

**NAV
TECH
DAYS**
2018

mibuso.com

Practical approaches for upgrading your NAV database and moving to extensions

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Reserve Your Prefix

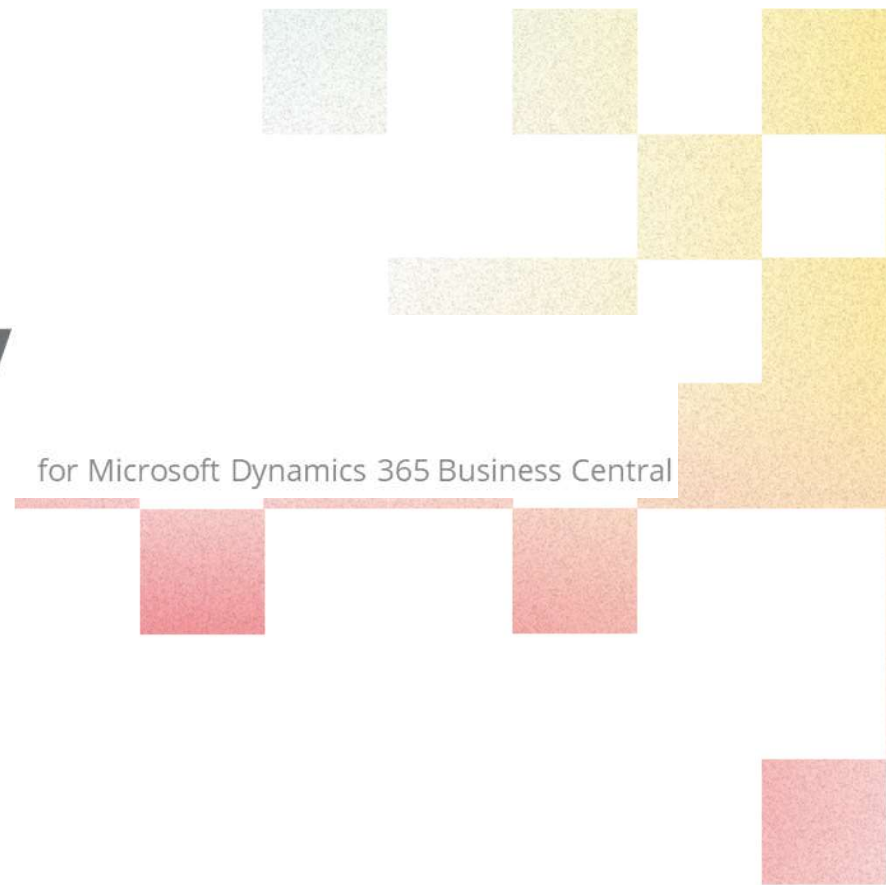
- Even though the solution sux, most ISV's have been doing it forever
- We reserved "For"

What you can already do in C/Side

- Add Notifications, Tooltips, Translations
- Implement Wizards
- Create the simplicity
- Write tests
- Write clean code
(Use events but that prevents downgrade)



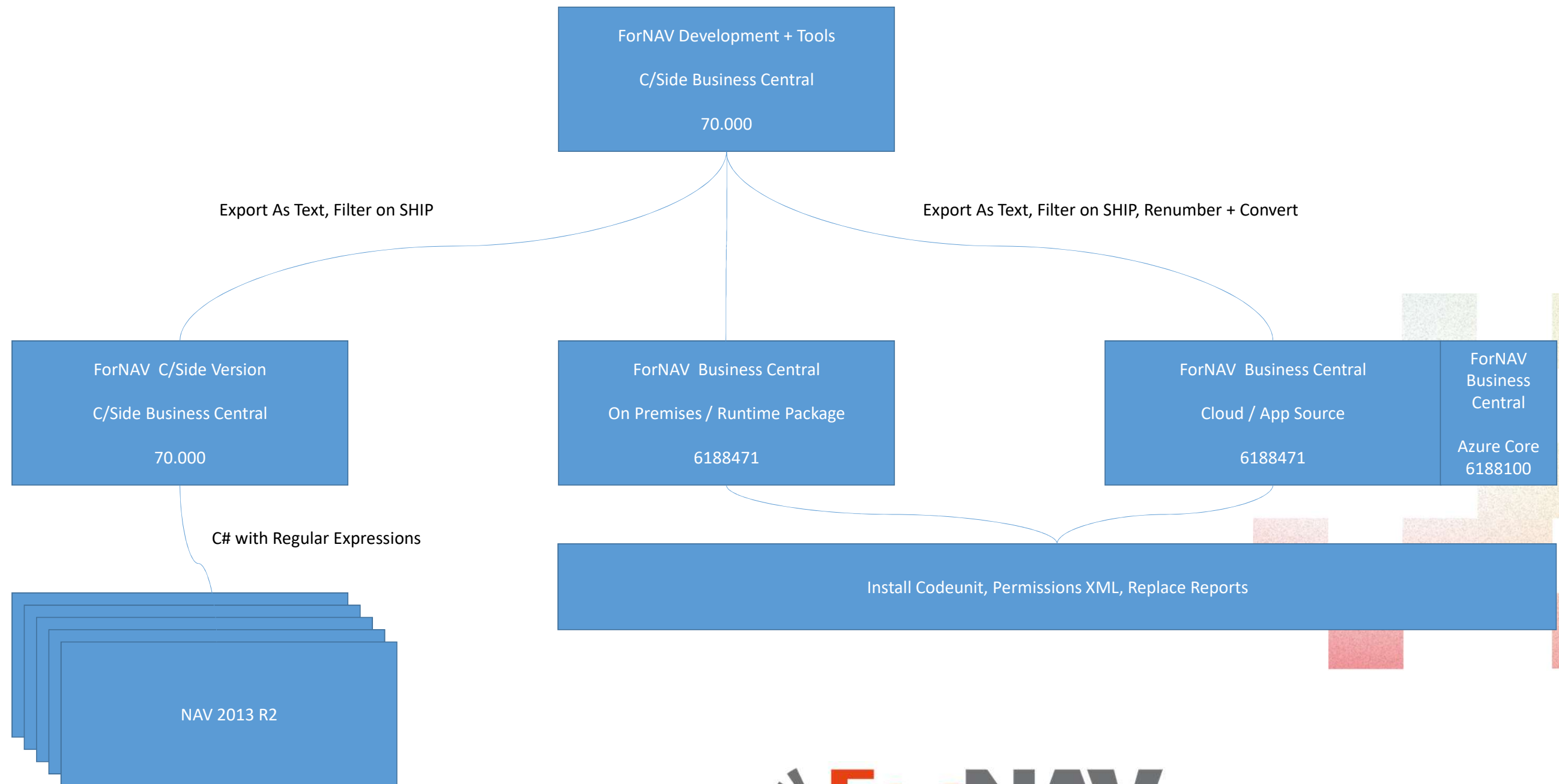
for Microsoft Dynamics 365 Business Central



Problem

- ISV Solution has to span multiple versions
- Here is how we do it
- Code everything in Business Central C/Side
 - Downgrade to NAV2013 to NAV2018
 - Upgrade to Extensions

Development Process



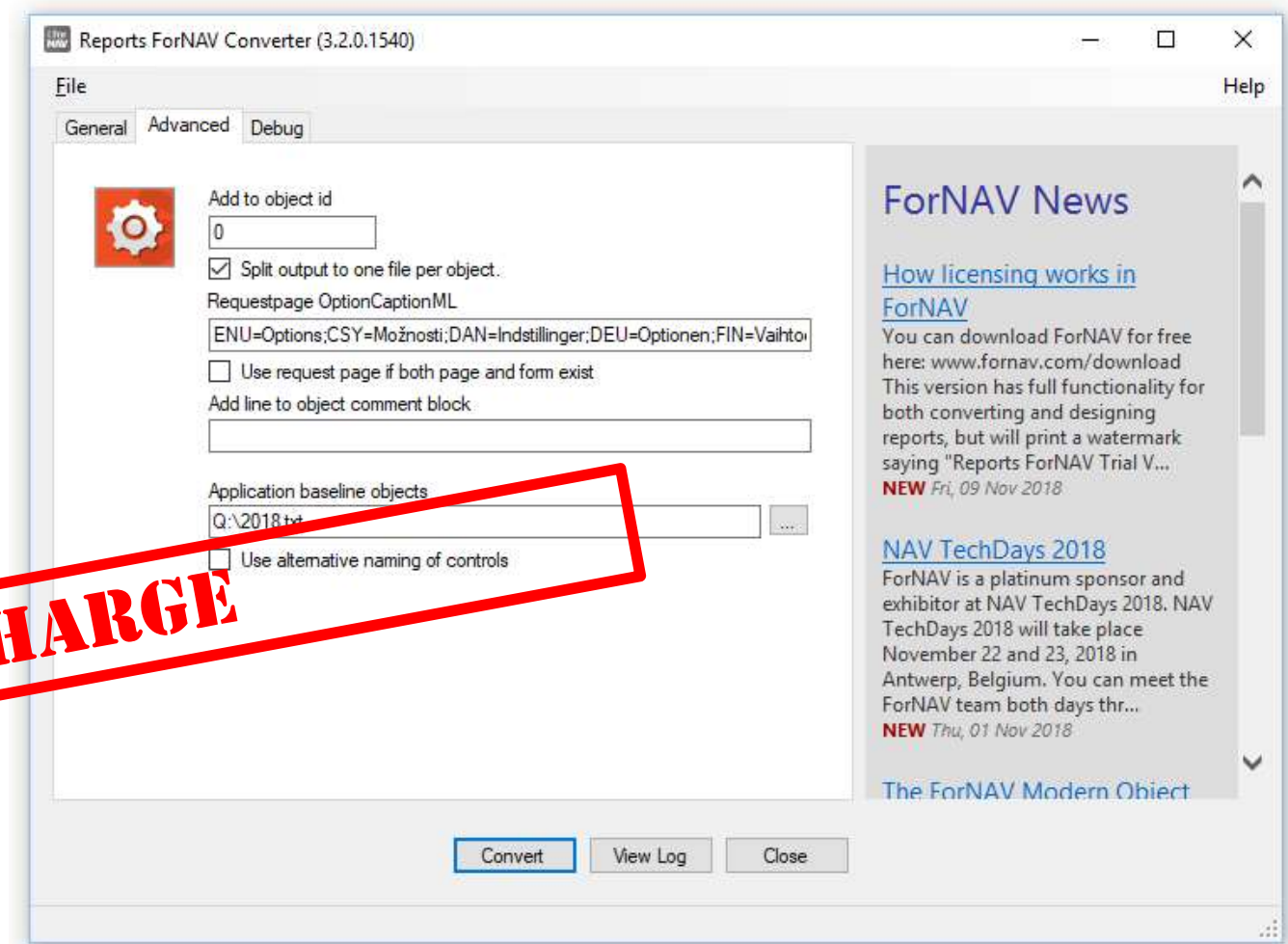
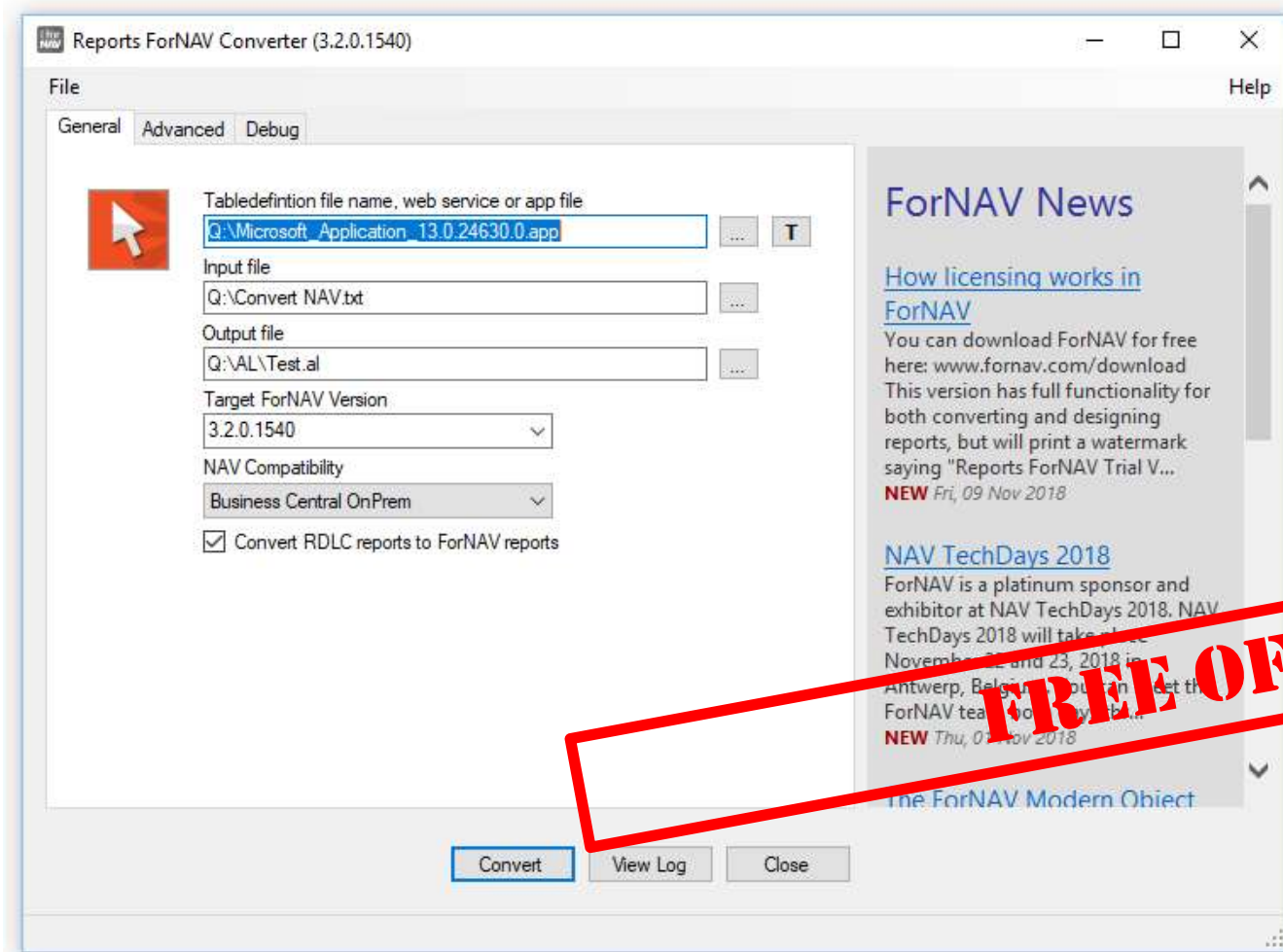
Downgrade

- Don't use images in actions that were not available
- Put Notifications in separate codeunits and yank them out
- Remove unused properties like ApplicationArea
- We use an internal tool, but essentially it's just regular expressions

Upgrade

- Create Table/Page Delta Files and Event Subscriber Codeunits
- Run Txt2AL
- Problem: NAV2018 mandatory as a minimum for ExportToNewSyntax
- Cumbersome

Convert from C/AL to AL

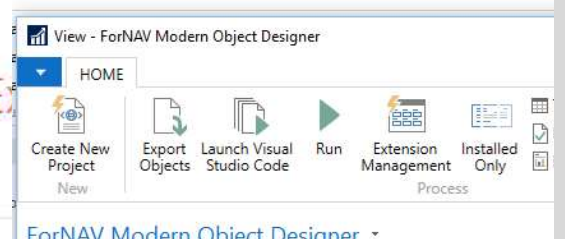


Object Designer

Type	ID	Name	Modified	Version List	Date	Time
Table	1000	ForNAV Modern Object Designer	✓	AL	28-10-18	14:24:51
Page	1001	Job Task Lines Subform		NAVW113.00	19-09-18	12:00:00
Page	1002	Job Task Lines		NAVW113.00	19-09-18	12:00:00
Report	1003	Job Task Lines		NAVW113.00	19-09-18	12:00:00

Our solutions Testimonials Where to buy Download Download More

Category: Modern Object Explorer



Sales Order Processor - Dynamic x +

localhost:8080/BC130/

Dynamics 365 Business Central

CRONUS International Ltd. Sales

Sales Orders Sales Orders - ...s 365 for Sales

KOP

Good morning!

VERTEL ME WAT U WILT DOEN

fornav

Ga naar Pagina's en taken

> ForNAV Modern Object Explorer Beheer

ALSO AVAILABLE

The ForNAV Modern Object Explorer

Modern Object Explorer

The ForNAV Modern Object Explorer is a way to manage Visual Studio AL-code from within NAV. By Michael Nielsen, Partner

Continue Reading

Weergeven - ForNAV Modern Object Explorer x +

localhost:8080/BC130/?bookmark=36%3blpQ1dwCRc1hv26Km9kujlc8HSM2sBQCLDgAAAACHNgQ%3d&page=1000&company=CRONUS%20International%20Ltd.&dc=0

Dynamics 365 Business Central ForNAV Modern Object Explorer

CRONUS International Ltd.

Sales Orders Sales Orders - ...s 365 for Sales

KOP

Good morning!

FORNAV MODERN OBJECT EXPLORER

Zoeken Nieuw Verwerken Gekoppeld weergeven Openen in Excel

Installed Only Extension Management Report Xmlport

Launch Visual Studio Code Table Codeunit All

Run Page Query Export Objects

Intelligent Cloud Base	Page	4001	Intelligent Cloud...	Card	
Intelligent Cloud Base	Page	4002	Hybrid Product ...	List	
Intelligent Cloud Base	Page	4003	Intelligent Cloud...	List	
Intelligent Cloud Base	Page	4005	Hybrid Compani...	ListPart	
Intelligent Cloud Base	Page	4006	Intelligent Cloud...	List	
Intelligent Cloud Base	Page	4007	Intelligent Cloud...	Card	
Intelligent Cloud Base	Page	4008	Intelligent Cloud...	CardPart	

Existing Situation

- NAV 2017 & NAV 2018 (Started with Navision 3.70)
- 80+ Users, 5 Offices
- Base NAV with 9 Financial Companies in NL
- Two CfMD Add-Ons
- 1800 objects added
- Few 100 customized objects
- Power BI, Direct SQL Access
- Databases in Romania, Lithuania & Germany (Base NAV, no mods)



Functionality Chart

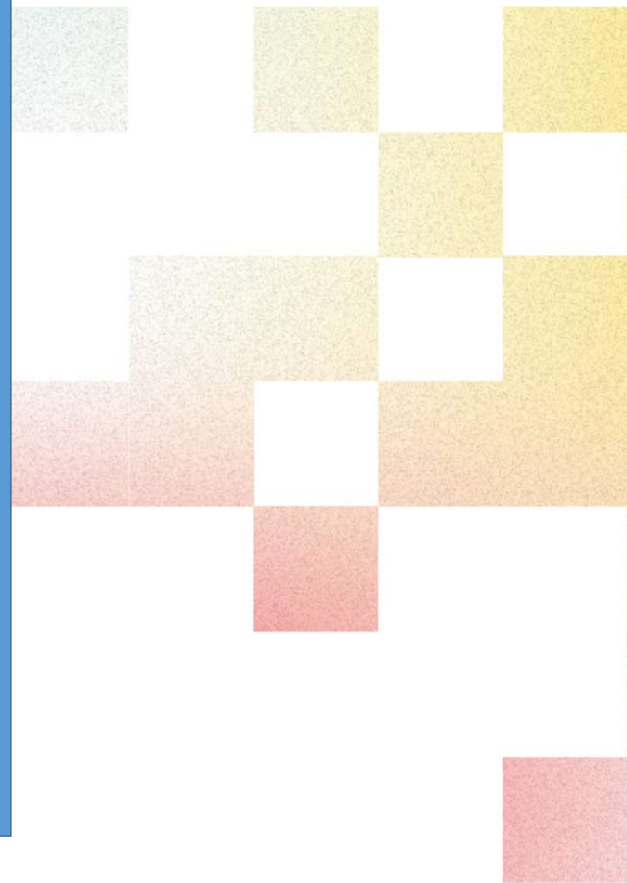
Microsoft			
Customer Service	Planning	Invoicing	Cost Matching
Cross Dock	Fleet Management	Self-Service Portal	Quote 2 Cash
Board Computer	KPI	Info Screens	Track & Trace
In & Outbound Orders	Status (T & T)	Purchase Invoices	Sales Invoices & Payments

In Numbers

75 Interfaces

25 Custom
DotNet DLL
Files

1800+ Objects
added to NAV



Extensions The First Test

- All Core Page Changes as Single-Extension
- Interfacing Operational & Romanian Financials using API & Extensions
- Isolated New Functions as Extensions



Next Step – Business Central

100% Extensions, On Premises with DotNET



General Tips

- Use an excel sheet for object numbers, verify with ForNAV Object Explorer and use the idRange
- Use Date in your versioning
- Deploy using PowerShell to test with the Windows Client
- Turn ON ShowMyCode
- Windows Debugger works just fine



How did we convert?

- Export all objects to Text from C/Side in 2018
- Run the ForNAV Converter
- And Voila, you have an extension with Table Extensions, Page Extensions Etc...



Step 1 After Converting

- Go back to C/Side and fix those old, stupid errors
 - Flowfilters cannot be in repeaters
 - Actions with fields that no longer exist (C/Side does not error)
 - API pages → EntitySet, Delayed Insert must be true
 - Remove Automation Controls
 - Tablerelations with non-existing fields



Example Compiler Differences

```
IF Optional = Optional::Always THEN
```

```
  CASE "No." OF
```

```
    TariffSetup."Marpol Proceed No.":
```

```
      EXIT(NOT Cust."Marpol Surcharge Blocked");
```

```
    TariffSetup."Levy Pro121
```

```
      EXIT(NOT Cust."Levi122
```

```
    TariffSetup."Maut Adj123
```

```
      EXIT((NOT Cust."Mau124
```

```
    TariffSetup."Maut Pro125
```

```
      EXIT(NOT Cust."Maut126
```

```
    TariffSetup."Maut Adj127
```

```
      EXIT(NOT Cust."Maut128
```

```
    TariffSetup."Belgian129
```

```
      EXIT(NOT Cust."Belg130
```

```
    TariffSetup."ADR Proc131
```

```
      EXIT(NOT Cust."ADR132
```

```
  ELSE133
```

```
    EXIT(TRUE);134
```

```
END;135
```

```
136
```

```
137
```

```
138
```

```
139
```

```
if Optional = Optional::Always then
```

```
  case "No." of
```

```
    TariffSetup."Marpol Proceed No.":
```

```
      exit(not Cust."Marpol Surcharge Blocked");
```

```
    TariffSetup."Levy Proceed No.":
```

```
      exit(not Cust."Levi Surcharge Blocked");
```

```
    TariffSetup."Maut Adj. Proceed No.":
```

```
      exit((not Cust."Maut Adj. Surcharge Blocked") and Cust."Maut Surcharge Blocked");
```

```
    TariffSetup."Maut Proceed No.":
```

```
      exit(not Cust."Maut Surcharge Blocked");
```

```
    TariffSetup."Maut Adj. Proceed No.":
```

```
      exit(not Cust."Maut Adj. Surcharge Blocked");
```

```
    TariffSetup."Belgian Toll Proceed No.":
```

```
      exit(not Cust."Belgian Toll Surcharge Blocked");
```

```
    TariffSetup."ADR Proceed No.":
```

```
      exit(not Cust."ADR Surcharge Blocked");
```

```
  else
```

```
    exit(true);
```

```
end;
```

```

478 AgentShipment(VAR Shipment : Record Shipment) : Boolean
479 WITH Shipment DO BEGIN
480     IF "From Address Country Code" = 'NL' THEN
481         567 procedure AgentShipment(var Shipment: Record Shipment): Boolean
482         568 begin
483             569 with Shipment do begin
484                 570 if "From Address Country Code" = 'NL' then
485                     571 exit(false);
486             572
487                 573 if "To Address Country Code" = 'NL' then
488                     574 exit(false);
489             575
490                 576 if "From Address Country Code" <> "To Address Country Code" then
491                     577 exit(false);
492             578
493             579 if ("From Address Depot" = "from address depot"::"1") or ("To Address Depot" = "to address depot"::"1") then begin
494                 580 Shipment.Status := Shipment.Status::Unloaded;
495                 581 Shipment.Modify(true);
496                 582 exit(true);
497             583 end;
498         584
499         585 end;
500
501         586
502         587 exit(false);
503     588 end;
504
505     589

```


Format Address & Dimension Management

- No longer possible to add functions
- Move the functions to the table and call directly into FormatAdd
- Create your own DimensionManagement Codeunit and map

Report 50013 Label.al 10

- ✖ [AL] 'Codeunit "Format Address"' does not contain a definition for 'TMSCompany' [AL0132] (147, 28)
- ✖ [AL] Table '50139' is missing [AL0185] (181, 18)
- ✖ [AL] 'Codeunit "Format Address"' does not contain a definition for 'TrOrdLnFrom' [AL0132] (205, 20)
- ✖ [AL] 'Codeunit "Format Address"' does not contain a definition for 'TrOrdLnTo' [AL0132] (206, 20)
- ✖ [AL] 'Codeunit "Format Address"' does not contain a definition for 'TrOrdLnFrom' [AL0132] (238, 20)
- ✖ [AL] 'Codeunit "Format Address"' does not contain a definition for 'TrOrdLnTo' [AL0132] (239, 20)
- ✖ [AL] 'Codeunit "Format Address"' does not contain a definition for 'TrOrdLnFrom' [AL0132] (295, 20)
- ✖ [AL] 'Codeunit "Format Address"' does not contain a definition for 'TrOrdLnTo' [AL0132] (296, 20)

OnAfterGetCurrRecord

- Form to Page Transformation Tool Issue

```
17 OnNextRecord(Steps : Integer) : Integer
18
19 OnAfterGetRecord()
20 ShowShortcutDimCode(ShortcutDimCode);
21 OnAfterGetCurrRecord;
22
23 OnNewRecord(BelowxRec : Boolean)
24 Type := xRec.Type;
25 CLEAR(ShortcutDimCode);
26 OnAfterGetCurrRecord;
```

```
332
333
334
335
336
337
338
339
340
341
342
343
```

2 references

```
local procedure OnAfterGetCurrRecord()
begin
    xRec := Rec;
    if PurchSetup."Show Totals on Purch. Inv./CM." then
        if ("Document No." <> xRec."Document No.") or
            ("Line No." <> xRec."Line No.")
        then
            MakeTotals;
    end;
}
```

PROBLEMS 589 OUTPUT DEBUG CONSOLE TERMINAL

Filter. Eg: text, **/*.ts,...

Page 50162 Purch. Cr. Regist. Subform.al 2


[AL] 'Codeunit' does not contain a definition for 'Codeunit75' [AL0132] (198, 32)

[AL] Member name 'OnAfterGetCurrRecord' is only allowed on triggers. This warning will become an... [AL0299] (3

Table Extensions – Local Variables

```
5 references
395 procedure GetProceed()
396 var
397     Proc: Record Proceed;
398     ProcCostElem: Record "Proceed & Cost Element";
399     TrOrdLn: Record "Transport Order Line";
400     Trip: Record Trip;
401     UserSetup: Record "User Setup";
402     TripNoBlankErr: Label 'Trip No. must be populated in order %1 %2.';
403     InvoiceExceptionIsNotAcceptedErr: Label 'Invoice Exception is not accepted in
404 begin
405     if not Proc.Get("Proceed No.") then
406         exit;
407
408     ProcCostElem.Get(Proc."Proceed No.");
409
410     GetHeader;
411     "Bill-to Customer No." := SalesHeader."Bill-to Customer No.";
412     "Currency Code" := SalesHeader."Currency Code";
413
414     Validate("No.", Proc."Proceed No.");
415
```

PROBLEMS 199 OUTPUT DEBUG CONSOLE TERMINAL

Filter. Eg: text, **/*.ts, !*... 



TableExtension 37 Sales Line.al 11

✖ [AL] 'SalesHeader' is inaccessible due to its protection level [AL0161] (411, 35)

✖ [AL] 'SalesHeader' is inaccessible due to its protection level [AL0161] (412, 28)

Enums, Type in Sales/Purchase Line

- We used to have Proceed & Cost added to Sales & Purchase
- They acted as Service Items
- Added 20 years ago
- Replaced now by Service Items
- We still create our own Ledger Entries
- Could possibly be an Enum once Microsoft is finished



ACTIONS
> Trip Scanning Check > Planview Shipments

Insights

Operationeel
ORDER ENTRY

EDICODES
0
>

MASTER ORDERS
0
>

TRANSPORT O... TODAY
0
>

EDI STATUS EXCEPTIONS
0
>

EDIERRORS
0
>

Verkoop
CALCULATIONS

NEW
0
>

ACCEPTED
0
>

SENT
0
>

BOOKED
0
>

REJECTED
0
>

Key Performance Indicators
Error: The KPI Analysis table is empty..

KPI List		
PRIMARY KEY	FILTER CODE 1	OMSCHRIJVING
COUNTER	:	Balie Performance

IT WORKS!

PLANNING

NO. OF SHIPME... TODAY
0
>

NO. OF TRIPS TODAY
0
>

NO. OF TRIPS TOMORROW
0
>

NO. OF PRINT ERRORS
0
>

CONTRACTS

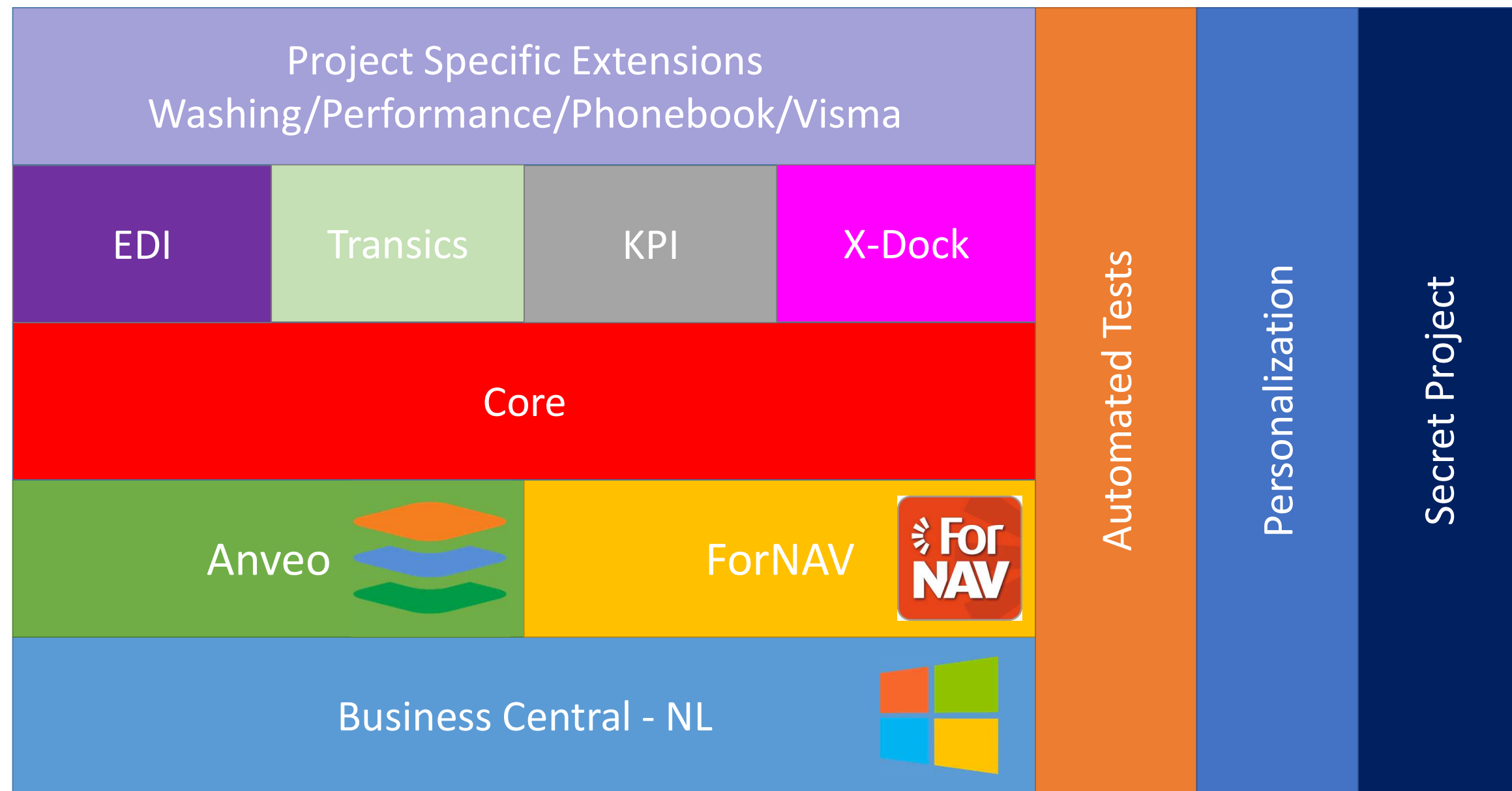
QUOTES
0
>

CONTRACT PE... APPROVAL
0
>

ACTIVE
0
>

CONTRACTS ARCHIVED
0
>

Breaking Up your Extension



Key Takeaways

- Stay Away from the base code. Period.
- Start Clean Up in C/Side, Try to Delete Objects and see what happens
- Take incremental steps, but real ones, not baby steps
- It's fun!

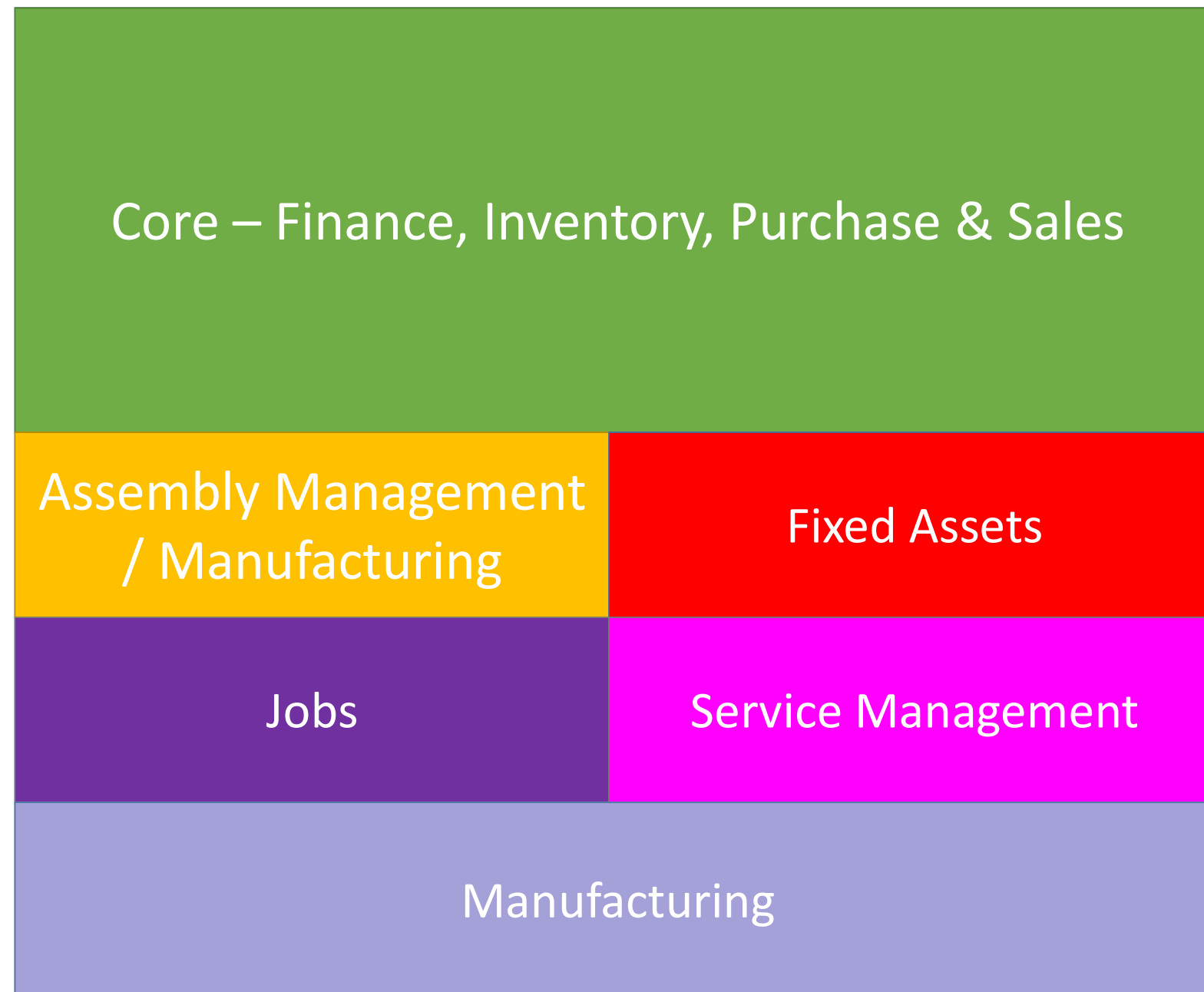




Inventory
Manufacturing
Item Tracking
Service Management
Jobs



Microsoft



Let's Delete Fixed Assets

Object Designer

Table

Page

Report

Codeunit

Query

XMLport

MenuSuite

All

Type	ID	Name	Modified	Version List	De
	5540	Timeline Event		NAVW113.00	
	5541	Timeline Event Change		NAVW113.00	
	5600	Fixed Asset		NAVW113.00	
	5601	FA Ledger Entry		NAVW113.00	
	5603	FA Setup		NAVW111.00	
	5604	FA Posting Type Setup		NAVW16.00	
	5605	FA Journal Setup		NAVW113.00	
	5606	FA Posting Group		NAVW113.00	
	5607	FA Class		NAVW17.00	
	5608	FA Subclass		NAVW111.00	
	5609	FA Location		NAVW17.00	
	5611	Depredation Book		NAVW111.00	
	5612	FA Depredation Book		NAVW111.00	
	5615	FA Allocation			
	5616	Maintenance Registration			
	5617	FA Register			
	5619	FA Journal Template			
	5620	FA Journal Batch			
	5621	FA Journal Line			
	5622	FA Redass. Journal Template			
	5623	FA Redass. Journal Batch			
	5624	FA Redass. Journal Line			
	5625	Maintenance Ledger Entry			
	5626	Maintenance			
	5628	Insurance			
	5629	Ins. Coverage Ledger Entry			
	5630	Insurance Type			
	5633	Insurance Journal Template			
	5634	Insurance Journal Batch			
	5635	Insurance Journal Line			
	5636	Insurance Register			
	5637	FA G/L Posting Buffer			
	5640	Main Asset Component			
	5641	FA Buffer Projection			
	5642	Depredation Table Header			

Delete

Do you want to delete the selected lines?

Synchronize Schema... Force

Changes will be synchronized to the data without validation. Data in table columns affected by the changes will be deleted.

OK Cancel

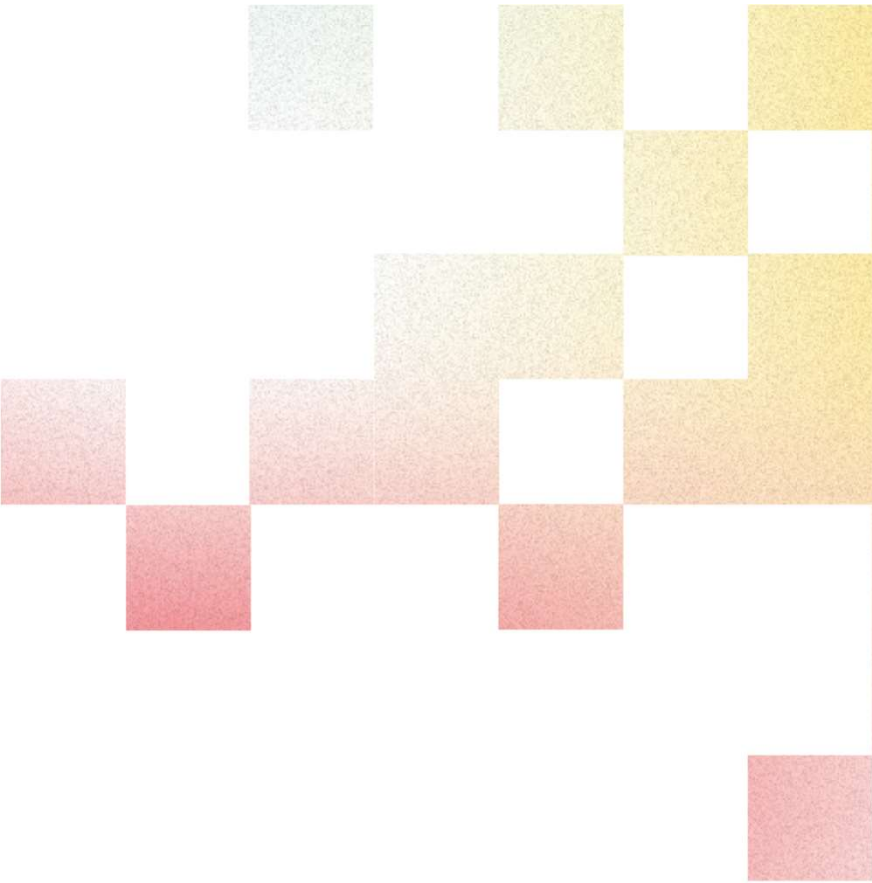
Codeunit 80 Sales-Post - C/AL Editor

```
1 Documentation()
2
3 OnRun(VAR Rec : Record "Sales Header")
4 OnBeforePostSalesDoc(Rec, SuppressCommit, PreviewMode);
5
6 ValidatePostingAndDocumentDate(Rec);
7
8 SavedPreviewMode := PreviewMode;
9 SavedSuppressCommit := SuppressCommit;
10 ClearAllVariables();
11 SuppressCommit := SavedSuppressCommit;
12 PreviewMode := SavedPreviewMode;
13
14 GetGLSetup;
15 GetCurrency("Currency");
16
17 SalesSetup.GET;
18 SalesHeader := Rec;
19 FillTempLines(SalesHeader, TempSalesLineGlobal);
20 TempServiceItem2.DELETEALL;
```

Microsoft Dynamics NAV Development Environment

TableData 5600 does not exist.

OK





Object Designer

Type	ID	Name	Modified	Version List	Date	Time
Table	1001	Job Task Lines Subform		NAVW113.00	19-09-18	12:00:00
Page	1002	Job Task Lines		NAVW113.00	19-09-18	12:00:00
Report	1003	Job Task Card		NAVW113.00	19-09-18	12:00:00
Codeunit	1004	Job Task List		NAVW113.00	19-09-18	12:00:00
Query	1005	Job Task Dimensions		NAVW113.00	19-09-18	12:00:00
XMLport	1006	Job Task Dimensions Multiple		NAVW113.00	19-09-18	12:00:00
MenuSuite	1007	Job Planning Lines		NAVW113.00	19-09-18	12:00:00
All	1008	Job WIP Entries		NAVW113.00	19-09-18	12:00:00
Table Extension	1009	Job WIP G/L Entries		NAVW113.00	19-09-18	12:00:00
Page Extension	1010	Job WIP Methods		NAVW113.00	19-09-18	12:00:00
	1011	Job Resource Prices		NAVW113.00	19-09-18	12:00:00
	1012	Job Item Prices		NAVW113.00	19-09-18	12:00:00
	1013	Job G/L Account Prices		NAVW113.00	19-09-18	12:00:00
	1014	Job Transfer Job Planning Line		NAVW111.00	22-11-17	12:00:00
	1020	Job G/L Journal		NAVW113.00	19-09-18	12:00:00
	1024	Job Task Statistics		NAVW113.00	19-09-18	12:00:00
	1025	Job Statistics		NAVW113.00	19-09-18	12:00:00
	1026	Job WIP Warnings		NAVW111.00	22-11-17	12:00:00
	1027	Job WIP Cockpit		NAVW113.00	19-09-18	12:00:00
	1028	Job WIP Totals		NAVW110.0	25-10-16	12:00:00
	1029	Job Invoices		NAVW111.00	22-11-17	12:00:00
	1030	Job Cost Factbox		NAVW113.00	19-09-18	12:00:00
	1032	Available - Job Planning Lines		NAVW113.01	13-11-18	12:00:00
	1040	Copy Job		NAVW113.00	19-09-18	12:00:00
	1041	Copy Job Tasks		NAVW113.00	19-09-18	12:00:00
	1042	Copy Job Planning Lines		NAVW111.00	22-11-17	12:00:00
	1050	Additional Fee Setup		NAVW113.00	19-09-18	12:00:00
	1051	Additional Fee Chart		NAVW113.00	19-09-18	12:00:00
	1052	Reminder Terms Translation		NAVW113.00	19-09-18	12:00:00
	1060	Payment Services		NAVW113.00	19-09-18	12:00:00
	1061	Select Payment Service		NAVW110.0	25-10-16	12:00:00
	1062	Select Payment Service Type		NAVW110.0	25-10-16	12:00:00
	1100	Chart of Cost Types		NAVW113.00	19-09-18	12:00:00

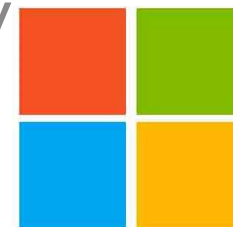
New Design Run Help

WHAT IF...



mibuso.com

solved by



Microsoft

Any Questions?

Thank
THANK YOU
you