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Agenda

Why to move to the Cloud?

When is the right moment for an upgrade?

Upgrade process	BC up to version 14.0 and NAV versions
	BC from version 14.0

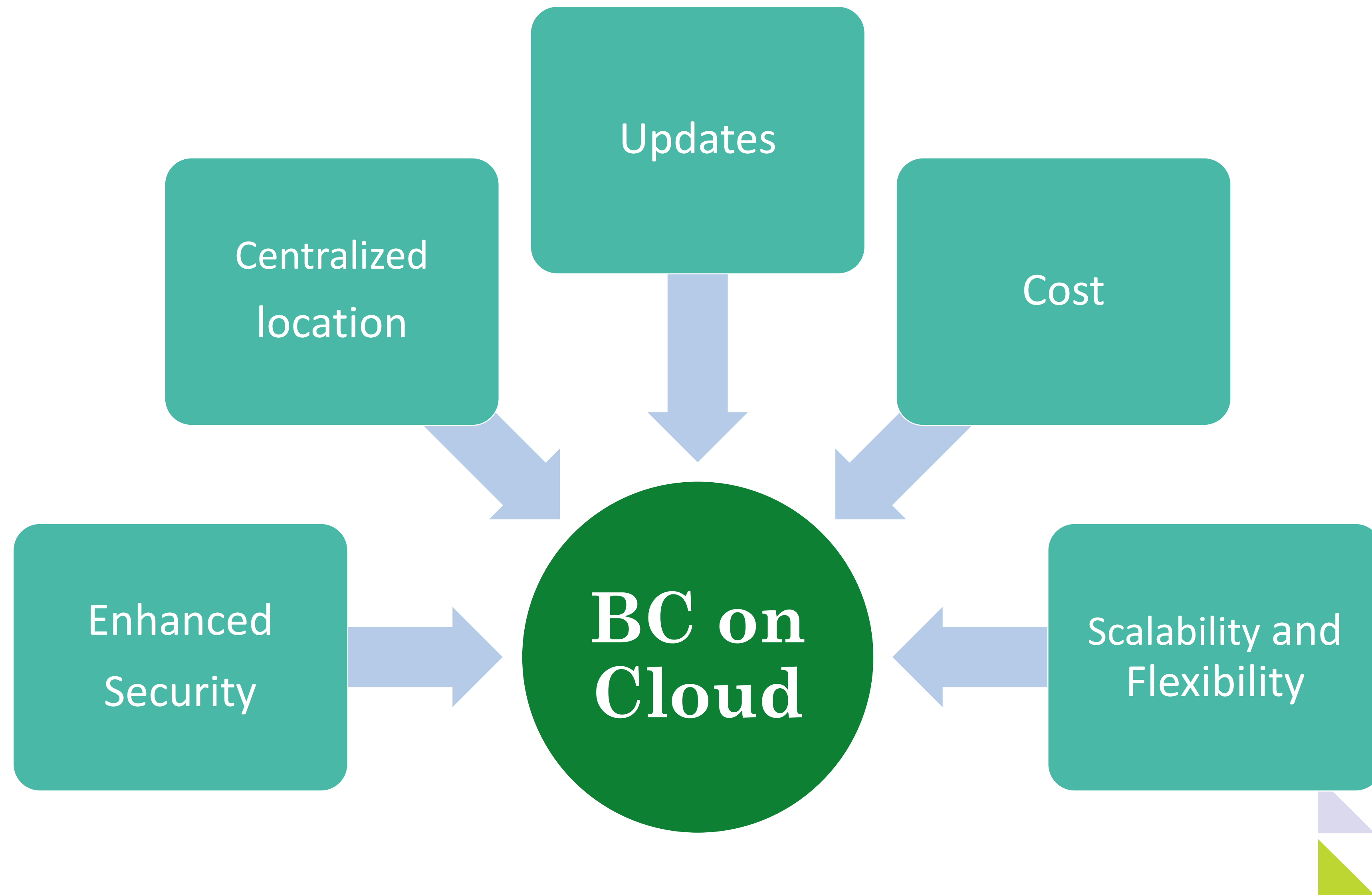
Data migration Challenges and best practices

Customizations, Extensions, and Code-related challenges

Case Studies and Lessons Learned

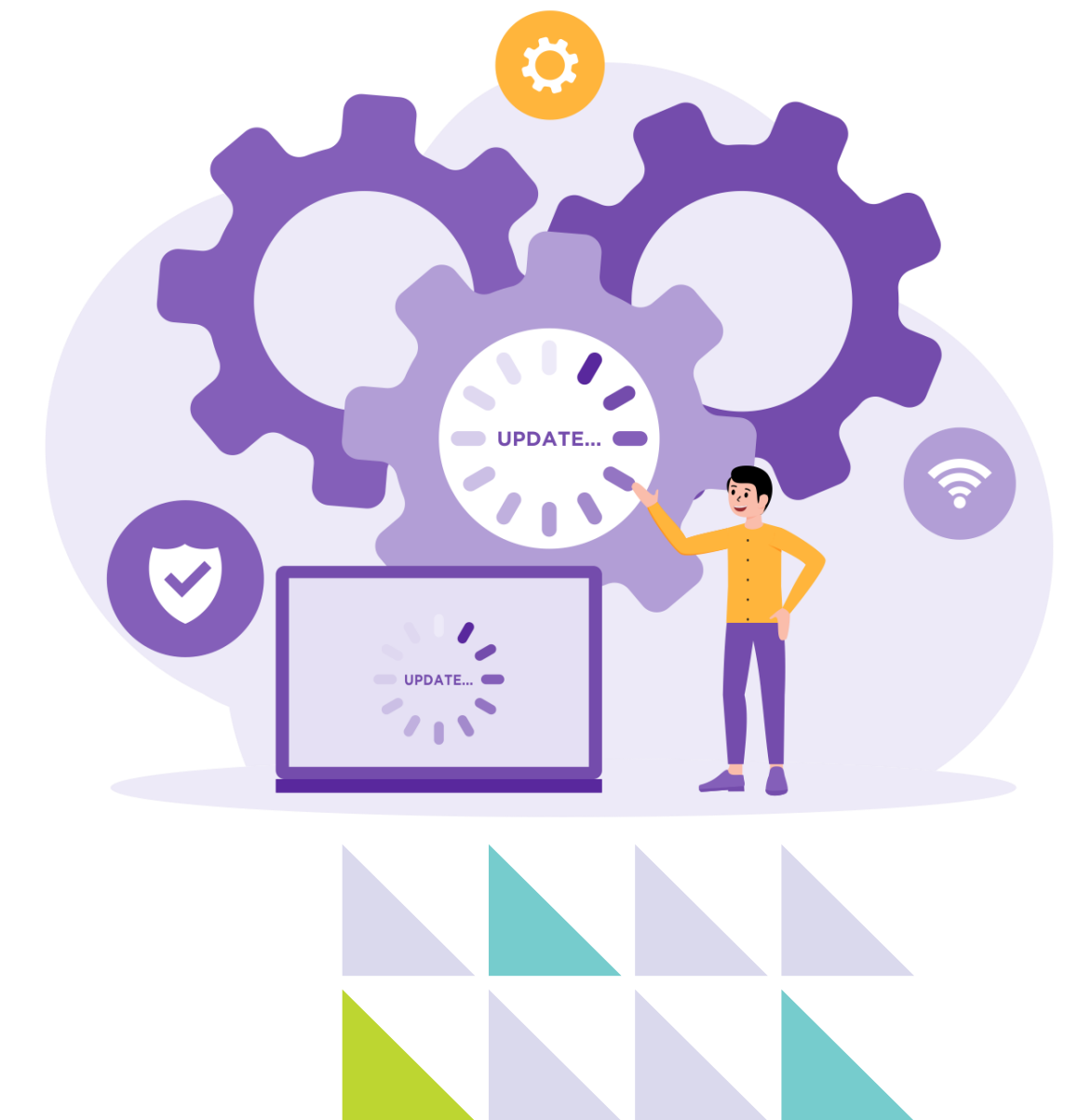


Why to move to the Cloud?



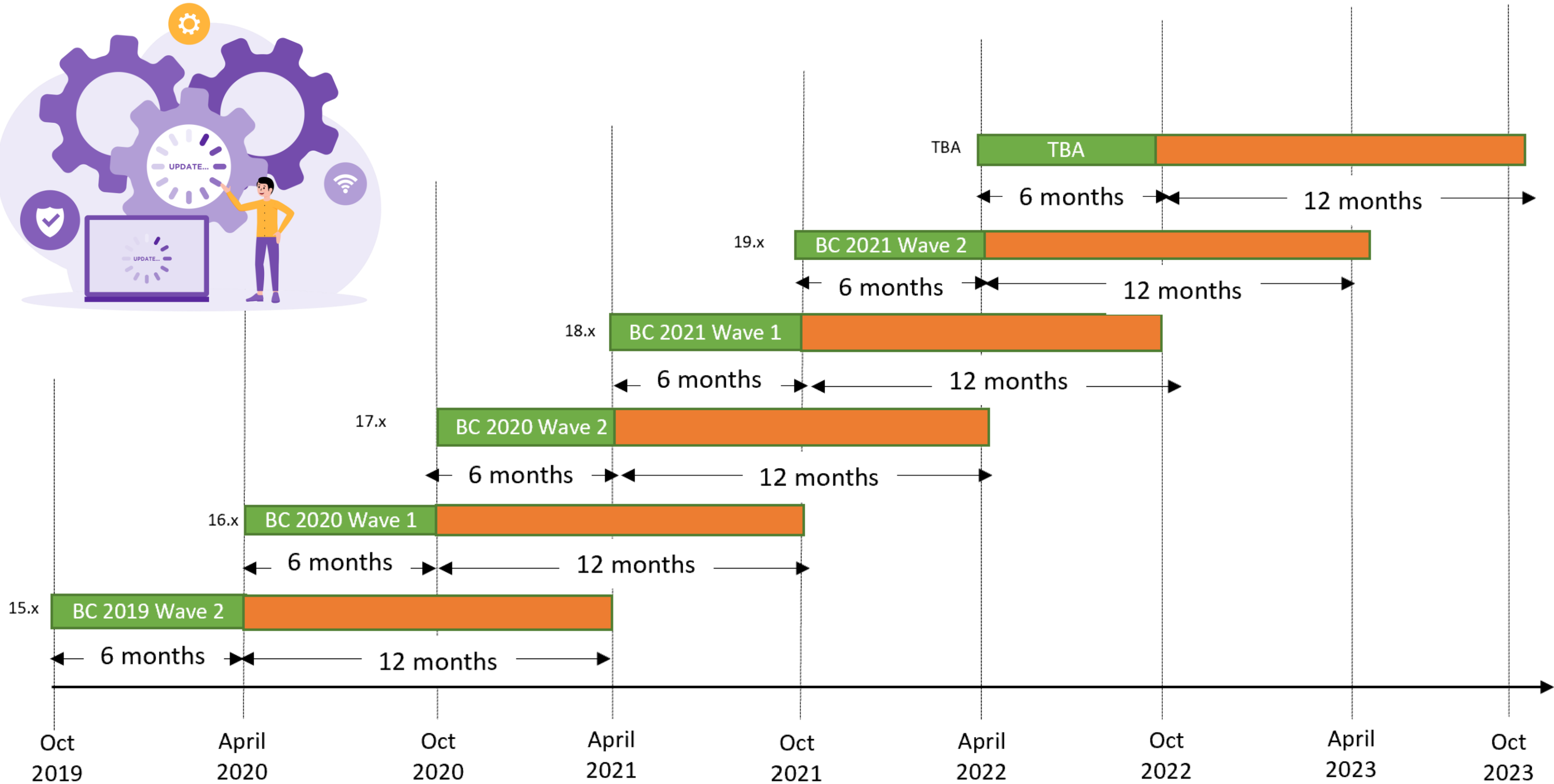
When is the right moment for an upgrade?

- Is the version of your solution still supported by Microsoft?



When is the right moment for an upgrade?

Modern Lifecycle Policy



Modern Lifecycle Policy Legend

- ← 6 months → 6 months incidates features/bugs/regulatory fixes released for this cycle
- ← 12 months → 12 months incidates bugs/regulatory fixes released for this cycle

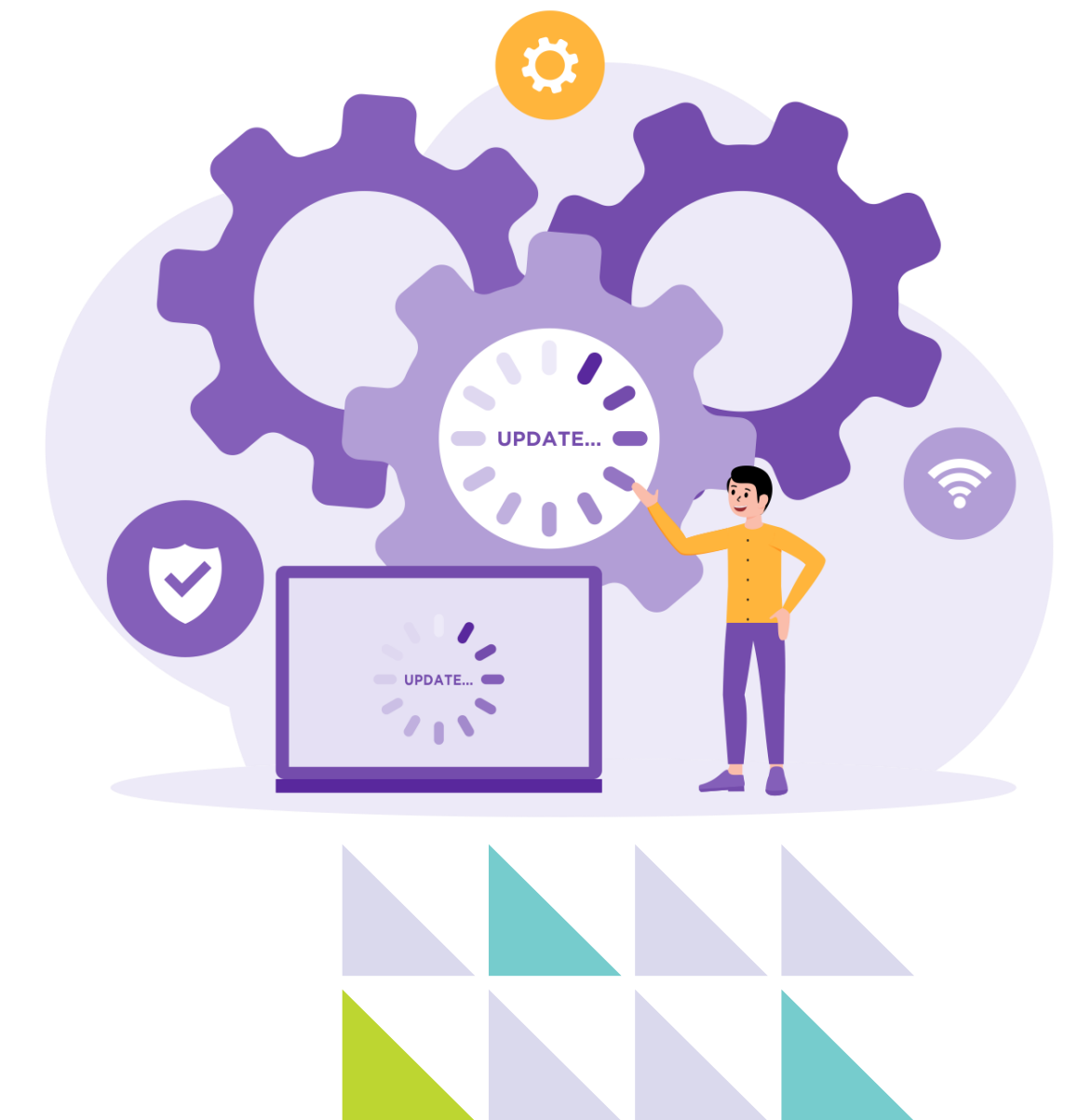
Source: Microsoft Docs

Version	Start Date	End Date
2023 release wave 1, version 22.x	Apr 3, 2023	Oct 13, 2024
2022 release wave 2, version 21.x	Oct 3, 2022	Apr 14, 2024
2022 release wave 1, version 20.x	Apr 1, 2022	Oct 10, 2023
2021 release wave 2, version 19.x	Oct 1, 2021	Apr 12, 2023
2021 release wave 1, version 18.x	Apr 1, 2021	Oct 11, 2022
2020 release wave 2, version 17.x	Oct 1, 2020	Apr 12, 2022
2020 release wave 1, version 16.x	Apr 1, 2020	Oct 12, 2021
2019 release wave 2, version 15.x	Oct 1, 2019	Apr 13, 2021

Fixed Lifecycle Policy
Dynamics 365 Business Central (on-premises) 14.x
October 10, 2023 (Mainstream support)
Final date: October 14, 2025

When is the right moment for an upgrade?

- Is the version of your solution still supported by Microsoft?
- Do you have a demand for new features?
- Is your solution lightly or heavily customized?



Solutions that can be moved right NOW

NO
CUSTOMIZATIONS



OBSOLETE
CUSTOMIZATIONS



LIGHT
CUSTOMIZATIONS



Customizations Complexity

Light

- **Additive** changes in standard objects:
 - Additional Fields
 - Additional Page Actions
 - Additional New Functions
- Custom new objects
- Customizations using Events
- Solutions that are easy to implement are:
 - SaaS compatible
 - Web Client compatible
 - Standard event publishers available

Heavy

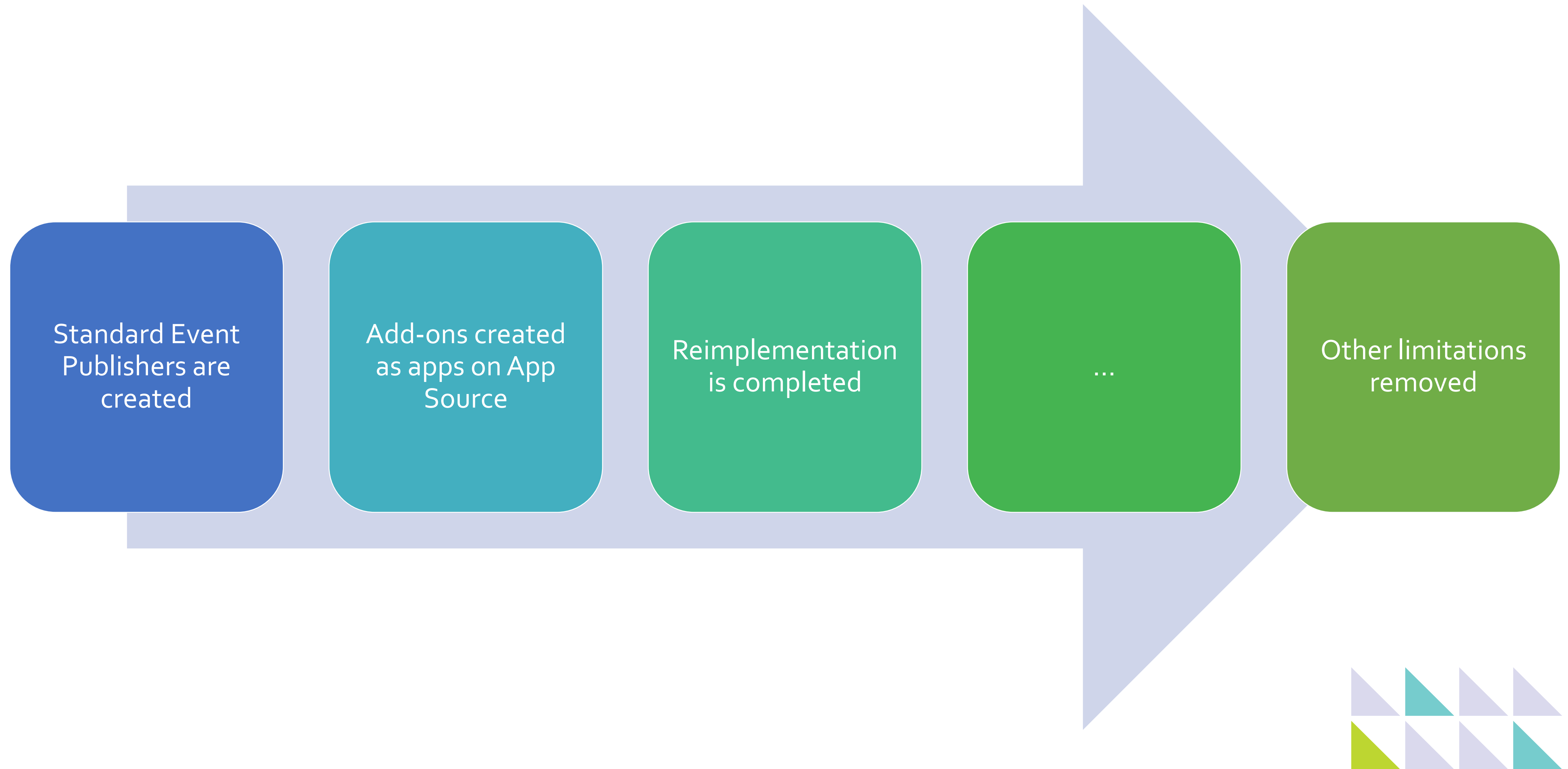
- **Destructive** changes in standard objects:
 - Removed/changed fields
 - Changed primary key
 - Removed/replaced code parts
- Lot of customizations on complicated standard functionalities (posting routines, reservation, etc.)
- Customizations on obsolete old functionality (Jobs, Prices, Product Groups, Approvals etc.)
- Or when some other complex reimplementation is needed



Solutions that can be moved LATER?



When to move from BC On-Prem to BC SaaS



Is Add-on already on AppSource?

- 3881 apps

Dynamics 365 Business Central

Connect your financials, sales, service, and operations with an all-in-one business management solution. Easily tailor and extend the application to meet your business or industry-specific needs.


[Get Dynamics 365 Business Central >](#)

Apps results

Showing 3881 results in apps. [View 640 related results in consulting services](#) or [22 related results in industry clouds](#).

Business Central x Dynamics 365 x

All results



Use Dynamics

Abakion


Business Central

Easy Access to hundreds of free video user guides for Microsoft Dynamics 365 Business Central

★ 4.9 (60 ratings)

Free

[Get it now](#)



B2B Ecommerce - Webshop & PIM in one


Abakion

Business Central

Launch a B2B ecommerce webshop in no time. Manage PIM data and e-commerce from Business Central.

★ 4.9 (44 ratings)

[Free trial](#)



Master Data Information


Abakion

Business Central

The simple way to create custom fields and do master data management and PIM without customization

★ 4.9 (50 ratings)

[Free trial](#)



Data Access - API data integration


Abakion

Business Central

Managed API integration for Business Central - to connect Power BI or any third-party solution

★ 5.0 (1 ratings)

[Free trial](#)



Intercompany


Abakion

Business Central

Easy, automated and feature-rich intercompany - with instant execution of transactions.

★ 4.9 (34 ratings)

[Free trial](#)



Graphical Inventory Profile

Abakion


Business Central

Predict and prevent supply issues with a graphical overview of demand and supply.

★ 4.9 (36 ratings)

Free

[Get it now](#)



Excel Importer


Theta Systems Limited

Business Central

Import any Excel spreadsheet quickly into Microsoft Dynamics 365 Business Central

★ 5.0 (3 ratings)

[Free trial](#)



Continia Document Capture


Continia Software

Business Central

Reduce your manual tasks, avoid errors & save time – automate your entire Accounts Payable

★ 4.8 (39 ratings)

[Free trial](#)



Jet Reports for Business Central

Jet Global Data Technologies


Business Central

Advanced Operational and Financial Reporting Inside of Excel.

★ 3.8 (24 ratings)

Free

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Simple Object Designer


Hougaard

Business Central

The easiest way to create customizations without writing a single line of code

★ 4.9 (19 ratings)

[Free trial](#)



Navigate Pro


Info Studi

Business Central

Navigate your documents in a "more than fast, more than cool" way!

★ 5.0 (3 ratings)

[Free trial](#)



Shopify Connector

Microsoft

Business Central

Synchronize order, stock, and customer information.

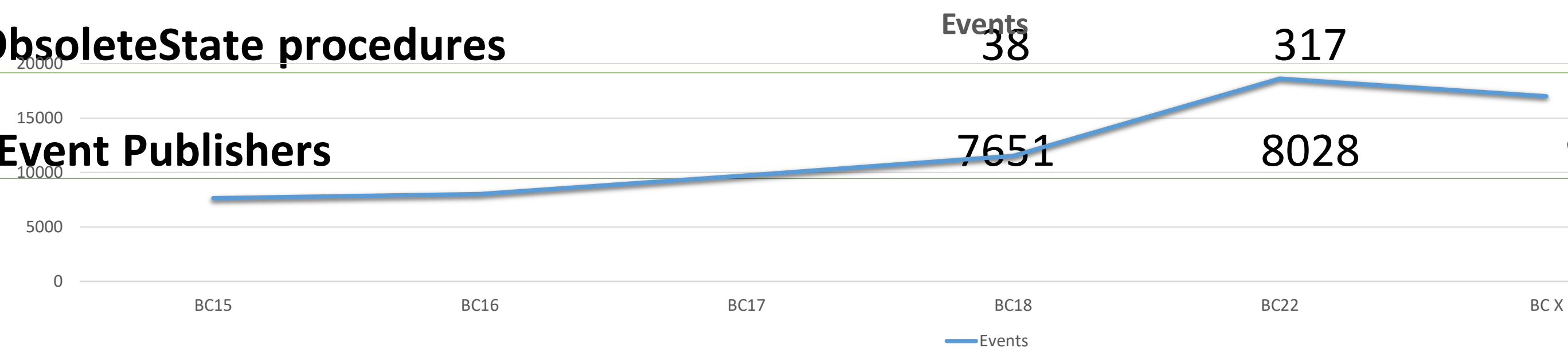
★ 5.0 (1 ratings)

Free

[Get it now](#)

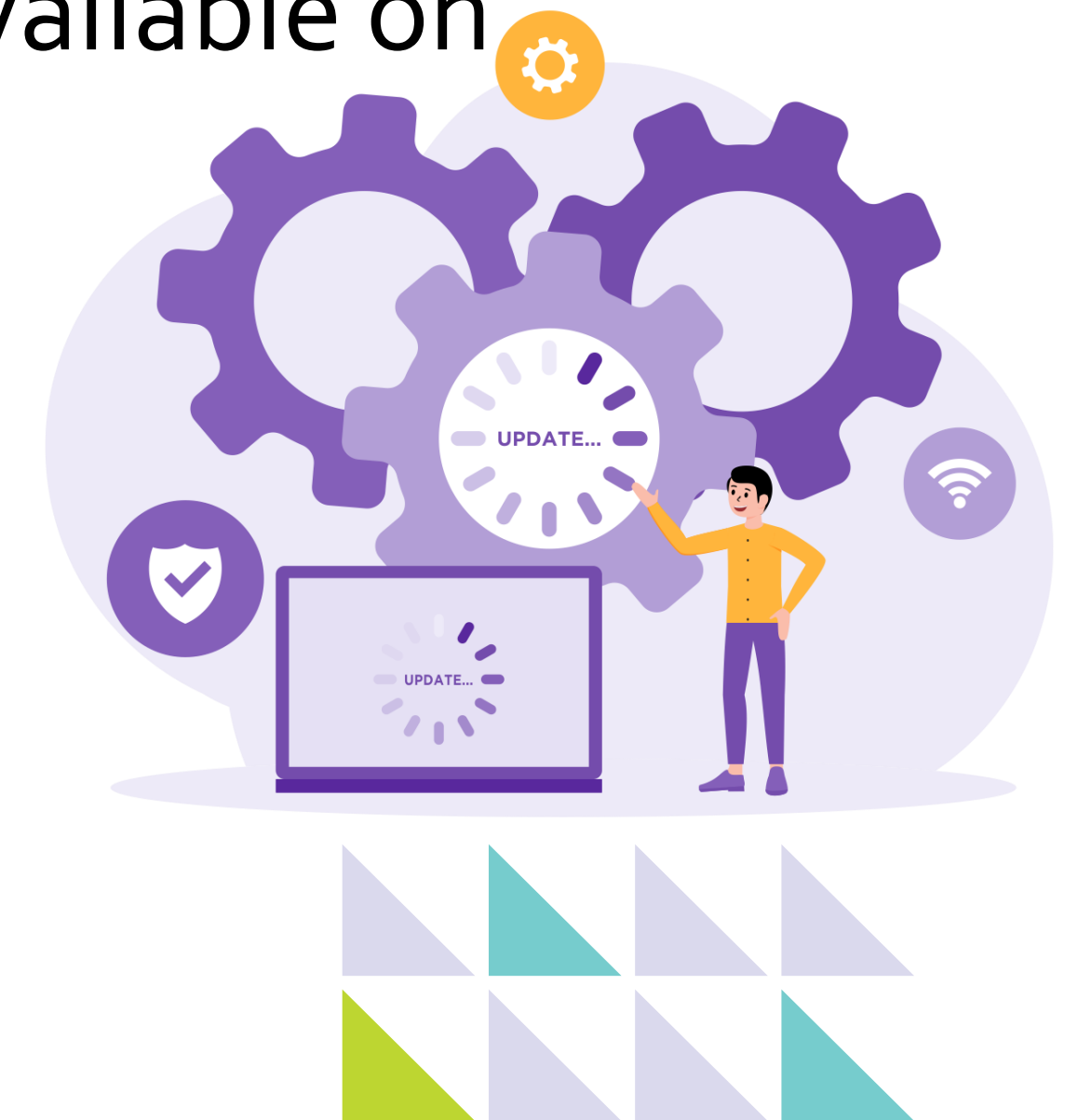
Changes among versions

Changes among versions	BC 15	BC 16	BC 17	BC 18	BC 22
Enum objects	1	129	231	287	457
Remaining Option fields	2308	1955	1713	1621	1105
Interface objects	-	5	5	5	12
Pending ObsoleteState Objects	24	95	206	500	445
Removed ObsoleteState Objects	26	27	27	118	156
Pending ObsoleteState procedures	38	317	624	788	1099
Standard Event Publishers	7651	8028	9746	11538	18630



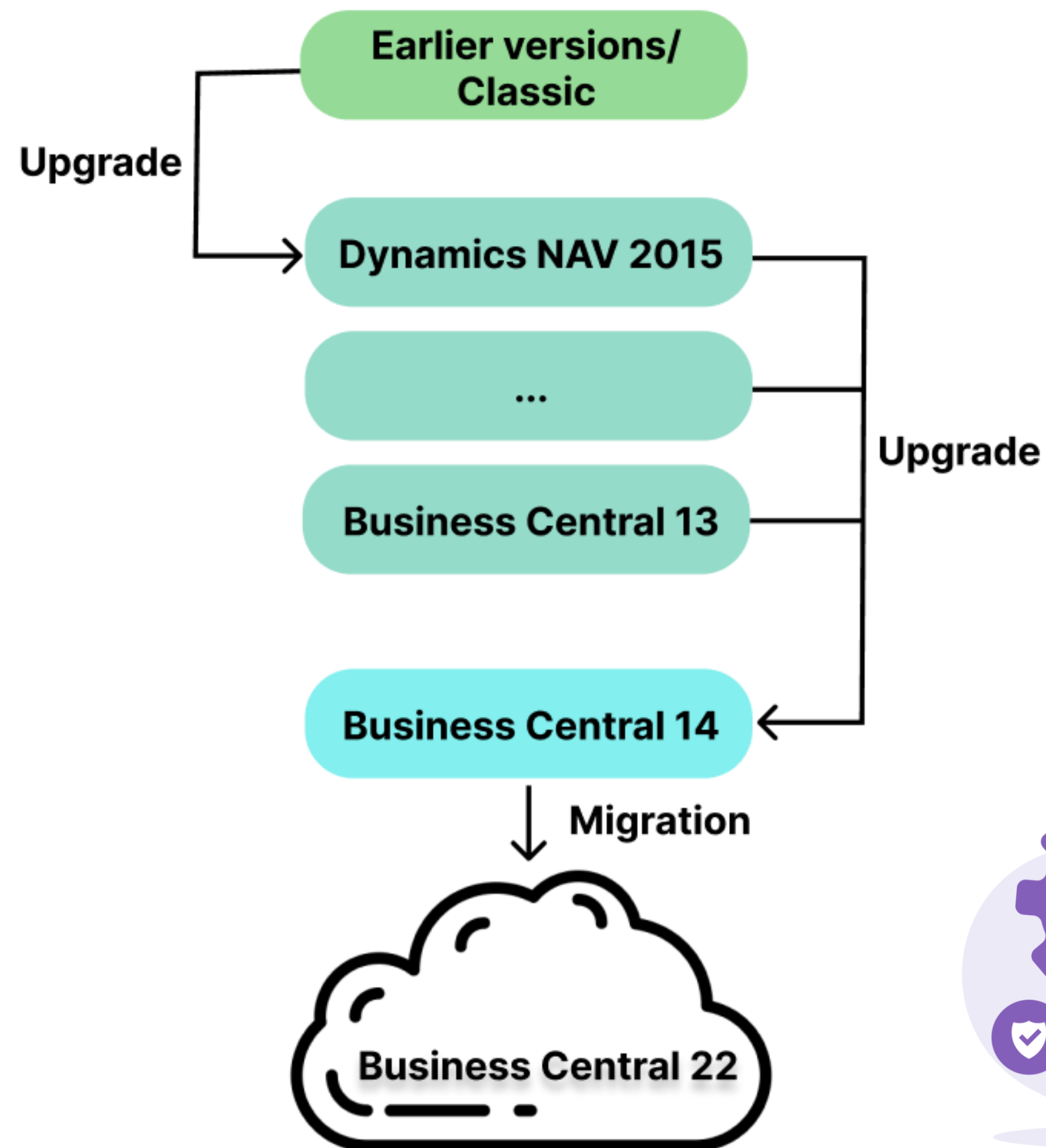
When is the right moment for an upgrade?

- Is the version of your solution still supported by Microsoft?
- Do you have a demand for new features?
- Is your solution lightly or heavily customized?
- Do you have a small or large (80+ GB) database? And do you want to keep all your historical data?
- Do you want to keep your customizations and business processes?
- Are all the Add-ons that you use and want to keep in the future available on AppSource?
- Are you ready to live with 'Web Client' only?

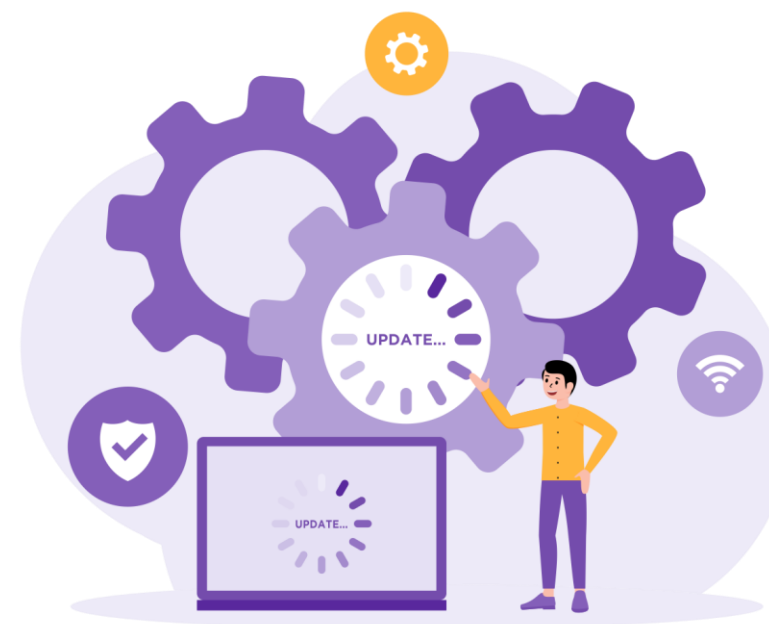
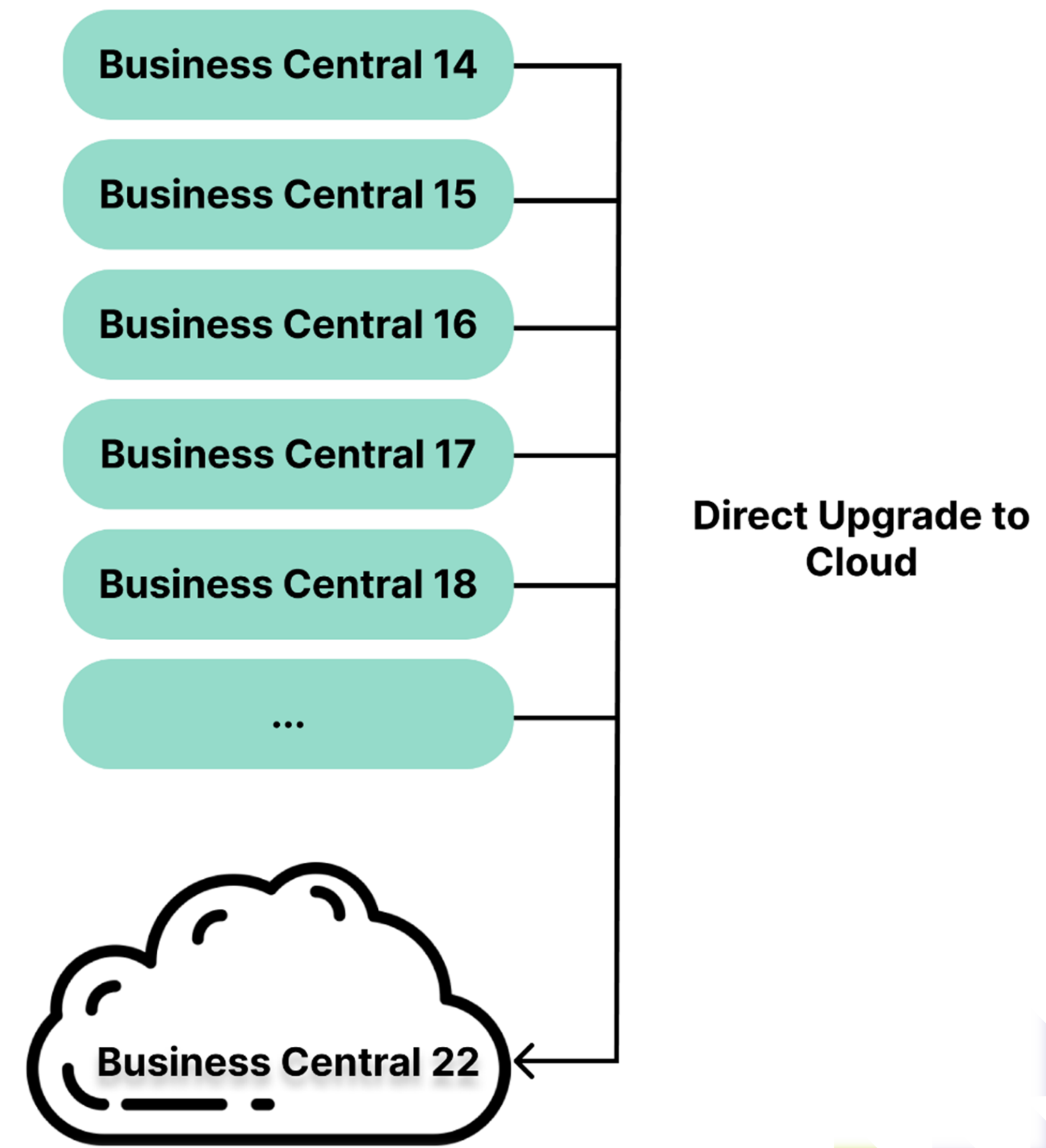


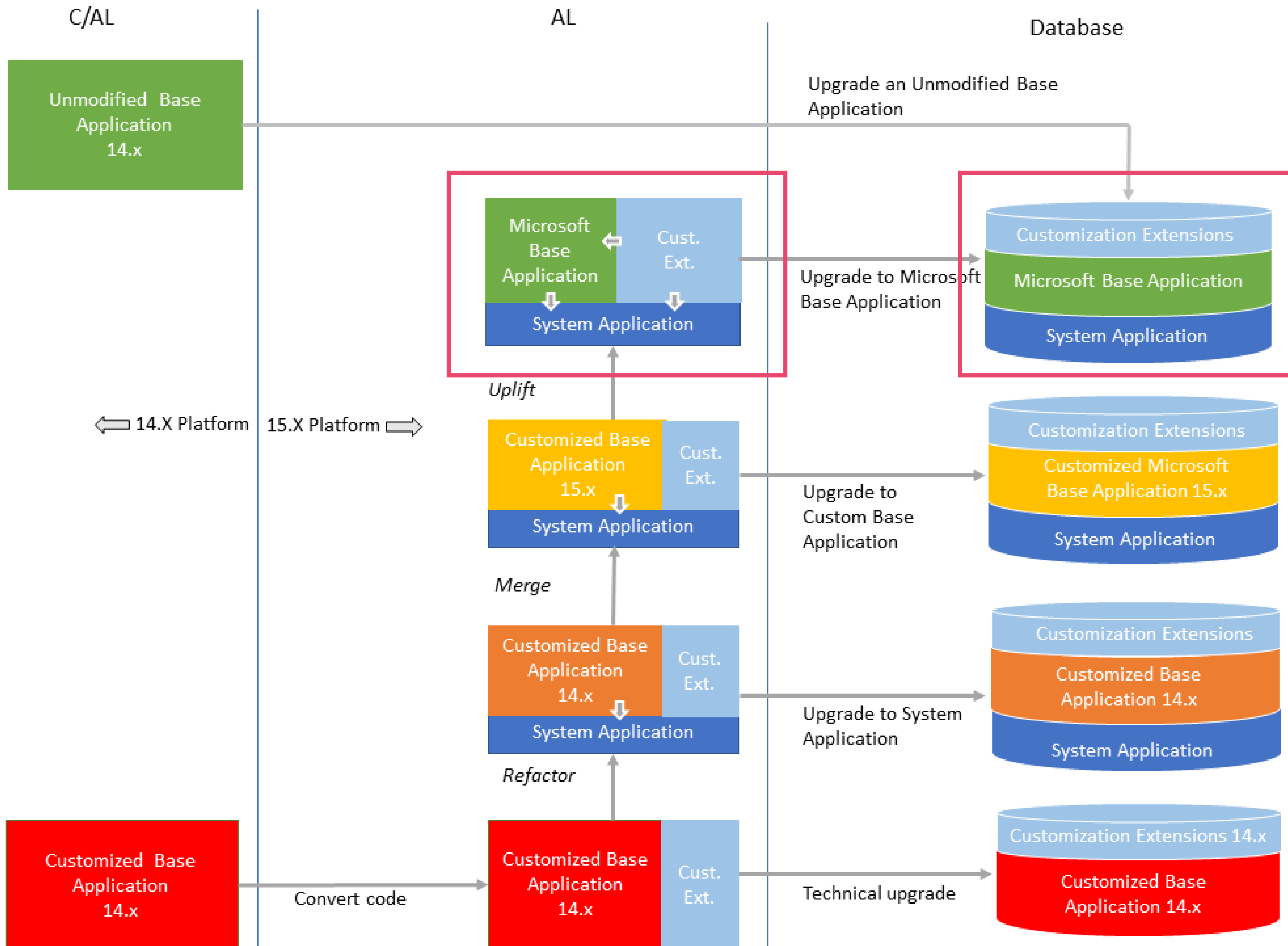
Upgrade process

From Classic, NAV and up to BC14 to Cloud

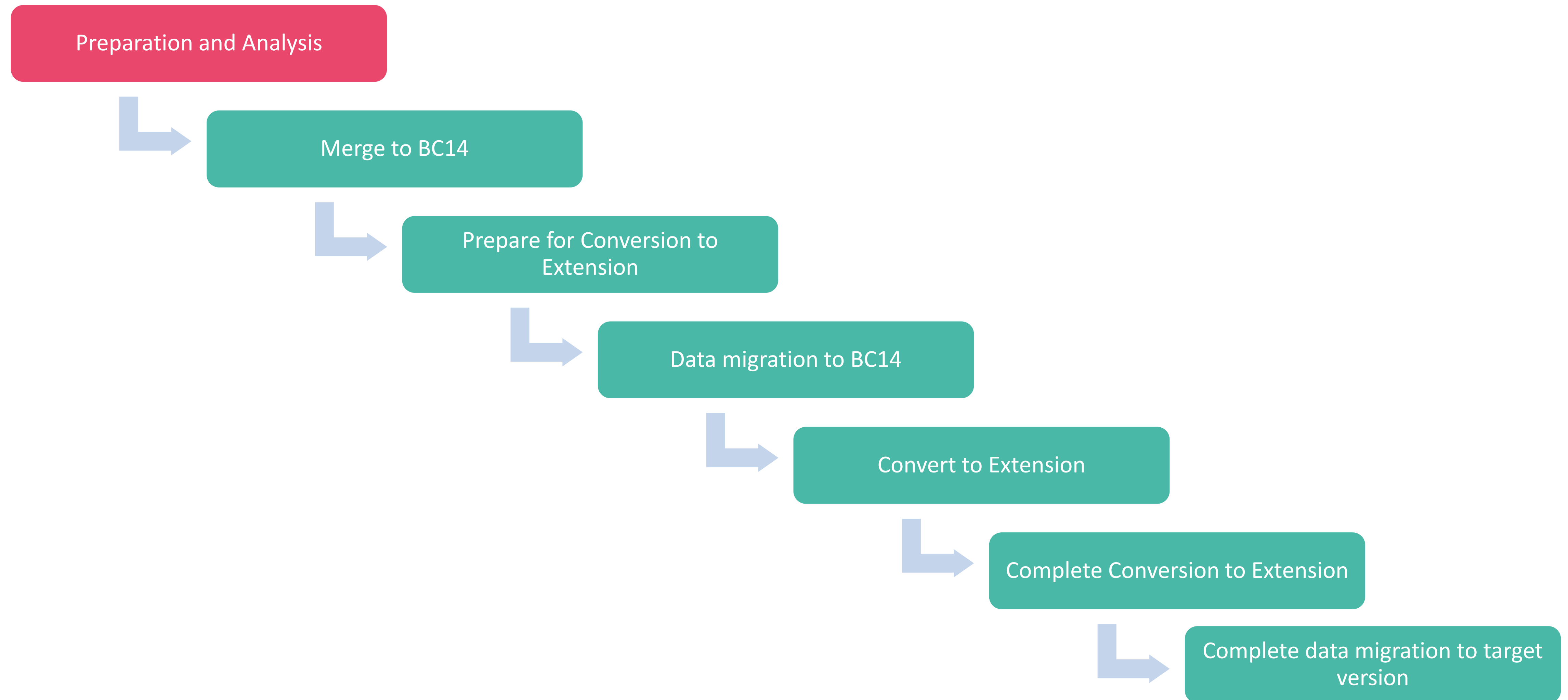


From BC14 to Cloud





Upgrade process



Upgrade process

Analysis of the issues in the project:

- Automations
- Codeunit/XMLPort not searchable in Web Client
- Custom code in standard object
- Direct access to server resources
- Field needs to be extended for Target
- Obsolete properties (TestTableRelation, ValidateTableRelation...)



Upgrade process

Analysis of the issues in the project:

- Modification of Dataset and Layout of standard reports
 - Report substitution or Report Extension?
- Only stream file operations should be used on SaaS
- Changed parameters in standard functions
- Standard fields cannot be part of custom keys in Table Extension
- Standard internal functions cannot be used in extensions for SaaS
- Some Table Relation changes are not allowed in Table Extension
- DotNET variables
- ...



Upgrade process



Preparation phase:

- Database cleanup and decide what to migrate
- Database backup
- License for old database
- Object range, PTE or AppSource?
- Solution affix, PTE or AppSource?

Addons?

- What is the plan with those Addons?
- Get Base version of Addon
- Get Target PTE version of Addon or if existing on AppSource
- Data migration tools?



Code upgrade steps

Code upgrade to BC140 (Standard objects).

Filling missing ENU caption properties.

Renaming custom objects and fields by adding prefix. Keep in mind that maximum is 30 characters.

Setting UsageCategory, AccessByPermissions, and ApplicationArea properties to match MenuSuite properties by using Microsoft Tool “**Transition MenuSuite Objects for Search**”.

Field expansion based on standard field length changes.

Code upgrade steps

Converting C/AL code of solution to AL language using Txt2AL Microsoft tool.

Moving code customizations to extension by subscribing to standard or custom event publishers or adding them to extension objects (table extension, page extension, report extension, etc.).

Fixing compilation errors and unsupported features

Updating translation .xliff files.

What requires reimplementation usually?


- Web Client limitations
- **Automations** and .NET variables
- Integrations
- **File system limitations**
- Other technological constraints:
 - Access to system tables
 - **Modification of standard keys**, variables, and table relations
 - Standard fields cannot be used in custom keys
 - Some standard object properties are not supported
 - Some UI features not supported by Web Client



UCI (Universal Code Initiative)

- Microsoft's cloud-first strategy
- Only extension, no base app modification!

Universal Code initiative - Timeline summary

 <p>From Q4 CY22 onwards,</p> <ul style="list-style-type: none"> ▪ Technical enforcement will be introduced in Business Central where only "Universal code" is allowed as additional code in customer environments. ▪ Non-universal code modules can be licensed to allow "non-Universal code" in customer environments. 		
April 1 st , 2022	Q4 CY22	Jan 1 st 2023...
<ul style="list-style-type: none"> • Customers licensed on Business Central on-premises before this date <u>will not be impacted</u> with non-universal code fees • Customers licensed on Business Central on-premises after this date <u>will be impacted</u> by non-universal code fees from Q1 CY23 	<ul style="list-style-type: none"> • Technical enforcement will be introduced to all supported Business Central platform versions • Non-universal code modules will be required when non-universal code is licensed by impacted customers • Non-universal code modules are exempt from fees in 2022 	<ul style="list-style-type: none"> • Non-universal code fees will be charged when non-universal code is licensed by impacted customers



UCI (Universal Code Initiative)

- Only extension
- No base app modification!
- Target: Cloud

Typical issues:

- File operations
- DotNet's
- Print operations
- Direct access to SQL
- Missing event for the reimplementing of customization
- ...



UCI (Universal Code Initiative)

Recurring fee(s) Timeline	Implemented code is not in extensions	Implemented code is not cloud-optimized
2023	75\$	0\$
2024	125\$	75\$
2025	250\$	175\$
2026 onwards	TBD	TBD



UCI (Universal Code Initiative)

Configuration and Development

<input type="checkbox"/> Dyn365 Business Central Codeunits (100)	109110086	
<input type="checkbox"/> Dyn365 Business Central Pages (100)	109110105	
<input type="checkbox"/> Dyn365 Business Central Queries (100)	109110113	
<input type="checkbox"/> Dyn365 Business Central Reports (100)	109110115	
<input type="checkbox"/> Dyn365 Business Central Tables (10)	109110124	
<input type="checkbox"/> Dyn365 Business Central XML Ports (100)	109110134	
<input checked="" type="checkbox"/> Implemented code is not cloud-optimized	109110138	<input type="text" value="1"/> *
		Minimum
<input checked="" type="checkbox"/> Implemented code is not in extensions	109110140	<input type="text" value="1"/> *
		Minimum

Microsoft Dynamics 365 Business Central on premises 21

InstallationErrors

BackNextAdd ISV Modules

Microsoft Dynamics 365 Business Central on premises 21

Implemented code is not cloud-optimized must have a user count greater than or equal to Dyn365 Business Central Premium.

Implemented code is not in extensions must have a user count greater than or equal to Dyn365 Business Central Premium.



UCI (Universal Code Initiative)

	Item Number	Users	Price	Detail	Extended
Users					
<input checked="" type="checkbox"/> Dyn365 Business Central Premium	109110109	2 *	\$2,800.00/Named User		\$5,600.00
<input type="checkbox"/> Dyn365 Business Central Team Members	109110128		\$400.00/Named User		
ERP Solution Suite					
<input checked="" type="checkbox"/> Country Code: United States	109110082		\$0.00		\$0.00
Devices					
<input type="checkbox"/> Dyn365 Business Central Device	109110091		\$1,150.00/Device		
		Minimum	\$0		
Configuration and Development					
<input type="checkbox"/> Dyn365 Business Central Codeunits (100)	109110086		\$800.00/100-Pack		
<input type="checkbox"/> Dyn365 Business Central Pages (100)	109110105		\$800.00/100-Pack		
<input type="checkbox"/> Dyn365 Business Central Queries (100)	109110113		\$800.00/100-Pack		
<input type="checkbox"/> Dyn365 Business Central Reports (100)	109110115		\$800.00/100-Pack		
<input type="checkbox"/> Dyn365 Business Central Tables (10)	109110124		\$800.00/10-Pack		
<input type="checkbox"/> Dyn365 Business Central XML Ports (100)	109110134		\$800.00/100-Pack		
<input checked="" type="checkbox"/> Implemented code is not cloud-optimized	109110138	2 *	\$75.00/Named User		\$150.00
		Minimum	\$0		
<input checked="" type="checkbox"/> Implemented code is not in extensions	109110140	2 *	\$125.00/Named User		\$250.00
		Minimum	\$0		
					Order Total: \$6,000.00
Back Next Add ISV Modules Price Save Delete					

Upgrade process

Web Client Redesign – Technical Tasks

- Review „GridLayout – Rows“, „ColumnSpan“, „RowSpan“ properties, change the layout without using these properties.
- Review „OnLookup“ trigger code on fields that are not editable.
- Review „OnClosePage“, „OnQueryClosePage“. Maybe a code redesign is needed.
- Review used REPORT.RUN functions where the report is used without a request page.
- Review „DotNet“ RunOnClient – True variables. Change to False or re-implement with standard functionality (Xml DOM Management, Mail, and others).
- Review file functionality



Data migration Challenges and best practices

- Ensuring data integrity and consistency during migration
- Data cleansing and analysis prior to the upgrade
- Creating a robust **data migration strategy**
- **SaaS Limitations**
 - No direct access to Azure SQL
 - Manual backup (.BACPAC)
 - Emergency restore through Microsoft support only



Data migration Challenges and best practices

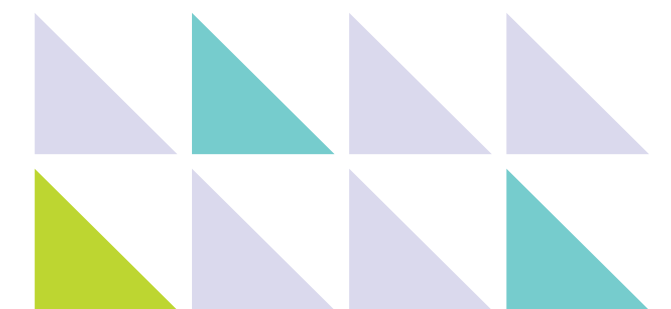
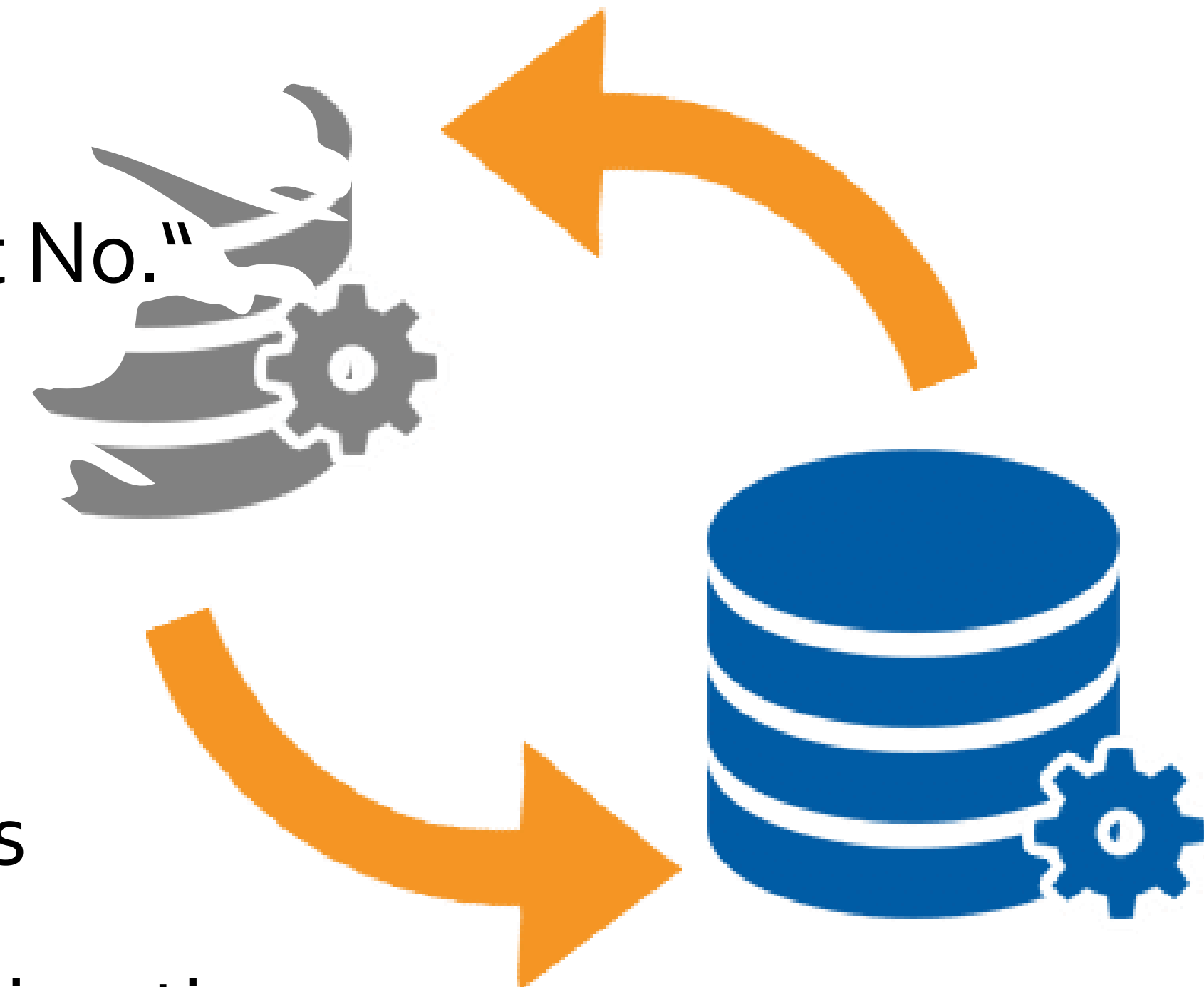
Common things to remember:

- Debugger breakpoints
- Table Reservation Entry should have a secondary key "Lot No."
- Empty Records In Item Category/Product Group Tables

Start data migration with standard Microsoft steps:

- from NAV to BC140 with Microsoft data migration toolkits
- from BC140 and up to Cloud with Intelligent Cloud data migration

Add-on data migration tools



Data migration Challenges and best practices

System data is not migrated, including:

- Users
- Personalization's
- Saved views
- Record Links
- ...



Data migration Challenges and best practices

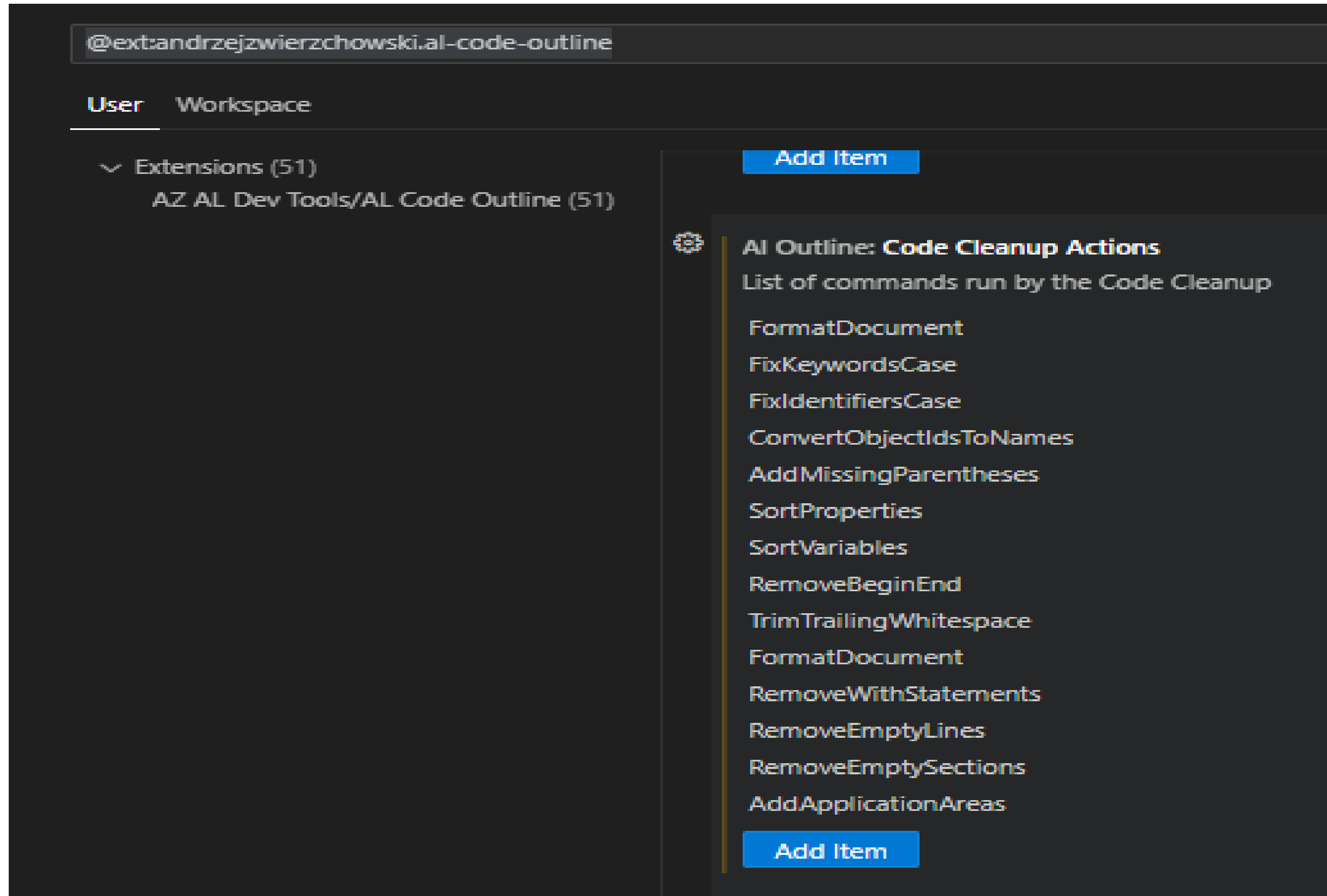
Record Links Challenge



- Create an XML Port pointing to the Record Link system table including all fields
- Export from NAV or BC all Record Links using created XML Port
- Import exported Record Links to BC On Cloud with the same XML Port



Customizations, Extensions, and Code-related challenges

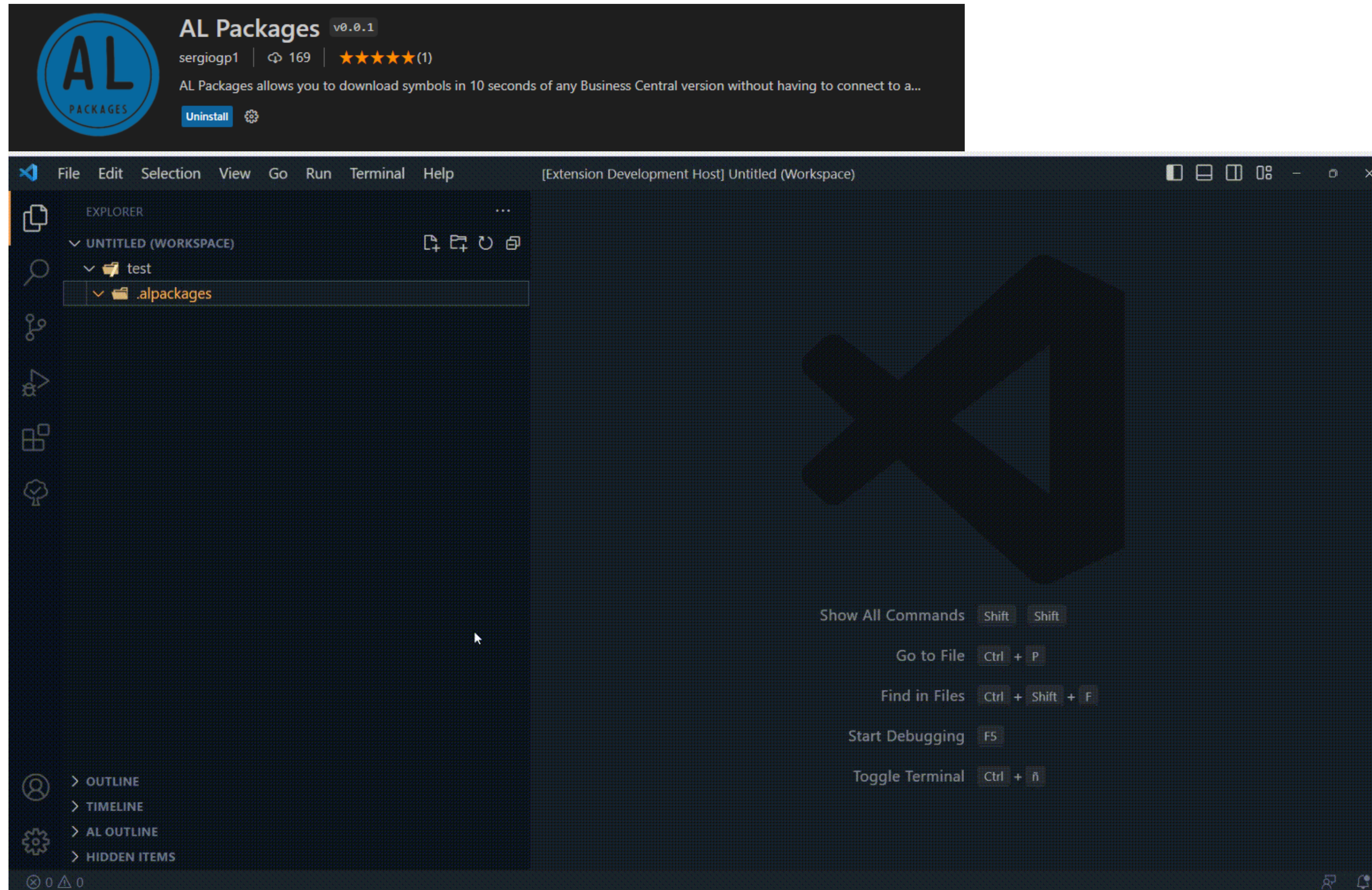


First thing after upgrading to Extension:

- Install AZ AL Dev Tools
- Cleanup actions



Customizations, Extensions, and Code-related challenges



Customizations, Extensions, and Code-related challenges

- Reimplementation examples:
 - XmlDocument
 - XmlElement
 - XmlNodeList
 - XmlNode
 - Streams
 - XmlNamespaceManager
 - Encoding/Convert
 - Http
 - Xml DOM Management
 - Record TempBlob to Codeunit "Temp Blob"



<https://bcility.com/bctechdays/>



Cheat sheet examples



OLD	New
vDotNetXmlDoc: DotNet XmlDocument;	vXmlDocument: XmlDocument;
vDotNetXmlDoc.XmlDocument()	XmlDocument.Create()
vDotNetXmlDoc.LoadXml(Text);	XmlDocument.ReadFrom(Text, vXmlDocument)

	OLD	NEW
vDotNetXmlDoc.Save(FileName)	TempBlobRecord.Init();	TempBlobCodeunit.FromRecord(VATReportArchive,
vDotNetXmlDoc.AppendChild(XmlElement);	TempBlobRecord.Blob := VATReportArchive."Message BLOB";	VATReportArchive.FieldNo("Message BLOB"));
vDotNetXmlDoc.CreateElement(pPrefix, pNa	TempBlobRecord.CalcFields(Blob);	var
vDotNetXmlDoc.CreateXmlDeclaration('1.0',	VATReportArchive."Message BLOB" := TempBlobRecord.Blob;	RecRef: RecordRef;
		RecRef.GetTable(VATReportArchive);
		TempBlobCodeunit.ToRecordRef(RecRef,
		VATReportArchive.FieldNo("Message BLOB"));
		RecRef.SetTable(VATReportArchive);
	ContentTxt := TempBlobRecord.ReadAsText(",	var
	TextEncoding::UTF8);	IStream: InStream;
		TempBlobCodeunit.CreateInStream(IStream

Customizations, Extensions, and Code-related challenges

Reimplement usage of System tables

```
{ 8 ; ;Change Password ;Boolean ;CaptionML=[ENU=Change Passw ENG=Authentication:Email] }
{ 10 ; ;License Type ;Option ;CaptionML=[ENU=License Type, ENG=License Type, OptionCaptionML=[ENU=Full U, ENG=Full U] }
{ 11 ;
```

```
Src > TableExtensions > User.TableExt.al > TableExtension 61509 "PTE User" > var > myInt: Integer
0 references
1 tableextension 61509 "PTE User" extends User
2 {
3     fields
4     {
5         // Add changes to table fields h
6     }
7
```

```
Table User
"User Security ID"      Guid (PK1)
"User Name"             Code[50]
"Full Name"             Text[80]
```

The system or virtual table 'User' cannot be extended. AL(AL0525)

Create a mapping table for reimplementation




Customizations, Extensions, and Code-related challenges

Web Client behavior of OnClosePage and OnQueryClosePage triggers

- Pages opened with RUN command will behave like they are opened with RUNMODAL command, will fire the triggers!

```
action(RunPage)
{
    ApplicationArea = All;
    Caption = 'Run Page';

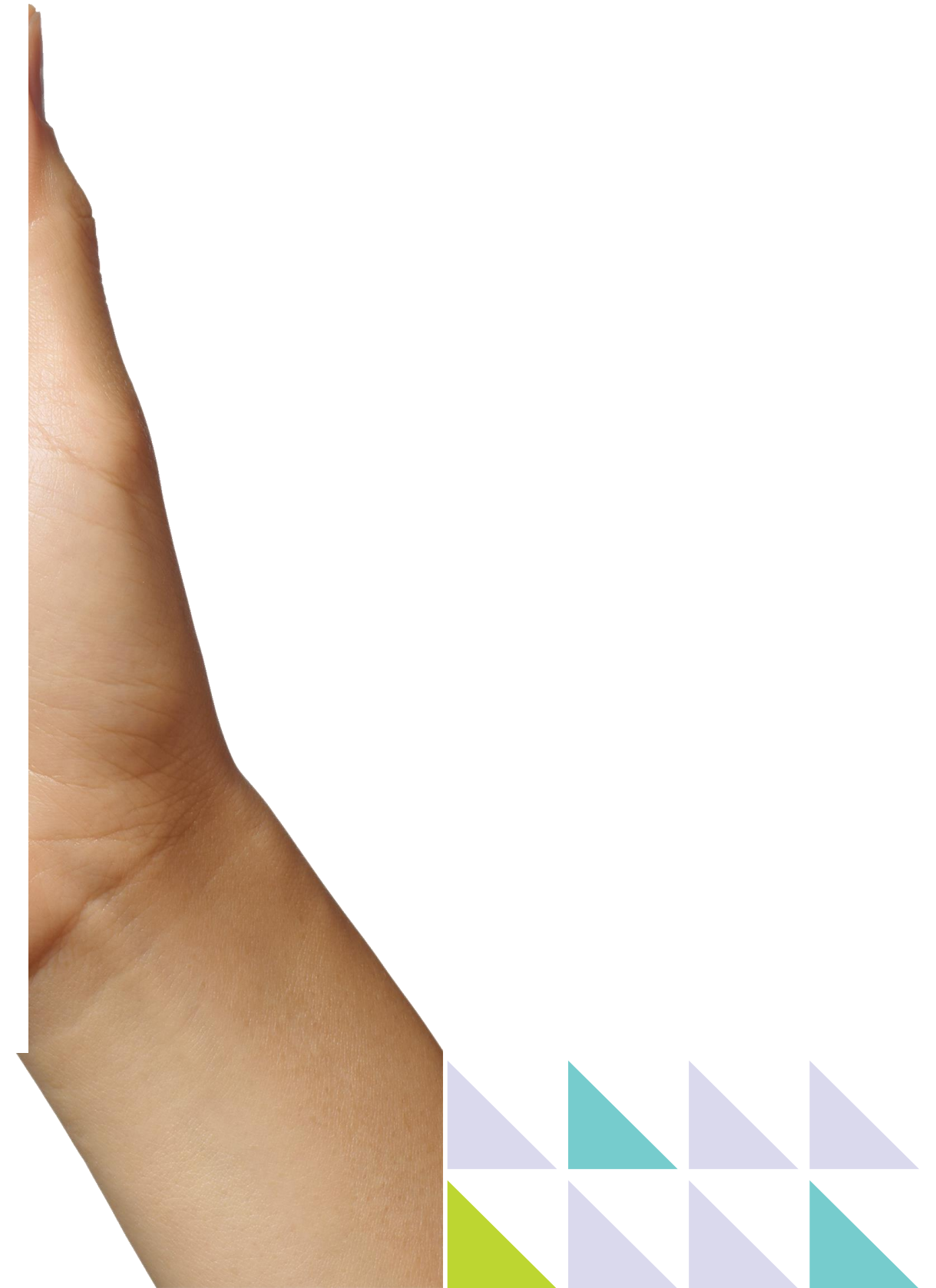
    trigger OnAction()
    begin
        Page.Run(Page::"Service Contract");
    end;
}
```



```
trigger OnQueryClosePage(CloseAction: Action): Boolean
begin
    if CloseAction = Action::LookupOK then
        if RejectionReason = '' then
            Error(RejectionReasonErr);
        end;
end;
```


Please grab your phone

- You have internet conn





When doing a merge, do you prefer using a 2-way or 3-way merge?

Is this custom change or standard? 2-way view

Users/neman/Documents/source.txt		C:/Users/neman/Documents/Target.txt	
SalesLinesProcessed := FALSE;	116	SalesLinesProcessed := FALSE;	116
IF SalesLine.FINDFIRST THEN	117	IF TempSalesLineGlobal.FINDSET THEN	117
REPEAT	118	REPEAT	118
ItemJnlRollRndg := FALSE;	119	ItemJnlRollRndg := FALSE;	119
LineCount := LineCount + 1;	120	LineCount := LineCount + 1;	120
IF GUIALLOWED THEN	121	IF NOT HideProgressWindow THEN	121
Window.UPDATE (2,LineCount);	122	Window.UPDATE (2,LineCount);	122
	123		123

SOURCE

TARGET



That is custom change...

623 diffs (Ignore line ending differences) | Tab spacing: 4 | File format (Encoding: System Line endings: Windows)

Base: Base.txt
Left: Target.txt
Right: source.txt
Merge: Not saved.

C:/Users/neman/Documents/Target.txt

```
109 SalesTaxCalculate.DistTaxOverS, 99
110 END; 100
111 END ELSE BEGIN 101
112 TempVATAmountLineRemainder.DELETEALL; 102
113 TempSalesLineGlobal.CalcVATAmountL 103
114 END; 104
115 105
116 SalesLinesProcessed := FALSE; 106
117 IF TempSalesLineGlobal.FINDSET THEN 107
118 REPEAT 108
119 ItemJnlRollRndg := FALSE; 109
120 LineCount := LineCount + 1; 110
121 IF NOT HideProgressWindow THEN 111
122 Window.UPDATE (2,LineCount); 112
123 113
124 PostSalesLine ( 114
125 SalesHeader,TempSalesLineGloba 115
126 TempItemLedgEntrvNotInvoiced.H 116
```

```
SalesTaxCalculate.DistTaxOverSalesLines (TempSalesLineForSalesTax);
END;
END ELSE BEGIN
TempVATAmountLineRemainder.DELETEALL;
TempSalesLineGlobal.CalcVATAmountLines (1,SalesHeader,TempSalesLineGlobal,TempVATAmountLine);
END;

SalesLinesProcessed := FALSE;
IF TempSalesLineGlobal.FINDSET THEN
REPEAT
ItemJnlRollRndg := FALSE;
LineCount := LineCount + 1;
IF NOT HideProgressWindow THEN
IF GUIALLOWED THEN //Custom
Window.UPDATE (2,LineCount);

PostSalesLine (
SalesHeader,TempSalesLineGlobal,EverythingInvoiced,TempInvoicePostBuffer);
```

Not saved.

```
SalesTaxCalculate.DistTaxOverSalesLines (TempSalesLineForSalesTax);
END;
END ELSE BEGIN
TempVATAmountLineRemainder.DELETEALL;
TempSalesLineGlobal.CalcVATAmountLines (1,SalesHeader,TempSalesLineGlobal,TempVATAmountLine);
END;

SalesLinesProcessed := FALSE;
IF TempSalesLineGlobal.FINDSET THEN
REPEAT
ItemJnlRollRndg := FALSE;
LineCount := LineCount + 1;
Window.UPDATE (2,LineCount);
IF NOT HideProgressWindow THEN
IF GUIALLOWED THEN
Window.UPDATE (2,LineCount);

PostSalesLine (
```


Testing after upgrade to Cloud

Things to check:

- Page layout
- Report layout
- Data comparison
- Basic master data input tests
- Basic test of posting routines
- Run your automated tests, you have them right?



Case Studies and Lessons Learned

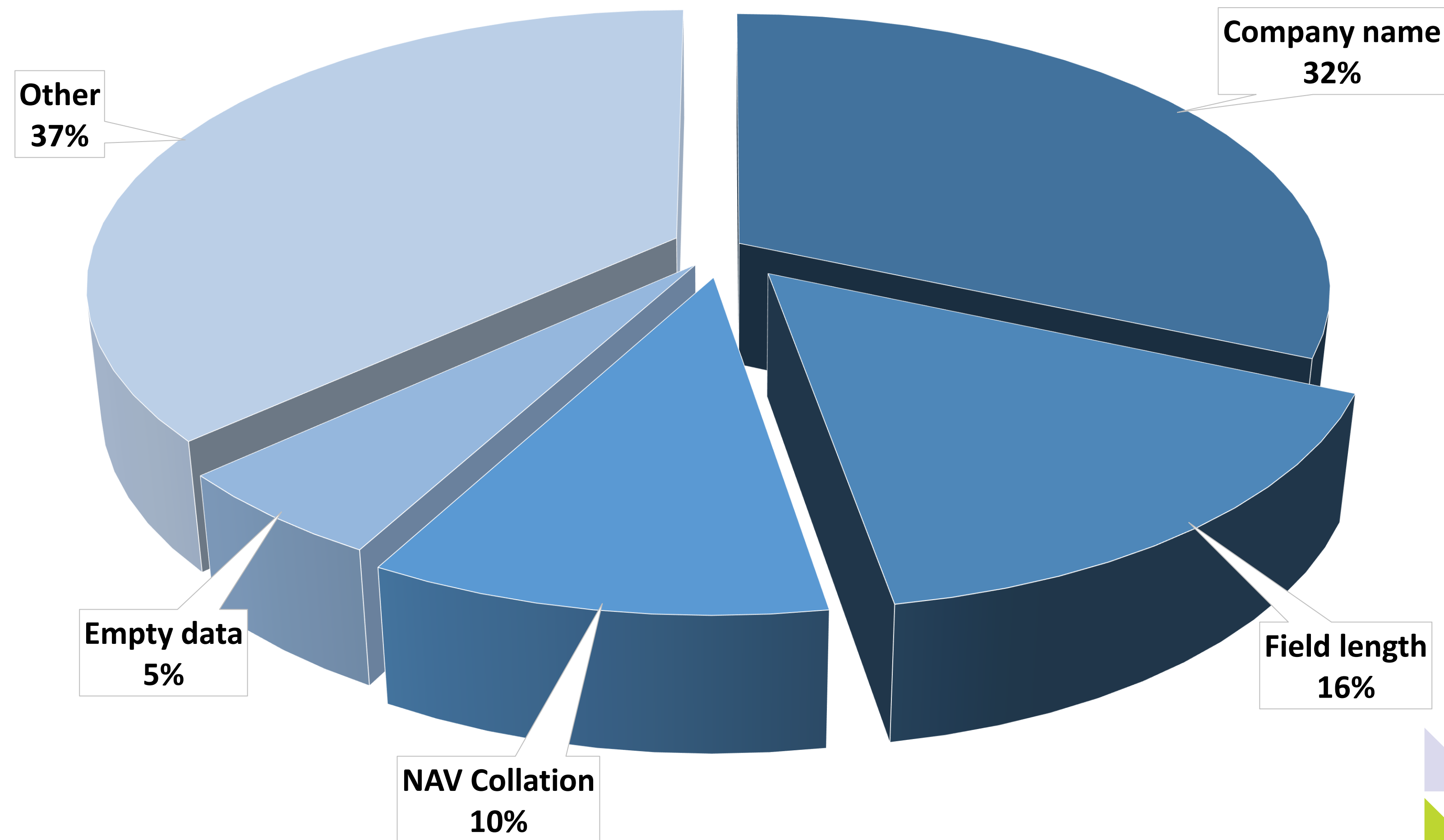
Data migration:

- Company name with "-" symbol (replace "-" in the company name)
- Decrease of field length (fields expansion needs to be done)
- NAV Collation (use Windows collation and adjust region)
- Empty Product Group and Item Category (remove)
- ...



Case Studies and Lessons Learned

Data migration



Case Studies and Lessons Learned

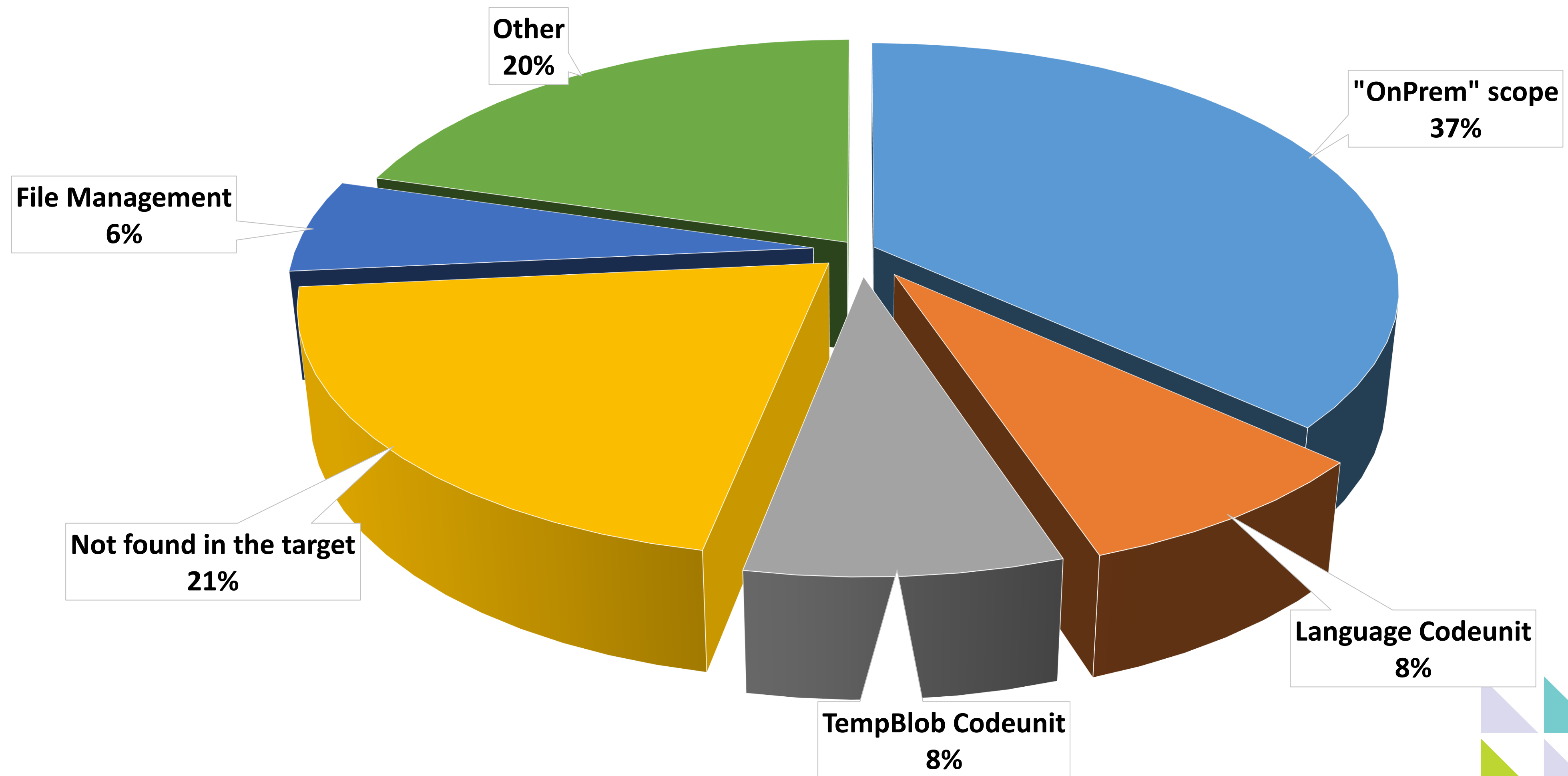
Upgrade to Extension most common **compilation errors**:

- ...has scope 'OnPrem' and cannot be used for 'Cloud' development.
- Language Record to Codeunit Issues
- Temp Blob Record to Codeunit Issues
- Action, control, field, not found in the target 'xxx'
- File Management Issues
- ...



Case Studies and Lessons Learned

Most common compilation issues



Case Studies and Lessons Learned

Upgrade to Extension most **unsupported features**:

- Property modification



Case Studies and Lessons Learned

Not extensible properties:

- AutoSplitKey
- Blank Numbers
- CardPageId
- DelayedInsert
- DeleteAllowed
- Extensible
- InsertAllowed
- Min/MaxValue
- ModifyAllowed
- MultiLine
- NotBlank
- PageType
- RunObject
- RunObjectLink
- SaveValues
- SubPageLink
- SubPageView
- UsageCategory
- ...



Case Studies and Lessons Learned

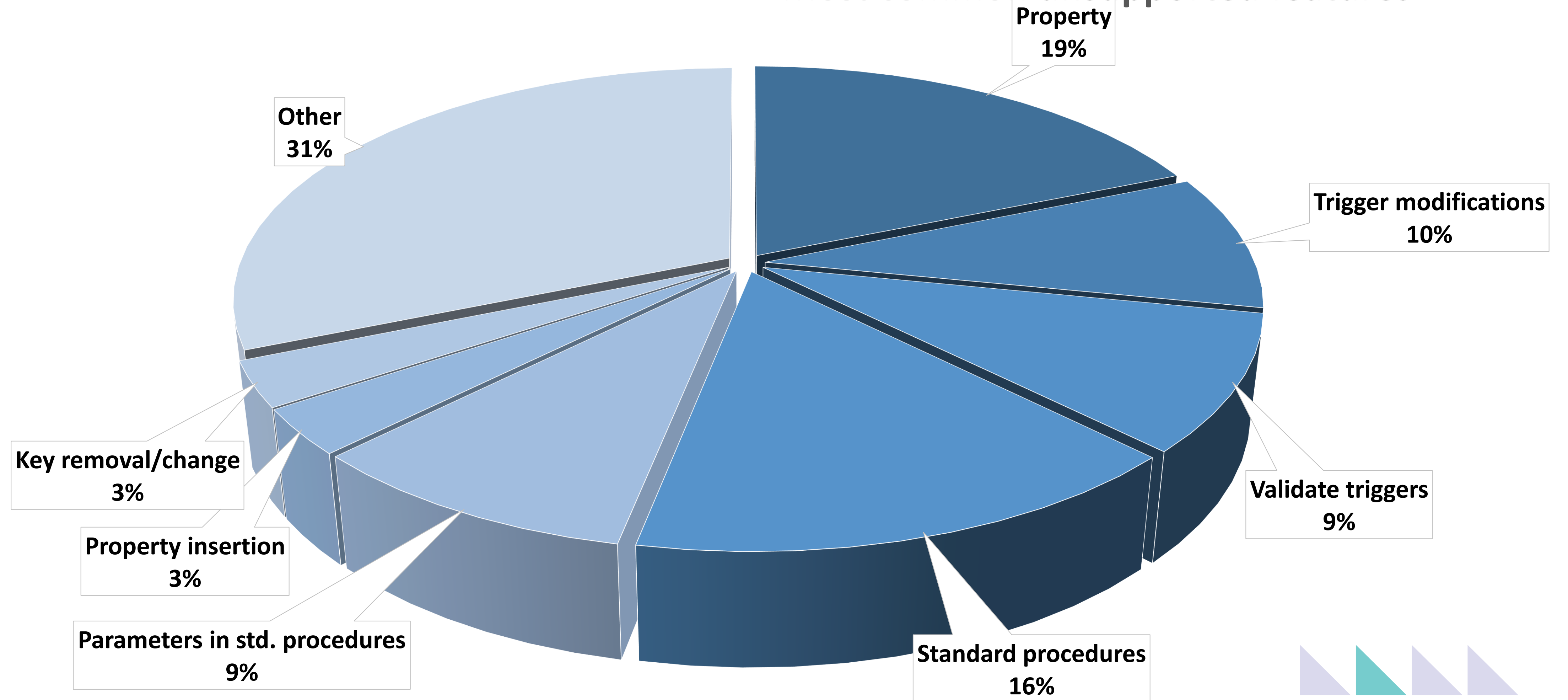
Upgrade to Extension most **unsupported features**:

- Property modification/insertion
- Code modification on standard triggers (insert, rename, delete, modify)
- Code modification on Validate Triggers
- Code modification in standard procedures
- Parameters insertion/removal in standard procedures
- Key removal/extend
- ...



Case Studies and Lessons Learned

Most common unsupported features



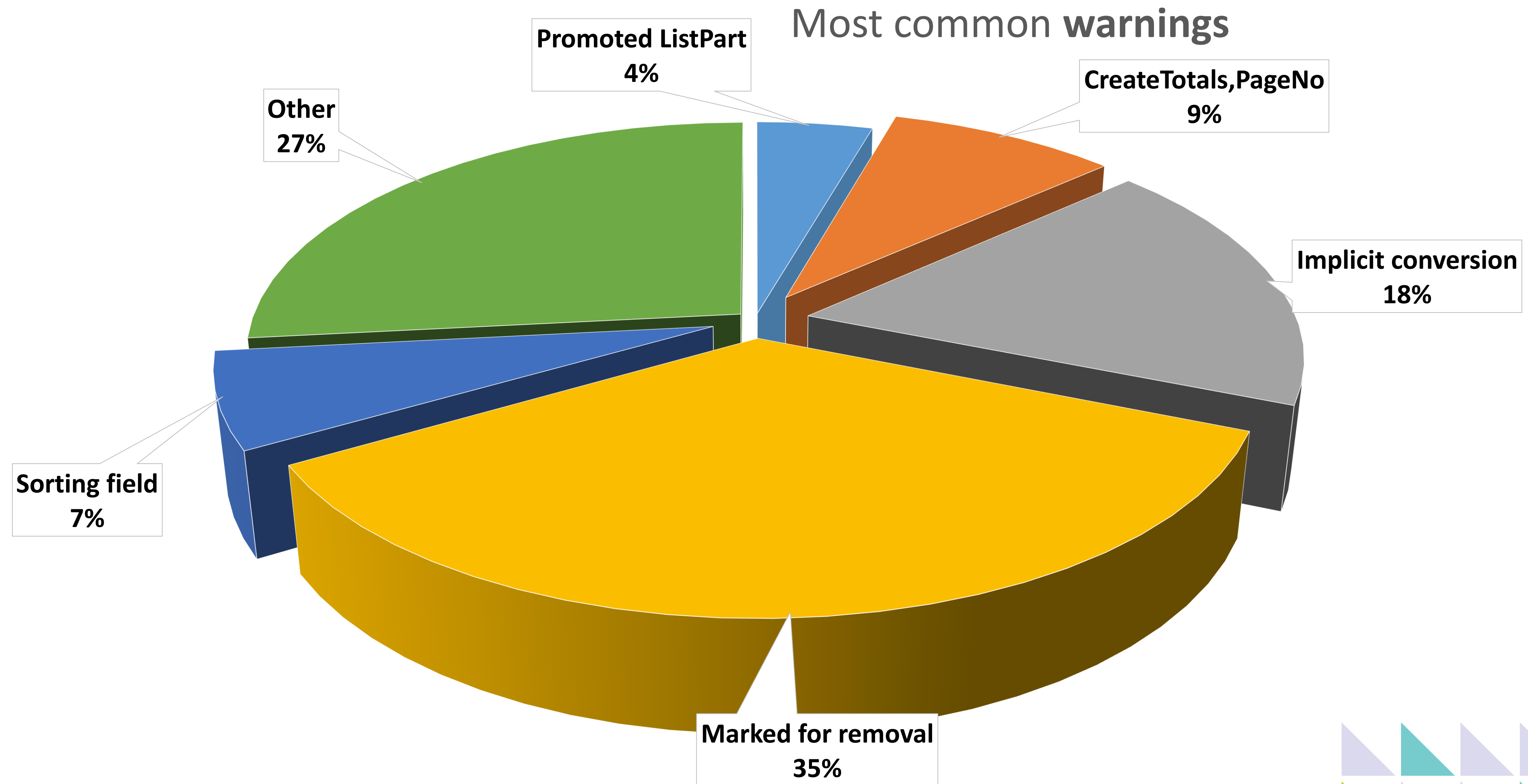
Case Studies and Lessons Learned

Upgrade to Extension most **common warnings**:

- Marked for removal
- Sorting field 'xxx' should be part of the keys for table 'xxx'
- Implicit conversion Option and Enums
- CreateTotals, PageNo... on reports
- Promoted properties for actions on ListParts
- ...



Case Studies and Lessons Learned



Q&A

Any Questions?



Thank
You!

