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My How-To guide to a successful data migration with Dynamics 365

To-do items in details as a migration guide

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Disclaimer

The white paper describes a helpful guide to a data migration related to Dynamics 365 on-premises. I describe the potential and different steps to follow during the development of the code migration. This description is based on my own experiences with Dynamics 365 on-premises. Regarding your business model, the level and the complexity of the customization, the guide would have to be adapted.

Finally, I do not provide any confidential client data related to data migration.

Table of Contents

Summary	4
Keywords.....	4
Confidentiality	4
INTRODUCTION: MIGRATION CONTEXT	6
Data Migration options	6
Data migration options applied to Dynamics CRM.....	6
Pitfalls of a data migration	6
PROBLEM: HOW TO ORCHESTRATE THE DATA MODEL.....	6
REQUIREMENTS RELATED TO THE ORCHESTRATION	8
Requirements related to Database SQL as migration tool.....	8
Requirements related to organization of entities.....	8
DATA PREPARATION: BEFORE DATA ORCHESTRATION.....	10
START THE DATA PREPARATION	10
VARIABLES INITIALIZATION	10
PREPARING CRM SECURITY MODEL	10
END THE DATA PREPARATION.....	10
CORE MODEL DATA ORCHESTRATION: WAVE 0	12
PRODUCT MODEL DATA ORCHESTRATION: WAVE 1	15
CUSTOMER MODEL DATA ORCHESTRATION: WAVE 2	17
CORE BUSINESS MODEL DATA ORCHESTRATION: WAVE 3.....	19
ACTIVITY MODEL DATA ORCHESTRATION: WAVE 4.....	21
THE INTERNAL SYSTEM PROCESS DATA MODEL ORCHESTRATION: WAVE 5	23
OTHER CUSTOM/SYSTEM BUSINESS DATA MODEL ORCHESTRATION: WAVE 6	25
AFTER DATA MODEL ORCHESTRATION: WAVE 7	27
CONCLUSION: DATA MODEL AND THE 7 WAVES OF ORCHESTRATION	29
The 7 waves.....	29
The 7 waves and integration of the validation process	29

Summary

This white paper provides an overview and a detailed view of pitfalls making painful a data migration related to Dynamics 365 or Dynamics CRM.

Regardless the type of data migration (migration to Dynamics online or migration to Dynamics On-Premises), native and custom items could delay the data migration process.

Those items should be categorized into 5 groups: data context, platform context, functional context, code context, architecture context.

Keywords

Data Migration, D365, Dynamics 365 On-Premises, Dynamics CRM On-Premises, Orchestration, Guide, Ordering, Prioritization, Grouping, Reporting, Logging, Tables, Attributes, Columns, Entities, Data Model, Customer Data Model, Activity Data Model, Custom Entities, System Entities, Core Data Model, Security Data Model, Internal System Process, Sequencies, Validation.

Confidentiality

The white paper does not provide any confidential client data related to data migration. All the code in this white paper is only related to the CRM SDK365 code.



Introduction: migration context

**Problem: How to orchestrate
the data model**

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INTRODUCTION: MIGRATION CONTEXT

Data Migration options

Without emphasizing the technical aspect of an option, in this case, whether it is a "Cloud" technology (cloud technology) or an "on Premise" technology, there are two execution contexts:

OPTION	DATA SOURCE	DATA DESTINATION	DESIGN OF SCENARIO
TYPE A	DATABASE (DB)	DATABASE (DB)	DB/DB
TYPE B	DATABASE (DB)	SERVICE	DB/SERVICE

Data migration options applied to Dynamics CRM

Emphasizing the technical aspect of an option, what does it mean regarding the platform Dynamics CRM or Dynamics 365?

OPTION	DATA SOURCE	DATA DESTINATION	DESIGN SCENARIO	DYNAMICS 365
TYPE A	DATABASE	DATABASE	DB/DB	FROM DYNAMICS ON-PREM TO DYNAMICS ON-PREM
TYPE B	DATABASE	SERVICE	DB/SERVICE	FROM DYNAMICS ON-PREM TO DYNAMICS ON-LINE

Pitfalls of a data migration

A data migration focuses on the movement of data between source (legacy data system and business) and destination (target system). However, pitfalls related to the CRM data context are real and can delay the data migration: data related to security model, data related to shared data, data model related to denormalization, data logs and audit and finally, data volume.

Even with the most thoroughly tested tools and procedures, we need to ask ourselves how to orchestrate a data migration, mainly from database to database.

PROBLEM: HOW TO ORCHESTRATE THE DATA MODEL

Here is the opportunity to orchestrate a data migration code related to Dynamics 365. So, we need to have a guide helping us to develop the right, accurate and structured code regarding the data model.

The questions raised by this problem could be challenging: How to group the entity model? What is the sequence of execution? How to prioritize the entities? How to exclude the unnecessary entities to migrate? Our guide could help to organize and structure the data migration and in so doing, we could establish the right requirements to fulfill.



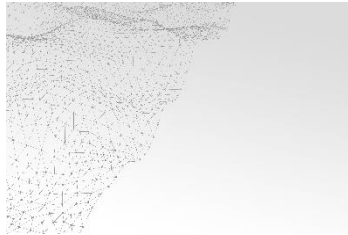
Requirements: Orchestration

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REQUIREMENTS RELATED TO THE ORCHESTRATION

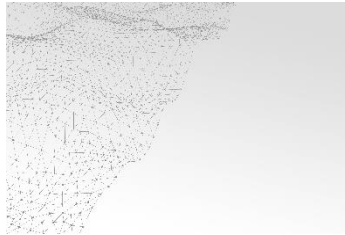
Requirements related to Database SQL as migration tool

First, we need to create 3 databases: a « source » database (Dynamics 365); a « target » database (Dynamics 365) and finally, a « tool » database we could call « CRM Tool ».



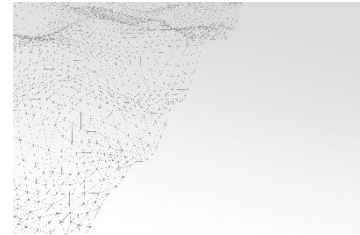
CRM Tool Database as tool

- 1- Create tables of reference in "CRM Tool" database: mapping, logging and reporting.
- 2- Create SQL objects (SQL Synonyms and functions): to map, to extract, to validate, to count...data.
- 3- Create SQL scripts as stored procedures.



Dynamics 365 – Database as source

- 1- Import the database source in the development environment.
- 2- Administrate the database as requested.
- 3- Backup the database source.

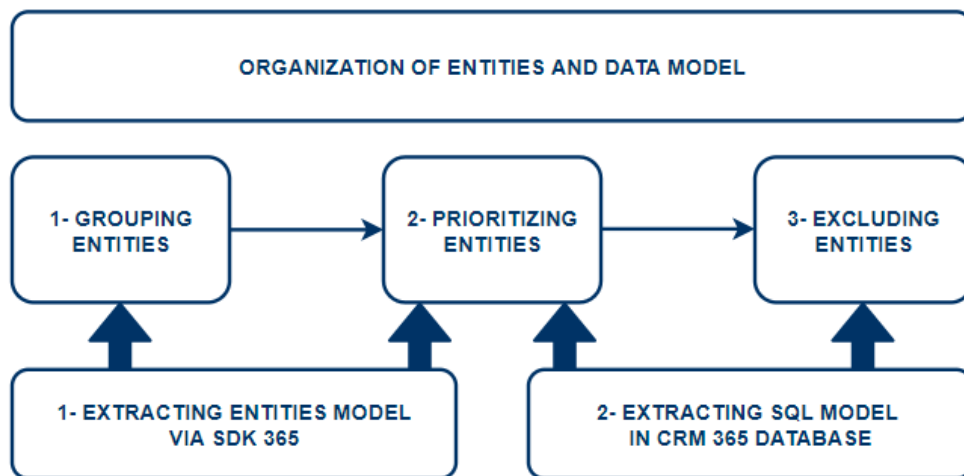


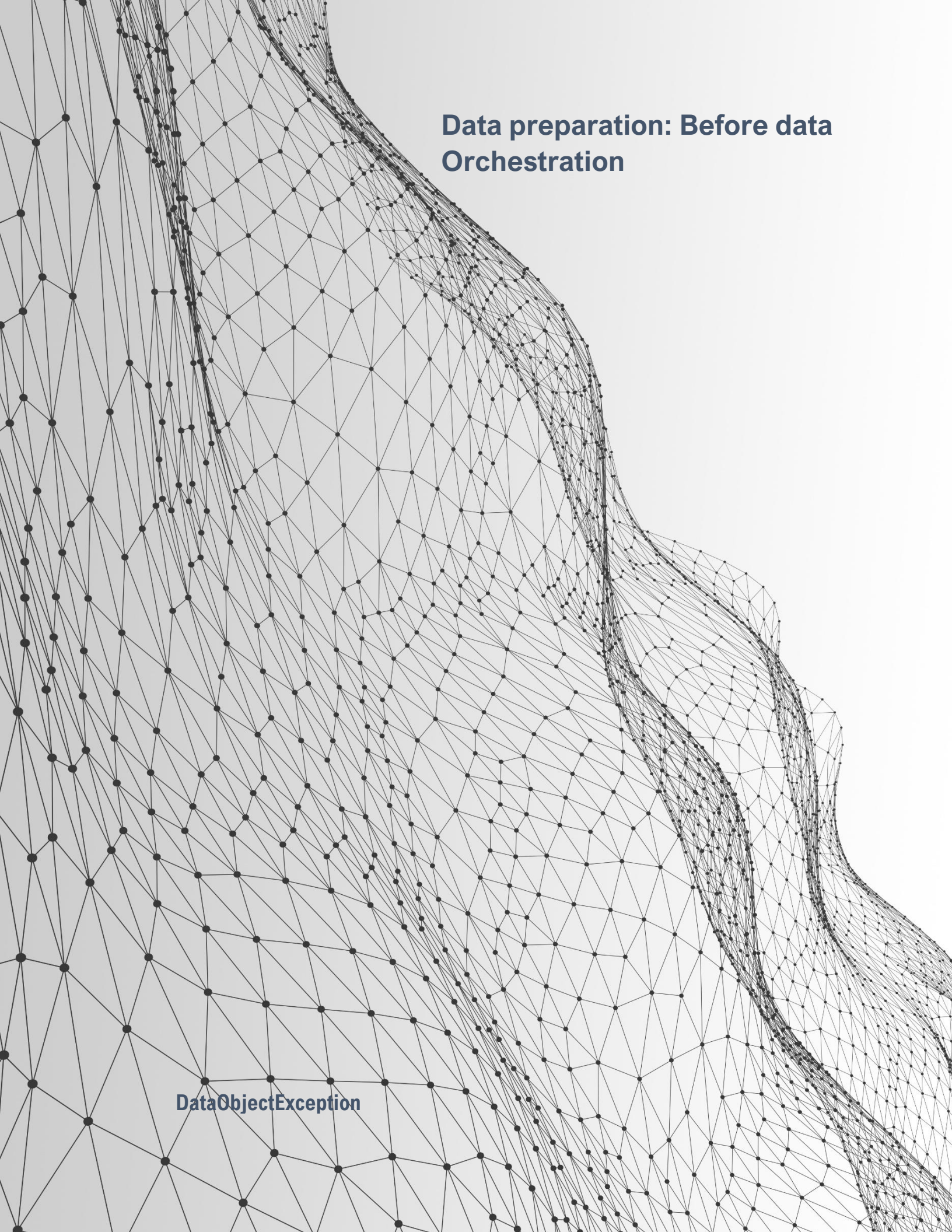
Dynamics 365 – Database as target

- 1- Create the new database with the Deployment Manager 365 (Deployment SDK).
- 2- Handle the entity model customizing the native model of CRM.
- 3- Administrate the database as requested.
- 4- Backup the database target.

Requirements related to organization of entities.

Here is the opportunity to define our strategy and actions related to grouping, prioritizing and excluding entities in the process.





Data preparation: Before data Orchestration

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DATA PREPARATION: BEFORE DATA ORCHESTRATION

Here is the first steps to fulfill before migrating our data and orchestrating our data model management.

1 START THE DATA PREPARATION

- Initialization of the logging table in the database “CRM Tool”
 - Initialization of the backup repository: repository will contain all the backups
 - Cleaning and initialization of the reporting statement in the database “CRM Tool”
 - Deploy the new customization to update the native data model of the new CRM organization: it will add the custom entities to the system entities and potentially update the relationships.
-

2 VARIABLES INITIALIZATION

- Initialization of the following variables: identifier of the “Organization” entity, identifier of the “Solution” entity, identifier of the “Business Unit” entity, identifier of the “System User” entity.
 - Complete the identifier “System User” with its properties and the “User Settings” entity.
-

3 PREPARING CRM SECURITY MODEL

- Update the following entities in the new database (target): System User, Business Unit, Team.
 - Complete the update with the following entities: organization, solution if needed.
-

4 END THE DATA PREPARATION

- Handle the indexes of the “target” database, executing a SQL command to disable the indexes.
- Logging the preparation in the database “CRM tool”.
- Create the backup of the preparation: “PREPARATION BEFORE DATA ORCHESTRATION”.



Data Orchestration: Wave 0

Core Data Model

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CORE MODEL DATA ORCHESTRATION: WAVE 0

Here is the first steps of orchestration: core data model.



Implement a strategy of grouping and ordering the entities to orchestrate in order to prioritize the last ones. It will help to accelerate the development, the deployment and the validation of the migrated data.

Regarding our guide, we could establish 6 sequences, as initial strategy.

SEQUENCE 1

- Logging of the group 1: process has started.
- Preparing initial values:
 - ❖ Organization and solution identifiers of the databases “source” and “target”.
 - ❖ Organization name of the database “target”.
- Handling “**Currency**” entity if needed:
 - ❖ Update “Organization” entity with the value of “currency”
 - ❖ Handle missing “Currency”
- Handling “**Owner**” entity if needed:
 - ❖ Handle the native service accounts “Integration” and “System”
- Generating report of the records.
- Logging of the group 1: process has ended.
- Creating the backing of the group 1.

SEQUENCE 2

- Logging of the group 2: process has started.
- Preparing initial values: Organization and solution identifiers of the database “target”.
- Handling “**System User**” entity.
- Handling “**Business Unit**” and “**Business Unit Map**” entities.
- Handling “**Client update**” entity, if needed.
- Handling “**Connection**” and “**Connection Role**”.
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 2: process has ended.
- Creating the backing of the group 2.

SEQUENCE 3

- Logging of the group 3: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to the security model: “**Role**”, “**Role Privilege**”, “**Internal Address**”, including “**User Settings**” and “**Business Unit**”, “**System User Business Unit Entity Map**”, “**System User Principals**”, “**System User Role**”, “**System User Profiles**”, “**Queue**”, “**Queue Membership**”.
- Handling the other entities: “**Mail Merge Template**”, “**Metric**”. “**Site**” entity, if needed, “**UoMSchedule**”, “**UoM**”, “**Territory**”, “**Calendar**”, “**Calendar Rule**” if needed.
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 3: process has ended.
- Creating the backing of the group 3.

SEQUENCE 4

- Logging of the group 4: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to “**Calendar Rule**” if not needed in sequence 3
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 4: process has ended.
- Creating the backing of the group 4.

SEQUENCE 5

- Logging of the group 5: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to “User” entity: “**User Settings**”, “**Team**”, “**Team Profiles**”, “**Team Membership**”.
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 5: process has ended.
- Creating the backing of the group 5.

SEQUENCE 6

- Logging of the group 6: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to the “User” entity: “**User Query**”, “**User Query Visualization**” if needed, “**User Entity UI Settings**” if needed.
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 6: process has ended.
- Creating the backing of the group 6.



Data Orchestration: Wave 1

Product Data Model

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PRODUCT MODEL DATA ORCHESTRATION: WAVE 1

Dynamics 365 has a product data model related to a main entity: product.



Implement a strategy of grouping and ordering the entities to orchestrate in order to prioritize the last ones. It will help to accelerate the development, the deployment and the validation of the migrated data.

Regarding our guide, we could establish 1 sequence, as initial strategy.

SEQUENCE 7

- Logging of the group 7: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to the “Product” entity: “**Production Association**”, “**Product Price Level**”, “**Price Level**”, “**Equipment**”, “**Product Substitute**”, “**Service**”, “**Product Sales Literature**”, if needed.
- Handling the other “system” entities regarding the relationships created in the customization process.
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 7: process has ended.
- Creating the backing of the group 7.



Data Orchestration: Wave 2

Customer Data Model

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CUSTOMER MODEL DATA ORCHESTRATION: WAVE 2

Dynamics 365 has a customer data model related to two main entities: contact and account.



Implement a strategy of grouping and ordering the entities to orchestrate in order to prioritize the last ones. It will help to accelerate the development, the deployment and the validation of the migrated data.

Regarding our guide, we could establish 2 sequences, as initial strategy.

SEQUENCE 8

- Logging of the group 8: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to the “Contact” entity: “**Contact**”, “**Contact Address**”.
- Handling the other “system” entities regarding the relationships created in the customization process.
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 8: process has ended.
- Creating the backing of the group 8.

SEQUENCE 9

- Logging of the group 9: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to the “Account” entity: “**Account**”, “**Account Address**”, “**Competitor**”, “**Competitor Address**”.
- Handling the other “system” entities regarding the relationships created in the customization process.
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 9: process has ended.
- Creating the backing of the group 9.



Data Orchestration: Wave 3

Core Business Data Model

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CORE BUSINESS MODEL DATA ORCHESTRATION: WAVE 3

Dynamics 365 has a core business data model related to a main entity: opportunity.



Implement a strategy of grouping and ordering the entities to orchestrate in order to prioritize the last ones. It will help to accelerate the development, the deployment and the validation of the migrated data.

Regarding our guide, we could establish 1 sequence, as initial strategy.

SEQUENCE 10

- Logging of the group 10: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to the “Opportunity” entity: **“Opportunity”**, **“Opportunity Close”**, **“Opportunity Product”**, **“Opportunity Sales Process”**, **“Lead”**, **“Lead Address”**, **“Quote”**, **“Quote Close”**, **“Quote Detail”**, **“Incident”**, **“Incident Resolution”**, **“Queue”**, **“Sales Order”** **“Sales Order Details”**.
- Handling the other “system” entities regarding the relationships created in the customization process.
- Handling custom entities if necessary, only because of the relationships.
- Generating report of the records.
- Logging of the group 10: process has ended.
- Creating the backing of the group 10.



Data Orchestration: Wave 4

Activity and Attachment Data Model

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ACTIVITY MODEL DATA ORCHESTRATION: WAVE 4

Dynamics 365 has an activity data model related to a main entity: activity pointer.



Implement a strategy of grouping and ordering the entities to orchestrate in order to prioritize the last ones. It will help to accelerate the development, the deployment and the validation of the migrated data.

Regarding our guide, we could establish 2 sequences, as initial strategy.

SEQUENCE 11

- Logging of the group 11: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to the “**Activity Pointer**” entity – orchestrate with object type code: type opportunity, type incident, type appointment, type recurring appointment, type email, type fax, type letter, type phone call, type task, type campaign response, type bulk operation.
- Handling the other “system” entities: “**Campaign Activity**”, “**Campaign Item**”, “**Campaign Activity Item**”, “**Email**”, “**Email Hash**”, “**Email Search**”, “**Activity Party**”.
- Handling the other system entities if needed: “**User Entity Instance Data**”, “**User Entity UI Settings**”.
- Handling custom activity entities if necessary, created as activity pointer.
- Generating report of the records.
- Logging of the group 11: process has ended.

SEQUENCE 12

- Logging of the group 12: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to the binary data: “**Attachment**”, “**Activity Mime Attachment**”, “**Annotation**”.
- Handling custom activity entities if necessary, because of the relationships.
- Generating report of the records.
- Logging of the group 12: process has ended.
- Creating the backing of the group 12.



Data Orchestration: Wave 5

Internal System Process Data Model

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THE INTERNAL SYSTEM PROCESS DATA MODEL ORCHESTRATION: WAVE 5

Dynamics 365 has an internal process related to a data model: this CRM internal services store data after execution.



Implement a strategy of grouping and ordering the entities to orchestrate in order to prioritize the last ones. It will help to accelerate the development, the deployment and the validation of the migrated data.

Regarding our guide, we could establish 1 sequence, as initial strategy.

SEQUENCE 13

- Logging of the group 13: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to a data repository: **“Audit”, “Principal Object Access”, “Principal Object Access Read Snapshot”, “Principal Object Attribute Access”, “Bulk Operation Log”, “Bulk Operation”, “Bulk Delete Operation”, “Bulk Delete Failure”, “Trace Log” “Trace Association”, “User Form”, “User Query Visualization”.**
- Handling other system entities if necessary, because of the relationships.
- Generating report of the records.
- Logging of the group 13: process has ended.
- Creating the backing of the group 13.



Data Orchestration: Wave 6

Other Data Model (custom & system entities)

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OTHER CUSTOM/SYSTEM BUSINESS DATA MODEL ORCHESTRATION: WAVE 6

Because of the relationships between the entities, logical and mainly physical relationships, we could orchestrate a more or less important number of entities (custom and system).



Implement a strategy of grouping and ordering the entities to orchestrate in order to prioritize the last ones. It will help to accelerate the development, the deployment and the validation of the migrated data.


Regarding our guide, we could establish 2 sequences, as initial strategy.

SEQUENCE 14

- Logging of the group 14: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities related to a system or native entity: “**Resource**”, “**Resource Group**”, etc...
- Handling entities related to a custom entity, created for business needs.
- Generating report of the records.
- Logging of the group 14: process has ended.
- Creating the backing of the group 14.

SEQUENCE 15

- Logging of the group 15: process has started.
- Preparing initial values: organization and solution identifiers of the database “target”.
- Handling entities representing a N-N relationship, entities not already handled: “**Account Leads**”, ...
- Handling other custom entities if necessary, because of the relationships.
- Generating report of the records.
- Logging of the group 15: process has ended.
- Creating the backing of the group 15.



Data finalization: After data Orchestration – Wave 7

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AFTER DATA MODEL ORCHESTRATION: WAVE 7



Implement a strategy of grouping and ordering the entities to orchestrate in order to prioritize the last ones. It will help to accelerate the development, the deployment and the validation of the migrated data.

Regarding our guide, we could establish 1 sequence, as final strategy.

SEQUENCE 16

- Logging of the final process: process has started.
- Handling the indexes: rebuild indexes.
- Logging of the final process: process has ended.
- Creating the backing of the whole database: whole data migration.

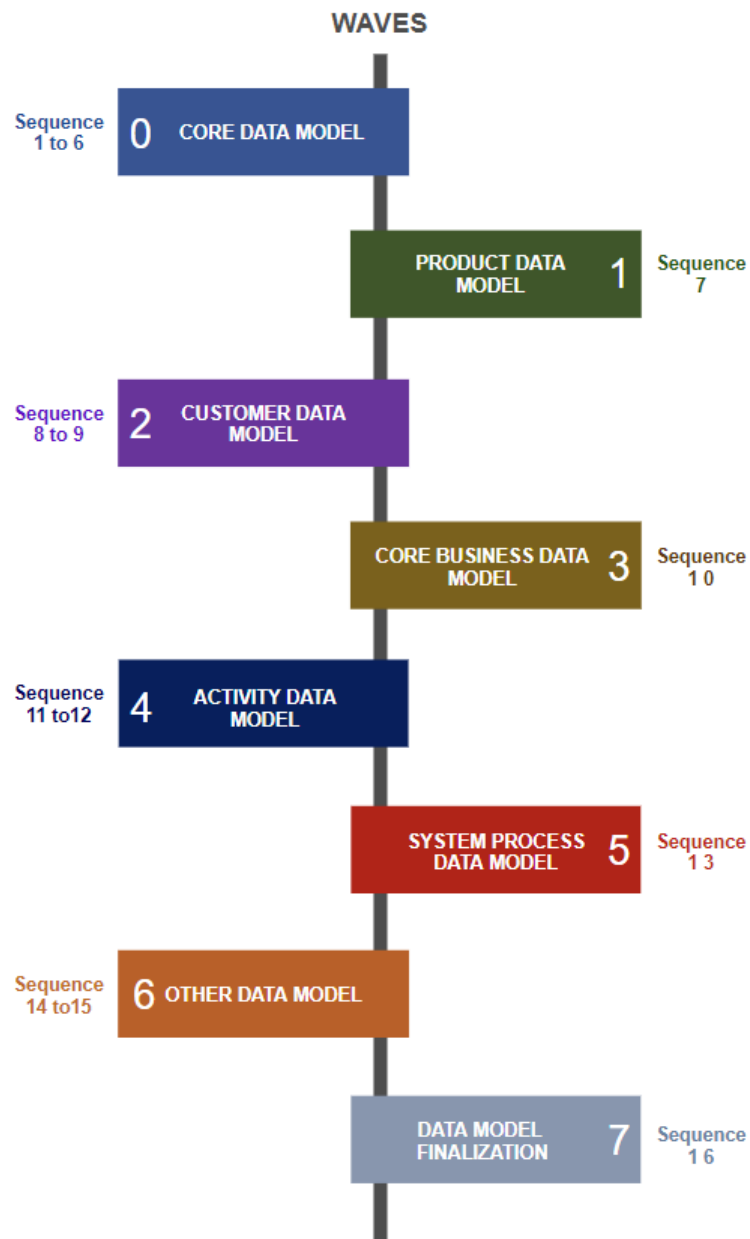


**Conclusion: 7 Waves and 17
sequences.**

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CONCLUSION: DATA MODEL AND THE 7 WAVES OF ORCHESTRATION

The 7 waves and the 16 sequences

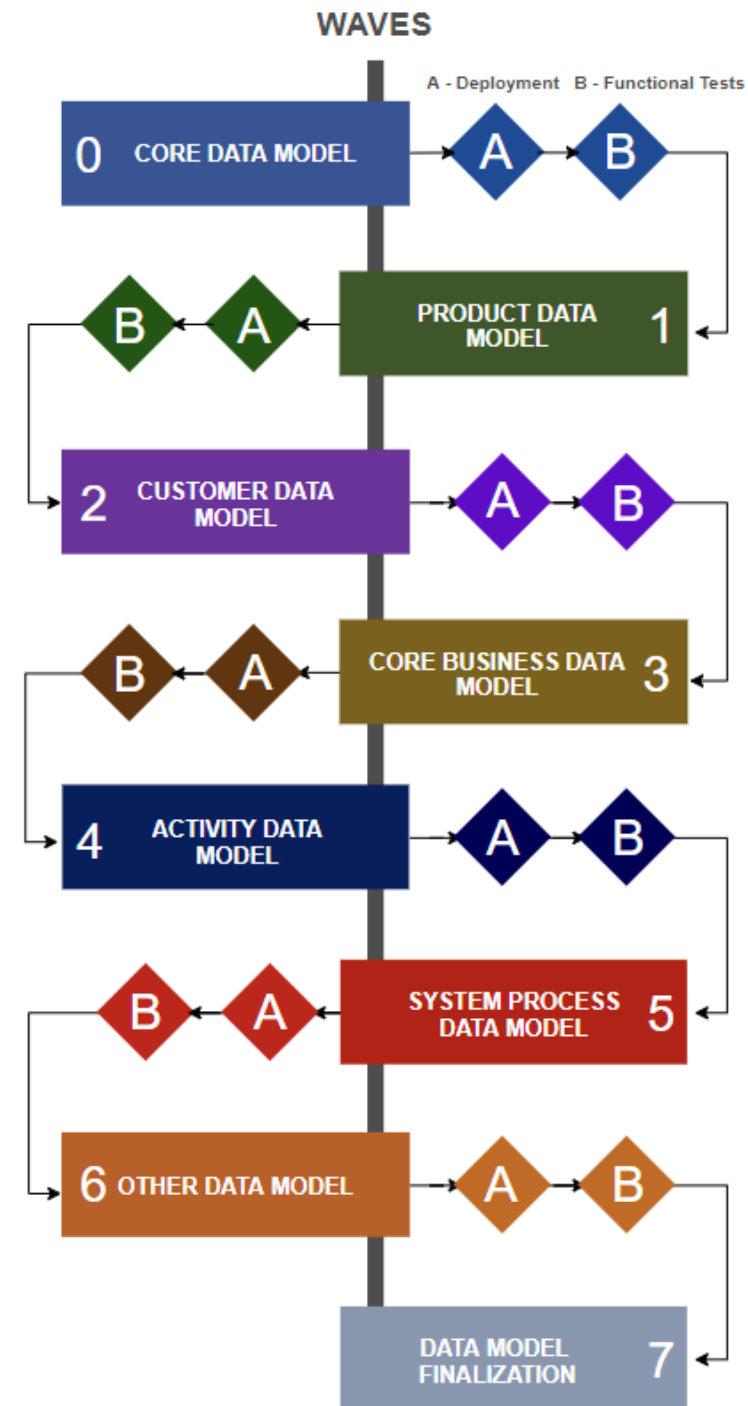


The 7 waves and integration of the validation process

Between each wave, we could integrate a validation process to validate the migration of the data. This validation process could be composed of 2 successive sub-processes: one process related to the deployment (letter A) and a second process related to functional tests (letter B).

If the deployment or the functional tests fail, the wave must be fixed before moving forward. The reasons for the failure could be the following:

- Data or records that have been migrated are the source of the error.
- Strategy related to the grouping, the ordering or the prioritizing has to be considered.



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About Me and philosophy

Thierry Sinassamy - I strongly advocate a methodology of data migration targeting D365 on-premise. The methodology describes how I have already orchestrated a data model during a process of data migration. Regardless of whether the target is on-premise or cloud, I am confident that this guide could help you to adjust your strategy of data migration and your way of orchestrating the data model.

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