



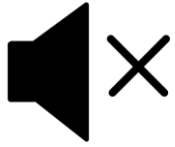
16 Dec, 2025

# Best Practices for Managing Reference Data at the Enterprise Level with R360

- Eric Dromazos, Solutions Architect, IPS
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Where data & AI come to The LIFE logo, where the letters L, I, F, and E are rendered in a colorful, multi-colored font.

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- Today's Webinar is scheduled for **1 hour**
- The session will include a webcast and then your questions will be answered live at the end of the presentation
- All dial-in participants will be muted to enable the speakers to present without interruption
- Questions can be submitted to "All Panelists" via the **Q&A option** and we will respond at the end of the presentation
- The webinar is **being recorded** and will be available on our [Success Portal](#) - where you can download the **slide deck** for the presentation. The link to the recording will be emailed as well.
- Please take time to complete the **post-webinar survey** and provide your feedback and suggestions for upcoming topics.

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# Reference 360 Best Practices

- Business Value Realization
- Designing, Implementing and Managing Reference 360

# Agenda

1 Business Value Realization

2 Reference 360 Technical Overview

3 Best Practices – Design & Implementation

4 Best Practices – Integration & Data Quality

5 Best Practices – Security

# Intelligent MDM SaaS

## EVERY DOMAIN



Customer



Product



Supplier



Reference



Any Domain



Industry  
Extensions

## ALL-IN-ONE CAPABILITIES

# CLAIRE™

AI-Powered Metadata Intelligence & Automation

## Connectivity

Connect to all systems containing or needing master data

SCALABLE MICROSERVICES-BASED CLOUD  
NATIVE ARCHITECTURE

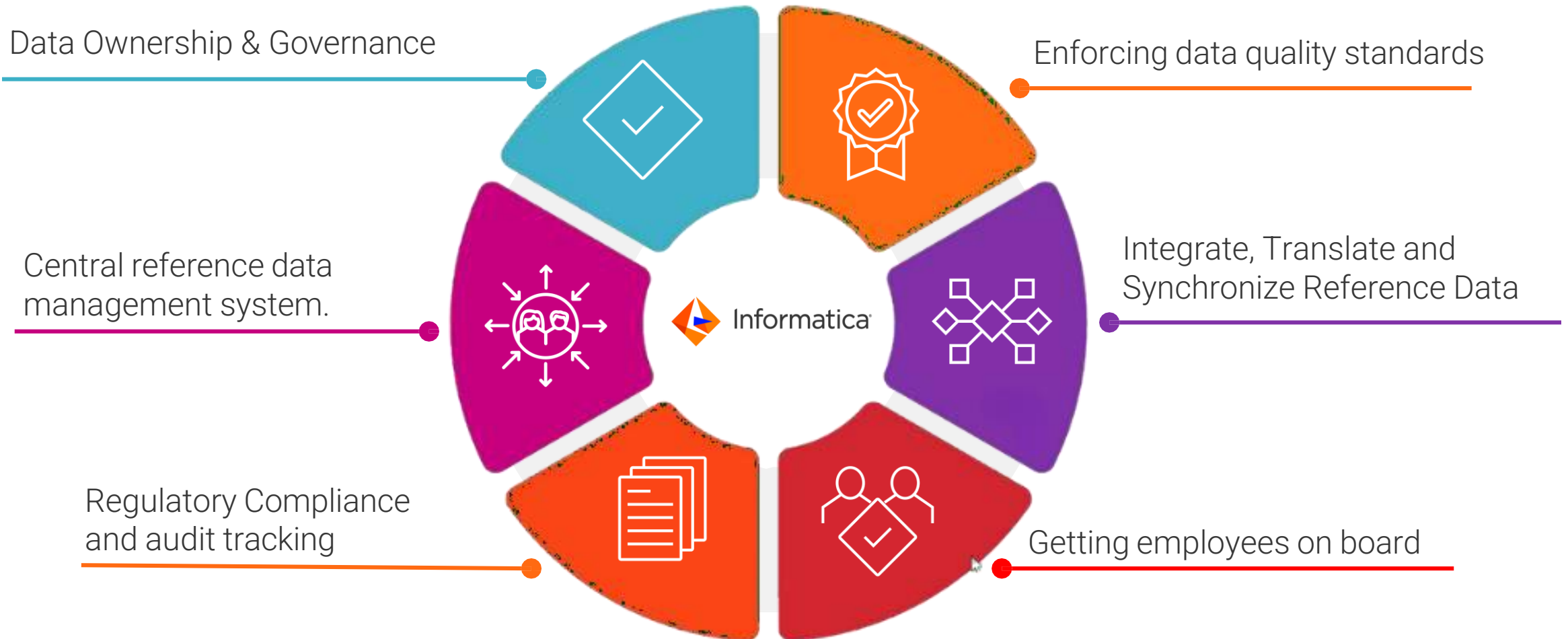
METADATA  
DRIVEN

NO CODE  
CONFIGURATION

CONTINUOUS  
INNOVATION

# Reference Data Management Challenges

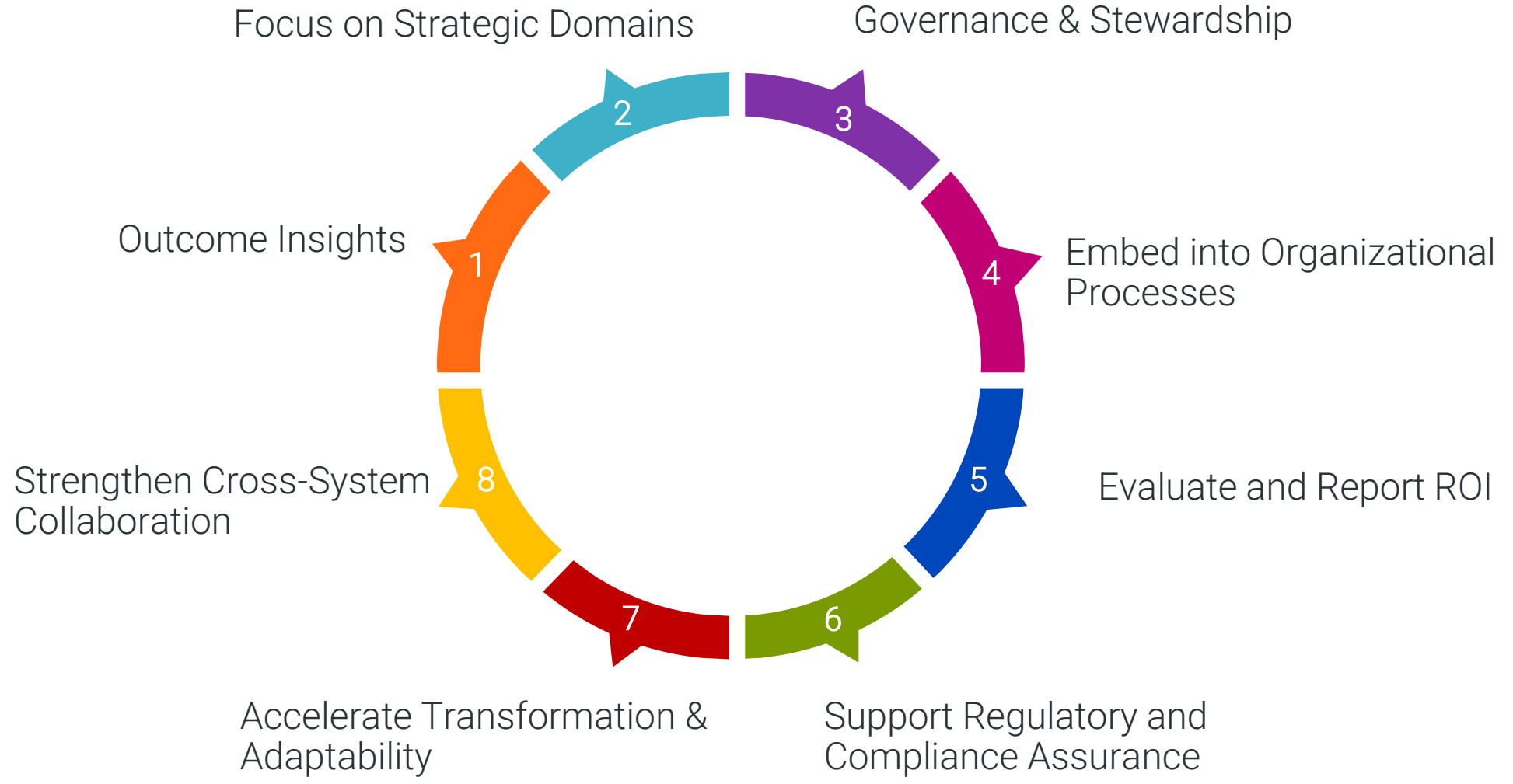
# Reference Data Complexities and Challenges



# Reference 360 Business Value

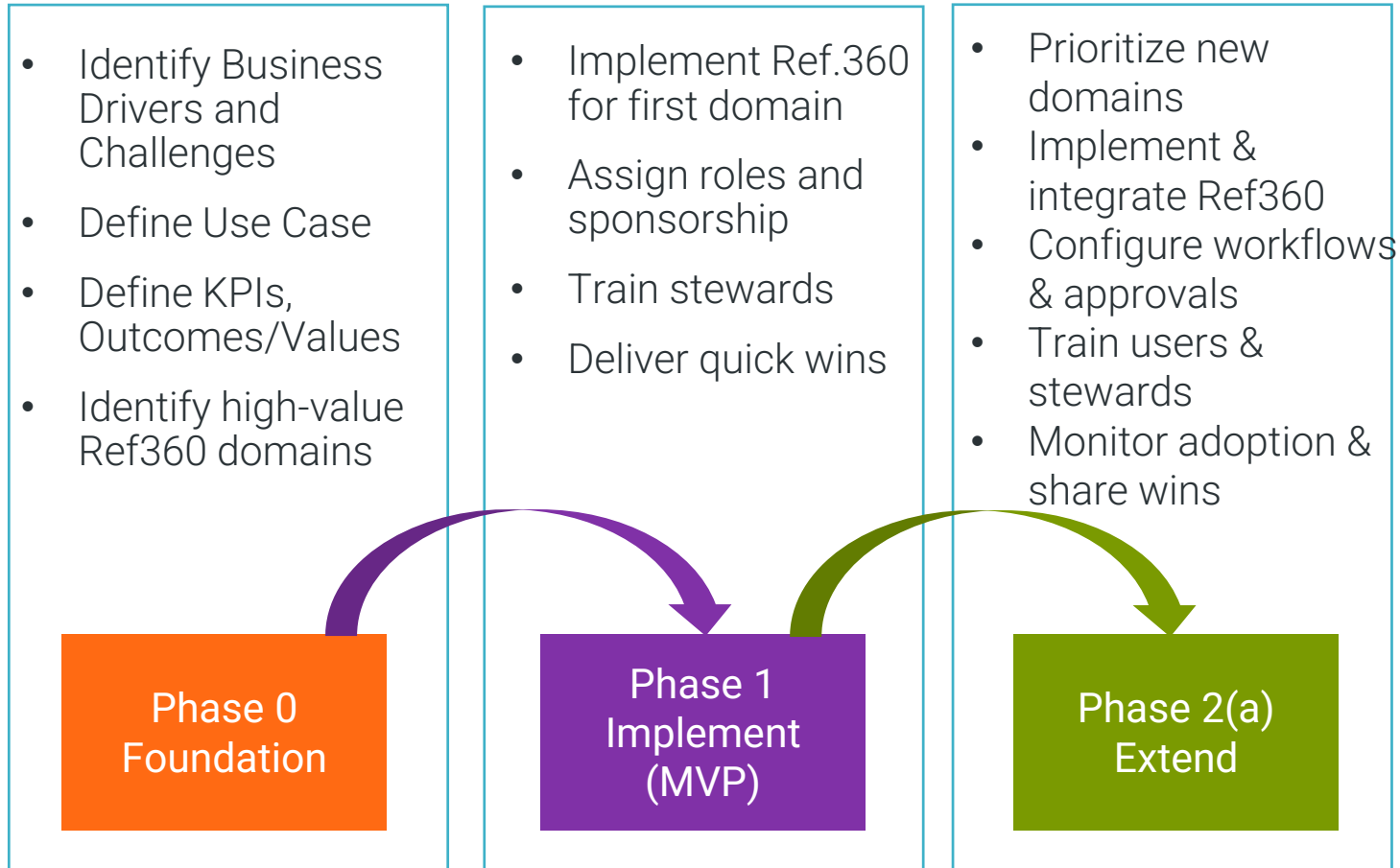
Where data & AI come to **LIFE**

# Business Drivers

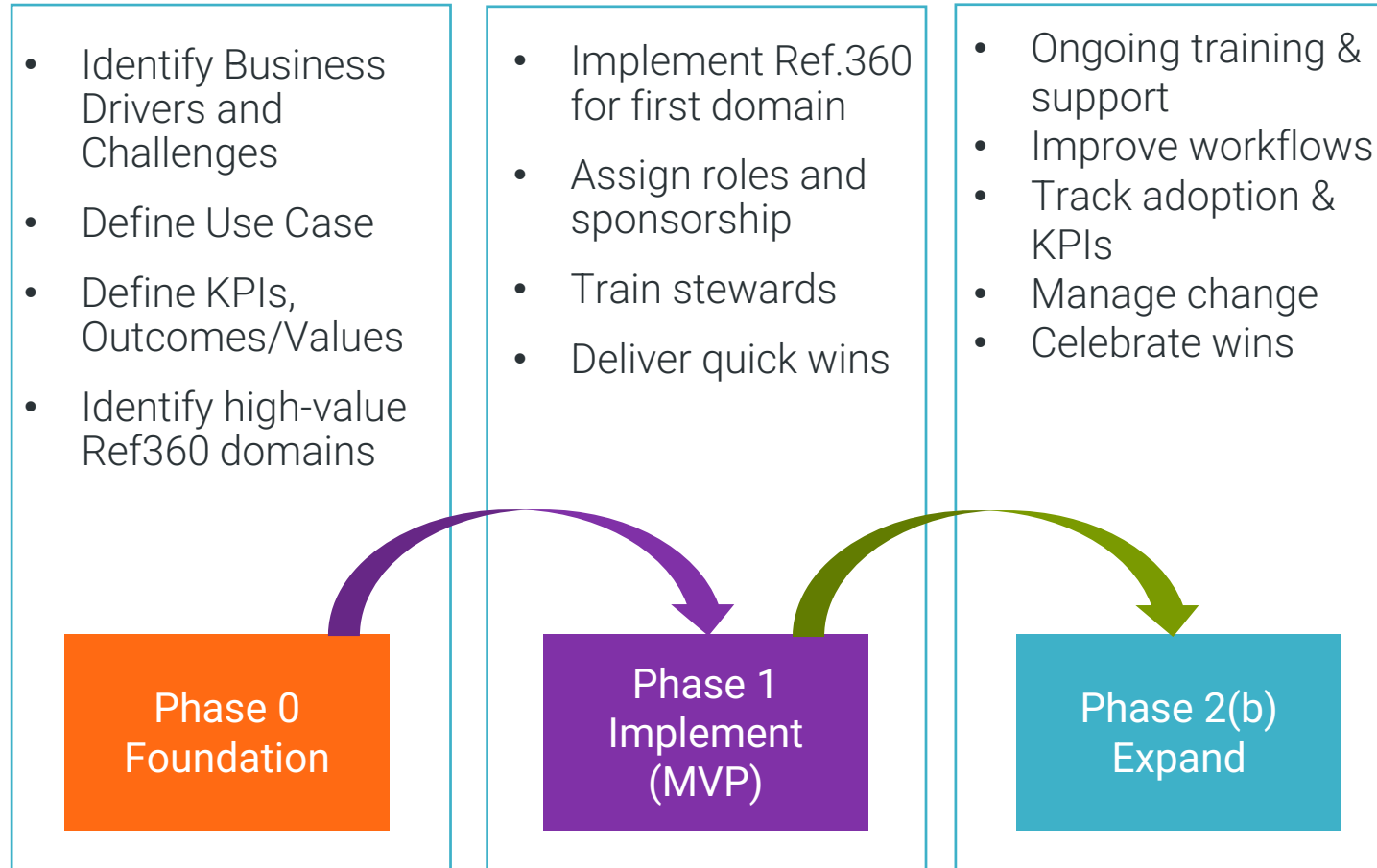


# Reference 360 Adoption

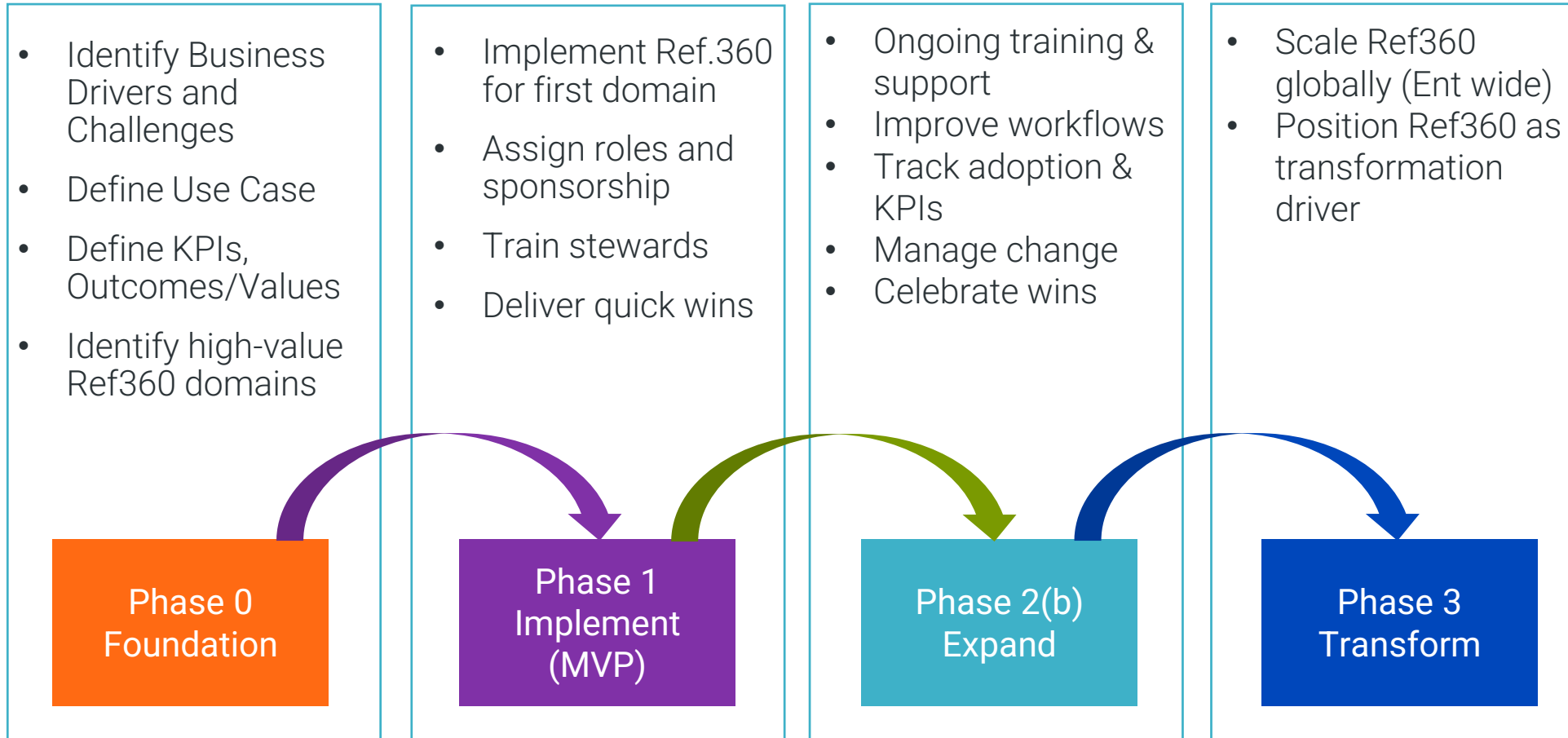
# Adoption Journey



# Adoption Journey



# Adoption Journey



# Reference 360 Best Practices

Eric Dromazos, Solutions Architect, Services Experience

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# Reference Data vs. Master Data

Master data represents core business entities like customers and products, while reference data classifies and categorizes this master data, often using standard values like country codes or units of measure.

- **Examples of Reference Data:**

- Countries, States, Geographical Regions, Regulatory Jurisdictions
- Company Brands, Sub-brands, Types, Form Factors, UOM
- Material Classifications, Product Lines, Product Groups
- Chart of Accounts, Company Codes, Profit Centers

- **Examples of Master Data:**

- Customers, Suppliers
- Products
- Employees and Contractors
- Assets, Equipment
- Offices, Facilities, Warehouse Locations

# Reference 360 Terminology



- **Reference Data Sets** - contain a category of reference data, such as country codes or currency codes. May be hierarchical or flat structure. May be dependent on other reference data sets.

- **Code Lists** - a set of code values for a particular application, within a reference data set

- **Code Values** - a unique value, such as a business term, code, or lookup value, within a code list

- **Attributes** – component of a code value, such as a Code, Name, Description

- **Crosswalks** - a one-way relationship between code values in a pair of code lists; provides a way to translate between the code lists, such as different ERP systems or from legacy codes



- **Hierarchies** - show how code values are related to other code values in a hierarchy or higher-level categorization, such as World, Region, Country, Sales Area, State



- **Workflows** – create a draft to propose changes to a code list, submit your proposed changes for approval. This creates a task and initiates an approval workflow

- **Enums** – System reference data that provide information about your reference data

- **Import/Ingress** - process to import data from external sources into Reference 360

- **Export/Egress** - process to export data from Reference 360 to external sources

# Reference 360 Best Practices Design & Implementation

# Reference 360 Best Practices

Strategic planning for long-term success

## Standardization and Governance

Defined standard code sets,  
create approval workflows and  
stakeholder assignments



## Data Integrations

Built integrations using  
external APIs and connectors  
across sources



## Reference Data Management Planning

Define sources, structure and  
dependencies of incoming  
reference data

## Data Quality

Build simple rules or  
advanced rule  
associations using CDQ

## Plan for future

Define future  
requirements around  
growth and scalability

# Reference 360 Best Practices - Planning



## Reference Data Management Planning

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- What types of reference data do I need to manage using Reference 360?
  - Example – Country Codes, Currency Code, Product categories
- Where does this reference data come from (internal or external sources?)
- How do I want to consume my reference data?
- Do I need to validate and cleanse my incoming reference data?
- Which users or groups will own and manage my reference data versus which users will just view the data?
- How can I use my reference data for reporting and analysis?
- Will I need to define a standardized set of reference data coming from different sources to be used in MDM and other applications?







# Reference 360 Best Practices - Planning

Will I need to define a standardized set of reference data coming from different sources to be used in MDM?

Yes

## ▪ Data Set design is inflexible

- Picklist in MDM can only display the Enterprise / “Default” code list values
- Configure Code Lists for Business Terms across different systems under the same Data Set
- Crosswalk system Code Lists to Enterprise List for automatic MDM Ingress code value translation

- ▼  R360: CostCenter
  - ▼  Enterprise R360: CostCenter
    -  ECC CostCenter
    -  S4H CostCenter
  - >  ECC CostCenter
  - >  S4H CostCenter

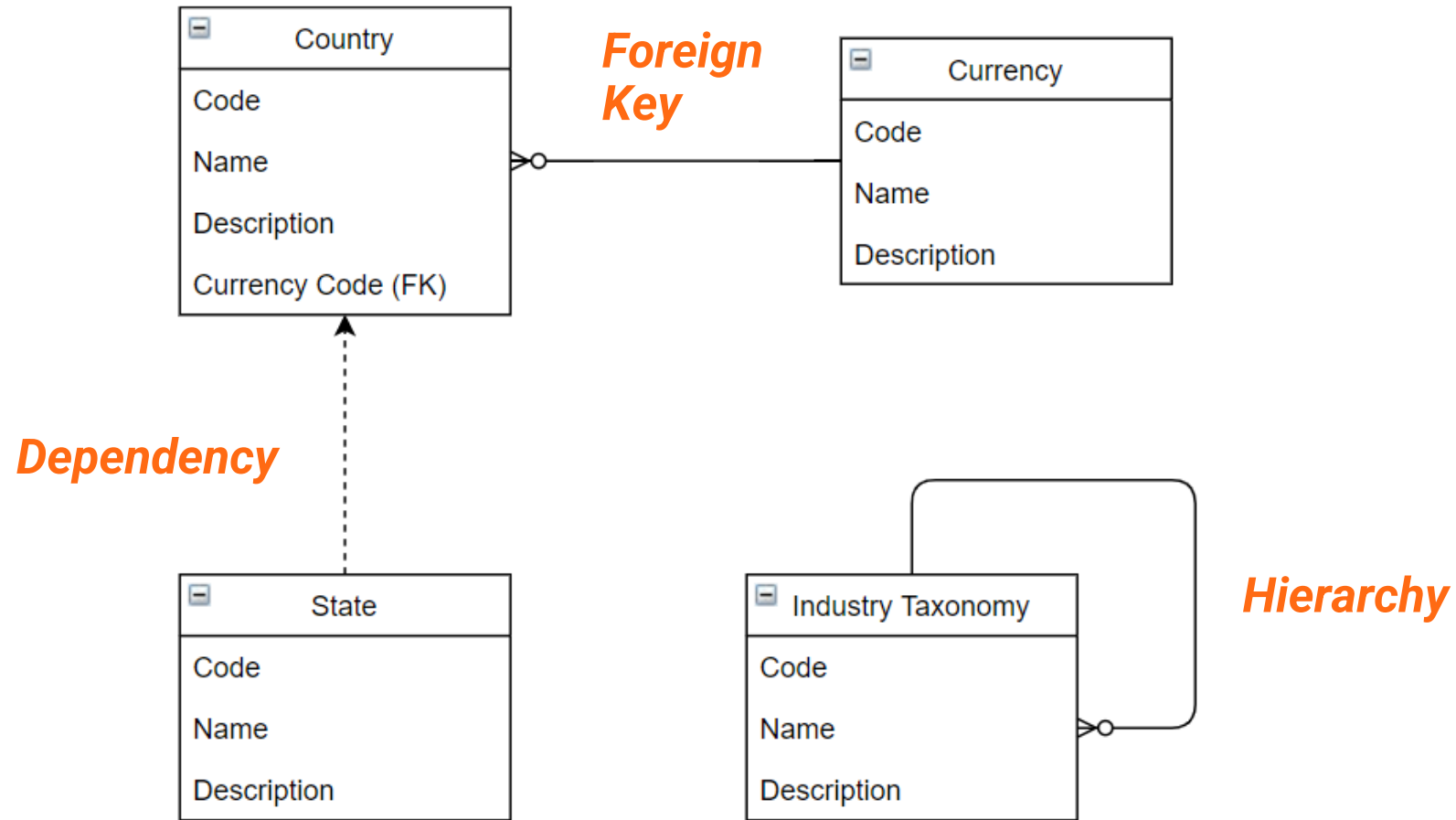


No

## ▪ Data Set design is flexible

- Configure Code Lists for different sources/systems under the same or different Data Sets depending on customer preference and requirements

# Reference Data Modeling – ER Diagram



# Reference 360 Best Practices - Modeling

- Avoid designs which could result in large volume code lists (code value count greater than 100k records)
  - While Reference 360 does support large lists, latency is likely and certain features, i.e., sort are restricted.
- Limit attribute & code value redundancy by leveraging relationships
  - Example #1 : List #1 has a relationship to List #2. List #2 contains Currency Code. The requirement is List #1 should inherit List #2's currency code when egressed outbound.
    - **Bad Practice Design:** Configure Currency Code on both lists. This results in redundancy, increased maintenance and significant risk of conflicting values.
    - **Best Practice Design:** Configure Currency Code only on List #2. Configure outbound mapping to join both lists and pull Currency Code from List #2.
  - Example #2: List #1 and List #2 have a logical relationship with no additional relationship specific attributes required.
    - **Bad Practice Design:** Create a third list to store the relationships between List #1 & #2
    - **Best Practice Design:** Depending on the relationship cardinality:
      - One To Many: Configure a "Reference Data" type attribute on the child "Many" List, pointing to the parent "One" code list
      - Many To Many: Configure a Crosswalk asset between List #1 and List #2

# Reference 360 Best Practices – Modeling Hierarchies

## Hierarchy

- **Stakeholder Roles**
  - Hierarchy has only 1 role available to control security (Reference 360 Planner)
- **Custom Attributes**
  - Does **not** support custom relationship attributes
- **API's**
  - Limited API's available
- **Crosswalk**
  - Does **not** support Crosswalk relationships
- **Hierarchy Model Definition**
  - Strictly Defined Hierarchy Model & Relationship Types

## Hierarchical Code List

- **Stakeholder Roles**
  - Supports all code list stakeholder roles
- **Custom Attributes**
  - Does support custom relationship attributes
- **API's**
  - Supports more expansive code list API's
- **Crosswalk**
  - Does support Crosswalk relationships
- **Hierarchy Model Definition**
  - No Hierarchy Model Definition or Relationship Types
  - A code value can be added as a parent or child at any level of the hierarchy

# Reference Data Modeling – Hierarchical Code List

Explore

The screenshot displays a software interface for exploring reference data. On the left is a navigation pane with a search bar and a list of categories. The 'Enterprise Industry Taxonomy' category is selected and highlighted. The main area shows a detailed view of this taxonomy, including a table of codes and descriptions.

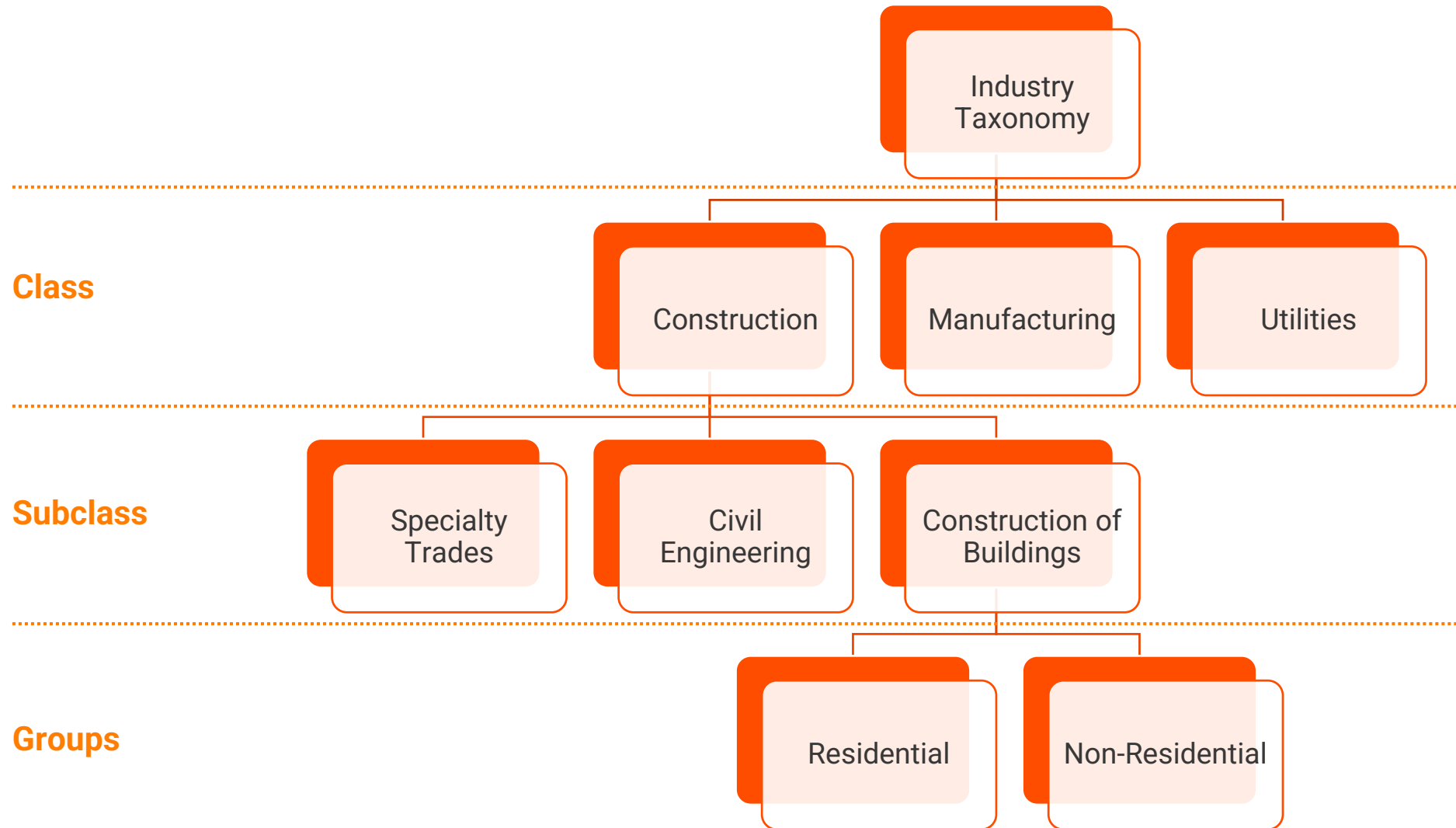
**Enterprise Industry Taxonomy** Open

Values | Crosswalk | Summary | Definition | Stakeholders | Workflow | History

Enterprise Industry Taxonomy (112) Find Filter Settings Share

| Name ▲  | Code  | Description                                |
|---|-------|--|
| ▶ <b>Accommodation and Food Services</b>            | 72    | Accommodation and Food Services            |
| ▶ <b>Agriculture, Forestry, Fishing and Hunting</b> | 11    | Agriculture, Forestry, Fishing and Hunting |
| ▶ <b>Arts, Entertainment, and Recreation</b>        | 71    | Arts, Entertainment, and Recreation        |
| ▼ <b>Construction</b>                               | 23    | Construction                               |
| ▼ <b>Construction of Buildings</b>                  | 236   | Construction of Buildings                  |
| ▶ <b>Nonresidential Building Construction</b>       | 2362  | Nonresidential Building Construction       |
| ▶ <b>Residential Building Construction</b>          | 2361  | Residential Building Construction          |
| ▶ <b>Heavy and Civil Engineering Construction</b>   | 237   | Heavy and Civil Engineering Construction   |
| ▶ <b>Specialty Trade Contractors</b>                | 238   | Specialty Trade Contractors                |
| ▼ <b>Manufacturing</b>                              | 31-33 | Manufacturing                              |
| ▶ <b>Apparel Manufacturing</b>                      | 315   | Apparel Manufacturing                      |
| ▶ <b>Beverage and Tobacco Product Manufacturing</b> | 312   | Beverage and Tobacco Product Manufacturing |
| ▶ <b>Chemical Manufacturing</b>                     | 325   | Chemical Manufacturing                     |

# Reference Data Modeling – Hierarchy



# Reference 360 Best Practices - Configuration

- Never use [reserved words](#) for custom attribute names (“dependency”, “Last Updated By”, etc.)
- Mirror attribute names across lists for relational/reference attributes
  - “Currency Code” vs “Currency Cd” vs “Currency”
- Be aware of certain configuration which cannot be changed after creation
  - Attribute names, data types, Reference Data “Display Attributes”, Definition Structure (Dependent/Hierarchical)
- Avoid renaming assets - If you rename an asset, the reference data import/export job fails **unless** the CDI connection and field mappings are re-configured.
- Configure Stakeholders and Workflow Approver **Groups**, instead of specific users
- Model Migration - [Migration Documentation](#)
  - Use Import / Export Model API via Swagger UI [<https://<host>:<port>/rdm-ui/swagger>] or 3rd party REST client (i.e., Postman) to migrate data model assets cross environments.
  - Manual modifications of Reference 360 assets outside of the designated development environment is strongly discouraged

# Reference 360 Best Practices – Workflow

When you propose changes to a code list, a crosswalk, or a hierarchy, you can send the changes for approval through an approval workflow.

- An approval workflow consists of one or more linked approval tasks to review and approve your changes.
- Avoid configuring more approval steps than necessary and steps with group(s) having a very small number of members
  - Can cause delays in pending changes getting published.
- Avoid assigning specific users to workflow & stakeholder configuration. Instead, it is recommended to configure groups and assign the relevant users to these groups.
  - Note: specific users configured as stakeholders &/or workflow approvers are NOT included during Ref360 model migration
- As of November 2025 release, the following features are not supported in Reference 360 Workflow:
  - Modification of data in an in-flight workflow / approval task
  - Dynamic routing or bypassing approval steps to specific approver groups depending on a transaction type (insert, update, delete) or attribute values
  - Approval or Rejection of only certain changes in the full change request. Approval or rejection is all-or-none across all changes in the change request.

# Reference 360 Best Practices – Dictionaries

## [Advanced Ref360 Dictionaries - Product Documentation](#)

- Dictionaries are Data Quality assets that are used to standardize and validate data values.
- You can create dictionaries for Data Quality based on attributes of **code lists** or value mappings of **crosswalks**.
- You must then synchronize data to populate the dictionaries in Data Quality with code values or value mappings.
  - As of November 2025, synchronizing dictionaries is only available via the UI, there is no API currently available
- You can view these dictionaries in Data Quality but can **edit them only** in Reference 360
- Creating dictionaries in Reference 360 eliminates duplication of reference data in Data Quality and ensures that Reference 360 serves as the single, trusted source of standardized reference data for dictionaries.

# Reference 360 Best Practices Integration and Data Quality

# Reference 360 Best Practices – Integration Methods

## Manual - File Import via Ref360 UI

- Manual process typically used by senior data stewards
- No custom integration development required
- Recommended for:
  - Post initial load bulk data changes
  - Low complexity models with minimal cross-asset relationships
- Not recommended for:
  - Complex Initial Data Loads, lists w/ complex transformation logic, Data models w/ large # of relationships

## Programmatic – CDI / CAI / API / Python

- Reusable programmatic process which can be tested and migrated to higher environments
- Custom Development Required
  - Leverages OOTB Reference 360 Jobs & IDMC Business360 Connection or Reference 360 APIs via RestV2 Connections
- Recommended for:
  - Most scenarios - including Initial Data Load, Incremental Inbound, Outbound, etc.
- Not required for:
  - Non-mission critical lists having minimal complexity, static data w/ low data volumes

# Reference 360 Best Practices – Import Job

## Import Integration Guideline - Product Documentation

- Ensure that you publish the taskflow in Cloud Data Integration.
  
- Asset Renaming
  - If you rename an asset that's associated with the mapping in Reference 360, manually update the mapping in Cloud Data Integration.
  
- Trim Code & Reference Data Type Attributes
  - Ensure that the Code fields don't contain leading or trailing spaces. Reference 360 uses the Code field values as source primary keys for code values.
  
- Ensure that the name of an asset you use in a Cloud Data Integration mapping doesn't contain a slash (/). If the asset name contains a slash (/), you can't view the asset in Cloud Data Integration.
  
- Be aware of load order
  - Before you import a child code list, use a separate reference data import job to import its parent code list. If you use the same job to import both the code lists, the load step fails.

# Reference 360 Best Practices – Export Job

## Export Integration Guideline - Product Documentation

- Ensure that you publish the taskflow in Cloud Data Integration.
  
- Asset Renaming
  - If you rename an asset that's associated with the mapping in Reference 360, manually update the mapping in Cloud Data Integration.
  
- Ensure that the name of an asset you use in a Cloud Data Integration mapping doesn't contain a slash (/). If the asset name contains a slash (/), you can't view the asset in Cloud Data Integration.
  
- Export Types
  - **Standard:** Exports all the records in the first run of a job based on their creation date, and then incrementally exports the records added or updated after the first run based on their last updated date.
  - **Custom:** Exports all the data added or modified after the specified date in the first run of the job and then exports the data that are added or updated after the first run incrementally.
  - **Export all:** Exports all the records in each run of the job based on their creation date.

# Reference 360 Best Practices – Data Quality

## Rule Types

### Basic Rules

- **Basic Rule** options are pre-defined basic functions which can be used for validations or automations.
  - For example, you can configure, max length, allowed characters, concatenation, trim, etc.

The screenshot shows a configuration window for a rule. On the left, there are labels for 'Run the rule on all input fields', 'Applied Field:', 'Name: \*', 'Description:', 'Condition', 'Configure a condition', and 'Function: \*'. The main area is a list of conditions: 'Maximum Length', 'Minimum Length', 'Starts With', 'Ends With', 'No Spaces' (highlighted), 'Contains', 'Does Not Contain', 'Allowed Characters', 'Not Allowed Characters', 'Regular Match', and 'External Validation'. At the bottom, there is a 'Function: \*' dropdown menu with the text 'Select a Function' and a downward arrow.

### Advanced Rules

- **Advanced rules** leverage custom Data Quality **Rule specifications** for validation and automation.
  - Rule specifications allow you to implement more complex logic and supports multiple input fields to derive the output value or error message

### General

Enable rule association:

Applied Field: TestString2

Rule Specification: \* rs\_Test\_Automation

# Reference 360 Best Practices – Data Quality

## Validation Error Messages

- Basic and Advanced DQ Rules allow you to customize the validation error message, if desired.
- If importing data via File Import or CDI Job, rejects + error messages will be routed to the job's reject file
  - Reject Reports can be found and downloaded via “My Jobs”

Applied Field: TestString1

Name: \* MaxLengthTestString1

Description:

Condition **Validation**

Configure the message to display when the validation fails.

Error Message: \* Enter a maximum of 2 characters.

**New Code Value** [X]

**Details**

Name: \* test

Code: \* test

TestString1: 333

✖ Enter a maximum of 2 characters.

# Reference 360 Best Practices – Data Quality

## Rules and Guidelines – Basic Rules

### Basic DQ Rule Guidelines - Product Documentation

- A basic rule association for a reference data field or a field that uses a reference data field, the rule passes / displays only the code field of the referenced **code value**.
- Ensure that the rule output doesn't include leading or trailing spaces.
  - For example, to concatenate two fields that include leading and trailing spaces, configure basic rule associations, such as left trim and right trim, to eliminate these spaces.
- Date fields that you might use must be in the YYYY-MM-DD format.
- When you have multiple basic rule associations for an attribute, you can set their order of execution to obtain clean and correct data:

#### Rules (3)

| Order | Rule Name     |
|-------|---------------|
| 1     | concatCode    |
| 2     | leftTrimCode  |
| 3     | rightTrimCode |

# Reference 360 Best Practices – Data Quality

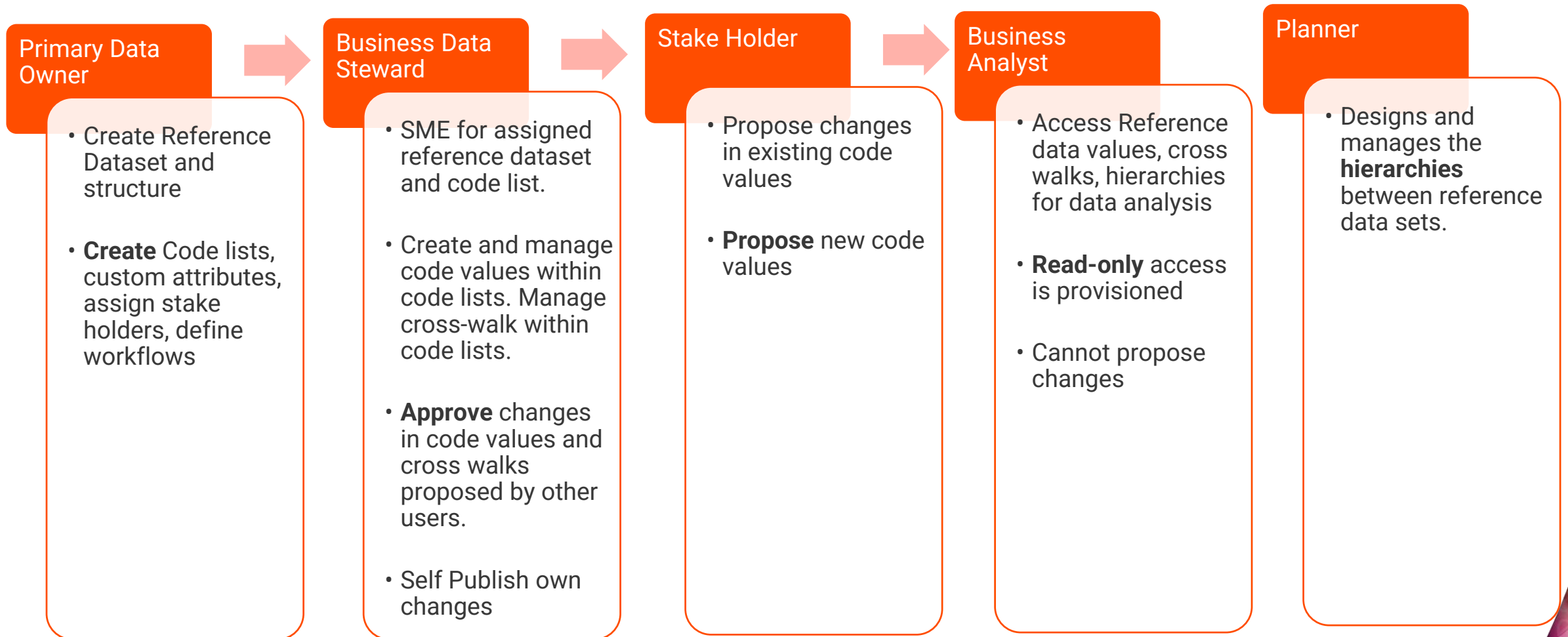
## Rules and Guidelines – Advanced Rules

### [Advanced DQ Rule Guidelines - Product Documentation](#)

- When a rule specification is modified, select the rule specification again or reset the fields of the advanced rule association in Reference 360.
  - Otherwise, the changes to the rule specification aren't effective when the rule is executed.
- An advanced rule association for a reference data field, the rule considers only the **code value** field of the referenced code value.
- When you configure an advanced rule association for a required field, ensure that the field value doesn't depend on the value of another field that is configured with an advanced rule association.
- **Reference 360 doesn't guarantee the execution order of the advanced rules.**

# Reference 360 Best Practices Security Roles and Groups

# Reference 360 Stakeholder Roles



Note: "Reference 360 User" Role not pictured. This role only grants access to Reference 360 service. It does not grant access any assets.

# Reference 360 Best Practices – Security

## Global vs Asset Specific Security

- Reference 360 roles define a set of privileges that a user has while working in MDM – Reference 360.
  - The privileges apply **to all assets or can be defined for specific assets** (Reference data set, code list or crosswalk)

| Reference 360 Roles (Global)   | Stakeholder Roles (Asset Specific)                           |
|--|--|
| Predefined, Out of the box roles that provides self-service access to the Reference 360 assets | Pre-defined roles that provide asset specific access control |
| Assigned through IDMC Administrator service  | Assigned inside Reference 360 to specific assets             |
| Applicable to all Reference 360 assets   | Applicable to assets they are assigned                       |
| <a href="#">For more information, see Reference 360 roles.</a>                                 | For more information, see <a href="#">Stakeholder roles</a>  |

| Values                         | Crosswalk | Summary                      | Definition | Stakeholders |
|--------------------------------|-----------|------------------------------|------------|--------------|
| <b>Stakeholders</b>            |           |                              |            |              |
| <b>Role</b>                    |           | <b>User or Group</b>         |            |              |
| Reference 360 Business Analyst |           | zRef360BusinessSteward       |            |              |
| Reference 360 Business Steward |           | zRef360SeniorBusinessSteward |            |              |

# Reference 360 Best Practices – Security

## Guidelines for Assigning Roles

- Administrators must assign at least one Reference 360 role to users or groups to access Reference 360.
- Role privileges are cumulative.
  - Users who have multiple roles or who belong to groups receive the combined privileges associated with each role.
- Assign the role with the minimum number of privileges required for each user to work with Reference 360.
- Restrict a user's access to assets and only grant access to the assets that the user needs to view and work on.
  - To restrict a user's access, assign the user the global Reference 360 User role, then asset specific stakeholder roles
    - For example, you assign John the Reference 360 User role. He cannot view any assets in Reference 360. John is the subject matter expert for the Enterprise Language code list, so you assign John the Business Steward stakeholder role for the code list. The role allows him to create, manage, and approve code values in the Enterprise Language code list. He can also directly publish his changes to the code list. For all other assets, John's Reference 360 User role applies.
- Avoid creating environment specific IDMC Ref360 Groups (especially for asset specific security requirements)
  - Since stakeholder configuration is at the asset level scope, non-existing groups in higher environments will be rejected during Ref360 Model migration
    - Avoid “Ref360\_BusinessSteward\_Dev” & “Ref360\_BusinessSteward\_Prod” group design.
    - Instead, it is recommended create a single “Ref360\_BusinessSteward” group for all environments.

# Reference 360 Best Practices – Security

## Workflow effects on Privileges

| Stakeholder Role | Workflow (review step vs final approval) | Propose Changes? | Publish Changes? (Direct Save) | File Import? | Claim Workflow Task |
|------------------|--|------------------|--------------------------------|--------------|---------------------|
| Analyst          | Review Step                              | No               | No                             | No           | Yes                 |
| Analyst          | Final Approval                           | No               | No                             | No           | Yes                 |
| Stakeholder      | Review Step                              | Yes              | No                             | No           | Yes                 |
| Stakeholder      | Final Approval                           | Yes              | Yes                            | No           | Yes                 |
| Business Steward | Review Step                              | Yes              | No                             | Yes          | Yes                 |
| Business Steward | Final Approval                           | Yes              | Yes                            | Yes          | Yes                 |

- Any "Reference360 User" role assigned user can be configured as a workflow approver, including read-only "Analyst" groups
- Direct Save / Publish is available to both Stakeholder and Business Steward roles, depending on if the role is configured as Final Approval
- Only Business Stewards can File Import

\* Behavior as of Nov 2025

# Where data & AI come to

