
COMMUNITY
SUMMIT
DYNAMICS 365
BUSINESS CENTRAL
(NAV)
2025
COMMUNITY SUMMIT
Orlando
OCTOBER 19-23, 2025
Business Central
SPEAKER
Orlando, FL
October 19-23, 2025

The largest Microsoft Business Applications user conference on the planet.

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AL Bootcamp: From Zero to Hero in Two Days

Day 1

A Dynamics-First, 'For User, By User' Event.

Speakers

Brad Prendergast

AJ Ansari

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Brad Prendergast

- 20+ years in Microsoft Dynamics, specializing in Business Central
- Unique dual perspective as a partner & end user
- Member of Summit Programming Committee & Board of Advisors
- Co-host of the popular Dynamics Corner podcast
- Passionate about bringing people together in the Dynamics space

DYNAMICS CORNER.COM

MVP Microsoft® Most Valuable Professional

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AJ Ansari

- Community Summit Legend and BCUG All-Star
- 17 years in Microsoft Dynamics; background as certified developer, consultant and practice leader
- Member of Summit Programming Committee & Board of Advisors

COO & Partner

aja@dswius.com

bit.ly/AJAnsari

Only BC Fans

Only Copilot Fans

DSWi

Microsoft® MVP Most Valuable Professional

Know Before You Go

- Restrooms are where?
- Nearest Emergency Exit is where?

Session Objectives

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- Setup a Development Environment
- Understand Business Central Architecture
- Create an extension in Business Central
- Extend Business Central

Agenda

- Day 1
- Introduction
- Getting Started
- Setting up your Development Environment
- AL Language
- Develop Your First Extension
- Creating an Extension
- Extending Business Central

- Day 2

About You

- Name
- Company
- Role
- What are you hoping to learn?

Getting Started

Business Central Architecture

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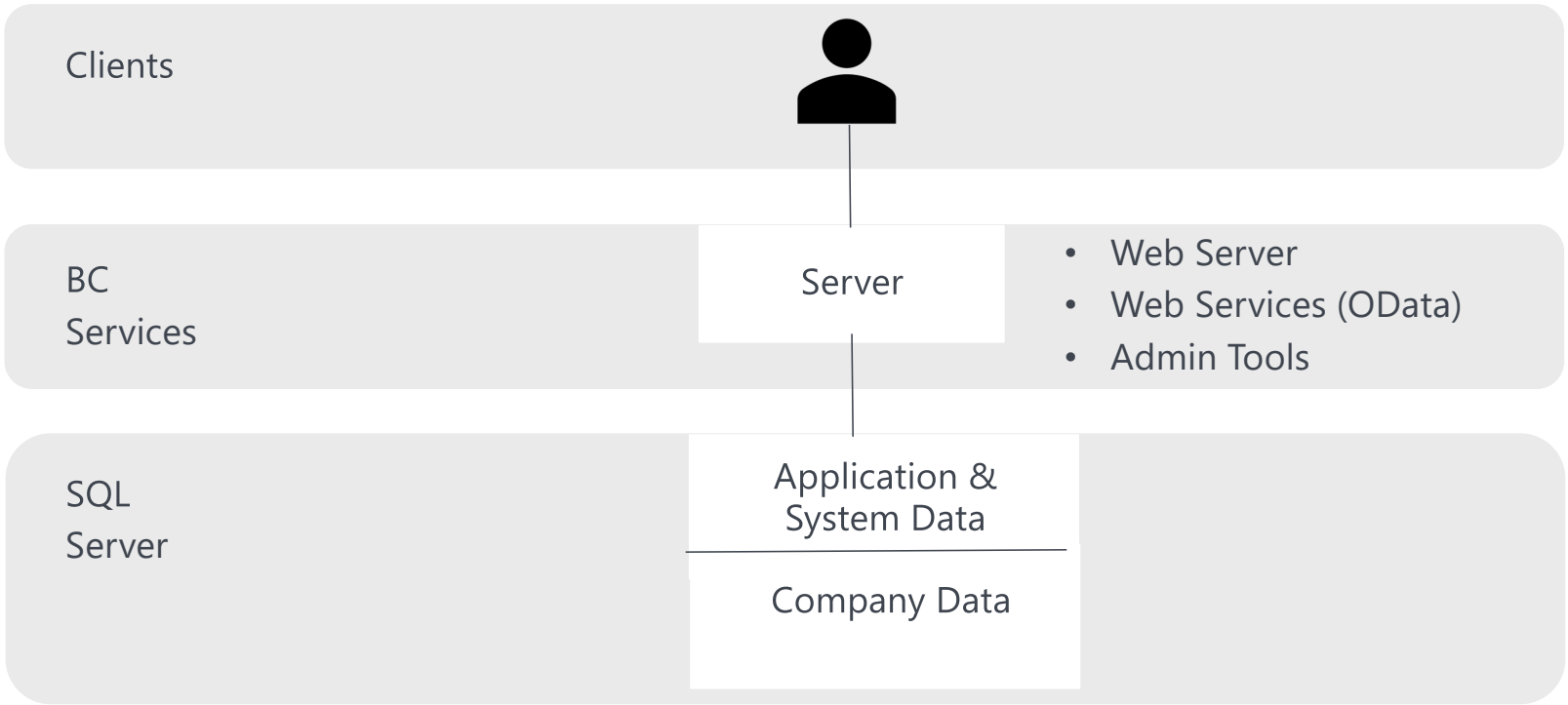
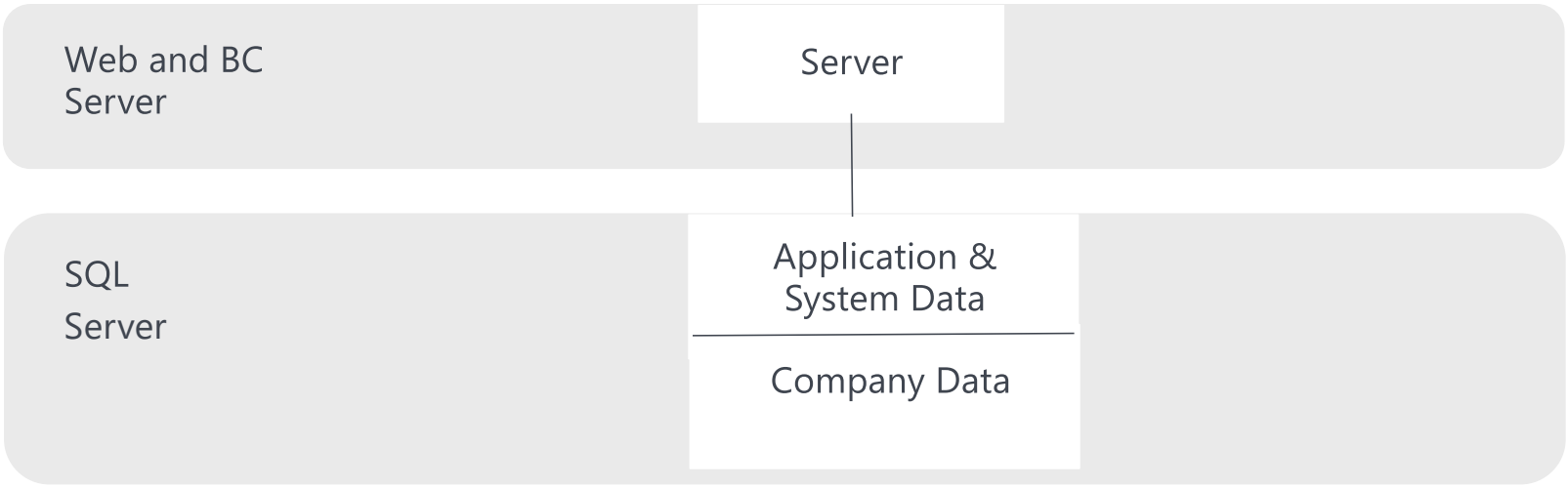
Single-Tenant or On-premises



Business Central Architecture

Recommended Architecture



Business Central Architecture

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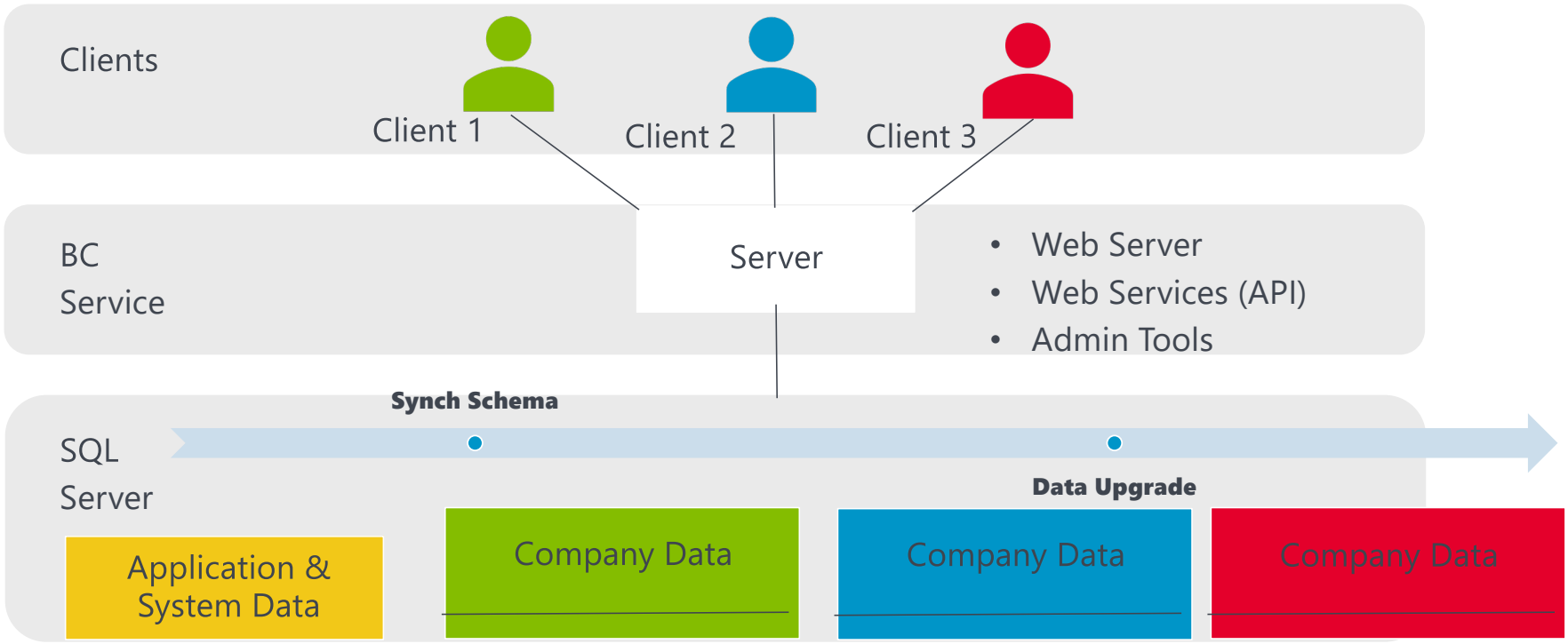
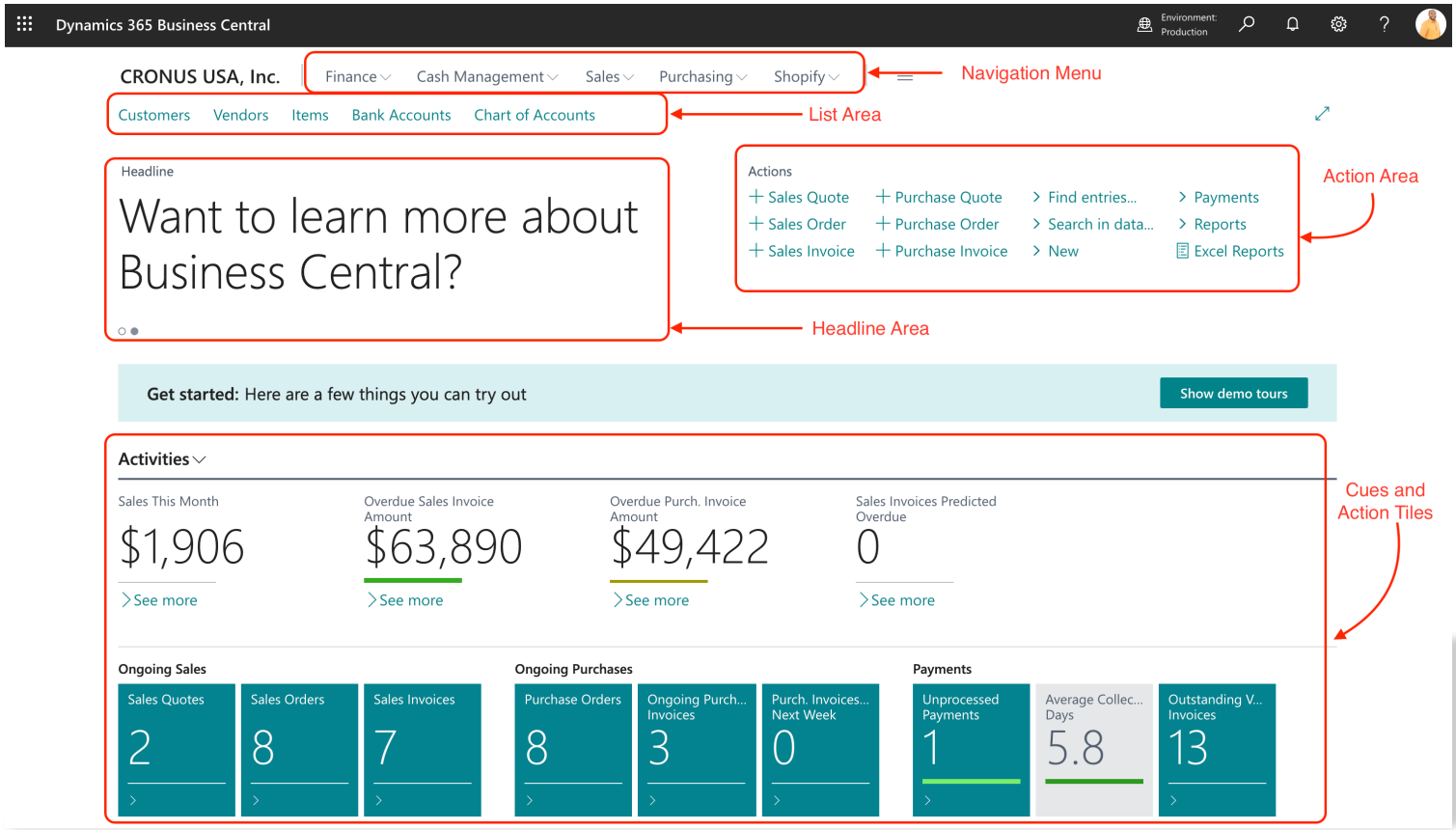
Multitenant Architecture



Business Central Architecture



What is the AL Language?

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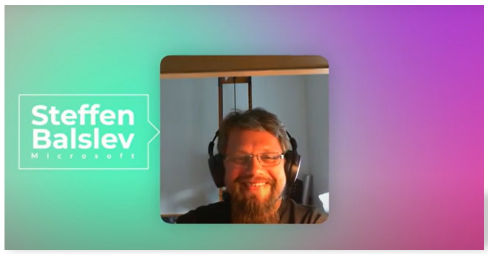
- AL is the program language used for Dynamics 365 Business Central; Extension Based Approach
- Origin from C/AL (Client/Server Application Language) for extending Dynamics NAV (along side C/SIDE)
- VS Code Integration
- Transpiler - source-to-source compiler - "translator" and "compiler."
- https://www.dynamicscorner.com/2023/06/episode-220-in-the-dynamics-corner-chair-the-al-compiler-in-depth/



Personalize vs. Design vs. Develop

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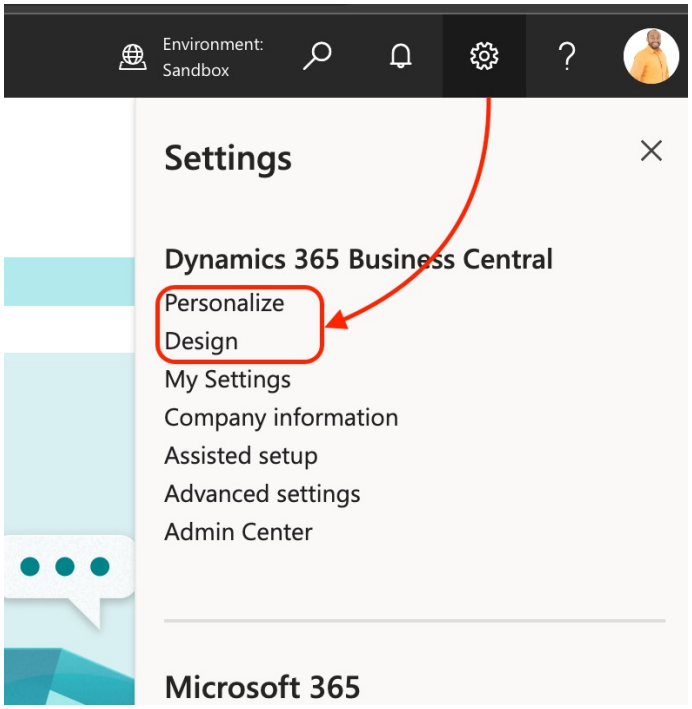
Personalize

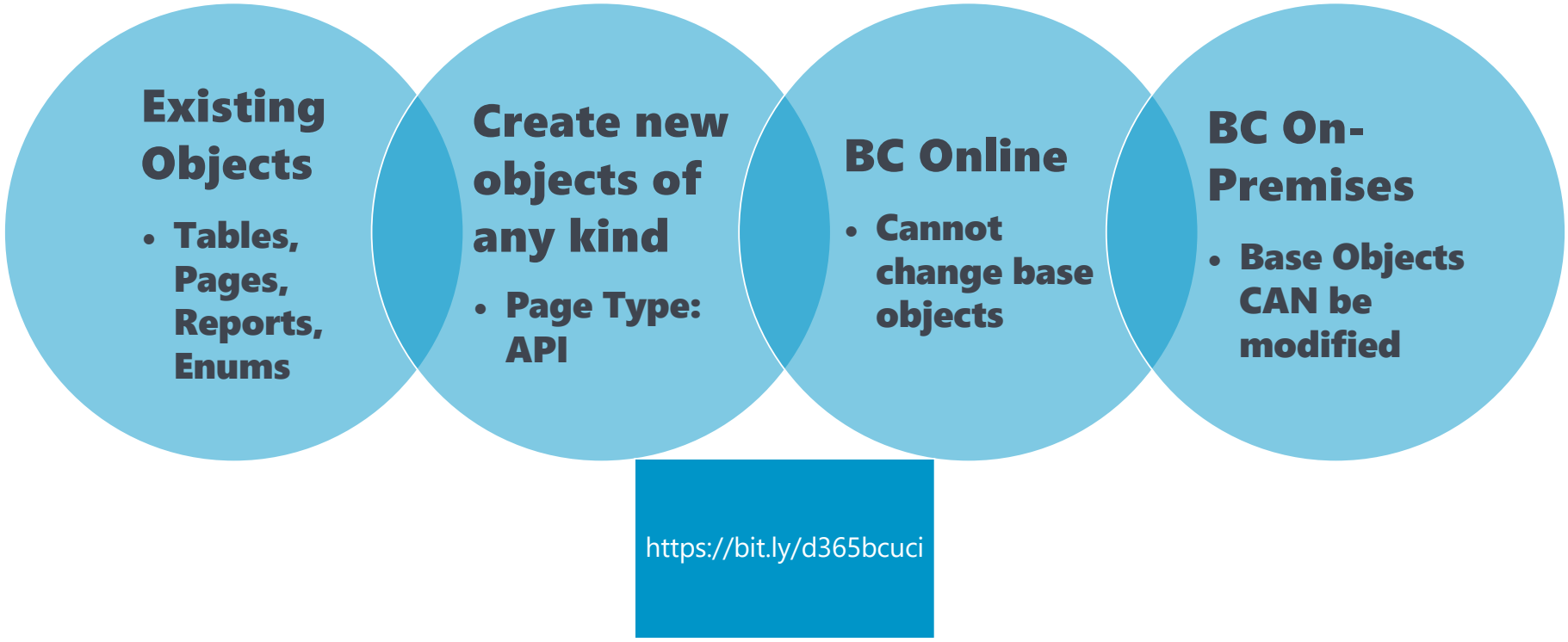
- User Specific
- Limited
- Only Fields Available to Page

Design

- Global
- Creates new Extension as .zip
- Only from Sandbox



Personalize vs. Design vs. Develop



Extension Types

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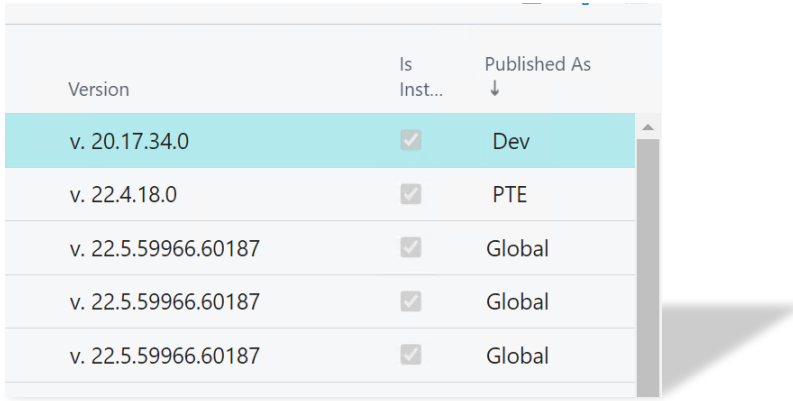
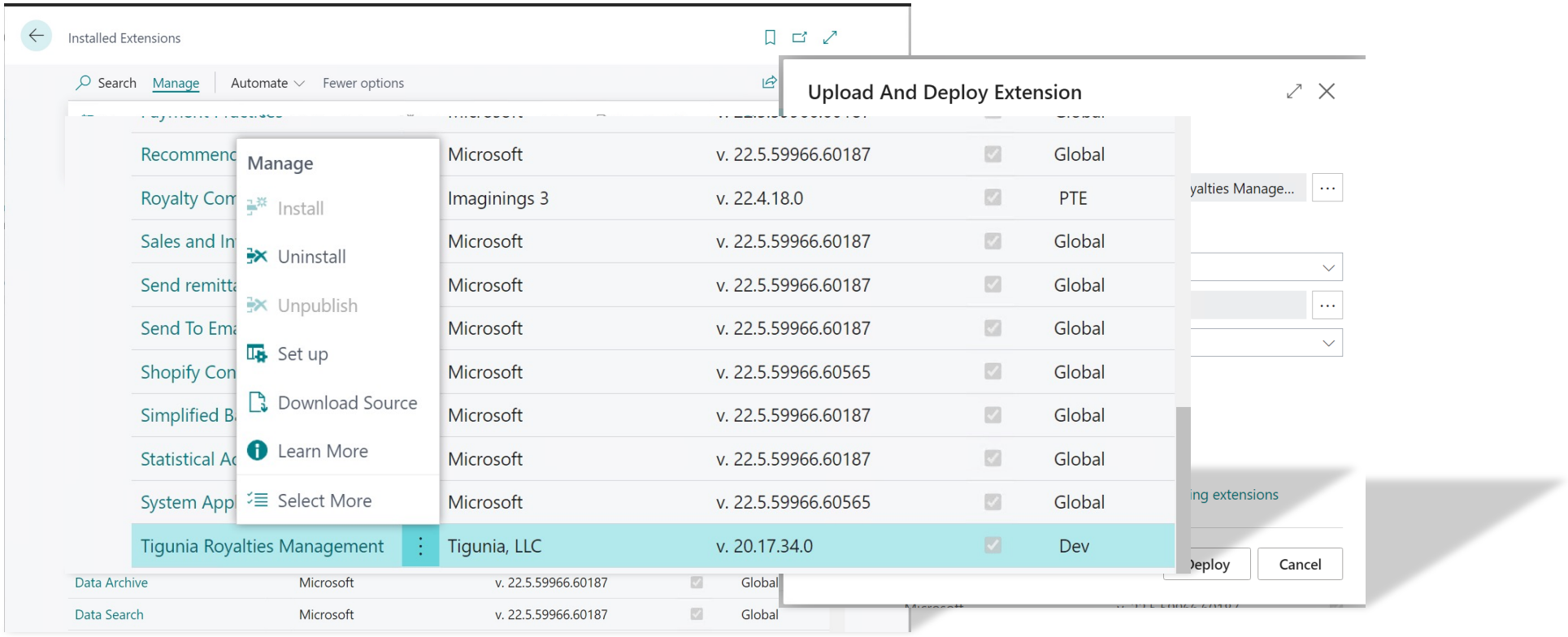
- Global
  - Installed from the AppSource
  - Production and Sandbox
  - Preserved on upgrade for both Production and Sandbox
- Per-tenant (PTE)
  - Installed through Extension Management
  - Specific to environment
  - Production and Sandbox
  - Preserved on upgrade in Production (unless there is a problem)
  - Uninstalled from Sandbox when relocated if dependent on DEV

Extension Types

- DEV
  - Published from VS Code
  - Used for development purposes
  - Only exist in Sandbox
  - uninstalled when the sandbox environment is upgraded or relocated (data is not removed)



Extension Management



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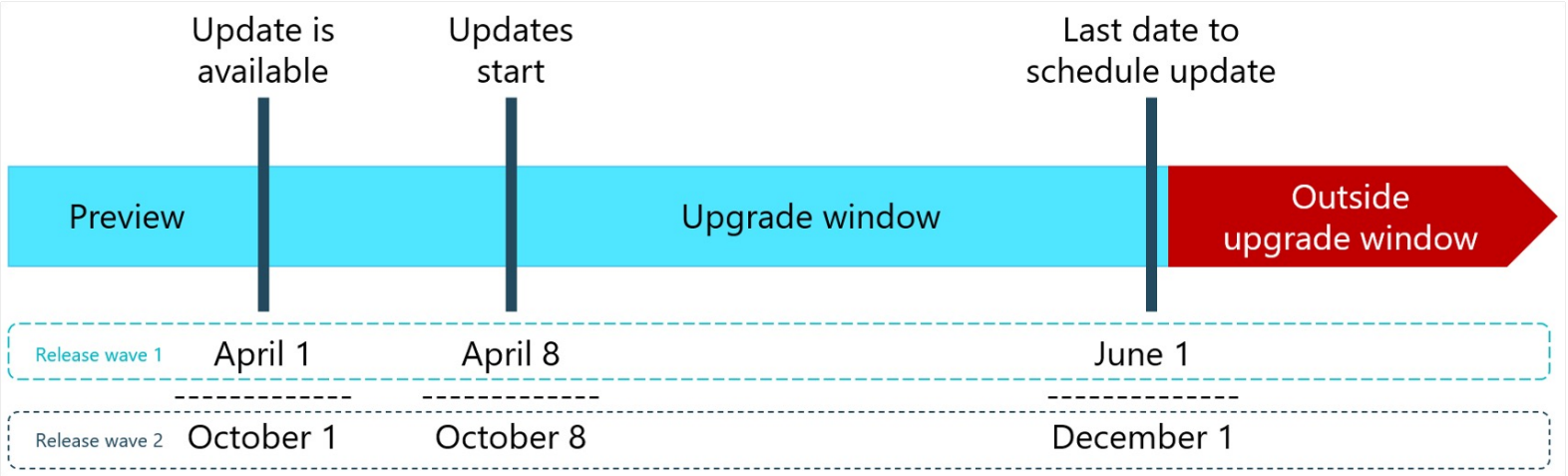
Setup Development Environment

Local Environment

- Visual Studio Code (https://code.visualstudio.com/Download/)
- AL Language Extension
- Other Extensions
  - AZ AL Dev Tools/AL Code Outline
  - Waldo's CRS AL Language Extension
  - Vscode-icons
  - Code Spell Checker
  - Create GUID
- Report Builder (https://www.microsoft.com/en-us/download/details.aspx?id=53613)

Business Central Tenant



Update Window is still currently at 60 Days

Business Central Tenant

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- Admin Center
- Create an Environment
  - Environment Types
  - Copy an environment
- Managing Updates
  - Set Update Window
  - Schedule an Update date
  - Get notified of Updates

Extension Settings

Environment

Workspace

Project

```
{
    "al.incognito": true,
    "al.browser": "Chrome",
    "al.enableCodeAnalysis": true,
    "al.backgroundCodeAnalysis": false,
    "al.incrementalBuild": false,
    "al.codeAnalyzers": [
        "${AppSourceCop}",
        "${CodeCop}",
        "${PerTenantExtensionCop}",
        "${UICop}"
    ],
    "al.compilationOptions": {
        "generateReportLayout": true
    },
    "alOutline.completionProviders": [
        "VariableNamesWithType",
        "VariableDataTypes"
    ],
    "debug.inlineValues": "on",
    "debug.console.fontFamily": "default",
    "debug.console.fontSize": 14,
```

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AL Language

AL Language

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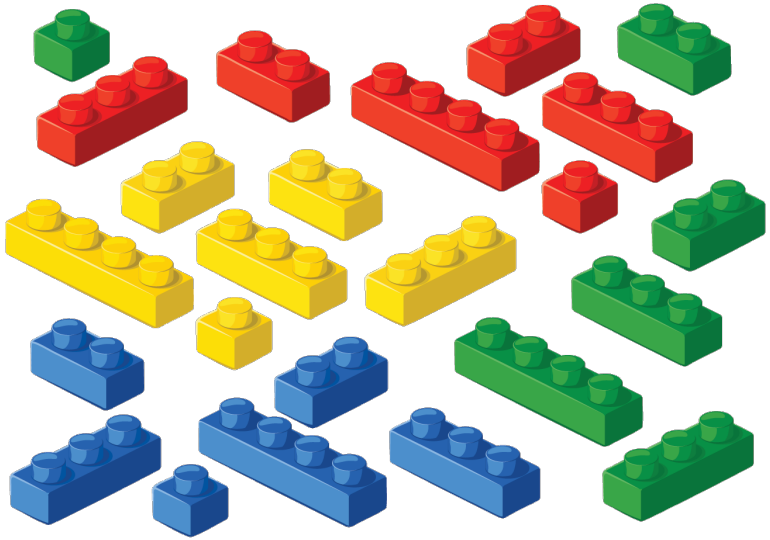
- Objects
  - Table
  - Page
  - Reports
  - Codeunits
  - XMLPorts
  - Query
  - Permissionset



AL Language - Table

- Tables are the core objects used to store data in Dynamics 365 Business Central

- The structure of a table has four sections:
  - The first block contains metadata for the overall table, such as the table type.
  - The fields section describes the data elements that make up the table, such as their name and the type of data they can store.
  - The keys section contains the definitions of the keys that the table needs to support.
  - The final section details the triggers and code that can run on the table.

```
table 50104 Address
{
    Caption = 'Sample table';
    DataPerCompany = true;

    fields
    {
        field(1; Address; Text[50])
        {
            Description = 'Address retrieved by Service';
        }
        field(2; Locality; Text[30])
        {
            Description = 'Locality retrieved by Service';
        }
        field(3; "Town/City"; Text[30])
        {
            Description = 'Town/City retrieved by Service';
        }
        field(4; County; Text[30])
        {
            Description = 'County retrieved by Service';

            trigger OnValidate();
            begin
                ValidateCounty(County);
            end;

        }
    }
    keys
    {
        key(PrimaryKey; Address)
        {
            Clustered = TRUE;
        }
    }

    var
        Msg: Label 'Hello from my method';

    trigger OnInsert();
    begin

    end;

    procedure MyMethod();
    begin
        Message(Msg);
    end;
}
```

AL Language - Page

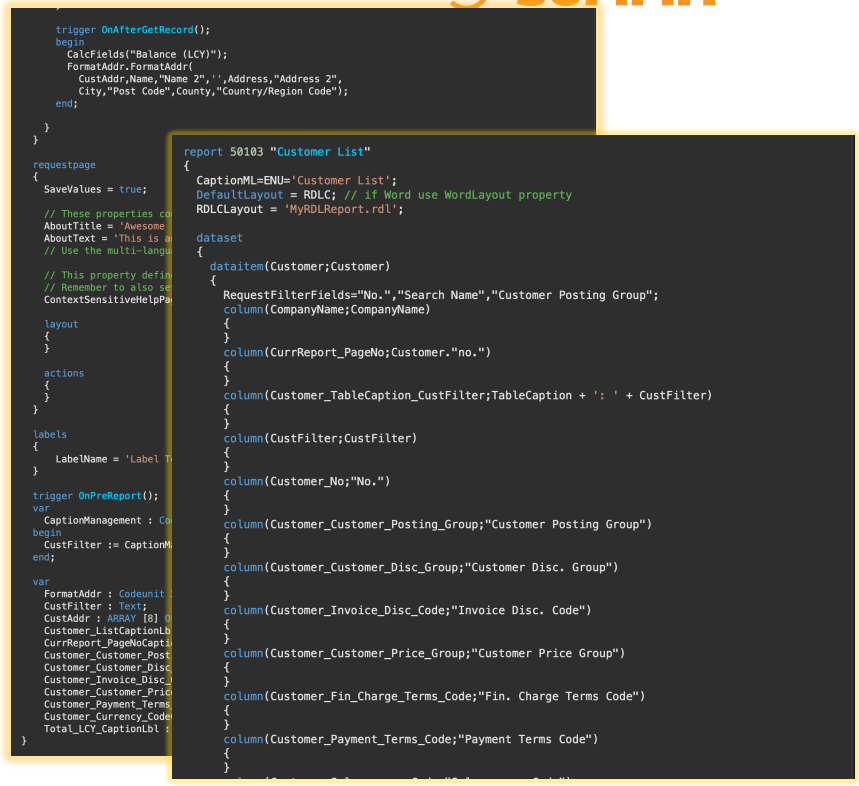
- Pages are the main way to display and organize visual data in Dynamics 365 Business Central.

- The structure of a table has four sections:
  - The first block contains metadata for the overall page; the type of the page and the source table it is showing data from.
  - The next section; the layout, describes the visual parts on the page.
  - The final section details the actions that are published on the page.

```
page 50101 SimpleCustomerCard
{
    PageType = Card;
    SourceTable = Customer;
    ContextSensitiveHelpPage = 'my-feature';

    layout
    {
        area(content)
        {
            group(General)
            {
                field("No."; "No.")
                {
                    ApplicationArea = All;
                    CaptionML = ENU = 'Hello';

                    trigger OnValidate()
                    begin
                        if "No." < '' then
                            Message('Number too small')
                    end;
                }

                field(Name; Name)
                {
                    ApplicationArea = All;
                }
                field(Address; Address)
                {
                    ApplicationArea = All;
                }
            }
        }
    }
    actions
    {
        area(Navigation)
        {
            action(NewAction)
            {
                ApplicationArea = All;
                RunObject = codeunit "Document Totals";
            }
        }
    }
}
```

AL Language - Report

- Reports are used to print or display information*
- Reports consist of a data model and layout
- A report object consists of four sections
  - The first block contains metadata for the overall table
  - The second block is the dataset that defines the data model
  - The third section is the request page for accepting user input
  - The final section details the triggers and code that can run on the report



```
report 50103 "Customer List"
{
  CaptionML=ENU='Customer List';
  DefaultLayout = RDLC; // if Word use WordLayout property
  RDLCLayout = 'MyRDLReport.rdl';

  dataset
  {
    dataitem(Customer;Customer)
    {
      RequestFilterFields="No.","Search Name","Customer Posting Group";
      column(CompanyName;CompanyName)
      {
      }
      column(CurrReport_PageNo;Customer."no.")
      {
      }
      column(Customer_TableCaption_CustFilter;TableCaption + ': ' + CustFilter)
      {
      }
      column(CustFilter;CustFilter)
      {
      }
      column(Customer_No;"No.")
      {
      }
      column(Customer_Customer_Posting_Group;"Customer Posting Group")
      {
      }
      column(Customer_Customer_Disc_Group;"Customer Disc. Group")
      {
      }
      column(Customer_Invoice_Disc_Code;"Invoice Disc. Code")
      {
      }
      column(Customer_Customer_Price_Group;"Customer Price Group")
      {
      }
      column(Customer_Fin_Charge_Terms_Code;"Fin. Charge Terms Code")
      {
      }
      column(Customer_Payment_Terms_Code;"Payment Terms Code")
      {
      }
```

* processing reports; Excel download; Excel Layouts

AL Language - Codeunit

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- Modularized container for AL Code that contains business logic.
- Procedures, Variables, Event Subscribers
- The Access property defines the scope of the codeunit - public or internal.

```
codeunit 50100 MyCodeunit
{
    Access = Public;
    Subtype = Normal;

    trigger OnRun()
    begin

    end;

    procedure MyFunction(Param1: Integer; Param2: Text[50]) : Boolean
    begin

    end;
}
```

AL Language - XMLPort

- Export and Import data between an external source and Dynamics 365 Business Central
- XML Document
- Variable or Fixed Text Format
- Direction – Inbound, Outbound

AL Language - Query

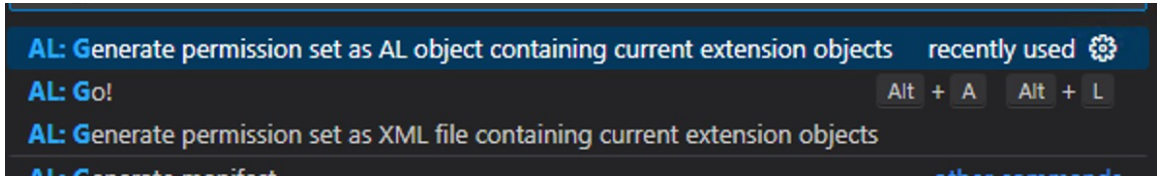
- Retrieve records from one or more tables and then combine the data into rows and columns in a single dataset
- Two Types - Normal and API
- dataitems and columns
- SqlJoinType Property

```
query ID Name
{

    elements
    {
        dataitem(DataItem1; Table1)
        {
            column(Column1; Field1)
            {
            }
            column(Column2; Field2)
            {
            }
            dataitem(DataItem2; Table2)
            {
                // Sets a link between FieldY of Table2 and FieldX of Table1.
                DataItemLink = FieldY = DataItem1.FieldX;
                //The dataset contains records from Table1 and Table2 where a match is found betweer
                SqlJoinType = InnerJoin;

                column(Column1; Field1)
                {
                }
                dataitem(DataItem3; Table3)
                {
                    DataItemLink = FieldZ = DataItem2.FieldY;
                    SqlJoinType = InnerJoin;
                    column(Column1; Field1)
                    {
                    }
                }
            }
        }
    }
}
```

AL Language – PermissionSet

- Describes permissions on objects
- Assignable to users in Business Central
- Extended permission sets are additive

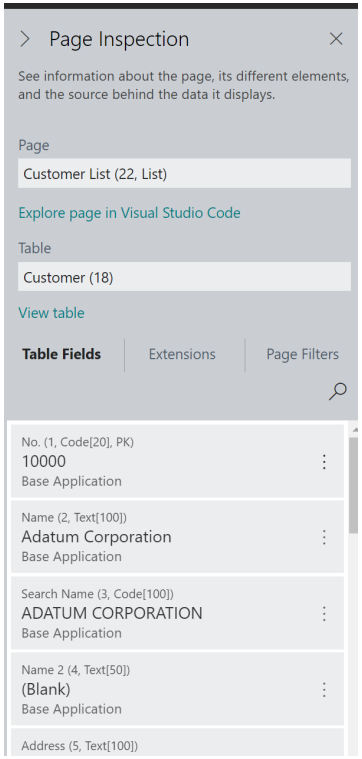
```
permissionset 50134 "Sales Person"
{
    Assignable = true;
    Caption = 'Sales Person';

    Permissions =
        tabledata Customer = RIMD,
        tabledata "Payment Terms" = RMD,
        tabledata Currency = RM,
        tabledata "Sales Header" = RIM,
        tabledata "Sales Line" = RIMD;
}
```



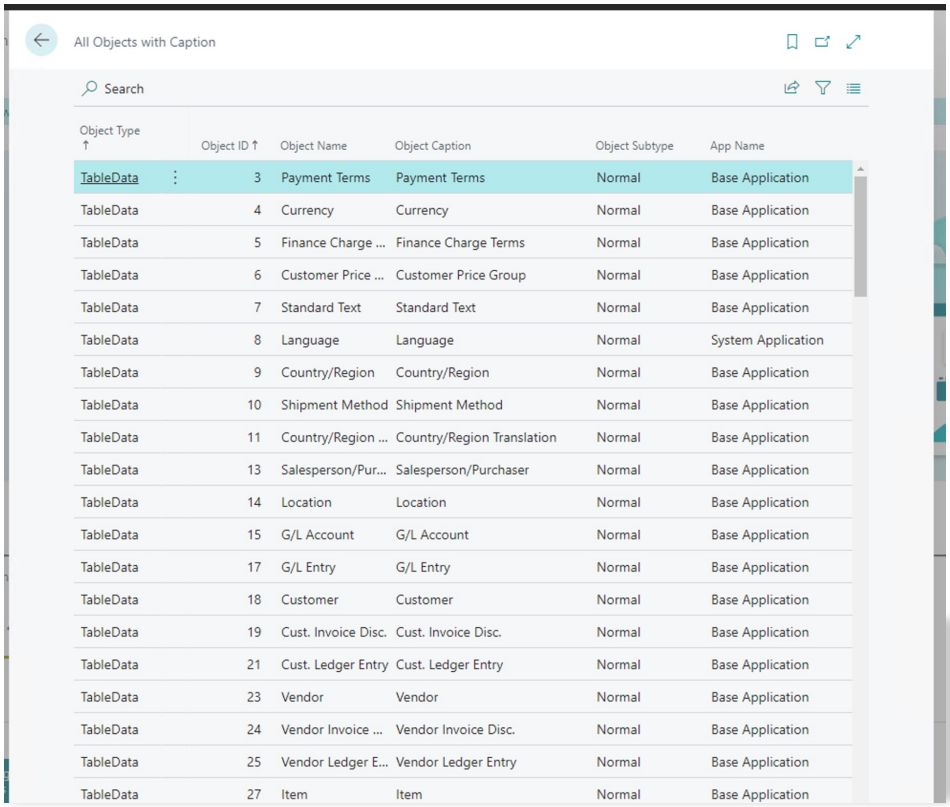
Page Inspector

- insight into the page design
- different page elements
- source behind the data

Ctrl + Alt + F1.

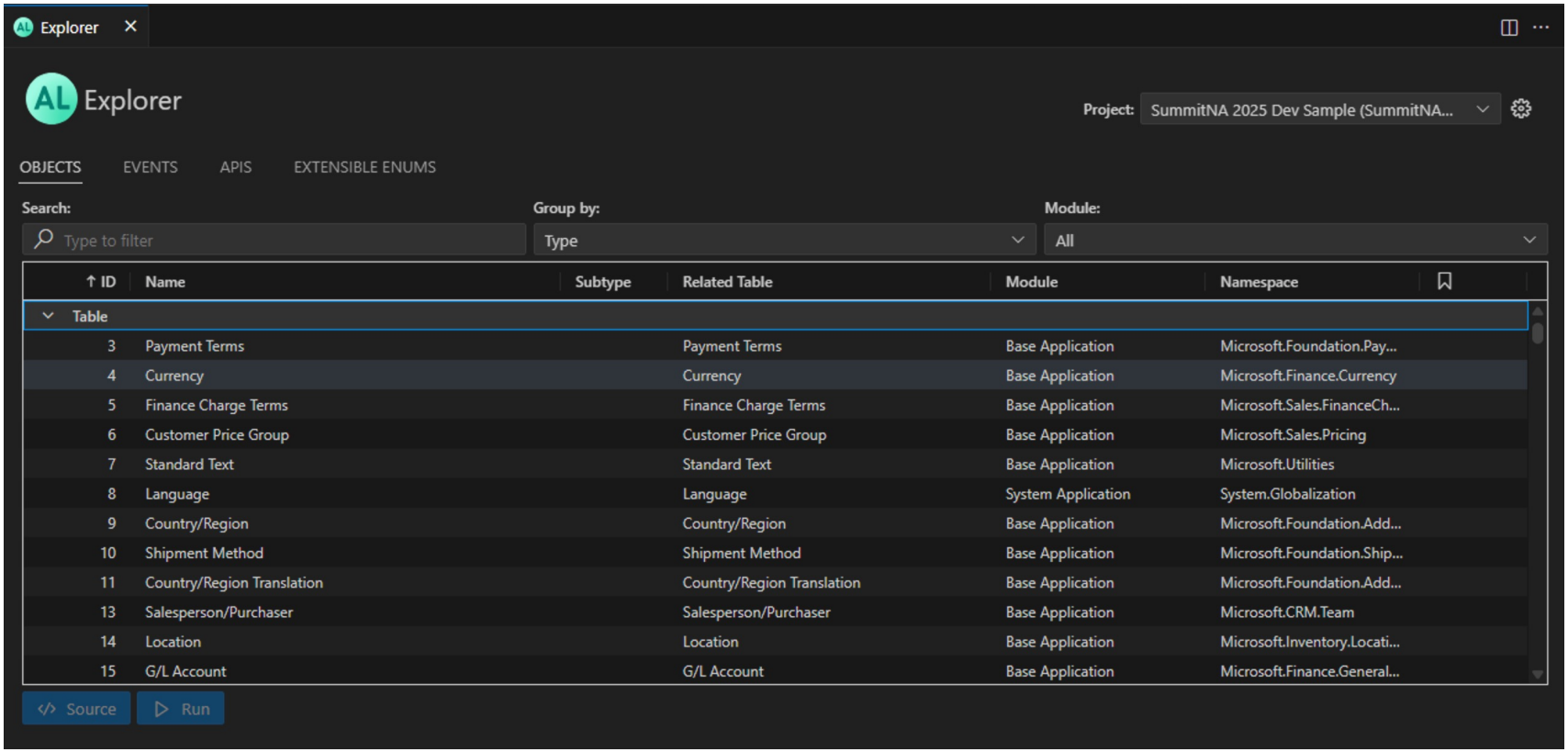


All Objects



Object Type	Object ID	Object Name	Object Caption	Object Subtype	App Name
TableData	3	Payment Terms	Payment Terms	Normal	Base Application
TableData	4	Currency	Currency	Normal	Base Application
TableData	5	Finance Charge ...	Finance Charge Terms	Normal	Base Application
TableData	6	Customer Price ...	Customer Price Group	Normal	Base Application
TableData	7	Standard Text	Standard Text	Normal	Base Application
TableData	8	Language	Language	Normal	System Application
TableData	9	Country/Region	Country/Region	Normal	Base Application
TableData	10	Shipment Method	Shipment Method	Normal	Base Application
TableData	11	Country/Region ...	Country/Region Translation	Normal	Base Application
TableData	13	Salesperson/Pur...	Salesperson/Purchaser	Normal	Base Application
TableData	14	Location	Location	Normal	Base Application
TableData	15	G/L Account	G/L Account	Normal	Base Application
TableData	17	G/L Entry	G/L Entry	Normal	Base Application
TableData	18	Customer	Customer	Normal	Base Application
TableData	19	Cust. Invoice Disc.	Cust. Invoice Disc.	Normal	Base Application
TableData	21	Cust. Ledger Entry	Cust. Ledger Entry	Normal	Base Application
TableData	23	Vendor	Vendor	Normal	Base Application
TableData	24	Vendor Invoice ...	Vendor Invoice Disc.	Normal	Base Application
TableData	25	Vendor Ledger E...	Vendor Ledger Entry	Normal	Base Application
TableData	27	Item	Item	Normal	Base Application

AL Explorer



Lunch ?!?

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Develop your first App

Develop your First App

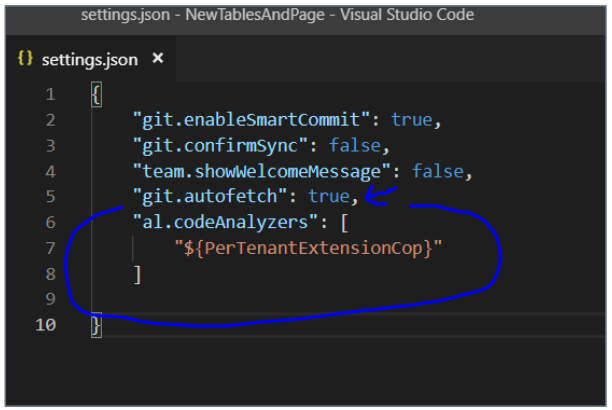
- AL Go!
- Download Symbols
- Publish
- Project Files
- AL Home
- AL Explorer
- Source Code Analyzers

Steps to Add PTE Cop

- Step 1: In VSCODE, **press Ctrl + Shift + P**
- Step 2: In the box the appears, type WORKSPACE SETTINGS or USER SETTINGS (as needed) after the > prompt
- Select the result that reads "Preferences: Open User Settings (JSON)" or "Preferences: Open Workspace Settings (JSON)"
  - Use User Settings to set default for all projects
  - Use Workspace Settings to define project by project
- Step 3: At the top right of your VSCODE window, you will see a {} icon (two curly brackets); click that. A window will open to the side
- Step 4: If there are any lines of code / settings that appear in the window, find the last line before the } line, add a comma, and insert a new line
- Step 5: Add the following:

```
"al.codeAnalyzers": [
    "${PerTenantExtensionCop}"
]
```

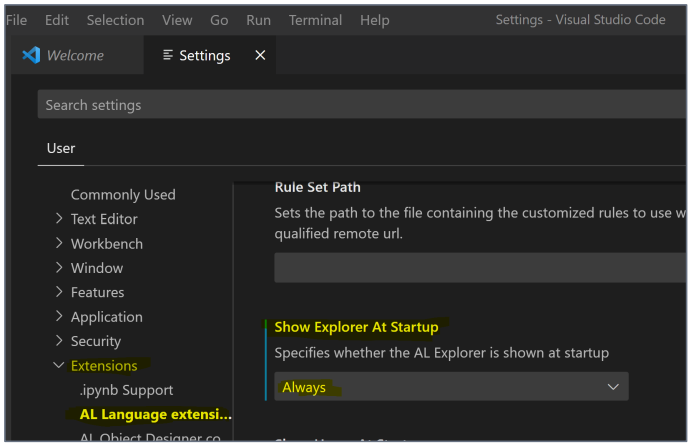
What mine looks like:



Steps to Enable AL Explorer

- Step 1: In VSCODE, **press Ctrl + Shift + P**
- Step 2: In the box the appears, type OPEN SETTINGS after the > prompt
- Select the result that reads "Preferences: Open User Settings" or "Preferences: Open Settings (UI)"
  - Use Open User Settings to set default for all projects
  - Use Open Settings (UI) to define by workspace
- Step 3: **Navigate to Extensions > AL Language extension**
- Step 4: In the right-hand pane, scroll down to **Show Explorer at Startup**
- Step 5: Set desired value: Always, Once (Default), Never

What mine looks like:



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Development

Repo Structure

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Development - Tables

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```
0 references
table id MyTable
{
    <property> = <value>;

    fields
    {
        0 references
        field(1; MyField; Integer)
        {
        <property> = <value>;
        }
    }

    keys
    {
        key(Key1; MyField)
        {
            Clustered = true;
        }
    }

    fieldgroups
    {
        fieldgroup(Name; Fields)
        { }
    }

    var
        myInt: Integer;

    trigger <OnInsert()> <OnModify()> <OnDelete()> <OnRename()>
    begin
    end;

    <local> procedure <method_name>(parameter list) <return_value_name> : <data_type>[<length>]
    begin
    end;
}
```

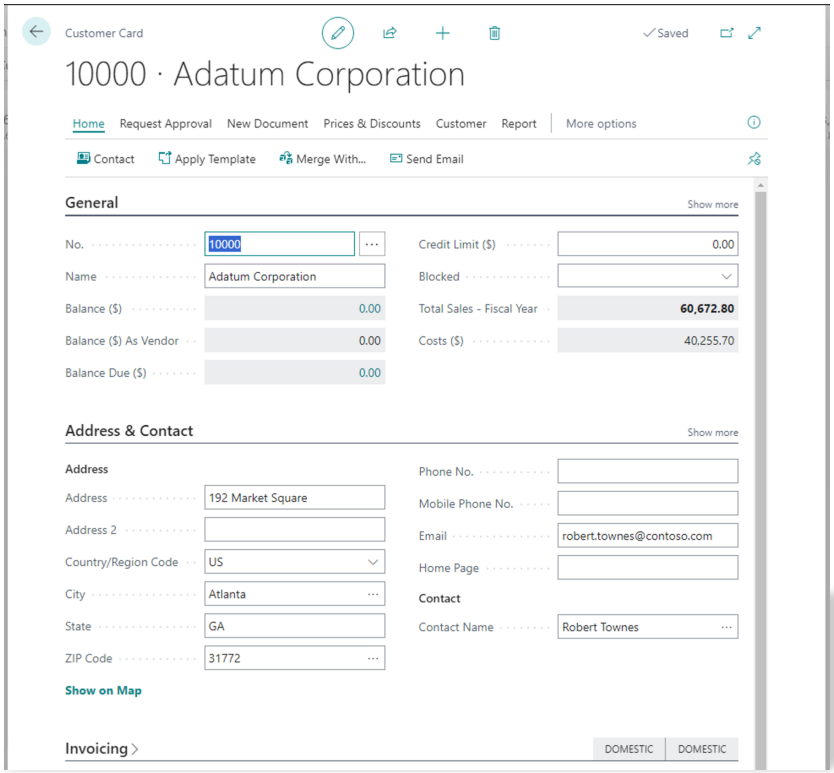
Development

- Assignment Statements
- Control Statements
- Repetitive Statements

```
procedure assignments()
var
    item: Record Item;
    itemNo: Code[20];
    price: Decimal;
    counter: Integer;
    i: Integer;
    color: Text;

begin
    ItemNo := '1000';
    Item.Get(ItemNo);
    Counter := 1;

    if counter > 1 then begin
        price := Item."Unit Price" * Counter;
    end else begin
        price := Item."Unit Price";
    end;

    for i := 1 to 10 do begin
        counter += 1;
    end;

    while counter > 0 do begin
        counter -= 1;
    end;

    repeat
        counter += 1;
    until counter >= 10;

    case color of
        'blue':
            Message('blue');
        'black':
            Message('black');
        'green':
            Message('green');
        else
            Message('no color');
    end;
end;
```

Development - Pages

```
page Id MyPage
{
    PageType = Card;
    ApplicationArea = All;
    UsageCategory = Administration;
    SourceTable = TableName;

    layout
    {
        0 references
        area(Content)
        {
            0 references
            group(GroupName)
            {
                0 references
                field(Name; NameSource)
                {
                    ApplicationArea = All;

                }
            }
        }
    }

    actions
    {
        0 references
        area(Processing)
        {
            0 references
            action(ActionName)
            {
                ApplicationArea = All;

                0 references
                trigger OnAction()
                begin

                end;
            }
        }
    }

    var
        0 references
        myInt: Integer;
}
```



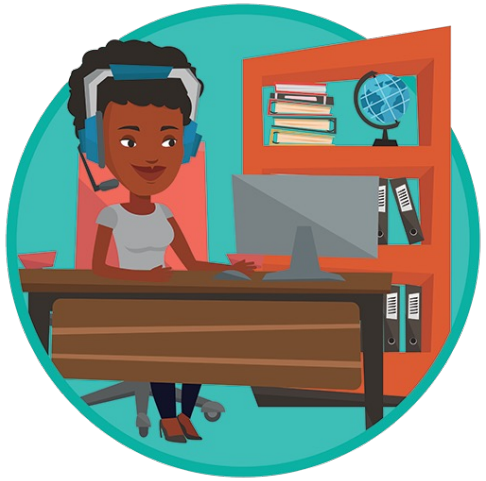
Development - Pages

Page type	Examples of use	Main data display
RoleCenter	Overview of business performance and the start page for a specific user profile.	Defined by the embedded parts.
Card	Master, reference, and set up data management. Card page example	Single entity
Document	Transaction and other document management.	Single entity
ListPlus	Statistics, details, and related data management.	Single entity
List	Entity overviews and navigation, and inline editing of simple entities. List page example	Collection of entities/entries
Worksheet	Line-based data entry tasks (such as journals) and inquiries.	Collection of entities
CardPart	A page that is embedded in another page, such as in a FactBox.	Single entity
ListPart	A page that is embedded in another page, such as in a FactBox.	Collection of entities/entries

Exercise 1

The Contoso Training and Events (CTE) company would like the ability to capture Instructor profile. They need to be able to capture detail information regarding the instructor. CTE would like to capture an instructor ID, Name, Type, and contact details. They would also like to be able to list Training and Events Sessions that contains the session ID, Name or description, capacity, Type, and if possible, start and end date.

Then create a location for where those sessions will be held.



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Development

- Table Relations - Sets up a lookup into another table

```
TableRelation = <TableName>[.<FieldName>] [WHERE(<TableFilters>)] |
[IF(<Conditions>) <TableName>[.<FieldName>] [WHERE(<TableFilters>)] ELSE <TableRelation>]
<Conditions> ::= <TableFilters>
<TableFilters>::= <TableFilter> {,<TableFilter>}
<TableFilter>::= <DestinationFieldName>=CONST(<FieldConst>) | FIELD(<SourceFieldName>)
```

```
field(5; "Instructor No."; Code[20])
{
    Caption = 'Instructor No.';
    TableRelation = "DEV Instructor"."No.";
}
```

Development

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- Enumerations – set of named constants

```
enum 50101 "DEV Program Level"
{
    Extensible = true;

    0 references
    value(0; "Beginner")
    {
        Caption = 'Beginner';
    }
    0 references
    value(1; Intermediate)
    {
        Caption = 'Intermediate';
    }
    0 references
    value(2; Advanced)
    {
        Caption = 'Advanced';
    }
}
```

Development

- PageParts

```
part(SalesLines; "DEV Registration Subform")
{
    ApplicationArea = Basic, Suite;

    SubPageLink = "Registration No." = field("No.");
    UpdatePropagation = Both;
}
```

- PageActions

```
action(Instructors)
{
    ApplicationArea = Basic, Suite;
    Caption = 'Instructors';
    Image = Resource;
    RunObject = page "DEV Session Instructors";
    RunPageLink = "Session No." = field("No.");
    ToolTip = 'View or edit the instructors for this session.';

    0 references
    trigger OnAction()
    begin
        InstructorList.Run();
    end;
}
```

Exercise 2

The Contoso Training and Events (CTE) company would like to extend the functionality beyond just managing the instructor profiles into a page that shows what sessions the instructors are assigned to. Contoso would like to be able to capture registrations that contains the session and Contact/Attendees. Create a page and subpage.

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Extending Business Central

Extending Business Central

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- Table Extension Object
  - allows you to add additional fields or to change some properties on a table
  - define keys for fields added in the table extension
  - define keys for fields in base table

- Page Extension Object
  - adds or overrides the functionality
  - Use keywords to place actions and controls (addfirst, addlast, add after)

Extending Business Central

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- FlowFields - display the result of the calculation described in the CalcFormula Property.
  - Sum — The sum of a specified set in a column in a table.
  - Average — The average value of a specified set in a column in a table.
  - Exist — Indicates whether any records exist in a specified set in a table.
  - Count — The number of records in a specified set in a table.
  - Min — The minimum value in a column in a specified set in a table.
  - Max — The maximum value in a column in a specified set in a table.
  - Lookup — Looks up a value in a column in another table.

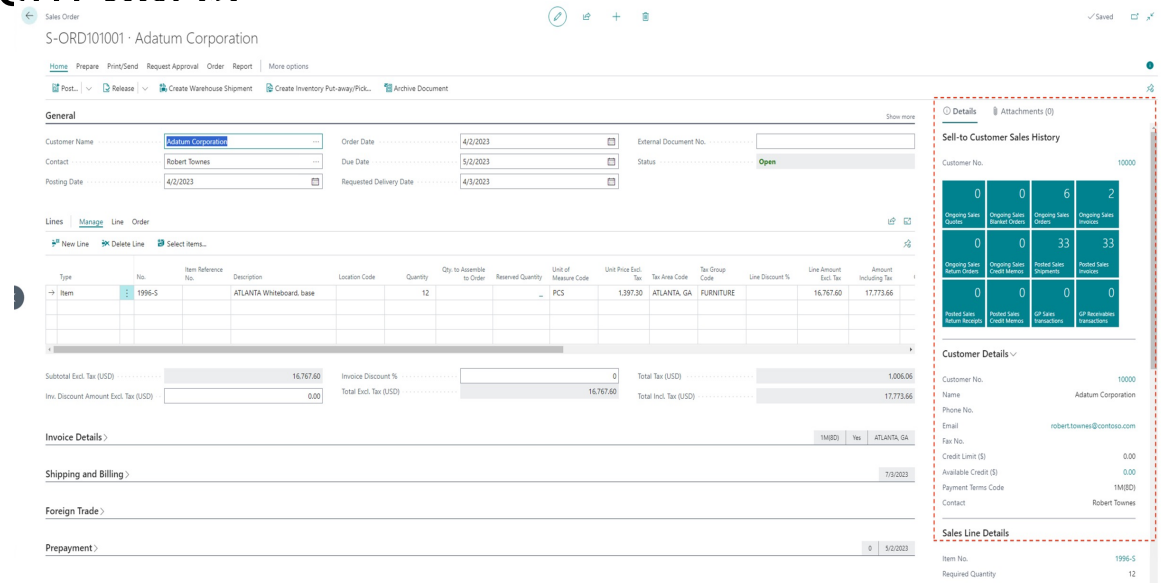
```
field(80; "No. Sessions"; Integer)
{
    Caption = 'No. Sessions';
    Editable = false;
    FieldClass = FlowField;
    CalcFormula = count("DEV Session Instructor" where("Instructor No." = field("No.")));
}
```

Extending Business Central

- FactBoxes - right-most side of a page for displaying content – other pages, charts, system parts

```
page 50100 "Simple Customercard Page"
{
    PageType = Card;

    layout
    {
        area(FactBoxes)
        {
            part(MyPart; "Acc. Sched. KPI Web Srv. Lines")
            {
                ApplicationArea = All;
                SubPageView = SORTING ("Acc. Schedule Name");
            }
            systempart(Links; Links)
            {
                ApplicationArea = All;
            }
            systempart(Notes; Notes)
            {
                ApplicationArea = All;
            }
        }
```



Exercise 3

The Contoso Training and Events (CTE) company would like the ability to see the instructor information quickly from the registration list without having to drill into the record itself. Create a factbox that shows additional detail of the instructor. It must list the Instructor ID, Name, Type, and Job Title.

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Day 1 Recap

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- Set up Development Environment
- AL Language
- Creating an App
- Extending Business Central

Thank You

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The largest Microsoft Business Applications user conference on the planet.

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AL Bootcamp: From Zero to Hero in Two Days

Day 2

A Dynamics-First, 'For User, By User' Event.

Day 1 Recap

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- Set up Development Environment
- AL Language
- Creating an App
- Extending Business Central

Agenda

- Day 1

- Day 2
- Working with multiple Projects
- Reports and Report Extensions
- Codeunits
- Functions
- Debugging in AL

Working with Multiple Projects

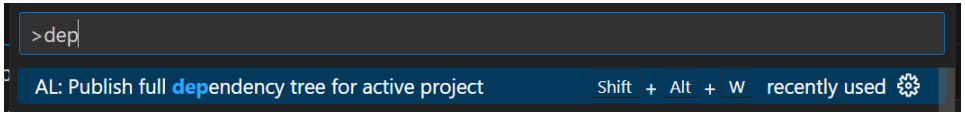
Working with Multiple Projects

- Workspaces
  - A Visual Studio Code "workspace" is the collection of one or more folders that are opened in a VS Code window (instance)
  - <name>.code-workspace

Working with Multiple Projects

- Dependencies
  - Packages that the extension is dependent upon

```
"dependencies": [
    {
        "id": "eeb5ab52-dbde-4bac-b267-c44446a1b7ef",
        "name": "SummitNA 2023 Dev Sample",
        "publisher": "SummitNA 2023",
        "version": "22.5.0.0"
    }
],
```



Reports

Report Architecture

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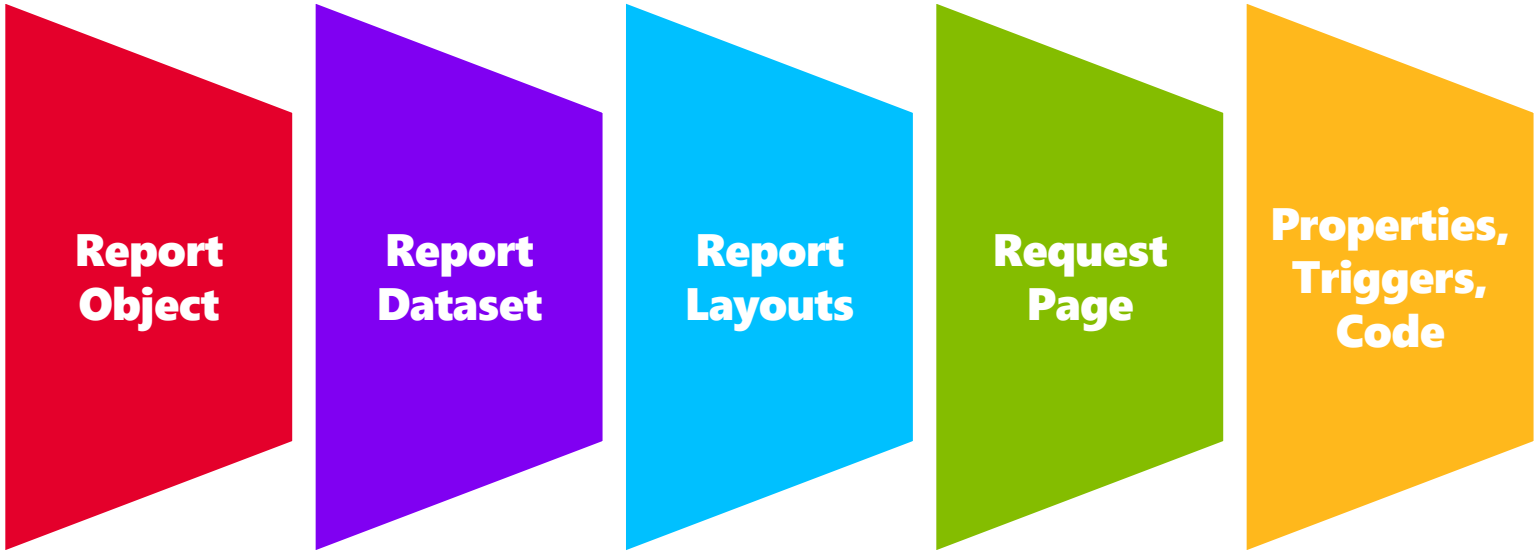

Report Layouts

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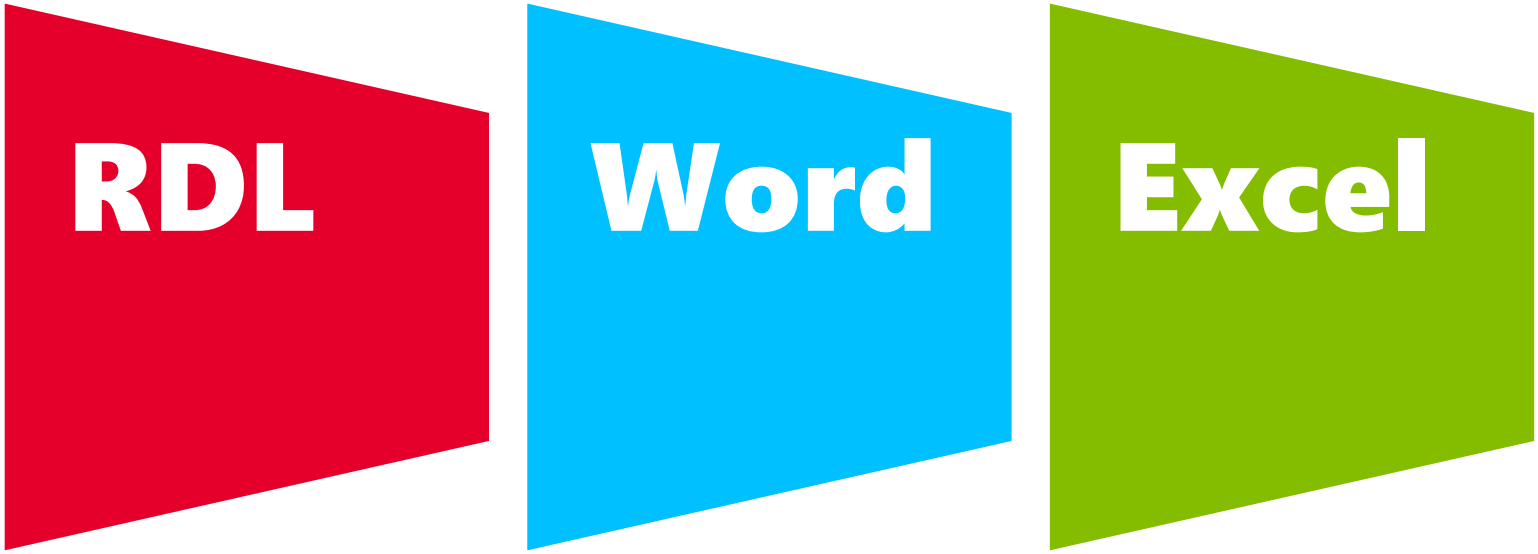

Improvements to Word Layouts

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- https://aka.ms/bcReporting
- https://aka.ms/BCYouTube
  - https://www.youtube.com/watch?v=V8CSor5qBRE
  - https://www.youtube.com/watch?v=hn92AI_x-s8

Extending Base Report

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You can:

- Add to Request Pages
- Add new Data Items
- Implement Triggers
- Add Columns to existing data items in the report dataset
- Add new Report layout to reflect the new fields

Multiple Report Layouts

- treportext
- Rendering
- Layout in sec
- Caption
- Summary
- LayoutFile


```
nds "Employee - List"

own in Pivot table in Excel';
ot.xlsx';

rted by last name in Excel';
stName.xlsx';
        }

        layout(LayoutWord)
        {
            Type = Word;
            Caption = 'WordList';
            Summary = 'Employee list sorted by last name in Word';
            LayoutFile = 'EmpSortedByLastName.docx';
        }
    }
}
```

Processing Reports

- Designed primarily to perform data processing tasks
- Handle backend operations efficiently
- Request Page for Filters

Exercise 4

The Contoso Training and Events (CTE) company would now like to have a few reports built.

- Create a report that list the sessions.
- Extend an existing Report
- Use Report Layout of your choice on one
- Utilize the Multiple Report Layouts with Rendering

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Codeunits

Codeunits

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- Modularized container for AL Code that contains business logic.

```
codeunit 50101 "DEV Rental Managment"
{
    Access = Public;
    Subtype = Normal;
    TableNo = "DEV Book Rental Header";

    0 references
    trigger OnRun()
    begin
        CheckRental(Rec);
    end;
```

Codeunits - Procedures

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- group of statements that perform an operation or task
- Scope determines if the procedures can be called, from the same object in which they are declared or from other parts of the application

```
    //[Attributes(arguments list)]
    //local procedure <method_name>(parameter list) <return_value_name> : <data_type>[<length>]
```

Lunch ?!?

Exercise 5

The Contoso Training and Events (CTE) company would now like to

Create a new extension that is adds two new fields to the instructor table and displays those fields on the instructor card

Create a codeunit that can accept the Registration Table as a source that will check for specific conditions of your choice on the registration

Create a library codeunit with a set of procedures for performing mathematical functions on sets of numbers.

Create a page that accepts user input and processes the data by using the library procedures

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GitHub Copilot

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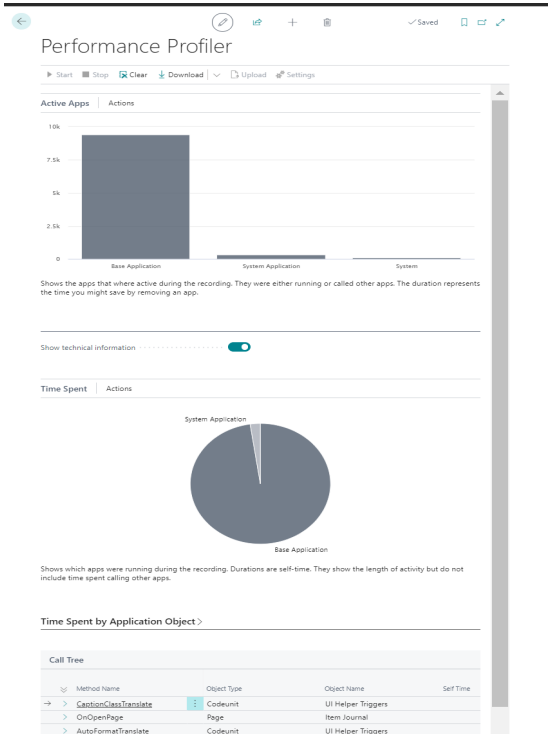
Debugging in AL

- Breakpoints
- Break on Errors
- Break on Record Change
- Attach and Debug Next
- Watches

```
{
    "name": "Microsoft cloud sandbox",
    "request": "attach",
    "type": "al",
    "environmentType": "Sandbox",
    "environmentName": "sandbox",
    "tenant": "117d2cc0-dbb2-4e85-b82d-96d851551dff",
    "breakOnError": "All",
    "breakOnRecordWrite": "ExcludeTemporary",
    "userId": "brad",
    "enableLongRunningSqlStatements": true,
    "enableSqlInformationDebugger": true
},
```

Performance Profiler

- In-client Performance Profiler, to record a snapshot of the process
- Profiler monitors all of the apps that are involved in the process
- Identify where there may be a holdup



Vibe Coding

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Day 2 Recap

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- Working with multiple Projects
- Codeunits
- Functions
- Debugging in AL

- It doesn't end here!

GitHub Repos

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SCAN ME

Full AL Bootcamp Solution:
https://bit.ly/albootcampsummit2024

SCAN ME

Additional Resources (Processing Reports, Report Extensions, Page Actions):
https://bit.ly/ajsalgithubrepo

Suggested Resources

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Thank you for Attending

Brad Prendergast

AJ Ansari

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COMMUNITY SUMMIT

AL Bootcamp: Extending Extension Development for Business Central

Speakers

Brad Prendergast

AJ Ansari

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Brad Prendergast

- 20+ years in Microsoft Dynamics, specializing in Business Central
- Unique dual perspective as a partner & end user
- Member of Summit Programming Committee & Board of Advisors
- Co-host of the popular Dynamics Corner podcast
- Passionate about bringing people together in the Dynamics space

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AJ Ansari

- Community Summit Legend and BCUG All-Star
- 17 years in Microsoft Dynamics; background as certified developer, consultant and practice leader
- Member of Summit Programming Committee & Board of Advisors

COO & Partner

aja@dswius.com

bit.ly/AJAnsari

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Know Before You Go

- Restrooms are where?
- Nearest Emergency Exit is where?

Session Objectives

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- Utilize events to implement custom business logic and extend Business Central functionality
- Implement robust error-handling strategies to improve extension reliability and user experience.
- Develop and expose APIs to enable integration with external systems and enhance interoperability.
- AI Toolkit – overview touchpoint – mention sessions (Summit and Outside)

What is an Event

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- Significant occurrence or change in state within an application that can trigger a response or action

How Do Events Work

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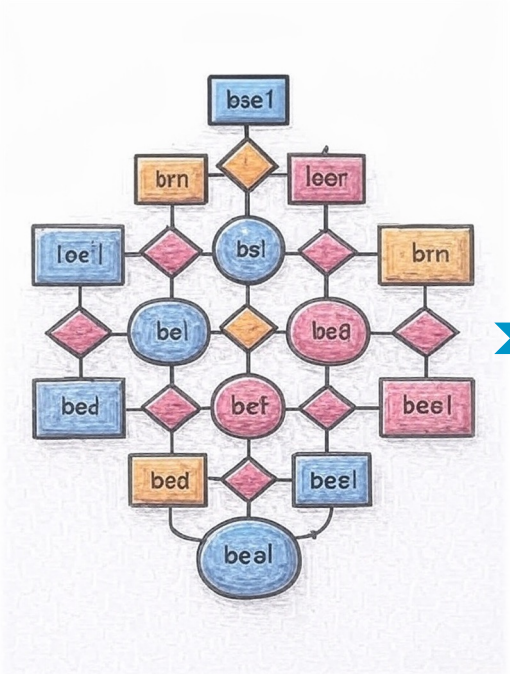

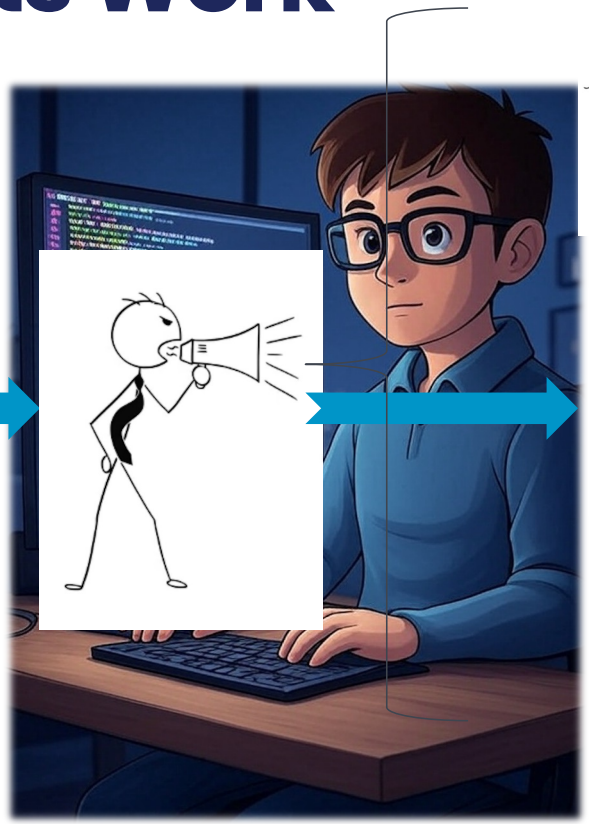

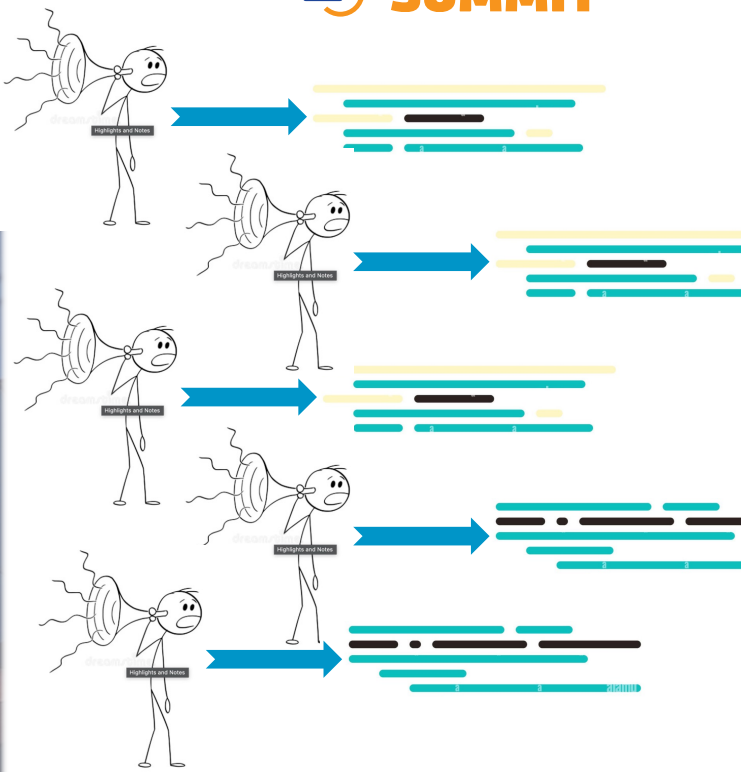

Types of Events

- Business Event
  - Defined that structure is not going to change
  - Facilitate communication between BC and external systems
  - Do not have access to global variables

```
[BusinessEvent(IncludeSender: Boolean [, Isolated: Boolean])]
```

```
[ExternalBusinessEvent(Name: Text, DisplayName: Text, Description: Text, Category: enum [, Version: Text])]
```

Types of Events

- Business Event

```
[ExternalBusinessEvent('PurchaseReceiptPosted', 'Purchase receipt posted',
        'This business event is triggered when a purchase order is received.', EventCategory::"My Purchase Events")]
1 reference
local procedure MyBusinessEventPurchaseReceivedPosted(PurchaseInvoiceId: Guid; Url: Text[250]; Base64Text: Text[250])
begin
end;
```

Microsoft Power Automate

Types of Events

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- Integration Events
  - Extend Business Central at specific points in application logic
  - Base Application
  - ISV Solutions
  - Your own solutions

```
[IntegrationEvent(IncludeSender: Boolean, GlobalVarAccess: Boolean [, Isolated: Boolean])]
```

Types of Events

- In
  -

```
SalesHeader := SalesHeader2;
OnCodeOnBeforeFillTempLines(SalesHeader, CalledBy);
FillTempLines(SalesHeader, TempSalesLineGlobal);

// Check that the invoice amount is zero or greater
OnRunOnBeforeCheckTotalInvoiceAmount(SalesHeader);
```

```
[IntegrationEvent(false, false)]
local procedure OnRunOnBeforeCheckTotalInvoiceAmount(var SalesHeader: Record "Sales Header")
begin
```

```
[IntegrationEvent(false, false)]
local procedure OnRunOnBeforeCheckAndUpdate(var SalesHeader: Record "Sales Header")
begin
end;
```

```
OnRunOnBeforeFinalizePosting(
```

```
[IntegrationEvent(false, false)]
local procedure OnRunOnBeforeFinalizePosting(var SalesHeader: Record "Sales Header"; var SalesShipmentHeader: Record "Sales Shipment
begin
end;
```

Types of Events

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- Internal Event
  - Most restrictive in scope
  - Can only be subscribed within same module

Types of Events

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- Global Events
  - Global events are predefined system events that are automatically raised by various base application codeunits.

Codeunit ID	Codeunit Name	Event
9170	Conf./Personalization Mgt.	OnRoleCenterOpen
		OnAfterLogInEnd
		OnBeforeLogInStart
		OnBeforeCompanyOpen
		OnAfterCompanyOpen
		OnBeforeCompanyClose
		OnAfterCompanyClose
42	TextManagement	OnBeforeMakeTextFilter
		OnAfterMakeDateTimeFilter
		OnAfterMakeDateFilter
		OnAfterMakeTextFilter
		OnAfterMakeTimeFilter
49	GlobalTriggerManagement	OnAfterGetGlobalTableTriggerMask
		OnAfterOnGlobalInsert
		OnAfterOnGlobalModify
		OnAfterOnGlobalDelete
		OnAfterOnGlobalRename
		OnAfterGetDatabaseTableTriggerSetup
		OnAfterOnDatabaseInsert
		OnAfterOnDatabaseModify
		OnAfterOnDatabaseDelete
		OnAfterOnDatabaseRename
		OnBeforeOnDatabaseInsert
		OnBeforeOnDatabaseModify
		OnBeforeOnDatabaseDelete
		OnBeforeOnDatabaseRename

Event Recorder

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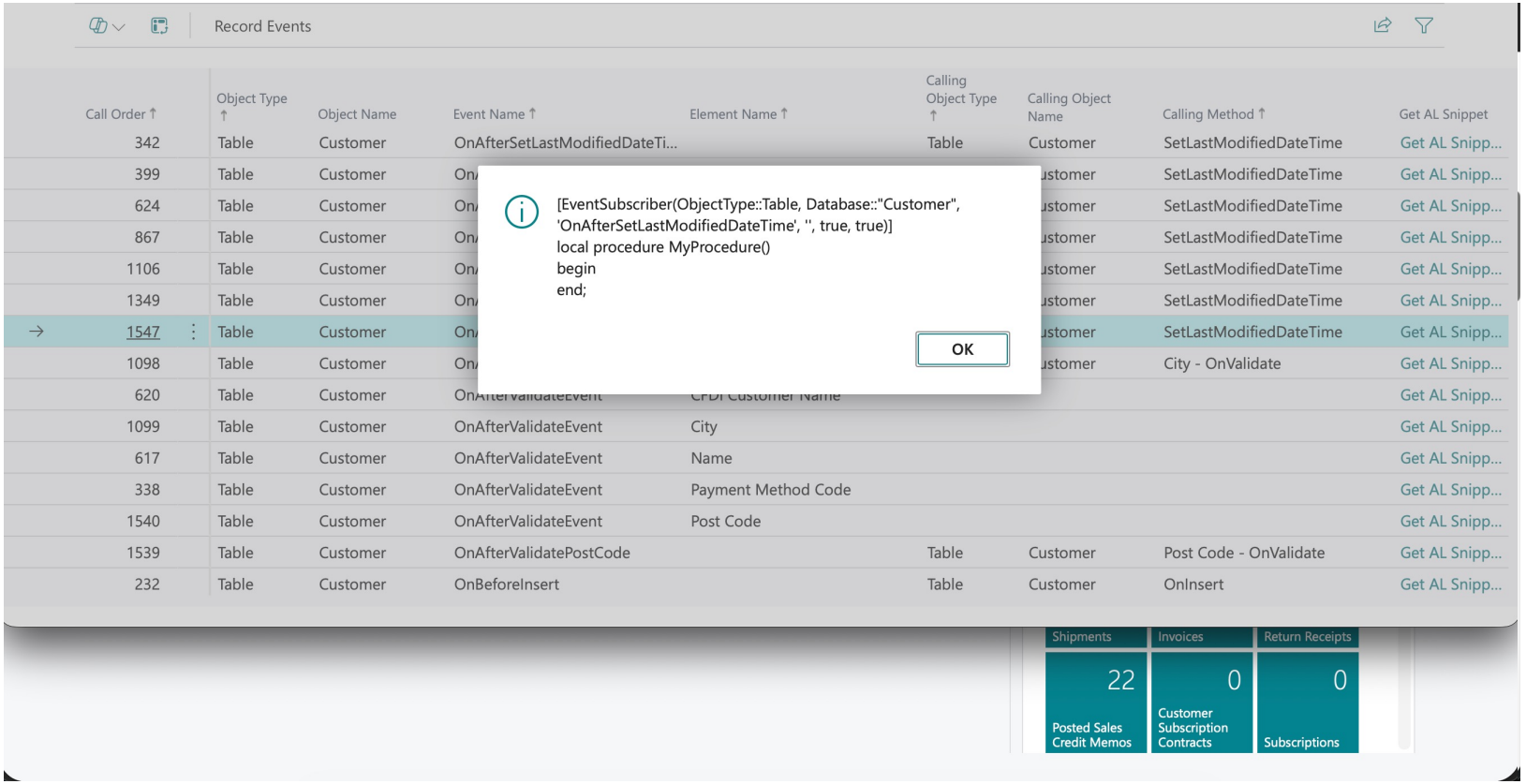
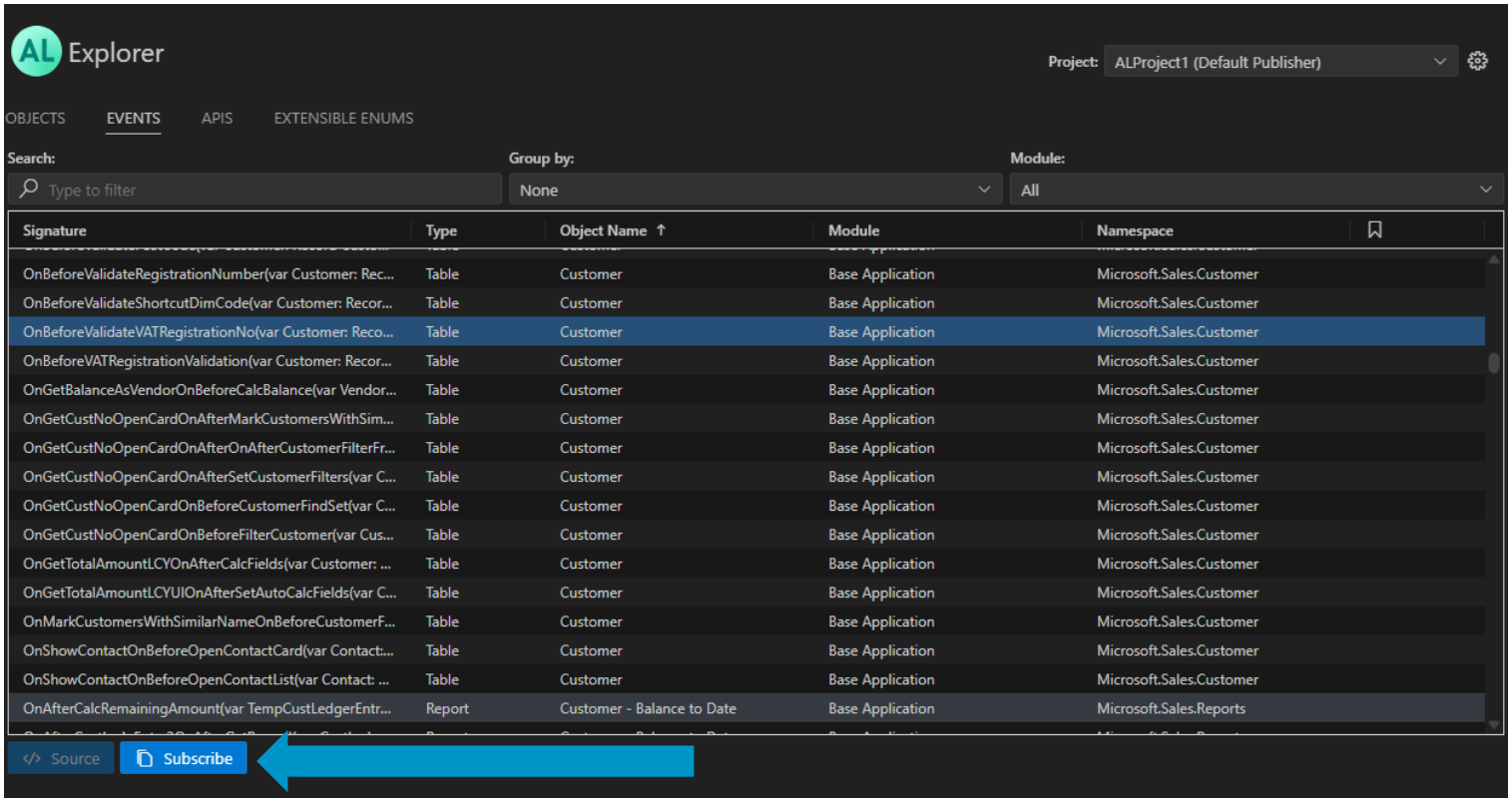
- Built in tool designed to help discover events raised during a process
- Includes name, type, and where it is published
- AL Snippet Generation

Event Recorder



Event Subscriptions



Event Subscriptions

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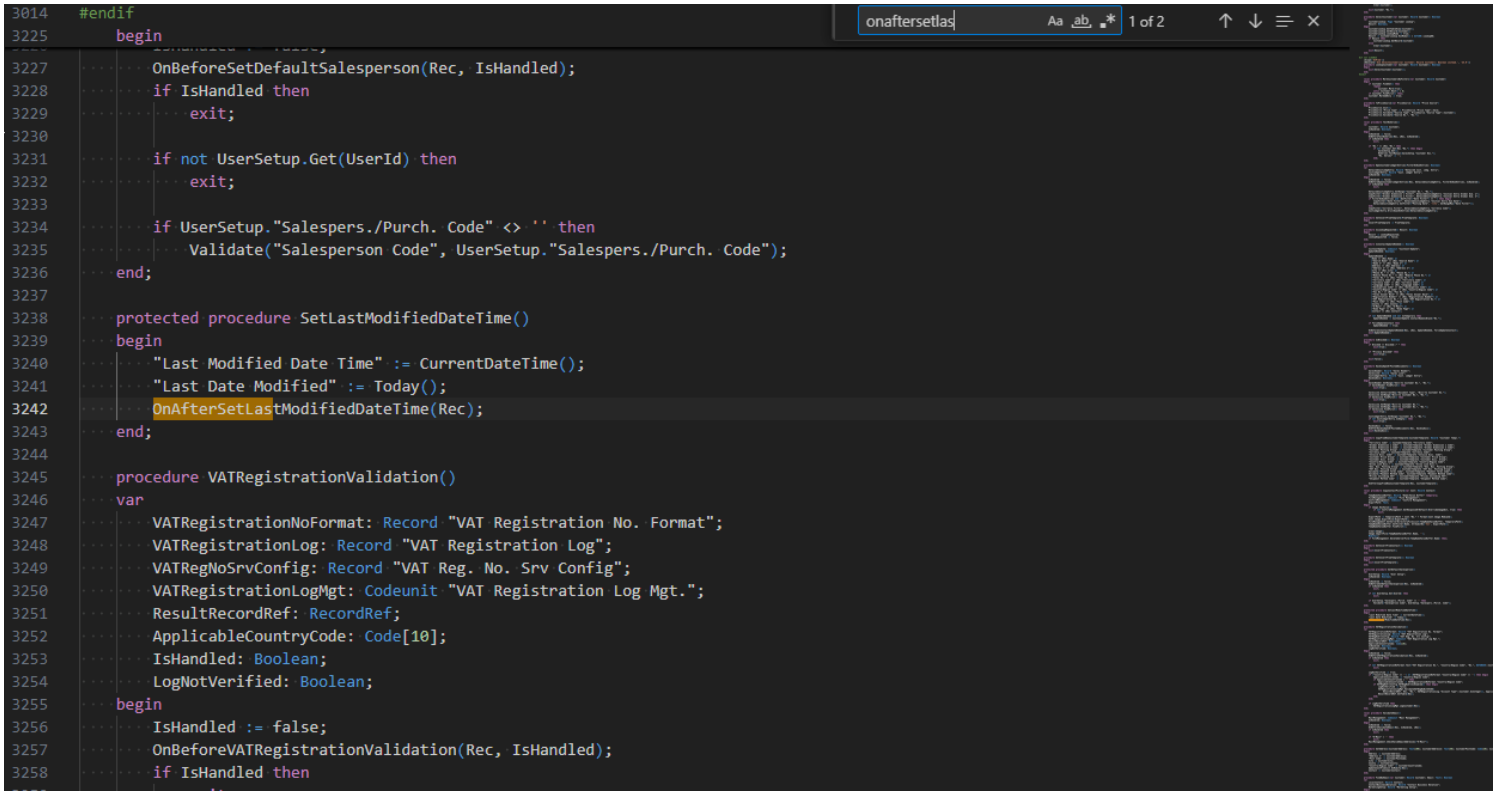


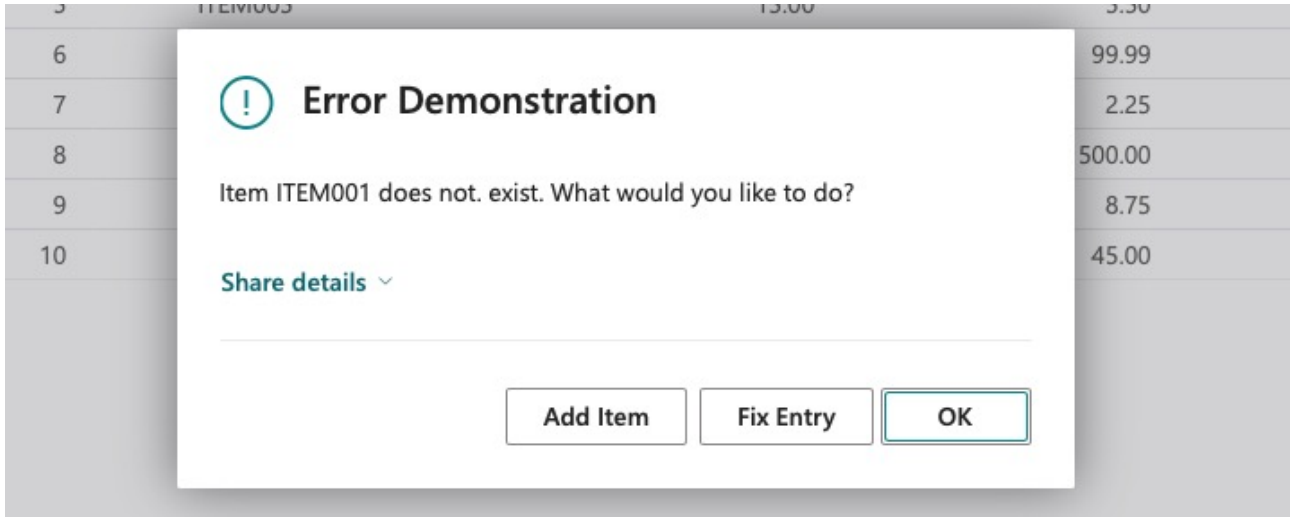

```
3014  #endif
3225      begin
3227          OnBeforeSetDefaultSalesperson(Rec, IsHandled);
3228          if IsHandled then
3229              exit;
3230
3231          if not UserSetup.Get(UserId) then
3232              exit;
3233
3234          if UserSetup."Salespers./Purch. Code" <> '' then
3235              Validate("Salesperson Code", UserSetup."Salespers./Purch. Code");
3236      end;
3237
3238      protected procedure SetLastModifiedDateTime()
3239      begin
3240          "Last Modified Date Time" := CurrentDateTime();
3241          "Last Date Modified" := Today();
3242          OnAfterSetLastModifiedDateTime(Rec);
3243      end;
3244
3245      procedure VATRegistrationValidation()
3246      var
3247          VATRegistrationNoFormat: Record "VAT Registration No. Format";
3248          VATRegistrationLog: Record "VAT Registration Log";
3249          VATRegNoSrvConfig: Record "VAT Reg. No. Srv Config";
3250          VATRegistrationLogMgt: Codeunit "VAT Registration Log Mgt.";
3251          ResultRecordRef: RecordRef;
3252          ApplicableCountryCode: Code[10];
3253          IsHandled: Boolean;
3254          LogNotVerified: Boolean;
3255      begin
3256          IsHandled := false;
3257          OnBeforeVATRegistrationValidation(Rec, IsHandled);
3258          if IsHandled then
```

Event Exercise

You are developing an extension for a fictional company, "AdventureWorks Cycles," that wants to extend its sales order process in Business Central. Without using the Change Log or the Monitor Fields features of Business Central, the company would like to monitor changes made to a Sales Order or Sales Invoice. The company requires a custom log to track the date, time, user, and field information for modifications made to the shipping and pricing information of the order.

The company also requires custom logging to track the duration when posting a sales order. They would like to track the start and end times of the posting process, as well as the time it takes to process the lines.

Error Handling



Error Handling

COMMUNITY SUMMIT

- ErrorInfo Data Type
  - Provides a structure for grouping information about an error.

Error Handling Exercise

Scenario:

You are developing an extension for a fictional company, "Cronus Retail," that manages a customer loyalty program. The company wants a custom page called "Loyalty Card Setup" where users can enter details for a loyalty card, including a customer number, loyalty points, and a card activation date. The system must validate the input and provide detailed error messages using the ErrorInfo data type if the input is invalid.

If any validation fails, the system should display a detailed error message with a custom title, description, and a link to the relevant record or page for correction.

Error Exercise

Create a Table Extension:
Extend the Customer table to include a new field: Loyalty Card No. (Code[20]).
Ensure the field is linked to a new table called Loyalty Card Setup.

Create a New Table:
Create a table called Loyalty Card Setup with the following fields:
Card No. (Code[20], Primary Key)
Customer No. (Code[20], linked to the Customer table)
Loyalty Points (Integer)
Activation Date (Date)

Create a Page for Data Entry:
Create a new card page called Loyalty Card Setup Card for the Loyalty Card Setup table.
Add fields for Card No., Customer No., Loyalty Points, and Activation Date.
Ensure the page allows users to input and save data.

Error Exercise

Implement Error Handling with ErrorInfo:
The Customer No. exists in the Customer table.
The Loyalty Points is positive and does not exceed 10,000.
The Activation Date is not in the past (relative to the system date, e.g., WorkDate()).

Use the ErrorInfo data type to create detailed error messages for each validation failure. For example:

- If the customer number is invalid, provide a message like "Invalid Customer No." with a link to the Customer List page.
- If loyalty points exceed 10,000, include a custom title like "Loyalty Points Error" and a detailed message explaining the limit.
- If the activation date is in the past, provide a message with a call to action to correct the date.
- Use ErrorInfo properties such as Title, Message, RecordId, TableId, and AddAction to enhance the error details.

Working with APIs

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Working with APIs

Bound unbound actions – AJ has sample
Sample API page - screen

Working with APIs

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- What are APIs?
  - Application Programming Interface
  - allows two applications to talk to each other
  - Standardized

Working with APIs

- API Pages
  - API Page types create versioned, webhook-supported, OData v4 enabled REST web services
  - page cannot be displayed in the user interface
- Naming
  - camelCase for naming attributes, tables, as well as APIPublisher, APIGroup, EntityName, and EntitySetName
  - Alphanumeric characters
  - APIVersion follows the pattern vX.Y

Working with APIs

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```
page 50200 "DEV Widget Entity"
{

    APIGroup = 'Sample';
    APIPublisher = 'SummitNA';
    APIVersion = 'v2.0';
    Caption = 'widgetEntity', Locked = true;
    ChangeTrackingAllowed = true;
    DelayedInsert = true;
    EntityName = 'widget';
    EntitySetName = 'widgets';
    ODataKeyFields = SystemId;
    PageType = API;
    SourceTable = "DEV Widget";

    layout
    {
        0 references
        area(content)
        {
            0 references
            repeater(General)
            {
                0 references
                field(id; Rec.SystemId)
                {
                    ApplicationArea = All;
                    Caption = 'Id', Locked = true;
                    Editable = false;
                }
                0 references
                field(no; Rec."No.")
                {
                    ApplicationArea = All;
                    caption = 'no', Locked = true;
                }
                0 references
                field(description; Rec.Description)
                {
                    ApplicationArea = All;
                    caption = 'description', Locked = true;
                }
                0 references
```

PowerPlatform

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- Consume API Pages

API Exercise

The Contoso Training and Events (CTE) company would like to provide an endpoint for a 3rd-Party, Vendor, or Website to consume registrations, sessions available, or Instructor information.

- You should create an API Page for information to be consumed externally.

Vibe Coding

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