

☰

Dynamics 365

Project Operations

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Customers

Customers

Contacts

Price Lists

Sales

Leads

Opportunities

Quotes

Project Contracts

Transactions

Approved Time

Approved Expenses

Journals

Actuals

Billing

Fixed Price Milestones

Retainers and Advan...

Time and Material Bil...

Available Retainers a...

Invoices

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📊 Show Chart

+ New

🗑️ Delete

↺ Refresh

✉️ Email a Link

🔄 Flow

📄 Run Report

📄 Excel Templates

📄 Export to Excel

📄 Import from Excel

📄 Create view

Active Journals

🔍

🔍 Search this view

✓ Description ↑

Is Submitted

Created On

📄

No data available.

Trial balance -- Finance

Customer balance -- Finance

All projects -- Finance

Dashboard -- Finance

General journals -- Finance

Project: Information: DM

Invoice: Project Invoice:

Practice Management D

General (ProjOps P_Crew

d365rsatlab.sandbox.operations.dynamics.com/?cmp=uspm&mi=ProjProjectsListPage

OtherEnvironmentsEcosia - the search...

Finance and Operations

Search for a page

USPM

Home

Favorites

All projects

Data management

Import from staging table

Project Operations integration journal

Subledger journal entries not yet transferred

Recent

Workspaces

Modules

Project

Plan

Manage

Control

Options

New

Process

Bill

Related information

Item task

Estimates

Project invoice proposals

Invoice journals

On-account transactions

Item tasks

Pending transactions

Posted transactions

All projects

Standard view

Filter

Legal entity

uspm

Project ID	Project name	Legal e...	Project contract ID	Customer name
P-001000-V	MDD-Adatum-01	uspm	ORD-01005-Y1C9...	Adatum Corporation
P-001001-S	MDD-Adatum-02	uspm	ORD-01004-Y1B0...	Adatum Corporation
P-001002-J	TestProj01	uspm		
P-001003-N	MDD_PP1Adatum Corpor...	uspm	ORD-01013-Y4S0...	Adatum Corporation
P-001004-W	MDD_HPE_01	uspm	ORD-01015-S1W...	HPE
P-001005-V	MDD_OMNC2_Project Op...	uspm		Omnicom
P-001006-C	MDD_OMNC3_Project Op...	uspm	ORD-01016-Q8Y0...	Omnicom
P-001007-T	Quote Teset	uspm		Adatum Corporation
P-001008-R	Project with Expense	uspm		Adatum Corporation
P-001009-L	Test Project 002	uspm		Demo0Customer
P-001010-Q	DM-Project-0001	uspm	ORD-01018-N5L2...	DM-Customer-0001
P-001011-J	Demo0Project	uspm	ORD-01028-N3X5...	Demo0Customer
P-001012-R	MWTestProject	uspm	ORD-01027-X1X5...	Demo0Customer
P-001014-T	FastTrack base	uspm	ORD-01030-L0T1...	FastTrack
P-001015-F	Demo1Project	uspm	ORD-01031-W9D...	Demo 1 Customer
P-001016-V	Demo2Project	uspm	ORD-01032-T0W...	Demo 2 Customer
P-001017-Y	Demo4Project	uspm	ORD-01033-X4J7Y7	Demo 4 Customer
P-001020-C	FastTrack project 0	uspm	ORD-01034-S3Z2...	FT account 1
P-001026-L	FastTrack MI5	uspm	ORD-01035-C0Q...	MI5 007
P-001028-S	DM-Project-0002	uspm	ORD-01036-N6F2...	DM-Customer-0001
P-001029-V	FT_DM 000	uspm	ORD-01037-B3N5...	FT_DM 000
P-001032-Z	MWTestProject2	uspm	ORD-01038-W1K...	Demo0Customer
P-001033-H	MDD-Demo-01	uspm		Adatum Corporation
P-001034-M	Demo5Project	uspm	ORD-01039-K9Q7...	Demo 5 Customer
P-001035-V	Demo6Project	uspm		Demo 5 Customer
P-001037-K	MWFPETest1	uspm	ORD-01040-L3T7...	MW Test Customer
P-001038-K	MWFPETest2	uspm	ORD-01041-N3H...	MW Test Customer
P-001039-Y	DM-Project-0003	uspm	ORD-01044-Z7Z2J6	DM-Customer-0001
P-001040-L	DM-Project-0004	uspm	ORD-01046-J7B9B1	DM-Customer-0001

Actual costs

Currency

USD

Hour costs

Expense costs

Item costs

Total costs

How to Upload Costs / Sales not-posted in Legacy system

- Upload entries (time, expense) in status draft
- Upload material via Purchase order
- Use UI logic or customize to bring it to the actual status
 - Submit
 - Approve
 - Mark it Ready to Invoice
- Upload milestones

Time

Status	Action	Entity
Draft	Upload as draft	Time Entry
Submit	Call msdyn_TimeEntriesSubmit**	Time Entry
Approved	Call msdyn_TimeEntriesApprove**	Time Entry
Ready To Invoice	Call msdyn_MarkActualReadyToInvoiceOrNot**	Actual *

* identify link between Time Entry and Actual

** microsoft internal

Expense*

Status	Action	Entity
Draft	Upload as draft	Expense
Submit	Call msdyn_ExpenseEntriesSubmit	Expense
Approved	Call msdyn_ExpenseEntriesApprove	Expense
Ready To Invoice	Call msdyn_MarkActualReadyToInvoiceOrNot	Actual **

* in case of F&O expense use DMF framework

** identify link between Expense and Actual

Materials*

Status	Action	Entity
Draft	Upload as draft	Material Usage Log
Submit	Call msdyn_MaterialUsageLogSubmit	Material Usage Log
Approved	Call msdyn_MaterialUsageLogApproval	Material Usage Log
Ready To Invoice	Call msdyn_MarkActualReadyToInvoiceOrNot	Actual **

* in case of F&O expense use DMF framework

** identify link between Expense and Actual

Fully invoiced billing Milestones

1. Modify D/W map for Project Operations integration contract line milestones (msdyn_contractlinescheduleofvalues) with adding additional attribute mapping map status "ready for invoicing" to "fully invoiced"
Run D/W map with these changes
2. Import milestones to Dataverse with Invoice status set "Ready for invoicing". **Make sure that in this step you are importing only the milestones that have been fully invoiced.**
Verify in F&O created On-Account transactions shows up as "Fully Invoiced"
3. Stop Dual Write Maps
 - Project Operations integration contract line milestones (msdyn_contractlinescheduleofvalues)
 - Project Operations integration actuals
 - Project invoice proposal V2
4. Create and Confirm proforma invoices in Dataverse
5. Revert the modification from step 1.
Run D/W map Restart D/W maps

[Migrate fully invoiced billing milestones at cutover | Microsoft Docs](#)

Key take-aways

- Data migration effort should not be underestimated and postponed till later stages in the project
- Data migration must be a joined responsibility
- Be familiar with tools that will be used
- Identify different data sets and upload them one by one with verifications in between
- Data migration is a repetitive activity – it must be planned for , rehearsed, tested and validated
Try to avoid manual interactions and automate as much as possible

Thank you



