





SQL and NAV: From Foes to Friends

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Briefly About Me

- Trainer, Data Coach, Developer, Project Manager
- Favorites: SQL and PowerShell (and getting into Python)
- I am data centric not necessarily NAV centric.
- Accounting and financial reporting.
- Other Presentations/Blog Posts: The auditors are here and they have a few questions. A Rapid Guide to Rapid Start Excel into SQL Server (blog posts)





About You – Poll 1

- Developers?
- DBAs?
- Admins?
- Super Users?
- Curious/Bored?
- Level of SQL Knowledge
 - Can Spell SLQ
 - Worked with Data in tools like Jet Reports
 - Used tools to connect tables and write reports (SSRS/Crystal)
 - Write My Own SQL
 - Live in SQL





Why This Presentation?

- You have multiple systems and SQL is the common denominator.
- You want to use a standard reporting solution that's not NAV specific – and again SQL is the common denominator.





Two Key Things

- Ask Questions
- If this isn't working, don't feel guilty about leaving.





The Overview

- 1) The Basics NAV and SQL
- 2) Tables and Relations
- 3) The Fun Stuff





The Basics – NAV and SQL





From NAV to Tables

- 1) It all starts with a table.
- 2) Option Fields or, of course a Credit Memo is a 3.
- 3) Flow Fields, Flow Filter Fields, Sum Index Fields (When is a field not a field or not quite a field)
- 4) NAV (is/is not) relational.
- 5) Exploring Metadata





It all starts with a table







It all starts with a table

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It all starts with a table

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More Information from the Development Environment

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DynamicsUAT90 - Microsoft Dynamics NAV Development Environment

File Edit View Tools Window Help

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- Deport		5	Finance Charge Terms		NAVW 19.00.00.44974	01/29/16	12:00:0
		6	Customer Price Group		NAVW 19.00.00.44974	01/29/16	12:00:0
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		30	Item Translation		NAVW 17.00	09/07/12	12:00:0
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~	3	Search Name	Code	50		
~	4	Name 2	Text	50		
v	5	Address	Text	50		
~	6	Address 2	Text	50		
~	7	City	Text	30		
~	8	Contact	Text	50		
~	9	Phone No.	Text	30		
v	10	Telex No.	Text	20		
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It start with a table – Let's Look in SQL

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- 🗉 🧮 dbo.CRONUS USA, Inc_\$Mini Vendor Template
- 🗉 🧾 dbo.CRONUS USA, Inc_\$Payable Vendor Ledger Entry
- 🗉 🧾 dbo.CRONUS USA, Inc_\$Standard Vendor Purchase Code
- dbo.CRONUS USA, Inc_\$Vendor
 - 🖃 🚞 Columns
 - timestamp (timestamp, not null)
 - P No_ (PK, nvarchar(20), not null)
 - Name (nvarchar(50), not null)
 - Search Name (nvarchar(50), not null)
 - Name 2 (nvarchar(50), not null)
 - Address (nvarchar(50), not null)
 - Address 2 (nvarchar(50), not null)
 - City (nvarchar(30), not null)





SQL vs. NAV

ID Name	DataType	FieldClass	Len	name	name	Length	preci	sion	
				timestamp	timestamp)	8	0	Timestamp is created on every table. This is what generates the error message "Another user is editing the record"
1 No.	Code	Normal	20	No_	nvarchar		20	0	Note the . In NAV is replace by an underscore in NAV.
2 Name	Text	Normal	50	Name	nvarchar		50	0	
3 Search Name	Code	Normal	50	Search Name	nvarchar		50	0	
19 Budgeted Amount	Decimal	Normal		Budgeted Amount	decimal		38	17	No length is specified for decimal. They always default to 38,17 in SQL server. It's good practice to cast your information for precision before using it in a reporting tool.
39 Blocked	Option	Normal		Blocked	int		4	10	Option Fields are not stored in the database the same way they are stored in NAV
45 Pay-to Vendor No.	Code	Normal	20	Pay-to Vendor No	nvarchar		20	0	
46 Priority	Integer	Normal		Priority	int		4	10	
47 Payment Method Co	de Code	Normal	10	Payment Method Code	nvarchar		10	0	
54 Last Date Modified	Date	Normal		Last Date Modified	datetime		8	23	
55 Date Filter	Date	FlowFilter							FlowFilter is used on NAV pages to pass values to FLOW Fields. No relevance for reporting.
56 Global Dimension 1 F	ilt Code	FlowFilter	20						
57 Global Dimension 2 F	ilt Code	FlowFilter	20						
58 Balance	Decimal	FlowField							Flow fields are actions on other SQL tables based on the current table. We'll review them in the next section.
59 Balance (LCY)	Decimal	FlowField							





NAV vs SQL

- 1. Timestamp exists in all NAV tables. It's really a version number and used by NAV to keep multiple users from updating the same record. You cannot update this field by any command in SQL. Nor can you prevent it from being updated. This is why you cannot update directly in NAV.
- 2. SQL Special characters are allowed in NAV but not in SQL. These include "." and /. So, No. become No_.
- 3. Decimal fields in NAV are created as decimal(38,17) in SQL Server. It's important to adjust your precision in your code, not just with formatting. The syntax to do this is: CAST(ColumnName as Numeric(15,2))

or CONVERT(Numeric(15,2), ColumnName)





NAV vs SQL

- 4. Option Fields exist in the database. But the data is not stored the way you see it on NAV pages.
- 5. Flow Filters and Flow Filters do not exist in SQL. We'll talk about those next.





Option Fields – Vendor Blocked

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Option Fields – Vendor Blocked



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	No_	Name	Blocked
1	01254796	Progressive Home Furnishings	0
2	01587796	Custom Metals Incorporated	1
3	01863656	American Wood Exports	2





Option Fields How to Find the Values

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Option Fields How to Find the Values

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Flow Fields and Flow Filters

- Flow Fields Data from Another Table
- Flow Filters Values entered in the NAV application to specify how that data is retrieved from another table





Flow Field Example – Vendor Balance

3	Balance - Properties	
Property	Value	
Field No.		5
Name	Balance	
Caption	Balance	
CaptionML	ENU=Balance;ESM=Saldo;FRC=Solde;ENC=Balance	
Description	<>	
Data Type	Decimal	
Enabled	<yes></yes>	
InitValue	<undefined></undefined>	
FieldClass	FlowField	
CalcFormula	-Sum("Detailed Vendor Ledg. Entry".Amount WHERE (Vendor No.=FIELD(No.),Initial	
DecimalPlaces	<undefined></undefined>	
BlankNumbers	<dontblank></dontblank>	
BlankZero	<no></no>	





Flow Field Example

Calculation Formula
Method
Table Filter Vendor No.=FIELD(No.),Initial Entr OK Cancel

Field		Type	Value	OnlyMaxL	ValueIsFilter	
Vendor I	No.	+ FIELD	No.			Ż
Initial En	ntry Global Dim. 1	FIELD	Global Dimension 1 Filter			
Initial En	ntry Global Dim. 2	FIELD	Global Dimension 2 Filter			
Currence	y Code	FIELD	Currency Filter			
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Flow Field Options

- Sum
- Average
- Exist
- Count
- Min
- Max
- Lookup





Flow Field in SQL

NAV:

-Sum("Detailed Vendor Ledg. Entry".Amount WHERE

(Vendor No.=FIELD(No.),

Initial Entry Global Dim. 1=FIELD(Global Dimension 1 Filter), Initial Entry Global Dim. 2=FIELD(Global Dimension 2 Filter), Currency Code=FIELD(Currency Filter)





Flow Field in SQL

SQLQ	uery1.sq	ıl - AAM2019\adam (61))* 😐	× Constant and the second s									
	1 5	SELECT ven.No_,										
	2	ven.Name,										
	3	CAST(COALESCE	(SUM(dvle.Amount), 0) AS NUMERIC(15, 2)) AS Balance									
	4	FROM dbo.[CRONUS USA, Inc_\$Vendor] ven										
	5	5 LEFT OUTER JOIN dbo.[CRONUS Mexico S_A_\$Detailed Vendor Ledg_ Entry] dvle										
	6 ON dvle.[Vendor No] = ven.No											
	7	7 GROUP BY ven No										
	8	ven.Name										
	9	ORDER BY ven.No;										
	10											
⊞ Re	sults 🗊	Messages										
	No_	Name	Balance									
1	0125479	96 Progressive Home Furnishings	-1472018.33									
2	0158779	96 Custom Metals Incorporated	0.00									
3	0186365	56 American Wood Exports	-117125.32									
4	0190528	83 Mundersand Corporation	0.00									
5	0190538	82 NewCaSup	0.00									
6	010057	77 OakvillaWorld	0.00									





Sum Index Fields

- Sum Index Fields are aggregates which are created with indexed views in SQL Server
- How does this help? NAV has no aggregate tables. So, no table with the balance for an account per month.





Sum Index Fields – Example

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					36	Sance										0 1/20/17	1110010111		
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Sum Index Fields

E	Key	SumIndexFields	
	 Entry No. 		
Þ	 G/L Account No., Posting Date 	Amount,Debit Amount,Cre	t
	 G/L Account No., Global Dimension 1 Code, Global Dimension 2 Code, Posting Date 	Amount, Debit Amount, Credit	
1	 G/L Account No., Business Unit Code, Posting Date 	Amount, Debit Amount, Credit	
1	G/L Account No., Business Unit Code, Global Dimension 1 Code, Global Dimension 2 Code, Posting Date	Amount, Debit Amount, Credit	
1	 Document No., Posting Date 		
	 Transaction No. 		
1	 IC Partner Code 		
	 G/L Account No., Job No., Posting Date 	Amount	
1	 Posting Date,G/L Account No., Dimension Set ID 	Amount	
	External Document No., Posting Date		

	Field List	×
	Field Amount Debit Amount Credit Amount Additional-Currency Amount AddCurrency Debit Amount AddCurrency Credit Amount	^
E		~
	OK Cancel Help	





Sum Index Fields - SQL

```
□ ALTER VIEW [dbo].[CRONUS USA, Inc $G L Entry$VSIFT$1]
 WITH SCHEMABINDING
 AS
     SELECT "G L Account No ",
             "Posting Date",
             COUNT BIG(*) AS "$Cnt",
             SUM("Amount") AS "SUM$Amount",
             SUM("Debit Amount") AS "SUM$Debit Amount" ,
             SUM("Credit Amount") AS "SUM$Credit Amount" ,
             SUM("Additional-Currency Amount") AS "SUM$Additional-Currency Amount" ,
             SUM("Add -Currency Debit Amount") AS "SUM$Add -Currency Debit Amount" ,
             SUM("Add -Currency Credit Amount") AS "SUM$Add -Currency Credit Amount"
     FROM dbo."CRONUS USA, Inc_$G_L Entry"
     GROUP BY "G L Account No " ,
             "Posting Date";
 GO
```



Sum Index Fields - SQL

□ □ dbo.CRONUS USA, Inc_\$G_L Entry\$VSIFT\$1

🗆 📁 Columns

- ☐ G_L Account No_ (nvarchar(20), not null)
- Posting Date (datetime, not null)
- ₿ \$Cnt (bigint, null)
- ∃ SUM\$Amount (decimal(38,20), null)
- SUM\$Debit Amount (decimal(38,20), null
- 目 SUM\$Credit Amount (decimal(38,20), nul
- SUM\$Additional-Currency Amount (decir
- SUM\$Add_-Currency Debit Amount (deci
- SUM\$Add_-Currency Credit Amount (dec
- 🗄 💻 Triggers
- 🗆 💻 Indexes
 - لله VSIFTIDX (Clustered)





Sum Index Fields - SQL

```
/***** Object: Index [VSIFTIDX] Script Date: 11/15/2019 11:19:23 AM *****/
CREATE UNIQUE CLUSTERED INDEX [VSIFTIDX] ON [dbo].[CRONUS USA, Inc_$G_L Entry$VSIFT$1
(
    [G_L Account No_] ASC,
    [Posting Date] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, SORT_IN_TEMPDB = OFF,
    IGNORE_DUP_KEY = OFF, DROP_EXISTING = OFF, ONLINE = OFF, ALLOW_ROW_LOCKS = ON,
    ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
GO
```





Tables and Relations





NAV's Relation to Relational

- NAV validates data against other tables but not in the database
- NAV Duplicates Data
 - Sales Header has Customer Name and Address
- NAV also keeps separate tables for what is closely related data
 - Sales Header/Sales Line -Sales Invoice Header/Sales Invoice Line Sales Cr_Memo Header/Sales Cr_Memo Line Sales Header Archive/Sales Header Line





NAV Validates Data





NAV Validates Data – How to Figure this Out

manaye

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-	HOME	ACTIONS	NAVIGATE				
Viev		🗟 Release 💣 Reopen	Post	E Copy Document			.
Ma	nage	Release	Posting	Prepare	Order	Documents	Orde

101005 · John Haddock Insurance Co.

General			
Sell-to Customer No.:	30000	~	Document Date:
Sell-to Customer Name:	John Haddock Insurance Co	o.	Requested Delive
Sell-to City:	Miami	~	External Docume
Sell-to State / ZIP Code:	FL		Salesperson Code
Posting Date:	1/26/2018 🗸		Status:

Document Date:
Requested Delivery Date:
External Document No.:
Salesperson Code:
Status:

nelease rosung 101005 · John Haddock Insurance Co.

General					
Sell-to Customer No.:	30000	~ C	ocument Date:	1/11/2018	
Sell-to Customer Name:	▼ ^{No.} 🔺	Name	City	ZIP Code	Phone No
Sell-to City:	21233572	Somadis	AGDAL-RABAT	MA-10100	
Sell-to State / ZIP Code:	21245278	Maronegoce	CASABLANCA	MA-20200	
Posting Date:	21252947	ElectroMAROC	TEMARA	MA-12000	
Order Date:	27090917	Zanlan Corp.	Carletonville	ZA-2500	
	27321782	Karoo Supermarkets	Bloemfontein	ZA-9300	
	27489991	Durbandit Fruit Exporters	Durban	ZA-3600	
Lines	30000	John Haddock Insurance C	o. Miami	37125	
🔠 Line 🝷 🦸 Functions	New Adv	anced	·	NU 7000 00	
Line No. Type	No	Description	Loca	ation	Quar

ricpare





· Order · Documenta · Order Committedon · Neur

NAV Validates Data – Figuring this out

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01905893	Candoxy Canada Inc.		YELLOW	MICrosoft Exc	Send To	Ge	neral		
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01905902	London Candoxy Storage Campus		YELLOW	About This	Page: Select - (Customer	List		
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20339921	TraxTonic Sdn Bhd		YELLOW	Page Mode:	Select				
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27489991	Durbandit Fruit Exporters		YELLOW	FlowFilter Field	ds				~
30000	John Haddock Insurance Co.			URIS					•
31505050	Woonhoulevard Kuitenbrouwer		VELLOW	UNLS					





NAV Validates Data – Figuring This Out

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NAV Validates Data

• Development Environment





NAV Duplicates Data

Customer
No_
Name
Customer Posting Group

Cu	st_ Ledger Entry	
Entry No_		
Posting Date		
Document No_		
Customer No_		
Customer Posting Group		
	V	
	Detailed Cust_Led	g_ Entry







The Fun Stuff





The Fun Stuff – Switching To SQL

- Using the Same Code for multiple companies Poll 3 How many of you have multiple companies?
- Working with totaling accounts/dimensions in NAV Poll 4 – How many of you have totaling accounts (or dimensions)
- Using NAV "Logic" in SQL





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