Microsoft Dynamics® AX 2012

Implementing and Extending the Organization Model in Microsoft Dynamics AX 2012

White Paper

This white paper introduces the organization model in Microsoft Dynamics AX 2012 and discusses best practices for modeling complex organizational structures. It provides tips and implementation guidelines for upgrading companies and virtual companies. It also provides guidance for extending the organization model for new types of operating units required to support industry vertical scenarios.

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Introduction

International corporations can grow from within or through mergers and acquisitions. They might grow by targeting new markets, or they might establish new subsidiaries or acquire new legal entities in their own country or other countries. They might grow by targeting new consumer market segments or vertical industry segments. The new markets they serve might require new products and services. Effectively measuring the performance of such a growing business can become a challenge.

For corporations like this, performance is usually measured based on dimensions of the business, such as business units, business divisions, lines of business, or product lines. Corporations can also be organized based on these dimensions, or based on functions such as sales, marketing, product development, production, human resources, and accounting. In a mixed organization, services such as human resources and accounting are shared across business units.

Corporations may need both internal and external reporting structures. Generally, a legal or statutory structure is used for legal, regulatory, or external reporting requirements of federal, state, or local government entities. An operating or managerial structure is used for internal profit and loss reporting and for measuring the performance of the organization. Nonprofit, public sector, and governmental organizations would require an operating structure to create a statement of financial position.

Most corporations go through an iterative operating cycle of Monitor > Measure > Analyze > Improve. The Analyze phase results in new business rules and policies, and new strategic and operational initiatives that are aimed at improving performance. This cycle of performance improvement also occurs at lower levels of the organization, such as business units, divisions, departments, and cost centers.

The organization model in Microsoft Dynamics® AX 2012 supports creating the hierarchical structures that enable the cycle of performance improvement.

Audience

This white paper is targeted at implementers who need to model organizations in Microsoft Dynamics AX. Defining organizational structures is an important part of a Microsoft Dynamics AX implementation, and it requires input from executives such as the controller, the chief financial officer, the chief executive, the chief operating officer, and the head of human resources. Partner consultants and IT managers who are working on an implementation should be aware of the impact of the organization model on the application features and scenarios. Independent software vendors (ISVs) can also benefit from understanding the organization model for extensibility scenarios for specific vertical industries with unique organization requirements.

Improving on previous releases

In Microsoft Dynamics AX 2009 and previous releases, it was difficult to model key scenarios required by corporations with global operations and separate legal and operating organization structures. The following improvements were identified.

Improvement 1: Creating different types of organizations

In previous releases, the “dataAreaId” (or company) provided the data security boundary in Microsoft Dynamics AX. At the same time, customers used “dataAreaId” or company to define legal entities.

Multiple legal entities were modeled using multiple companies in Microsoft Dynamics AX. Operating organizations (such as departments and cost centers) were modeled within companies and were not independent entities. Furthermore, organization concepts existed independently of each other in dimensions functionality (cost center, department), and the Human Resource Management module (department and organization unit). They could not be maintained or managed in one place, which created the risk of data inconsistency.
Microsoft Dynamics AX 2012 introduces new types of organizations, such as legal entities and operating units, so that customers can model their businesses in the same way that they operate their businesses, without needing to customize Microsoft Dynamics AX.

**Improvement 2: Modeling organization hierarchies**

In previous releases, companies could not be organized into a hierarchy to represent the structure of an organization. In reality, organizations normally have a hierarchical structure that is used in defining business policies and rules, and for security access and reporting rollup.

The organization model framework in Microsoft Dynamics AX 2012 supports creating multiple hierarchies that take effect on multiple dates. The framework also supports creating hierarchies that are used for multiple purposes.

**Improvement 3: Sharing data and transactions between companies**

Because companies define the data security boundary in previous releases of Microsoft Dynamics AX, it is difficult to share master data across companies. For the same reason, parameters and reference data must be set up for every company. Virtual companies help support scenarios to share master data, but do not provide an ideal solution. Though some cross-company scenarios are enabled, in general there is no visibility into transactions across companies.

In contrast, the organization model framework in Microsoft Dynamics AX 2012 is integrated with other application frameworks to enable end-to-end application scenarios, and to enable visibility into transactions across companies. For example, application scenarios can take advantage of the following integration points with application frameworks:

- Using organizations as financial dimensions.
- Defining security access to organizations based on hierarchies.
- Defining business rules and policies for organizations.

**Overview of the organization model framework**

The organization model represents internal control, data security access, and performance reporting structures designed to divide responsibility for human and operations resources and work processes.

The organization model in Microsoft Dynamics AX 2012 introduces two new concepts: *legal entity* and *operating unit*.

**Legal entities**

A legal entity is an organization with a registered or legislated legal structure that is granted the authority to enter into legal contracts and that is required to prepare statements that report on its performance.

A legal entity and company in Microsoft Dynamics AX 2012 are semantically the same. However, some functional areas in the application are still based on a data model using company (or DataArea). These areas may have the same limitations as in Microsoft Dynamics AX 2009, and may have an implicit data security boundary.

**Operating units**

An operating unit is an organization that divides the control of economic resources and operational processes among people who have a duty to maximize the use of scarce resources, to improve processes, and to account for their performance.
Several types of operating units are available out of the box:

- A **business unit** is primarily an operating organization with a focus on industries or product lines that the organization is supposed to serve.

- A **cost center** is a type of operating unit that describes an organization used for tracking costs or expenses. It is a cost accumulator, and is used to manage costs.

- A **department** is a type of operating unit that may have profit and loss responsibility and could be a grouping of cost centers. Departments also are often created based on functional responsibility or skill, such as sales and marketing.

- A **value stream** is a type of operating unit commonly used in lean manufacturing. In lean manufacturing, a value stream owns one or more production flows that describe the activities and flows needed to supply a product, good, or service to the consumers of the product.

**Note** These operating unit types were created to support application functionality in Microsoft Dynamics AX 2012. However, every industry and business has unique requirements for their operating units and may call them by different names. The definition and use of custom operating units are described in the Development section of this paper.

A team is also a type of an internal organization, but it is an informal group of people primarily created for a specific purpose over a short duration. Teams may be created for specific projects or services. The other types described above are more permanent, though there could be major changes related to restructuring or frequent minor updates.

When legal entities and operating units are arranged into hierarchies and used for reporting rollup, security access, and business policies, they help enable internal control of your business.

### Implementation best practices

The organization model has a significant impact on the implementation of Microsoft Dynamics AX 2012, and on the business processes being implemented. We recommend that executives and senior managers from different functional areas such as finance and accounting, human resources, operations, and sales, and marketing be involved in defining the organization structures.

This section describes the best practices for modeling organizations and organization hierarchies. Your partner consultant should provide additional guidance based on their experience in various industries and across their customer base. They can best identify your unique requirements and make recommendations based on your particular needs.

Every best practice recommendation in this section may not have significant impact in this release, but all are important for using the organization model framework in future releases.

### Best practices for modeling organizations and hierarchies

Market segment, or size of the business, is an important consideration when modeling organizations. Market segment indicates the size and complexity of a business. However, keep in mind that specific customer requirements and individual business complexity may require modifications to this guidance.

**Note** Microsoft Dynamics AX is primarily targeted at small and midsize businesses, also known as the midmarket segment. The best practices in this document therefore also focus on that market segment.

### Organization modeling for the lower midmarket segment

Businesses in the lower midmarket typically have just one or very few legal entities. The legal structure is also often their operating structure because the business is involved in a very limited number of product lines or groups. The need for performance measurement and internal control of operations along these product lines can be easily handled through an organizational structure defined by extending the legal structure.
A typical lower midmarket business will need a single mixed hierarchy with legal entities at the top of the hierarchy and departments and cost centers that roll up to the legal entity.

If there is no need for complex internal control policies or data security access based on hierarchies, lower midmarket businesses need not define hierarchies. Basic setup of policies and data security can be done without hierarchies, based on a list of legal entities. We recommend creating a single mixed hierarchy anyway, to support the organization as it grows.

If more complex internal control scenarios such as audit control and invoice control are needed, businesses must define additional hierarchies consisting of legal entities only. Default hierarchy purposes are defined in the Set up and manage organizations and hierarchies section.

Note The guidance provided for the lower midmarket segment can also be applied to small businesses.

Organization modeling for the core midmarket segment
Businesses in the core midmarket may need to support complex internal control policies, and therefore may need separate legal entity and operating unit hierarchies.

The operating unit hierarchy might consist of business units under a root corporate legal entity, with departments rolling up to a business unit, and cost centers rolling up to a department.

Expenses are incurred against a cost center. Revenues may be recognized against a department or business unit, and they may be profit centers with profit-and-loss responsibility. If revenue is not recognized against a department, and it does not serve another purpose such as data security or internal control policies, the department may be used solely as a grouping of cost centers or may be eliminated from the hierarchy.

Organization modeling for the upper midmarket segment
For businesses in the upper midmarket that grow with mergers and acquisitions, a legal entity structure is inadequate for internal control, for effective performance measurement, and for efficient delivery of goods and services. These businesses likely want to analyze their business based on operating structures such as industries, consumers, or product lines. They also tend to restructure their businesses to meet the needs of the marketplace in an agile manner.

Upper midmarket businesses need to model multiple hierarchies. They would like to see the impact of restructuring and measure effectiveness by doing a before-and-after comparison of their organization structures.

Larger businesses may need to have some organizations based on business units and other organizations based on shared services such as human resources and IT. However, care must be taken to design hierarchies so that cost centers are created in shared service departments and are placed under appropriate business units to allocate the costs of shared services to the business units.

Best practices for upgrading existing company data
If you are using a previous version of Microsoft Dynamics AX, the organization model upgrade will have an impact on existing domains, companies, and virtual companies.

Upgrading domains and companies
In previous releases of Microsoft Dynamics AX, you could create a collection of companies called a domain.

During an upgrade, existing domains are converted into organization hierarchies. The first company in the domain is designated as the root, and all other companies are created at the second level of the hierarchy. These hierarchies are assigned a purpose of Security. Users assigned to a domain in the previous release are assigned to all companies in the corresponding hierarchy.
A company in the previous release is upgraded to a company in Microsoft Dynamics AX 2012, and a corresponding legal entity is created. A legal entity also is created for the out-of-the-box DAT company.

Note The DAT company is required to start the client and application for the first time. It is generally recommended not to use it in a production environment. In future releases, theDAT company may be considered for deprecation.

Upgrading shared data and virtual companies

Some shared data tables were introduced in Microsoft AX 2009. The primary goal of shared data tables is to avoid creating duplicate data in multiple companies. Other benefits of shared data include viewing and consolidating transaction data across companies. Most of the data for master data entities such as chart of accounts, party, and product is shared.

Some master data entities in Microsoft Dynamics AX are still defined per company (for example, customer and vendor accounts). In previous releases of Microsoft Dynamics AX, you could use virtual companies and table collections to share data for those entities.

Virtual companies are supported in Microsoft Dynamics AX 2012, and you can still use them for sharing customer and vendor data. However, note that you can share only certain attributes of a relationship using virtual companies. In Microsoft Dynamics AX 2012, you might want to use a shared data entity such as party to share data for customers and vendors.

Note If you want to secure shared data based on organization, a customization with changes to the data model and the use of extensible data security policies may be required.

When you upgrade, review the tables that are in the table collection of each virtual company. If any of the tables have been converted to shared data tables, having them in the table collection of the virtual company is redundant. We recommend removing them from the table collection.

Deployment scenarios

The duplicate company feature was used extensively to copy data from one company to another in Microsoft Dynamics AX 2009. Duplicate company functionality also was used to build development or test environments and deployment scenarios that moved data from one environment to another. We have deprecated this feature in Microsoft Dynamics AX 2012. We recommend that you now use the Microsoft Dynamics AX export and import data feature (found at System administration > Common > Data export/import) to support scenarios that previously required the duplicate company feature.

Follow these steps to use an existing legal entity as a template for other legal entities.

1. Create a legal entity that will be used as a template.
2. Create all configuration data for the legal entity.
3. Use the Microsoft Dynamics AX export and import data feature to export this legal entity to a file such as "TMP.dat."

Create new legal entities and import the TMP.dat file into each one individually. Shared and per-company data will be imported. Subsequent imports of other legal entities into the new legal entities would merge the shared data.

Notes

- Configuration data is usually stored in tables that have one of the following values in their TableGroup metadata property: "Reference," "Parameter," "Group," "Miscellaneous," or "Framework." If you want to include master data, include tables with a value of "Main" in their TableGroup metadata property.
- You are required to select table groups on the form during export only if transaction data has been created in the legal entity. In general, tables with their TableGroup property set to a value of
“Transaction,” “Transaction header,” “Transaction line,” “Worksheet,” “Worksheet header,” or “Worksheet line” are used to store transaction data, and you can exclude them from your export.

- Company (or DataArea) can no longer be used as a data security boundary. Even in previous releases the data was shared, which sometimes led to problems due to duplication of data. As a consequence of changes to the organization model, data will no longer be related to a company or legal entity in a simple relationship that is defined by setting the `SaveDataPerCompany` metadata property of a table to “Yes.” Because data relationships are now defined through the `Relations` metadata property, it would not be easy to duplicate the data. Semantically, it might not even make sense to duplicate it. For example, we create organizational hierarchies where the legal entities and business units exist in a complex relationship. There is no parent-child relationship between business units and legal entities. Therefore, the duplication of business units based on legal entities in the system would be erroneous. This is just one example of a case where it would not make sense to use the company as a data isolation or data security boundary, and to copy the data as if it were a template.

- Our customers and partners have reported scenarios in which they have built a demo environment by using the duplicate company feature. But these scenarios are rare and cannot currently be effectively recreated in Microsoft Dynamics AX 2012. You can still use the import and export data feature in Microsoft Dynamics AX to import and modify transaction data. However, it would be difficult to create the same environment for transaction data when the tables have their `SaveDataPerCompany` property set to “No.” We recommend that you use Microsoft SQL Server® backup-and-restore functionality to build demo environments in which minor configuration changes can be made to illustrate certain features.

**Best practices summary**

Keep in mind the following DOs and DON'Ts when implementing an organization hierarchy.

**DO** model multiple operating unit hierarchies if you have complex profit-and-loss (P&L) internal reporting needs.

**DON'T** create a hierarchy for every purpose. It is often sufficient to use one hierarchy for multiple purposes. For example, one operating unit hierarchy might be assigned to all policy-related purposes.

**DO** create a department to model the intersection between a legal entity and a business unit. This will enable you to model the rollup of departments to a legal entity (for statutory reporting), and to business units (for internal reporting).

**Note** Departments can serve as profit centers, with P&L responsibility. Using departments means that you do not have to carry both legal entity and business unit as dimensions on the account structure. It is sufficient to only carry department as a dimension. However, you must carry both cost centers and departments as dimensions on account structures if cost centers are just cost accumulators and departments are revenue-recognition organizations.

**DO** create balanced hierarchies. Creating dummy departments as the intersection of a legal entity and a business unit can help you to create balanced hierarchies. In a hierarchy, all nodes at a fixed depth from the root node define a level. In a balanced hierarchy, only one type of operating unit type is allowed at each level, and the depth of the tree from a root node to a leaf level node in any branch of the tree is fixed. If there are intermediate levels between a department and a legal entity or a business unit, dummy organizations might also be required.

**DON'T** model a separate operating unit hierarchy if the legal entity structure is your operating structure and a mixed hierarchy of legal entities and operating units is sufficient.

**DO** model a hierarchy consisting of only legal entities based on purposes that apply only for legal entities.
DO remove a table from a table collection of a virtual company if the table is now shared data in Microsoft Dynamics AX 2012.

DO cost allocation of shared service departments such as Human Resources and IT so that it is accounted for in the P&L for profit centers such as departments and business units.

DO model and validate scenarios, using date-effectivity hierarchies in a test environment, before doing major restructuring in production.

DO use draft mode for making changes to a hierarchy before publishing a new version in a production environment.

DO limit the number of people with permission to add or remove organizations in a hierarchy in a production environment. This will help you avoid costly mistakes and the need for corrections.

Application scenarios
The organization model is integrated with the application modules in Microsoft Dynamics AX. There are two types of scenarios:

- The organization model framework is integrated with other application frameworks.
- Transaction scenarios make use of integrations to create end-to-end scenarios.

Integration with application frameworks
The organization model is tightly integrated with following frameworks.

Address book
All internal organizations—legal entity, operating unit, and team—are types of the Party entity. This means that these organizations leverage the capabilities of the address book to store address and contact information.

![Figure 1: An address book](image-url)
For information about changes to the address book feature, see the online help documentation and the Microsoft Dynamics AX 2012 white paper Implementing the Address Book Framework for Microsoft Dynamics AX 2012 Applications.

Financial dimensions
Legal entities and operating units can be used to define financial dimensions, and those financial dimensions can be used in account structures.

Using organizations as financial dimensions enables analysis of an organization’s financial performance. The relationships between organizations described through hierarchies can also be used as constraints if two types of organizations are used as separate financial dimensions in the account structure.

The following illustration shows the list of entities that can be used as financial dimensions. To navigate to this form, click General ledger > Setup > Dimensions > Dimensions. Create a new dimension and click Use values from to see the list of entities.

![Entities that can be used as financial dimensions](image)

Figure 2: Entities that can be used as financial dimensions
The following illustration shows an account structure using organizations as dimensions. To navigate to this form, click **General ledger > Setup > Chart of accounts > Configure account structures.**

![Account Structure Using Organizations as Dimensions](image)

**Figure 3: An account structure using organizations as dimensions.**

For more information about financial dimensions and account structures, see the online help documentation and the Microsoft Dynamics AX 2012 white paper “Implementing the Financial Account and Dimension Framework for Microsoft Dynamics AX 2012 Applications.”

**Policy framework**

In Microsoft Dynamics AX 2012, a business policy can be defined for an organization by using the policy framework. The policy framework can be used to define policies for expense reports, purchase requisitions, audit control of documents, and vendor invoice payments.

The policy framework provides support for override and default behavior for organizations based on their hierarchies, and enables internal management control of organizations to facilitate cost control, fraud detection, better operating efficiency, and better performance in general.
The following example shows how to create a purchasing policy.

1. Rank the hierarchies that are used to define procurement policies. To navigate to the form, click **Procurement and Sourcing > Setup > Policies > Purchasing policies** and select **Parameters**.
2. Create a new policy by clicking **New** in the **Purchasing policies** form.

![Image of Purchasing policies form](image1.png)

3. Set up a policy for an organization by selecting an organization hierarchy and a specific organization in the **Policy organizations** FastTab of the **Purchasing policies** form.

![Image of Purchasing policies form with Policy organizations FastTab](image2.png)
4. Set up policy rules in the next FastTab.

The policy rule is applied when a new purchase requisition is created for this organization. For more information about the policy framework and complete steps to set up policies, see the online help documentation.

**Extensible data security**

Companies provided the data security boundary for most application data in previous releases. The new extensible data security framework provides capabilities to secure data based on any condition. For information about the extensible data security framework, refer to Microsoft online help documentation.

A very common scenario for data security is to filter master data or transaction data based on a user’s association to internal organizations. The master data or transaction data entity must have a foreign key relationship (field on the entity table) with the organization in order to set up a security policy. The following example shows how to filter data based on a user’s relationship to an organization.
Assign a user to an organization by using the following steps.

1. Select **System administration > Setup > Security > Assign users to role.**

2. Select a role to assign it to a user.
3. Select **Add organizations**.

4. Complete the following steps to grant data security access for organizations:
   a. Grant a selected user access to specific organizations or to all organizations.
   b. Select an organization hierarchy or a list of legal entities. (The second option is provided to support backward compatibility.)
   c. Select a specific set of organizations from the hierarchy or list.
   d. Select **Grant with children** to give access to an organization and all organizations below it in the hierarchy. To grant access to a specific organization only, select **Grant**.

   **Note** If a new organization is added below an organization where the user has been granted access, the user will automatically get access. Effectively, organization updates are reflected in the data security access when you select **Grant with children**.

**Note** There is no out-of-the-box integration of organization model with workflow framework in Microsoft Dynamics AX 2012. The workflow framework supports use of reporting relationships using positions for workflows on documents. However, a customization is required to create a new hierarchy
provider for workflow using organization hierarchies. For further details, see the online help documentation.

**Transaction scenarios**

There are several application areas that make use of the new organization model framework. The primary impact has been in the following modules. Here is a brief description of the usage. For a complete description and steps for the scenarios in these areas, see the online help documentation.

**Procurement and sourcing**

The lines of a purchase requisition are created for a buying legal entity, and they are received in an operating unit such as cost center or department. A purchase requisition is created for a requester and is prepared by a preparer. Various scenarios are enabled where you could view or create purchase requisitions for all buying legal entities and receiving operating units in which you have access to create requisitions.

**Human resources**

In human resources, workers hold employment contracts in a legal entity and have a position in a department. All transaction scenarios in human resources leverage these concepts to view and modify data.

**Travel and expense**

Expense reports and lines carry a legal entity to which the expense line item should be charged from a statutory perspective, and they also carry an operating unit for internal reporting.

**Set up and manage organizations and hierarchies**

There have been changes in the way organizations are managed in Microsoft Dynamics AX 2012 to support the new organization model. This section describes how the organizations and hierarchies are set up and managed.

The setup is done in the **Organization administration** module. However, organizations relevant for other application areas can also be set up in the **Human resources** and **General ledger** modules.

For more information about setting up organizations and hierarchies, see [Organizations and organizational hierarchies](#) on TechNet.
1. Create legal entities and operating units.

   **Note** There are two types of internal organizations—legal entities and operating units. Both types of organizations are created by navigating to *Organization administration > Setup > Organizations* and selecting *Legal entities* or *Operating unit*.

2. Enter the name of the new legal entity or operating unit and fill in all required fields.

3. If you are creating a new legal entity:
   a. Enter the country or region code so that country-specific fields will be enabled on the form. This code also is required to enable country-specific or region specific features in the application.
   b. Enter information for tax registration, statutory reporting, and other information based on the country or region of the legal entity.
4. Create hierarchies. To navigate to the form, click **Organization administration > Setup > Organization hierarchies**.

a. Click **New** to create a new hierarchy and enter a name.

b. Click **View** to open the hierarchy designer form in View mode.

c. Click **Edit** in the hierarchy designer form to edit the hierarchy. To modify the hierarchy, select a node and use the actions on the action pane or on the right-click menu.

d. Click **Publish and close** to publish the hierarchy for a selected date, and close the hierarchy designer form. For more information about editing and managing multiple versions of a hierarchy, see the online help documentation.

e. Assign a purpose to the hierarchy by clicking **Assign purpose**. A purpose defines how the hierarchy is used in application scenarios. For example, a hierarchy assigned a purpose of **Expenditure internal control** is used for defining policies for expense reports.
The following table defines the purposes that are shipped out-of-the-box in Microsoft Dynamics AX 2012. It describes how the purposes are used in the application, and the types of organizations that can belong to a hierarchy created for the purpose.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Usage</th>
<th>Organization types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure internal control</td>
<td>To define policies for expense reports</td>
<td>All organizations</td>
</tr>
<tr>
<td>Procurement internal control</td>
<td>To define policies for procurement</td>
<td>All organizations</td>
</tr>
<tr>
<td>Signature authority internal control</td>
<td>To define signature authority policies for approvals based on currency amounts</td>
<td>All organizations</td>
</tr>
<tr>
<td>Centralized payments</td>
<td>To enable centralized payments by a legal entity on behalf of other legal entities</td>
<td>Only legal entities</td>
</tr>
<tr>
<td>Vendor payment internal control</td>
<td>To define policies for payment of vendor invoices</td>
<td>Only legal entities</td>
</tr>
<tr>
<td>Audit internal control</td>
<td>To define policies to identify documents for audit</td>
<td>Only legal entities</td>
</tr>
<tr>
<td>Security</td>
<td>To define data security access for organizations</td>
<td>All organizations</td>
</tr>
<tr>
<td>Organization chart</td>
<td>For use in Human Resources</td>
<td>All organizations</td>
</tr>
</tbody>
</table>

For details about the application scenarios related to purposes, see the online help documentation.

**Development**

You can extend the organization model to support ISV or partner customization or configuration scenarios.

**Configuring a new type of custom operating unit**

One of the core extensibility scenarios is extending the organization model for specific industry vertical requirements such as retail, professional services, or public sector. Branches, stores, schools, and school districts are essentially organization concepts. You can model them as new types of operating units. The framework of the new organization model supports this extensibility by allowing you to define a new type of custom operating unit.

*Note* In Microsoft Dynamics AX 2012, existing entities like warehouse, site, and project are not organizations. There are two options if you want to leverage the organization model framework for these entities. The first option is to model them as cost centers or departments so that you can incorporate them in the hierarchy and use the framework. We recommend this option. The second option is to model them as custom operating units. In both options, you must manage data separately and keep it consistent. Also, data security access, policies, and dimensions that are defined for organizations that correspond to these entities will not apply to the actual entities. A customization is required if these limitations must be addressed. This customization is out of scope of this white paper.

In the following example, you will configure an operating unit called Branch. To configure Branch, do the following:

- Define a new Base Enum value for the `OMOperatingUnitType` that corresponds to the new type of operating unit.
- Define a view, `DimAttributeOMBranchView`, which is similar to views created for other types of operating units. For example, `DimAttributeOMBusinessUnit` was created for business units.
Optionally, define a new menu item that corresponds to this operating unit to create new instances of this type of operating unit.

**Define a new Base Enum value**
Define a new Base Enum value for the OMOOperatingUnitType that corresponds to the new type of operating unit.

1. In the AOT, right-click **Data Dictionary > Base Enums > OMOOperatingUnitType** and then click **New Element**.
2. In **Name** and **Label**, type Branch.

**Define a view**

1. In the AOT, right-click **Data Dictionary > Views** and then click **New View**.
2. In **Name**, type DimAttributeOMBranchView.

```plaintext
DimAttributeOMBranch(isv)
  Metadata(isv)
    Data Sources
      BackingEntity(OMOperatingUnit)
        Fields
        Ranges
          OMOOperatingUnitTypeOMBranch
            Data Sources
            Group By
            Having
            Order By
          Fields
          Field Groups
        Methods
          DimAttributeOMBusinessUnit
          DimAttributeOMCostCenter
          DimAttributeOMDepartment
          DimAttributeOMRegion(isv)
          DimAttributeOMRentalLocation(isv)
```
3. Define the view. The following code shows an AX Project (XPO) file that contains a view:

```xml
<Exportfile for AOT version 1.0 or later
Formatversion: 1

***Element: VIEW

; Microsoft Dynamics AX View : DimAttributeOMBranch unloaded
; ------------------------------------------------------------------------
TABLEVERSION 1

VIEW #DimAttributeOMBranch
  PROPERTIES
  Name       #DimAttributeOMBranch
  Label      #Branch
  TitleField1 #Value
  TitleField2 #Name
  DeveloperDocumentation #8SYS320938
  Origin     #([B440F32B-A1F0-4AAE-AB32-1E90998D263E})
ENDPROPERTIES

QUERY #Metadata
  PROPERTIES
  Name       #Metadata
  Version    #12
  NextUniqueId #1002
  Origin     #([0D2F7FD4-EE98-4E63-BDDF-4EF81201190})
ENDPROPERTIES

BLOCKS
  BLOCK #OMOperatingUnit
    PROPERTIES
    Name       #BackingEntity
    Table      #OMOperatingUnit
    UniqueId   #1000
ENDPROPERTIES

FIELDLIST
  PROPERTIES
ENDPROPERTIES
ENDFIELDLIST

LINES
  LINE #OMOperatingUnitType
    PROPERTIES
    Name       #OMOperatingUnitTypeOMBranch
    Table      #OMOperatingUnit
    Field      #OMOperatingUnitType
    Value      #OMBranch

```
Define a new menu item

Define a new menu item to create new instances of this type of operating unit.

This menu item will launch an operating unit form only for creating operating units of type Branch. This step is optional.

1. In the AOT, right-click **Menu Items > Display** and then click **New Menu Item**.
2. In **Name**, type **OMBranch**.
3. In **Label**, type **Branches**.
4. In **Object**, type **OMOperatingUnit**.
5. In **EnumTypeParameter**, type **OMOperatingUnitType**.
6. In **EnumParameter**, type **Branch**.

The integration of the organization model with other frameworks provides visibility into this new type of operating unit. You can define new instances of these organizations by using the operating unit form. (You also can use a parameterized version of the form launched by using the menu item if you performed the optional “Define a new menu item” procedure.) You can use the new instances of the custom operating unit in building new hierarchies within the hierarchy designer without any further changes. You can define data security access for these organizations based on the hierarchies. You can also use the policy framework to set policies for these types of organizations.
The new custom operating units also can be used as backing entities in financial dimensions and can be used as dimensions in account structures.

**Hierarchy designer extensibility**

In Microsoft Dynamics AX 2012, there is limited support for extending the hierarchy designer. The hierarchy designer control can be customized for four parameters of the organization nodes within the hierarchy: border color, node image, top gradient color, and bottom gradient color.

The following sample code modifies the `OMHierDesignExtClass` class to support new values for the border, top gradient, and bottom gradient colors, based on organization type. The methods should also be updated (based on these changes) for the properties of the node that correspond to a new custom operating unit type. Note that the sample code uses the image of the legal entity as the default for new custom operating unit types.

```csharp
class OmHierDesignExtClass
{
    #ResAppl

    #define.LegalEntityTopGradient("#FFA5CDFF")
    #define.LegalEntityBottomGradient("#FF7EB8FF")
    #define.LegalEntityBorderColor("#FF3F5C80")
    #define.LegalEntityImageID(10052)

    #define.BusinessUnitTopGradient("#FF6ECFFF")
    #define.BusinessUnitBottomGradient("#FF80E3FF")
    #define.BusinessUnitBorderColor("#FF407280")
    #define.BusinessUnitImageID(10053)

    #define.CostCenterTopGradient("#FFFA8A6")
    #define.CostCenterBottomGradient("#FFFF8280")
    #define.CostCenterBorderColor("#FF7F4140")
    #define.CostCenterImageID(10524)

    #define.DepartmentTopGradient("#FFE2FFA6")
    #define.DepartmentBottomGradient("#FFD6FF80")
    #define.DepartmentBorderColor("#FF6B8040")
    #define.DepartmentImageID(10054)

    #define.ValueStreamTopGradient("#FFFFCEA6")
    #define.ValueStreamBottomGradient("#FFFFB980")
    #define.ValueStreamBorderColor("#FF805D40")
    #define.ValueStreamImageID(10055)

    #define.DefaultTopGradient("#FFA5CDFF")
    #define.DefaultBottomGradient("#FF7EB8FF")
    #define.DefaultBorderColor("#FF3F5C80")

    #define.BranchTopGradient("#FFE2FFA6")
    #define.BranchBottomGradient("#FFD6FF80")
    #define.BranchBorderColor("#FF6B8040")

    #define.RentalLocationTopGradient("#FFFFA8A6")
    #define.RentalLocationBottomGradient("#FFFF8280")
    #define.RentalLocationBorderColor("#FF7F4140")

    #define.RegionTopGradient("#FFCEA6FF")
    #define.RegionBottomGradient("#FFB880FF")
    #define.RegionBorderColor("#FF5C4080")

    #define.DefaultOrganizationImageID(10901)
    #define.DefaultOrganizationImageName("Icon10901")

```
FormRun m_HDForm;
OMOrganizationHierarchy m_omOH;
}

Notes:
- A similar customization can be performed for a new type of operating unit by customizing this class to add a new border color, top gradient color, and bottom gradient color. Without the customization, the hierarchy designer uses default colors for a new type of operating unit.
- A customization to add a new custom purpose is out of scope of this white paper. Adding a new custom purpose requires customization of the `OMHierarchyPurposeTableClass` class and the `HierarchyPurpose` base enumeration. Customization must extend to the application scenario where the custom purpose will be used.
- A more complex customization of the `OMHierarchyPurposeTableClass` class is required if you want to force the design of balanced hierarchies.

Create or customize an end-to-end application scenario

You can set up a new end-to-end scenario or customize an existing end-to-end scenario by taking an approach similar to one of those outlined in the Transaction scenarios section of this document. The high-level steps are as follows:

1. Define or change the data model.
2. Create a new transaction table or make a Per company transaction table by changing the value of the metadata property from `SaveDataPerCompany = Yes` to `SaveDataPerCompany = No`.
3. Include relevant organizations as foreign keys (FK) on the table. It is sufficient to carry an operating unit because the relationship with the legal entity is established through organization hierarchies.
4. If the transaction table carries redundant data of the legal entity field, set up business logic constraints between legal entities and operating units to maintain data consistency.
5. Build a new form (for example, a list page) for the transaction scenarios, or change the existing user experience to view or maintain transactions. The custom filters can help view or manage data across organizations.
6. Apply default organizations on the transaction table in financial dimensions by including them in account structures.
7. Create extensible data security policies based on access to organizations of the user.
8. Use the policy framework to set up specific policies that are applied while creating a new transaction in the application scenario.

Notes:
- Special considerations might apply for intercompany trade and intercompany accounting if the transactions are between two legal entities of the same business, implemented in one instance of Microsoft Dynamics AX 2012.
- You must make special considerations if master data entities are referenced in the application scenario because they have a relationship in the data model with the transaction table. For more information, see the approach for purchase requisition in this release.
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