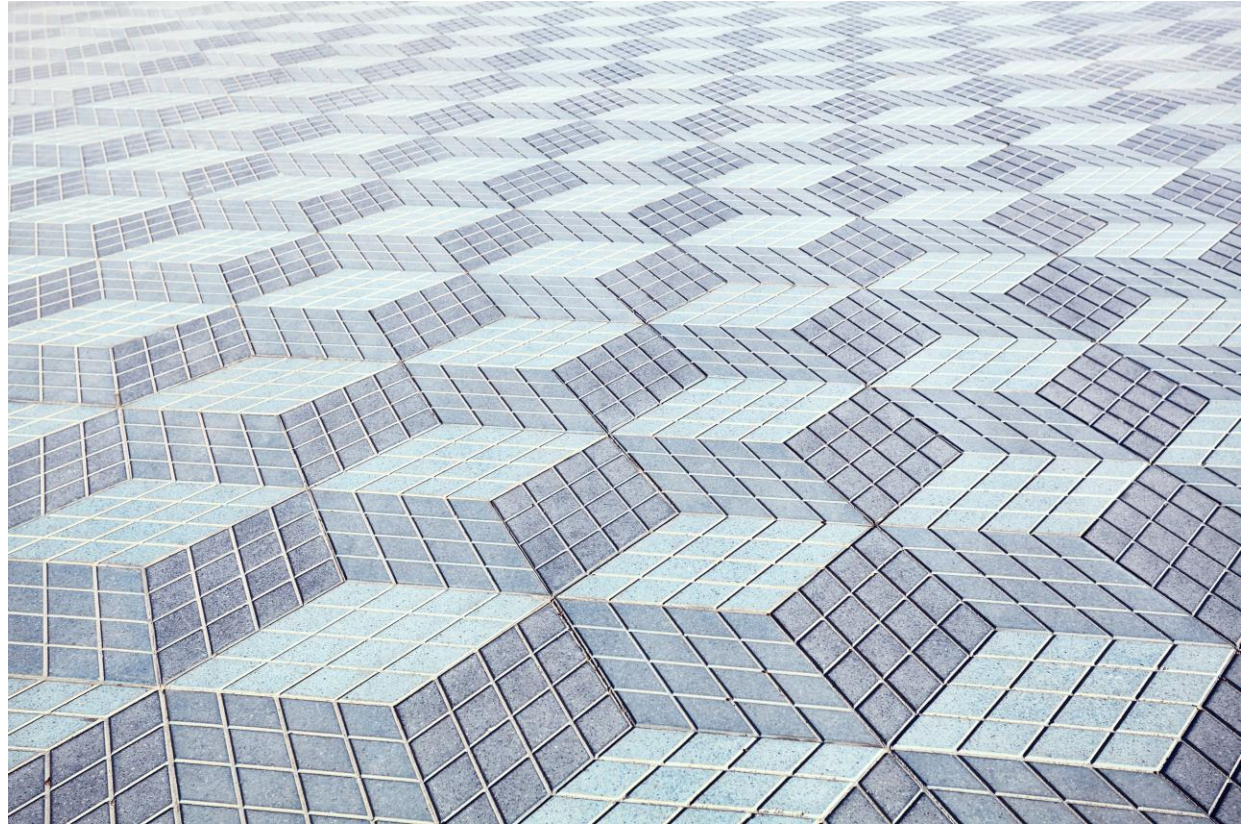


Financial dimension design

Eric Pegors
FastTrack Solution Architect
epegors@microsoft.com



Formerly: degenerate dimensions

- In the past, we used the term “degenerate dimension” to refer to a financial dimension with high cardinality
- “Degenerate dimension” is actually a specific term with a different meaning so we are going to stop using it the way we have in the past
- A “high cardinality financial dimension” is one that has lots of new values and new dimension combinations

Agenda

- Financial dimension background
- Financial dimension design principles
- Other considerations

Financial dimension background



Financial dimension

- A category used for similar values

- **Examples**

- Department
- Cost center
- Item group

The screenshot shows the 'Financial dimensions' setup page in Microsoft Dynamics 365. The top navigation bar includes 'Edit', 'New', 'Delete', 'Activate', 'Dimension values' (highlighted), 'Derived dimensions', 'Set up hierarchies', 'Translations', 'Main account translation', and 'Options'. On the left, a list of dimension types is shown: BusinessUnit (Active), BusinessUnit_FR (Active), Campaign (Active), Cargo (Active), Cashflow_CN (Active), Center (Active), Condition (Active), Contract (Active), and CostCenter (Active). The main area is titled 'Financial dimensions' and shows a table with columns: 'Use values from', 'Dimension name', 'Report column name', and 'Status'. The table contains one row: 'Business units', 'BusinessUnit', and 'Active'. Below this is the 'Administration' section, which includes a toggle for 'Copy values to this dimension on ea...' (set to 'No') and a toggle for 'Require the dimension to be balanced' (set to 'No'). There is also a field for 'Dimension value mask' and a partially visible label 'Require values for the dimension to b...'.

Use values from	Dimension name	Report column name	Status
Business units	BusinessUnit		Active

Administration

ADMINISTRATION

Copy values to this dimension on ea... ☐ No

Require the dimension to be balanced ☐ No

Dimension value mask

Require values for the dimension to b...

Dimension value

- The values for a specific financial dimension
- **Examples**
 - Business unit 001
 - Cost center 020
 - Item group 100

Financial dimension values

Dimension value: 001 | Description: Home

General

Σ Totals

Active from: | Suspended: ☒ No

Active to: | Group dimension:

Calculate total from multiple dimensions: ☒ No

Do not allow manual entry: ☒ No

Owner:

Require the dimension value to be blank: ☒ No

Legal entity overrides

+ Add | Remove

Legal entity	Name	Suspended	Active from	Active to	Owner
<input checked="" type="radio"/> GLMF	Contoso Entertainment System				

Default dimension

A set of dimension values

Entered directly on master records, subledger transactions, and general journal transactions (non-ledger account type)

Combined to create a dimension combination during subledger and journal posting to the general ledger

Dimension combination

A main account and a set of dimension values

Also referred to as a “ledger dimension”

Entered directly on general journal transactions (ledger account type)

Generated during subledger posting to the general ledger

Generated by various general ledger processes

Dimension combinations have no notion of being posted or unposted

Create

Creating a new dimension combination (or default dimension) is relatively expensive in terms of using system resources

A new dimension combination will be created if any of the individual dimension values is new and for a new combination of existing dimension values

The limits are quite high and performance typically becomes a problem only when the financial dimension design has multiple issues

Data model

The financial dimension data model is designed to support specific features and usage

- Segment data model is highly normalized so a schema change is not required for primary data storage
- Combination data model is denormalized for improved query performance

A dimension combination includes the following

- Records for each individual segment
- Records for the combination

Record counts

A dimension combination with all new dimension values will create up to 25 records (11 segments)

- 2 records for each individual segment (DimensionAttributeValue and DimensionAttributeLevelValue)
- 3 combination records (DimensionAttributeValueCombination, DimensionAttributeValueGroup, DimensionAttributeValueGroupCombination)

A dimension combination with one new dimension value will create up to 15 records (11 segments)

- 1 record for the new dimension value (DimensionAttributeValue)
- 1 record for each individual segment (DimensionAttributeLevelValue)
- 3 combination records (DimensionAttributeValueCombination, DimensionAttributeValueGroup, DimensionAttributeValueGroupCombination)

Segments from advanced rules will add additional records in some of these tables

Reuse

Reusing an existing dimension combination is very cheap in terms of using system resources

No records need to be created, we only have to look up the correct reference

Financial dimensions with high reuse: departments, cost centers, and so on

Number theory

Three

$$10 * 10 * 10$$

1,000

Six

$$10 * 10 * 10 * 10 * 10 * 10$$

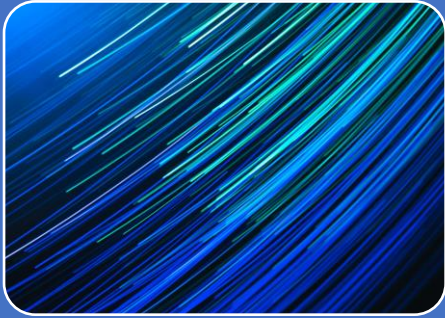
1,000,000

Eight

$$10 * 10 * 10 * 10 * 10 * 10 * 10 * 10$$

100,000,000

Number reality



The number of potential dimension combinations is not usually a problem because a small number of the dimension values typically have a lot of reuse



The most common source of problems is a financial dimension that has new values created very often, which implies there is low reuse

Customer examples

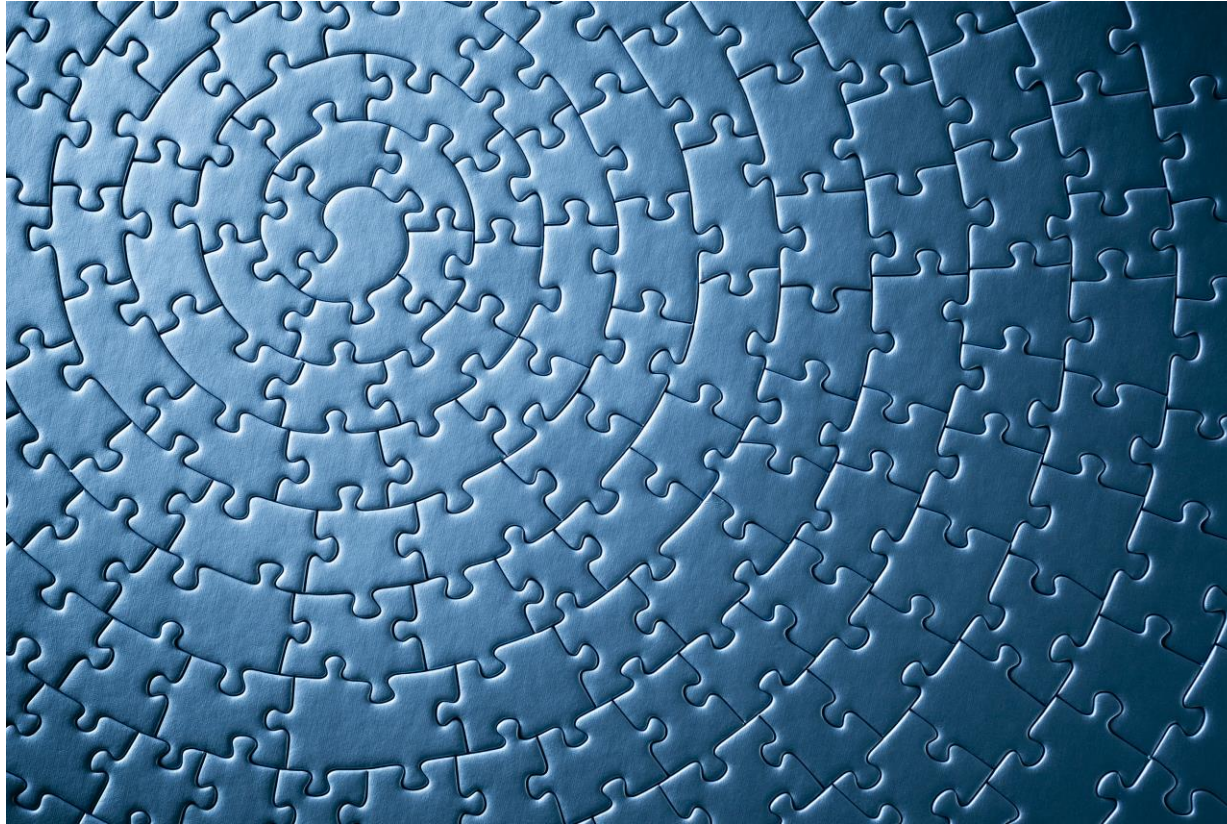
Moderate scenario (okay)

- 35M rows in the general ledger for a fiscal year
- 1M unique dimension combinations
- $1,000,000 / 365 = 2,739$ dimension combinations/day

Extreme scenario (bad)

- 71M rows in the general ledger for a fiscal year
- 7M unique dimension combinations
- $7,000,000 / 365 = 19,178$ dimension combinations/day

Financial dimension design principles



Recommended design principles

Choose financial dimensions where summarization is common and desirable

Summarization is directly related to frequent reuse of dimension combinations

Avoid choosing any other financial dimensions, especially ones with low reuse

Certain low reuse

Sales order number

Purchase order number

Serial number

Lot number

Potential low reuse

Customer number

- Yacht vs. widget

Item number

- Yacht vs. widget

Vendor number

- Yacht vs. widget

Combined low reuse

Multiple financial dimensions together can cause low reuse



One financial dimension can affect the balance sheet accounts while another affects the profit and loss accounts

Dimension sets

- A dimension set defines its own dimension combinations, separate from the account structure
- A dimension set exists to track summarized general ledger balances
- Updating dimension set balances requires creating dimension combinations as needed
- A financial dimension that is not in any dimension sets should not be a financial dimension

Good patterns

The trial balance summarizes general ledger data by dimension combination



Proper dimension combination reuse ensures the trial balance has a reasonable number of rows



A reasonable number of rows ensures the trial balance performs as expected



A financial dimension that is not on the trial balance should not be a financial dimension

Anti-patterns

Do not use a financial dimension because it is an easy way (no customization required) to get values into the general ledger

Do not use a financial dimension to get values needed during ledger settlement or reconciliation into the general ledger

Low reuse

Journal number	Voucher	Date	Ledger account	Account name	Currency	Amount CAD	Amount USD
021913	USMF-000000077	02/07/2022	401100-000001---	Product Sales	CAD	-11.00	-10.76
021913	USMF-000000077	02/07/2022	401100-000002---	Product Sales	CAD	-12.00	-11.74
021913	USMF-000000077	02/07/2022	401100-000003---	Product Sales	CAD	-13.00	-12.72
021913	USMF-000000077	02/07/2022	401100-000004---	Product Sales	CAD	-14.00	-13.70
021913	USMF-000000077	02/07/2022	110160---0001	Bank Account - Payroll	CAD	50.00	48.92
021914	USMF-000000078	02/08/2022	401100-000005---	Product Sales	CAD	-11.00	-10.76
021914	USMF-000000078	02/08/2022	401100-000006---	Product Sales	CAD	-12.00	-11.74
021914	USMF-000000078	02/08/2022	401100-000007---	Product Sales	CAD	-13.00	-12.72
021914	USMF-000000078	02/08/2022	401100-000008---	Product Sales	CAD	-14.00	-13.70
021914	USMF-000000078	02/08/2022	110160---0001	Bank Account - Payroll	CAD	50.00	48.92
021915	USMF-000000079	02/09/2022	401100-000009---	Product Sales	CAD	-11.00	-10.76
021915	USMF-000000079	02/09/2022	401100-000010---	Product Sales	CAD	-12.00	-11.74
021915	USMF-000000079	02/09/2022	401100-000011---	Product Sales	CAD	-13.00	-12.72
021915	USMF-000000079	02/09/2022	401100-000012---	Product Sales	CAD	-14.00	-13.70
021915	USMF-000000079	02/09/2022	110160---0001	Bank Account - Payroll	CAD	50.00	48.92

High vol

[illegible]

Other considerations



General journal entity

The dimension combinations for the ledger account type may need to be created during the import (they also go straight to the general ledger)

The other account types create both a special dimension combination for the account and a default dimension

An import file with a large number of new dimension combinations could have performance challenges but as before, the limits are high and reuse is the key

For example, importing the first set of opening balances may be slower because the dimension combinations need to be created while importing the subsequent opening balances will be faster assuming there is proper reuse

Year end close

Depending on the settings, every dimension combination for the fiscal year could generate a new dimension combination



This will repeat every fiscal year because there will be a large number of new dimension combinations each fiscal year

Consolidation

Depending on the settings, every dimension combination for the consolidation period could generate a new dimension combination

This will repeat every consolidation period because there will be a large number of new dimension combinations each consolidation period

Q & A

References

[Financial dimensions - Finance | Dynamics 365 | Microsoft Docs](#)

[Financial dimension sets - Finance | Dynamics 365 | Microsoft Docs](#)

[Financial Dimension Corruption: Understanding and Avoiding | March 2-3, 2022 - Microsoft Dynamics Blog \(TechTalk\)](#)

[TechTalk Series: Planning and Configuring your Chart of Accounts - Microsoft Dynamics Blog \(TechTalk series\)](#)

Thank you
