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TECH
DAYS
2017**

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POWERAPPS, COMMON DATA SERVICES AND COMMON DATA MODEL

MICHAEL NIELSEN
FORNAV.COM

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NAV SKILLS

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THE INTERNET OF THINGS

Michael

NAV Since 1987

ForNAV

The guy who invented C/AL



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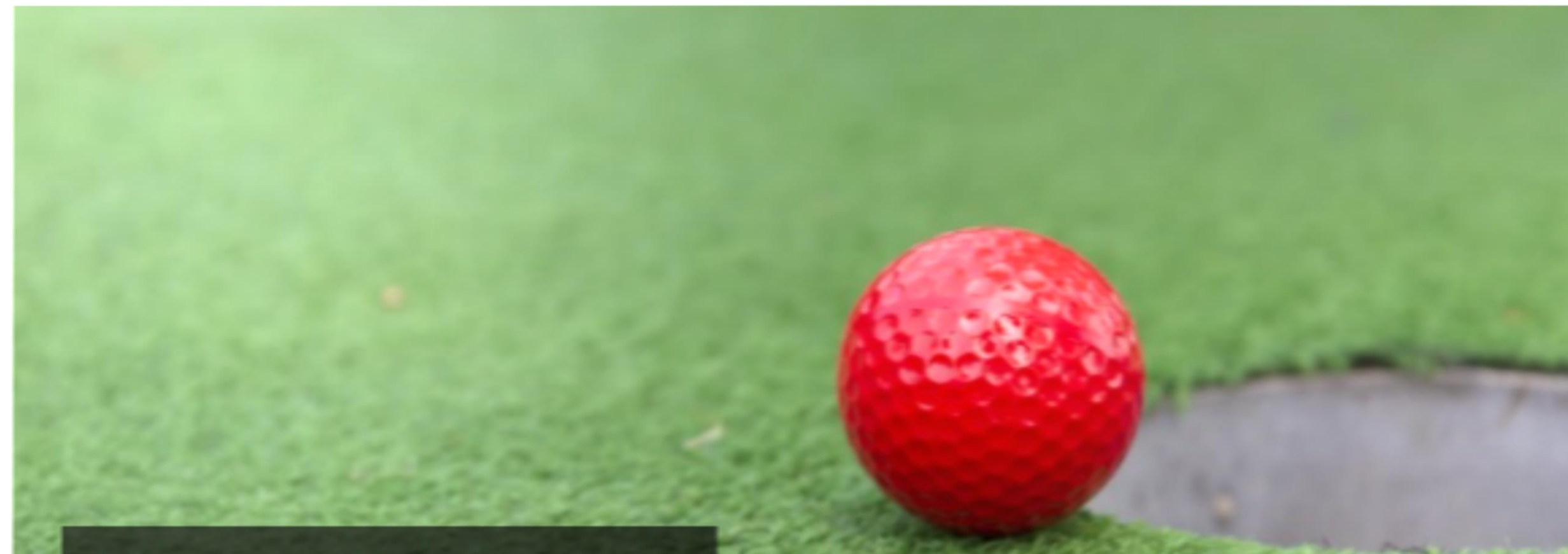
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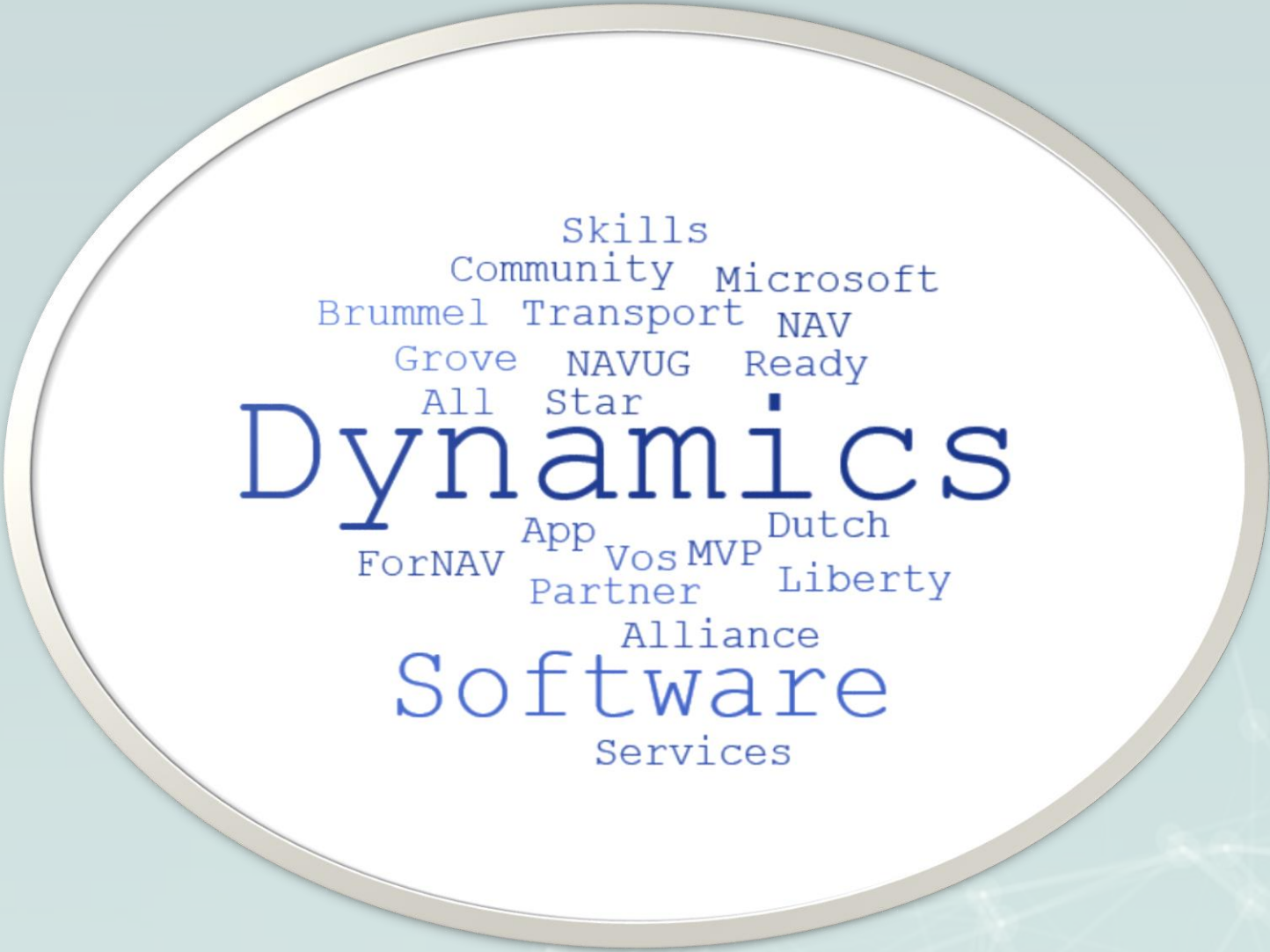


Mark

NAV Since 1997

Freelance

Clean Code Freak



Agenda

1 Introduction, building blocks & concepts

2 PowerApps

3 Common Data Model & Services SDK

4 Examples of Odata 4 in C# & AL

? Q & A

Technology
Understanding

C/Side

Demo Database NAV (10-0) - Microsoft Dynamics NAV Development Environment

File Edit View Tools Window Help

Object Designer

Table

Page

Report

Codeunit

Query

XMLport

MenuSuite

All

Type	ID	Name	Modified	Version List	Date	Time	Compiled	Locked	Locked By
	110	Customer Posting Groups		NAVW 110.0	08-07-17	12:00:00	✓		
	111	Vendor Posting Groups		NAVW 110.0	08-07-17	12:00:00	✓		
	112	Inventory Posting Groups		NAVW 110.0	08-07-17	12:00:00	✓		

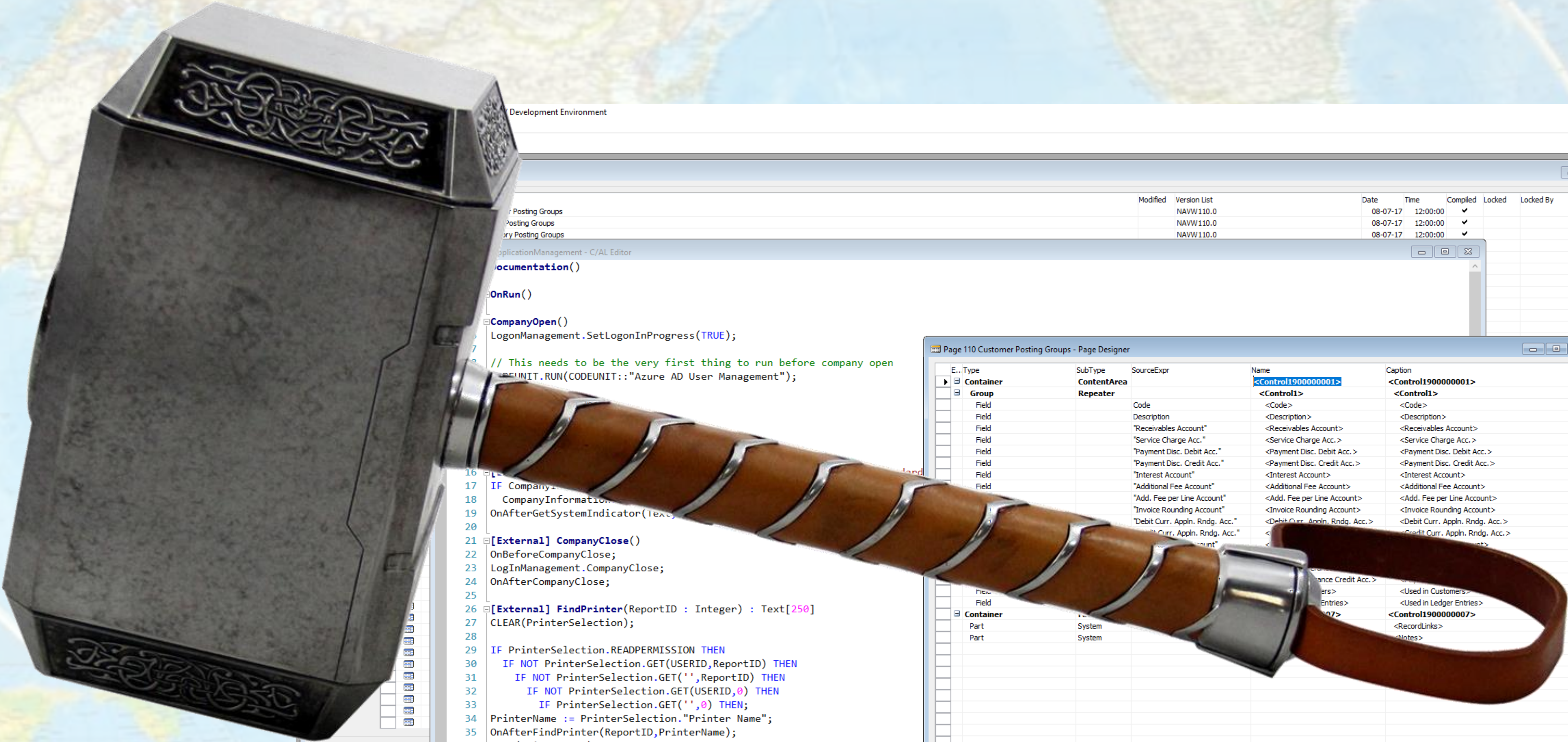
Codeunit 1 ApplicationManagement - C/AL Editor

```
1 Documentation()
2
3 OnRun()
4
5 CompanyOpen()
6 LogonManagement.SetLogonInProgress(TRUE);
7
8 // This needs to be the very first thing to run before company open
9 CODEUNIT.RUN(CODEUNIT::"Azure AD User Management");
10
11 OnBeforeCompanyOpen;
12 LogInManagement.CompanyOpen;
13 OnAfterCompanyOpen;
14 LogonManagement.SetLogonInProgress(FALSE);
15
16 [External] GetSystemIndicator(VAR Text : Text[250];VAR Style : 'Standard
17 IF CompanyInformation.GET THEN
18     CompanyInformation.GetSystemIndicator(Text,Style);
19 OnAfterGetSystemIndicator(Text,Style);
20
21 [External] CompanyClose()
22 OnBeforeCompanyClose;
23 LogInManagement.CompanyClose;
24 OnAfterCompanyClose;
25
26 [External] FindPrinter(ReportID : Integer) : Text[250]
27 CLEAR(PrinterSelection);
28
29 IF PrinterSelection.READPERMISSION THEN
30     IF NOT PrinterSelection.GET(USERID,ReportID) THEN
31         IF NOT PrinterSelection.GET(USERID,0) THEN
32             IF PrinterSelection.GET('',0) THEN;
33         PrinterName := PrinterSelection."Printer Name";
34     OnAfterFindPrinter(ReportID,PrinterName);
35     EXIT(PrinterName);
36
37
```

Page 110 Customer Posting Groups - Page Designer

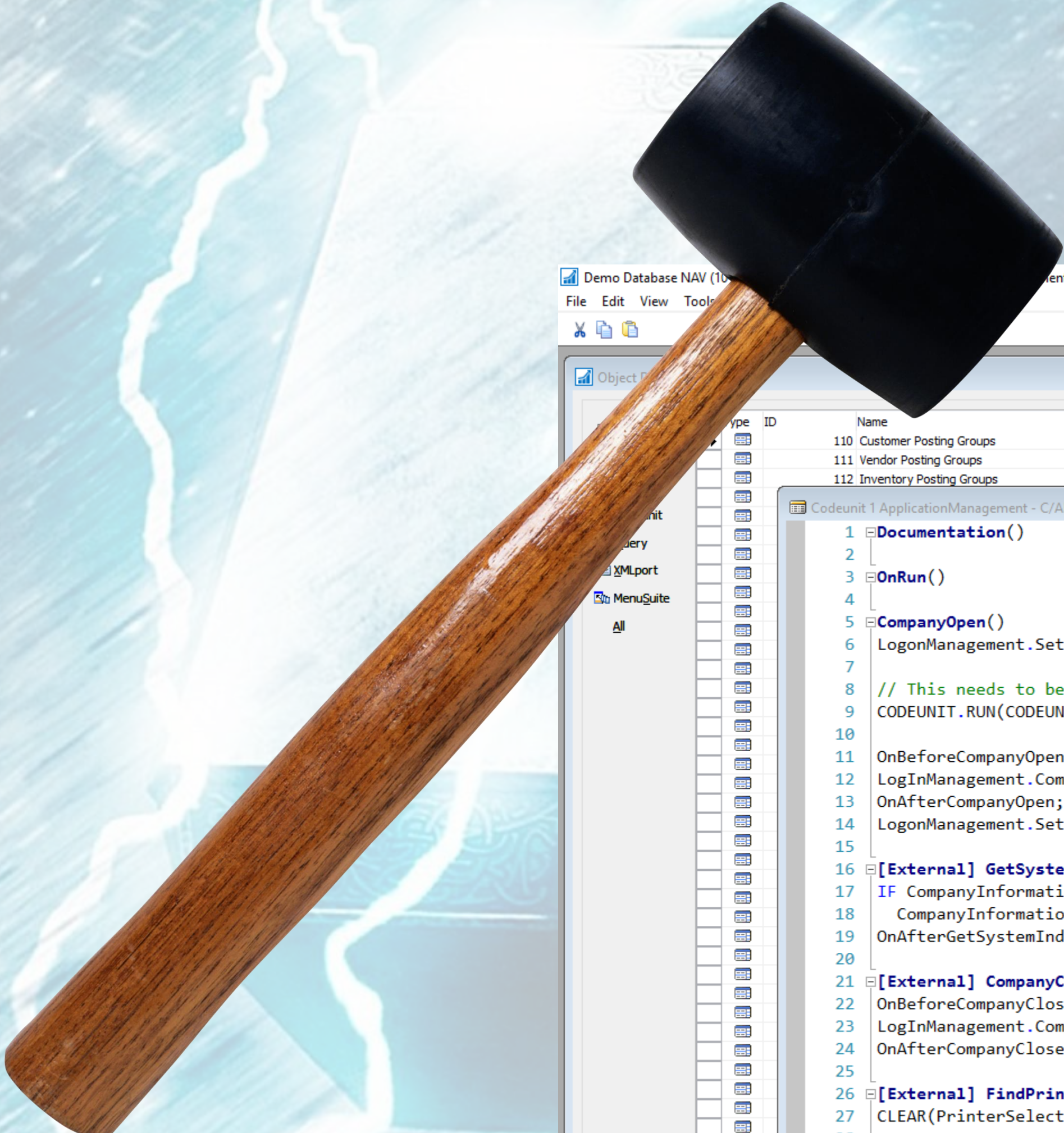
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Field		"Service Charge Acc."	<Service Charge Acc.>	<Service Charge Acc.>
Field		"Payment Disc. Debit Acc."	<Payment Disc. Debit Acc.>	<Payment Disc. Debit Acc.>
Field		"Payment Disc. Credit Acc."	<Payment Disc. Credit Acc.>	<Payment Disc. Credit Acc.>
Field		"Interest Account"	<Interest Account>	<Interest Account>
Field		"Additional Fee Account"	<Additional Fee Account>	<Additional Fee Account>
Field		"Add. Fee per Line Account"	<Add. Fee per Line Account>	<Add. Fee per Line Account>
Field		"Invoice Rounding Account"	<Invoice Rounding Account>	<Invoice Rounding Account>
Field		"Debit Curr. Appln. Rndg. Acc."	<Debit Curr. Appln. Rndg. Acc.>	<Debit Curr. Appln. Rndg. Acc.>
Field		"Credit Curr. Appln. Rndg. Acc."	<Credit Curr. Appln. Rndg. Acc.>	<Credit Curr. Appln. Rndg. Acc.>
Field		"Debit Rounding Account"	<Debit Rounding Account>	<Debit Rounding Account>
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Field		"Payment Tolerance Debit Acc."	<Payment Tolerance Debit Acc.>	<Payment Tolerance Debit Acc.>
Field		"Payment Tolerance Credit Acc."	<Payment Tolerance Credit Acc.>	<Payment Tolerance Credit Acc.>
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Part	System		<Notes>	<Notes>

Some Think C/Side is this





C/Side is like a rubber hammer



The image shows a screenshot of the Microsoft Dynamics NAV development environment, illustrating the 'rubber hammer' concept in C/Side development. The hammer is positioned diagonally across the screen, symbolizing the idea that C/Side is a 'rubber hammer'—a tool that can be used for many different tasks, even if it's not the best tool for the job.

The background of the slide features a dramatic, stormy sky with lightning bolts, adding to the visual impact of the message.

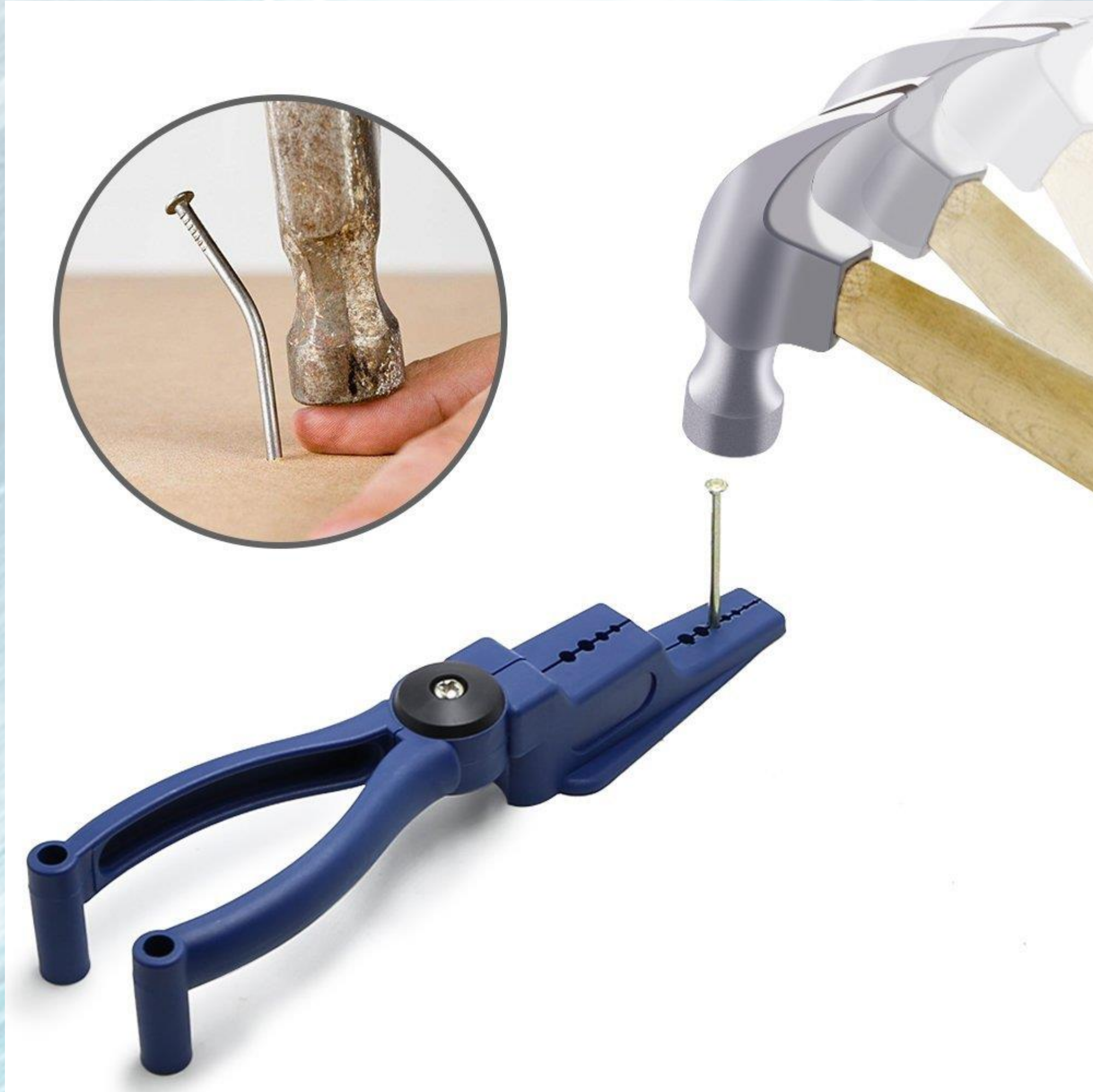
The screenshot displays the following components:

- Object Explorer:** Shows the database structure, including tables like 'Customer Posting Groups', 'Vendor Posting Groups', and 'Inventory Posting Groups'.
- Codeunit 1 ApplicationManagement - C/AL Editor:** Contains the following code:

```
1 Documentation()
2
3 OnRun()
4
5 CompanyOpen()
6 LogonManagement.SetLogonInProgress(TRUE);
7
8 // This needs to be the very first thing to run before company open
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27 CLEAR(PrinterSelection);
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30     IF NOT PrinterSelection.GET(USERID,ReportID) THEN
31         IF NOT PrinterSelection.GET('',ReportID) THEN
32             IF NOT PrinterSelection.GET(USERID,0) THEN
33                 IF PrinterSelection.GET('',0) THEN;
34 PrinterName := PrinterSelection."Printer Name";
35 OnAfterFindPrinter(ReportID,PrinterName);
36 EXIT(PrinterName);
37
```

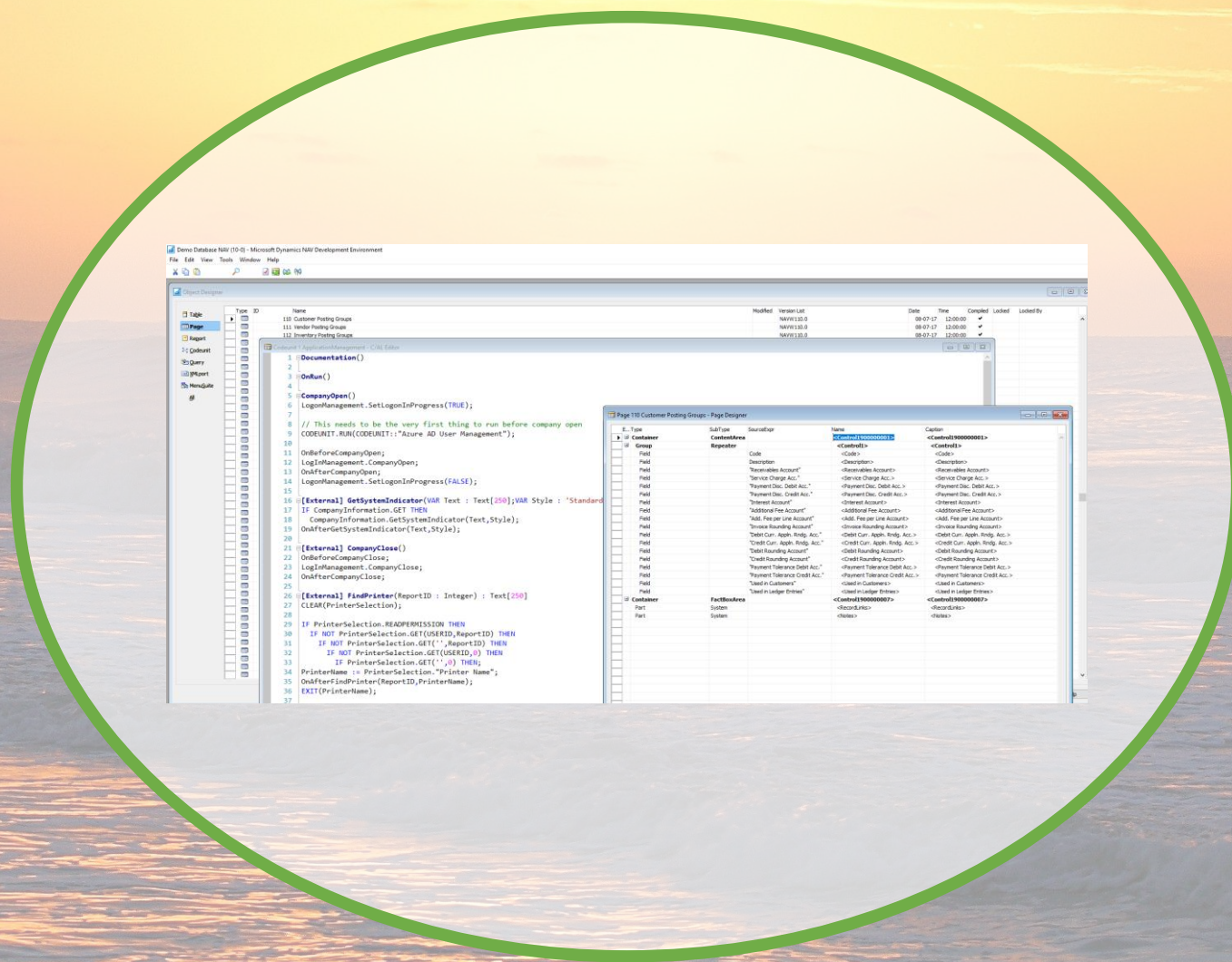
- Page 110 Customer Posting Groups - Page Designer:** Shows the layout of the page, including fields like 'Code', 'Description', 'Receivables Account', 'Service Charge Acc.', 'Payment Disc. Debit Acc.', 'Payment Disc. Credit Acc.', 'Interest Account', 'Additional Fee Account', 'Add. Fee per Line Account', 'Invoice Rounding Account', 'Debit Curr. Appln. Rndg. Acc.', 'Credit Curr. Appln. Rndg. Acc.', 'Debit Rounding Account', 'Credit Rounding Account', 'Payment Tolerance Debit Acc.', 'Payment Tolerance Credit Acc.', 'Used in Customers', and 'Used in Ledger Entries'.

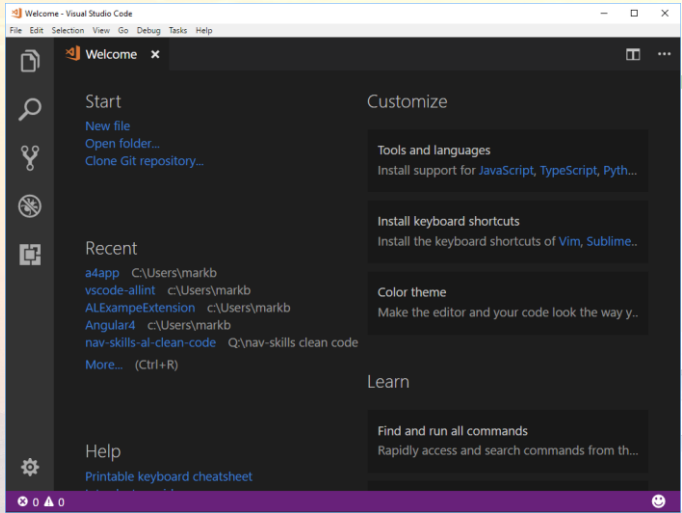
It's hard to make mistakes



A wide-angle photograph of a sunset over the ocean. The sun is a bright, glowing orb on the horizon, casting a long, shimmering reflection across the water. The sky is filled with soft, orange and yellow clouds. The ocean is dark blue with white-capped waves rolling in from the horizon. The text "Expand your horizon" is overlaid in the lower-left corner in a white, sans-serif font.

Expand your horizon





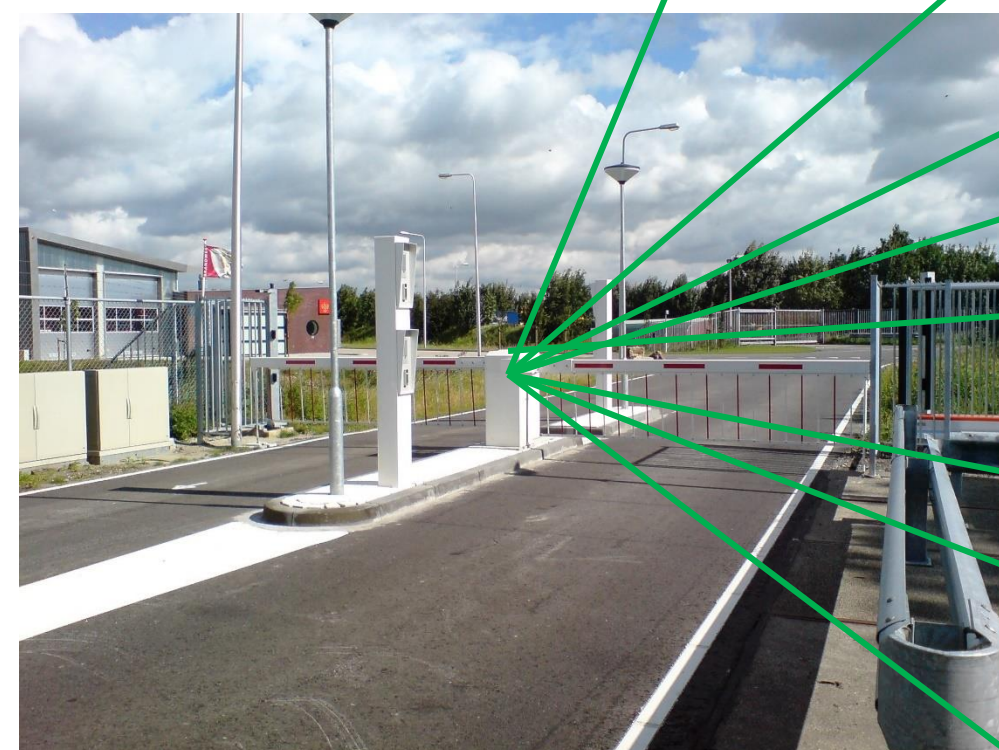
Learning Zone





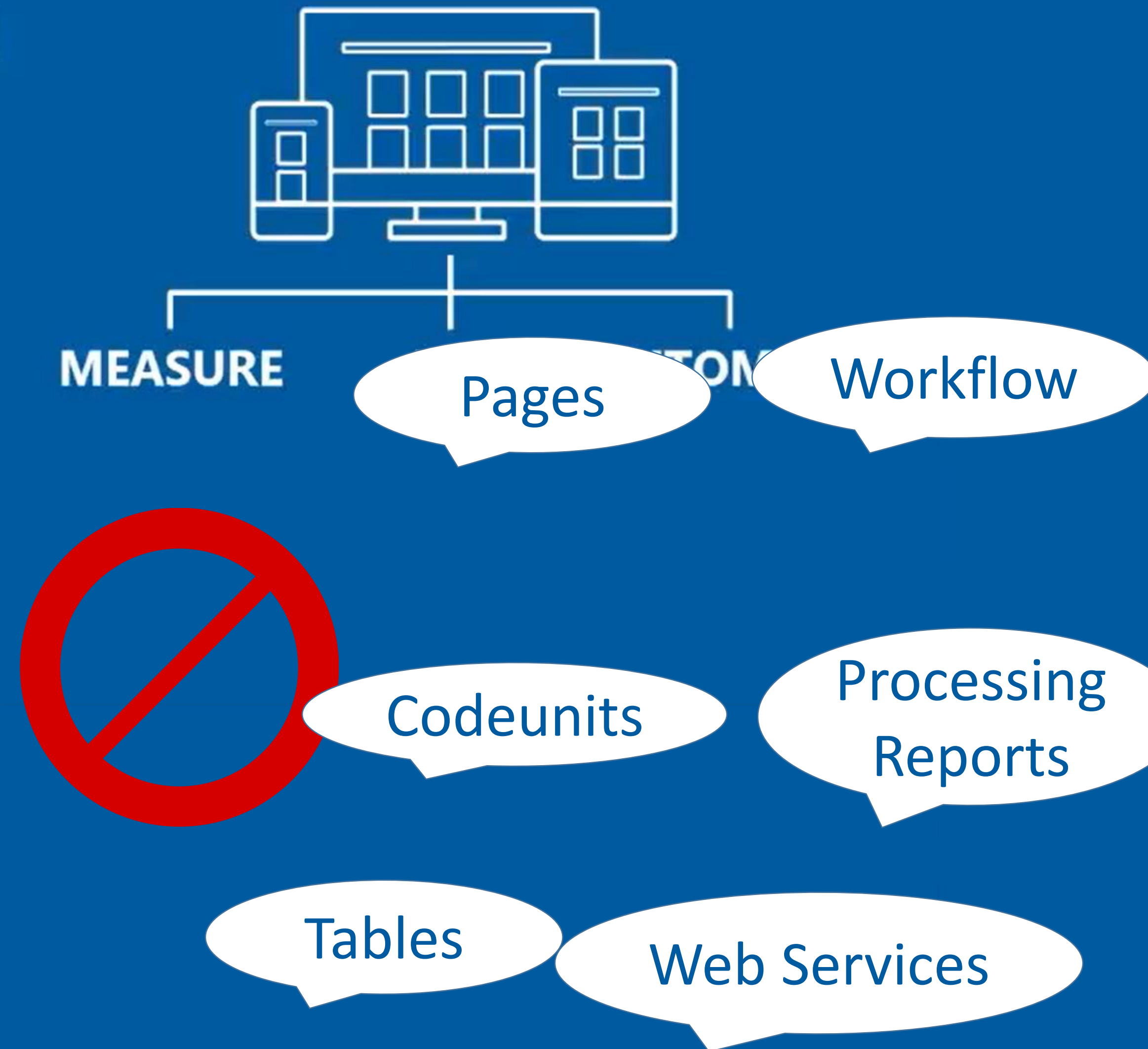
A wide-angle photograph of a sunset over the ocean. The sun is a bright, glowing orb on the horizon, casting a long, shimmering reflection across the water. The sky is filled with soft, orange and yellow clouds. The ocean has gentle waves with white foam, and the water's surface is textured with ripples. The overall mood is peaceful and contemplative.

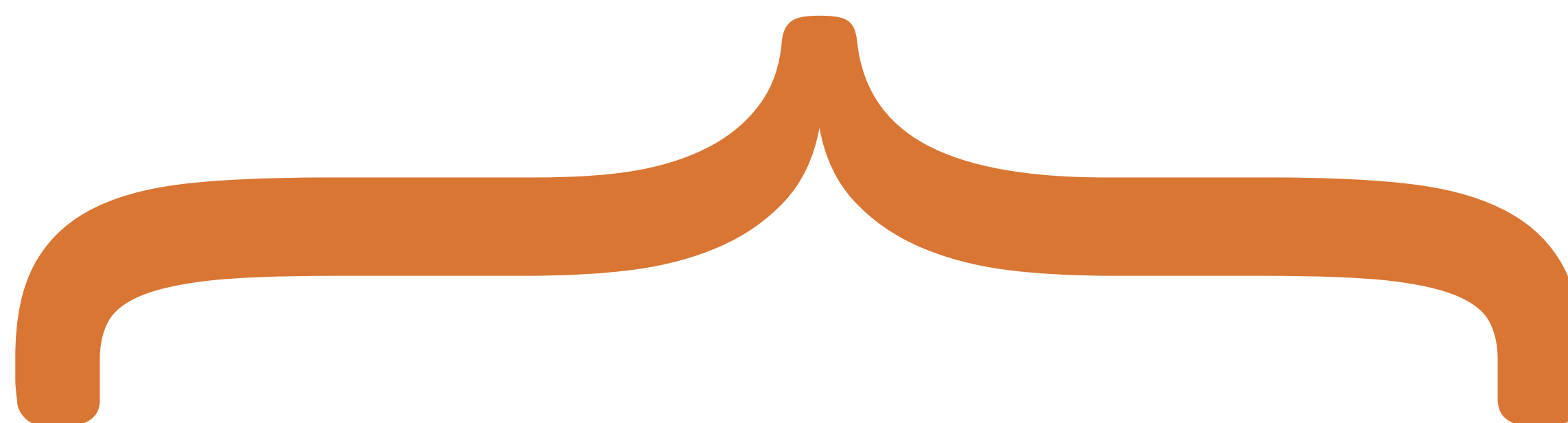
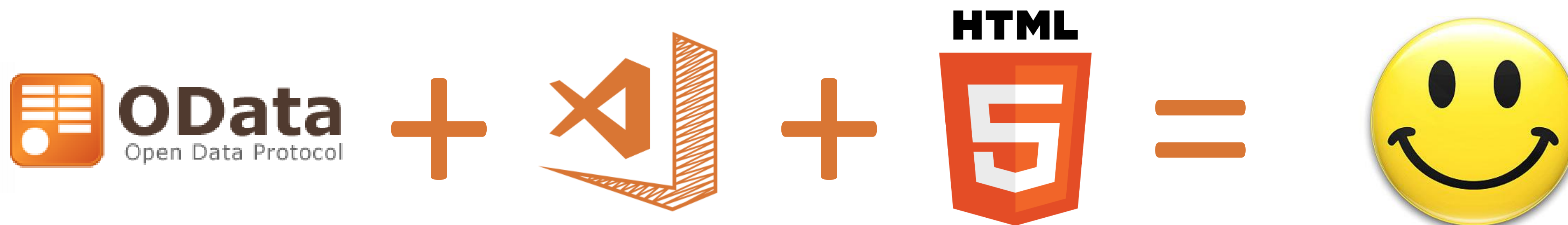
Life begins at the end of your comfortzone



Business Application Platform

A common data model and connectors make it possible to get more value out of the data and services you're already using.







DEMO



**DON'T TRY THIS AT
HOME !!**

Microsoft Flow & PowerApps

- 1 New Suite of Development Tools
- 2 Workflow & Event Driven
- 3 Based on Odata & Oauth
- 4 Using Common Data Model & Services
- 5 Code using Azure Functions

PowerApps vs. NAV 2018 Web Client

PowerApps

More Flexible Controls

WYSIWYG Design

Native Modern Dataitems

Connectors to endless # Apps

[Offline Capabilities](#)

Humongous Community

Web Client

UI Bound to Database

Native Office Integration

Only Online

Transaction Integrity

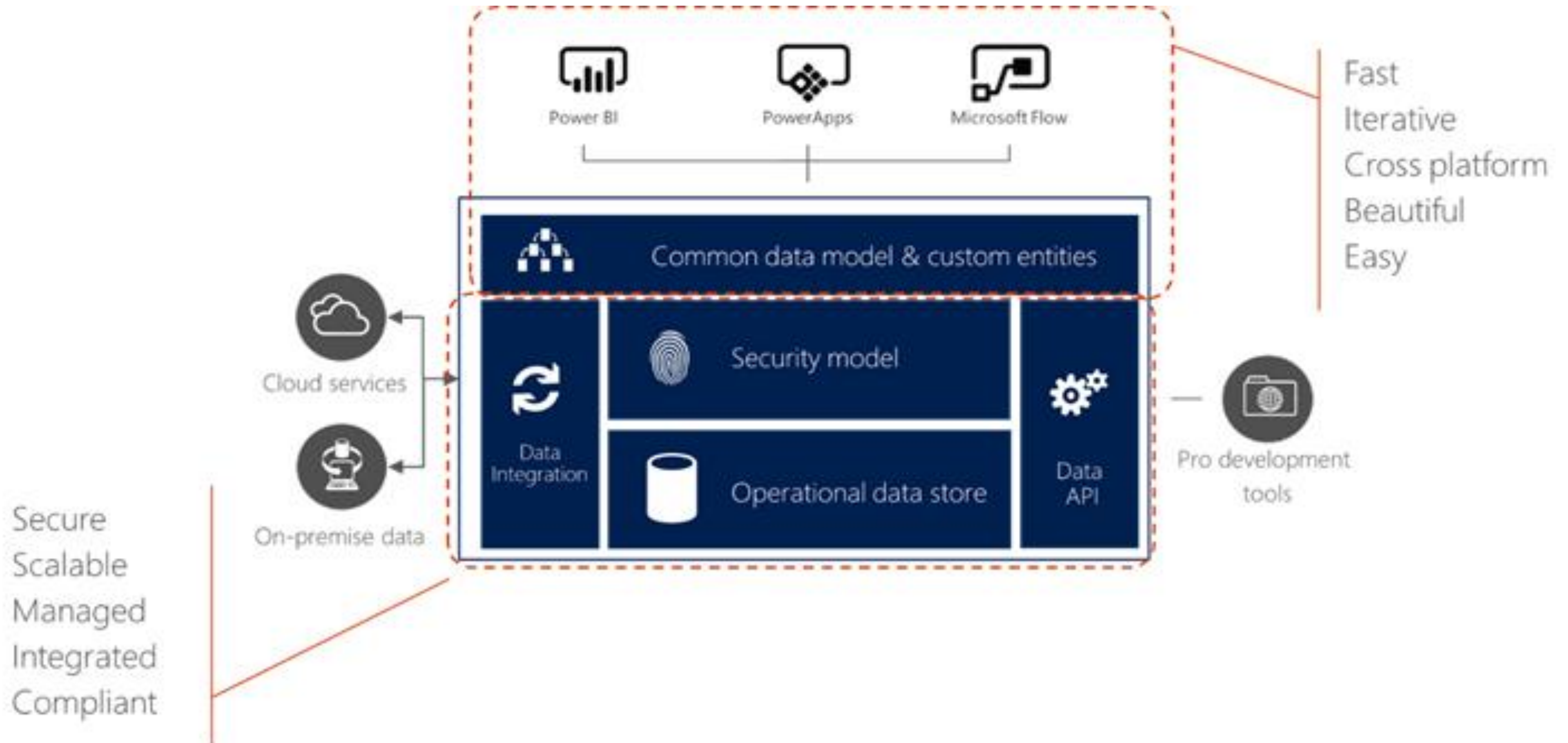
Accessible outside AD

SWAGGER

Key Takeaways

- 1 Easy to setup & get started
- 2 Connected to Flow
- 3 Not a replacement for ERP
- 4 Something every NAV Developer should know
- 5 Not limited for NAV2018+ customers

Common Data Model (CDM)



The promise

- An easy to provision, yet scalable data store
- A common data model with standard entity schema and behavior
- A powerful data access layer with support for data import, export and security
- Integration with Microsoft Office for Excel and Outlook
- A software developer kit (CDS SDK) for professional development scenarios

What is Common Data Model

A set of standard entities

- Foundation (Address, Currency, ...)
- Customer Service
- People, Organization and Groups
- Sales
- Purchasing

Custom fields

Custom entities

Let us take a look

```
...public class SalesOrder : TypedRelationalEntity
{
    public SalesOrder();

    ...public IList<RelationalEntityReference<SalesOrderTax>> SalesOrderTax_SalesOrder { get; set; }
    ...public IList<RelationalEntityReference<SalesOrderCharge>> SalesOrderCharge_SalesOrder { get; set; }
    ...public RelationalEntityReference<Account> InvoiceAccount { get; set; }
    ...public RelationalEntityReference<Opportunity> Opportunity { get; set; }
    ...public RelationalEntityReference<Contact> AccountContact { get; set; }
    ...public RelationalEntityReference<Worker> SalesPersonWorker { get; set; }
    ...public RelationalEntityReference<Account> Account { get; set; }
    ...public Address DeliveryAddress { get; set; }
    ...public Address BillingAddress { get; set; }
    ...public UtcDateTime ExpectedShipDate { get; set; }
    ...public UtcDateTime RequestedDeliveryDate { get; set; }
    ...public Currency TotalDiscountAmount { get; set; }
    ...public Currency DiscountAmount { get; set; }
    ...public PaymentTerms PaymentTerms { get; set; }
    ...public FreightTerms FreightTerms { get; set; }
    ...public ShippingMethod ShippingMethod { get; set; }
    ...public UtcDateTime OrderDate { get; set; }
    ...public OrderStatus Status { get; set; }
    ...public Currency TotalTaxAmount { get; set; }
    ...public Currency TotalChargeAmount { get; set; }
    ...public Currency TotalAmount { get; set; }
    ...public string Description { get; set; }
    ...public string CustomerPurchaseOrderReference { get; set; }
    ...public string Name { get; set; }
    ...public string SalesOrderId { get; set; }
    ...public IList<RelationalEntityReference<SalesOrderLine>> SalesOrderLine_SalesOrder { get; set; }
    ...public IList<RelationalEntityReference<SalesInvoice>> SalesInvoice_SalesOrder { get; set; }
}
```


Common Data Model Issues

- Discrepancy between entities (Org Structure vs. Sales Order)
- Enums does not (always) map to the real world

```
public enum PaymentTerms
{
    Net30 = 0,
    TwoPercent10Net30 = 1,
    Net45 = 2,
    Net60 = 3
}
```

- Document entities (Sales Order etc.) is missing information
Ex: DeliveryAddress and BillingAddress shares the same Name and Name 2
- Syncing with NAV
 - Dual masters and two synchronization is asking for trouble
 - Bad fit with the NAV data model
 - No mapping of the NAV security model to CDM

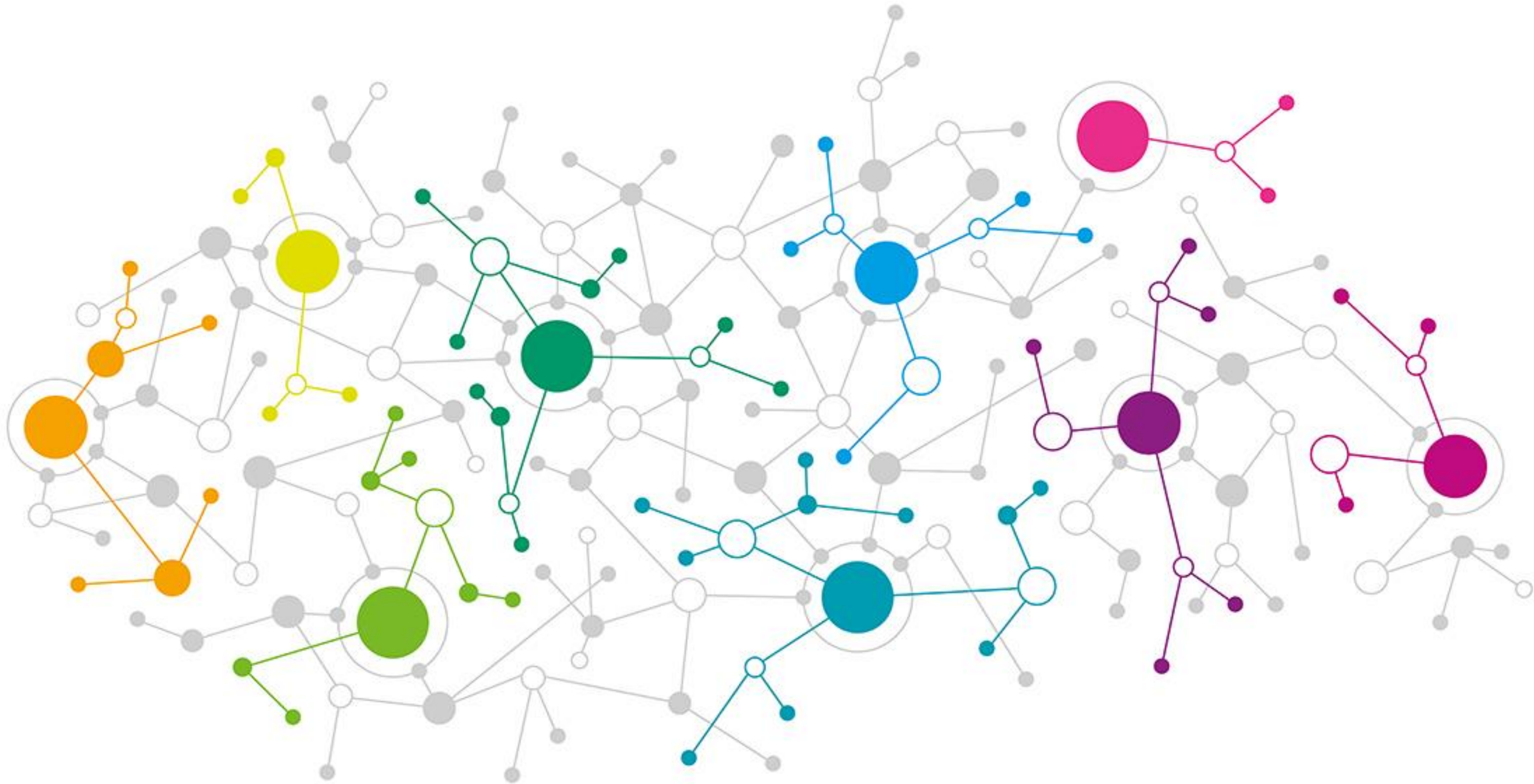
Common Data Service SDK - Let us take a look

```
<configuration>
<configSections>
  <section name="Microsoft.CommonDataService.Connection" type="Microsoft.CommonDataService.Configuration.ConnectionSettingsSection, Microsoft.CommonDataService.ServiceContracts"/>
</configSections>
<Microsoft.CommonDataService.Connection>
  <Tenant>908c9e73-ccd6-48d6-b315-0894799d5afa</Tenant>
  <EnvironmentId>6328fc2f-bd62-4d82-b131-9cbb863a18bb</EnvironmentId>
  <Credentials Type="User">
    <UserSource>Prompt</UserSource>
    <ApplicationId>54b8b475-a112-4875-9ae0-6ff99751471c</ApplicationId>
    <RedirectUri>http://localhost</RedirectUri>
  </Credentials>
</Microsoft.CommonDataService.Connection>
```


Common Data Service SDK Issues

- Configuration is not scalable
EnvironmentId, ApplicationId and TenantId has to be specified for all tenants
- All queries has to be written in code and are static (No SELECT *)
Dynamic queries can be created using codegen – but that will end up with an “out of memory” exception
- Proprietary query API (Not using the System.Data.Service API)
- Access to custom tables and custom fields has to be done using the index operator
.Where(pc => pc["Name"] == "Surface" || pc["Name"] == "Phone")
- No support for transaction across CDS calls

Everything Is Connected



Sharing Solutions is Easier than ever before!

Repeating the same modifications is history





















Customers can click-try-buy apps

Star-Rating-System

Everything is connected

App results (52) [View consulting services results \(26\)](#)

Are you looking for Dynamics 365 for Financials? [See your options ->](#)

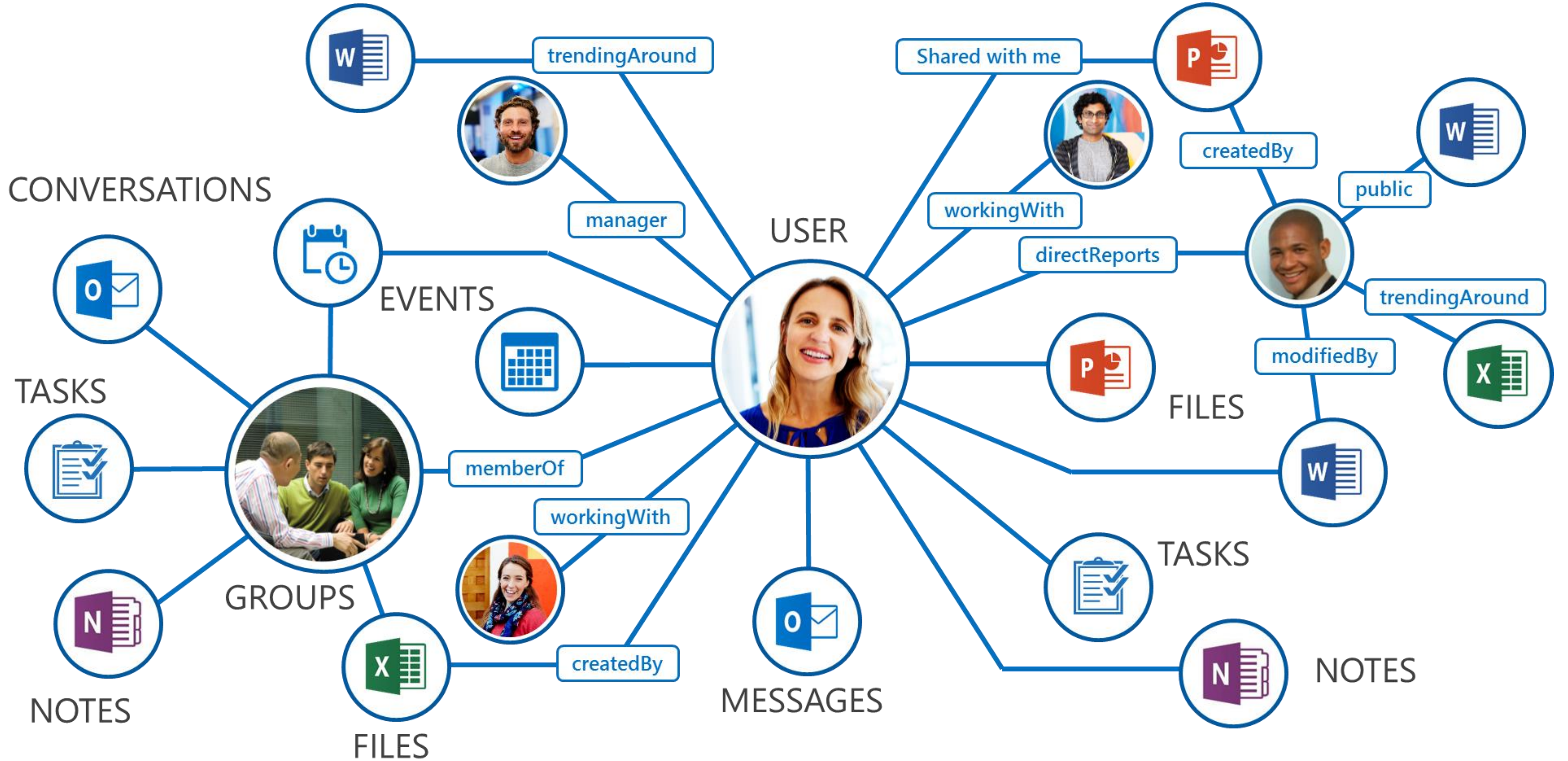
 Microsoft Dynamics 365 for Financials (trial) By Microsoft Dynamics 365 A business management solution for accounting, invoicing, purchasing, inventory and reporting. Free trial Get it now	 LS Express By LS Retail Dynamics 365 All the functionality you need in a retail POS, in the familiar Microsoft Dynamics look and feel. Free Get it now	 Expensify for Dynamics 365 By Stoneridge Software LLC Dynamics 365 Expensify Integration with Dynamics 365 for Financials Free Get it now	 Sales and Inventory Forecast By Microsoft Dynamics 365 Make your brand famous for always having items in stock (without extra costs to you). Free Get it now	 Sana Commerce By Sana Commerce Dynamics 365 Sana offers integrated E-commerce for Dynamics 365 for Financials, simplifying online sales. Free Get it now
 BuildFood - Recipes By IndustryBuilt Software Corp. Dynamics 365 Manage recipes, create ingredient declarations, track allergens and calculate nutrients. Free Get it now	 QuickBooks Data Migration By Microsoft Dynamics 365 Migrate accounts, customers, vendors, and items from QuickBooks to Dynamics 365 for Financials Free Get it now	 ChargeLogic Payments By ChargeLogic, LLC Dynamics 365 PCI-validated payment and credit card processing software for all your sales channels. Free trial Get it now	 Ceridian Payroll By Microsoft Dynamics 365 Ceridian Payroll allows you to import payroll transactions. Free Get it now	 Data Migration - Sage By Technology Management Ltd. Dynamics 365 Import data from Sage into Dynamics 365 for Financials Free Get it now
 Accountant Portal By Microsoft Dynamics 365 Provides a dedicated experience for external accountants. Free Get it now	 PayPal Payments Standard By Microsoft Dynamics 365 Adds a PayPal link to your sales documents so customers can easily pay using PayPal. Free Get it now	 ODT Rentals 365 By Open Door Technology Dynamics 365 ODT Rentals tracks rental units, produces quotes, and manages rental contracts and invoices. Free Get it now	 WorldPay Payments Standard By Microsoft Dynamics 365 Get paid faster by adding a link to the WorldPay Payments Standard on invoices. Free Get it now	 Shopify Connector By Scapta Dynamics 365 The app that connects Dynamics 365 for Financials with Shopify Free Get it now
 AMC Banking 365 Financials By AMC Banking Dynamics 365 AMC Banking for Dynamics 365 Financials Get it now	 nHanced 365 Core By The D365 People Dynamics 365 nHanced 365 enables a user to customize their user interface, data and reports Get it now	 CanadaPost AddressComplete Integration By WebSan Solutions Inc. Dynamics 365 This app allows you to utilize Get it now	 Dynamics SL Data Migration By Plumline Consulting LLC Dynamics 365 Dynamics SL import accounts, Get it now	 Avalara AvaTax By Avalara Dynamics 365 Avalara AvaTax for Dynamics 365 for Financials Get it now



One API to Rule them all



Microsoft Graph





WE WANT'S IT

THAT WAS COOL

YEAH, HEHE, COOL



Choose the correct tool for the job

And learn how to use it

**100.000 NAVISION CUSTOMERS
ON C/SIDE WILL PROBABLY
NEVER UPGRADE, YOU CAN
ALWAYS WORK FOR THOSE**



Any Questions ?



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