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Developing for Modern clients

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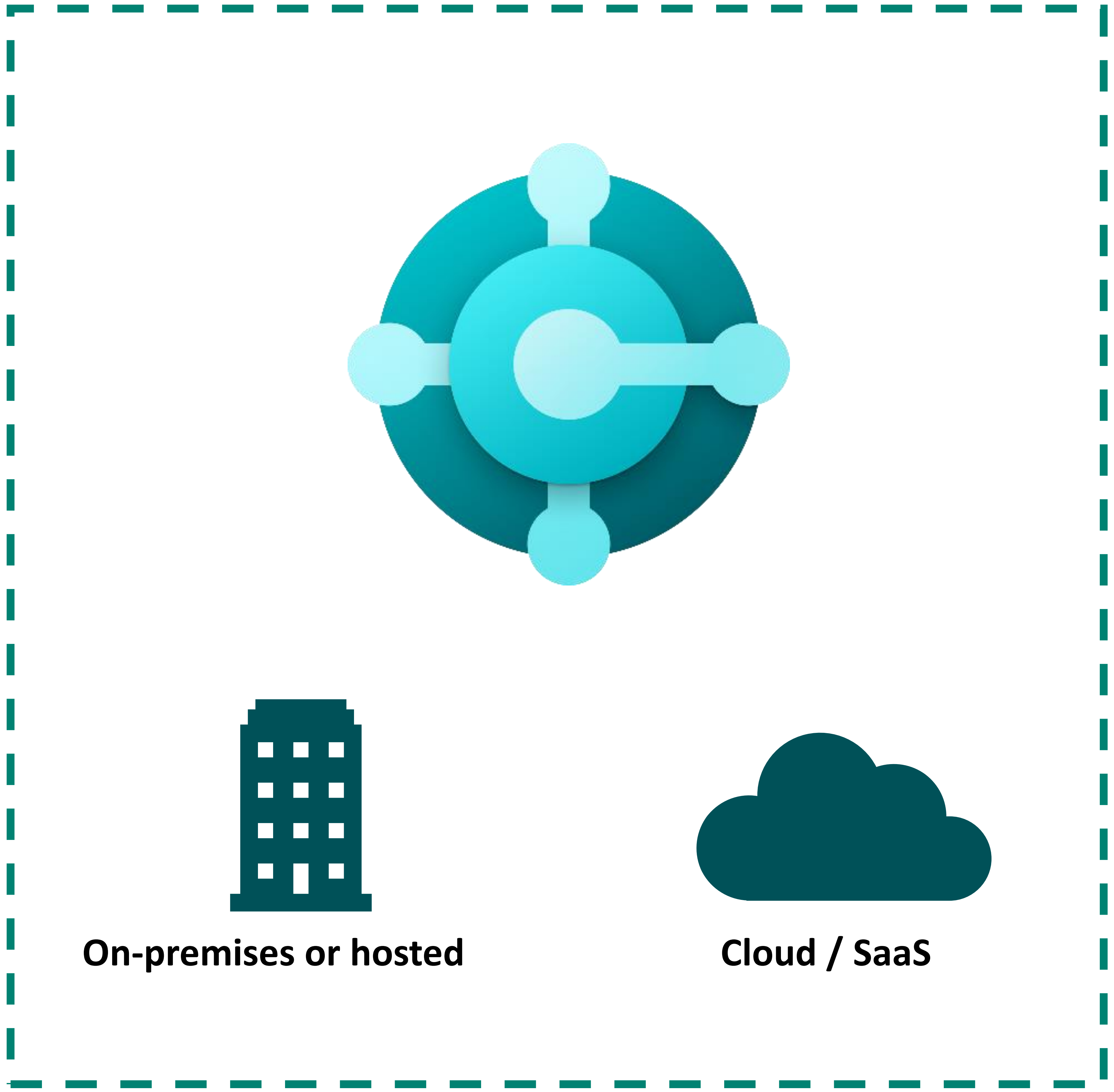
MICROSOFT DEVELOPMENT CENTER COPENHAGEN

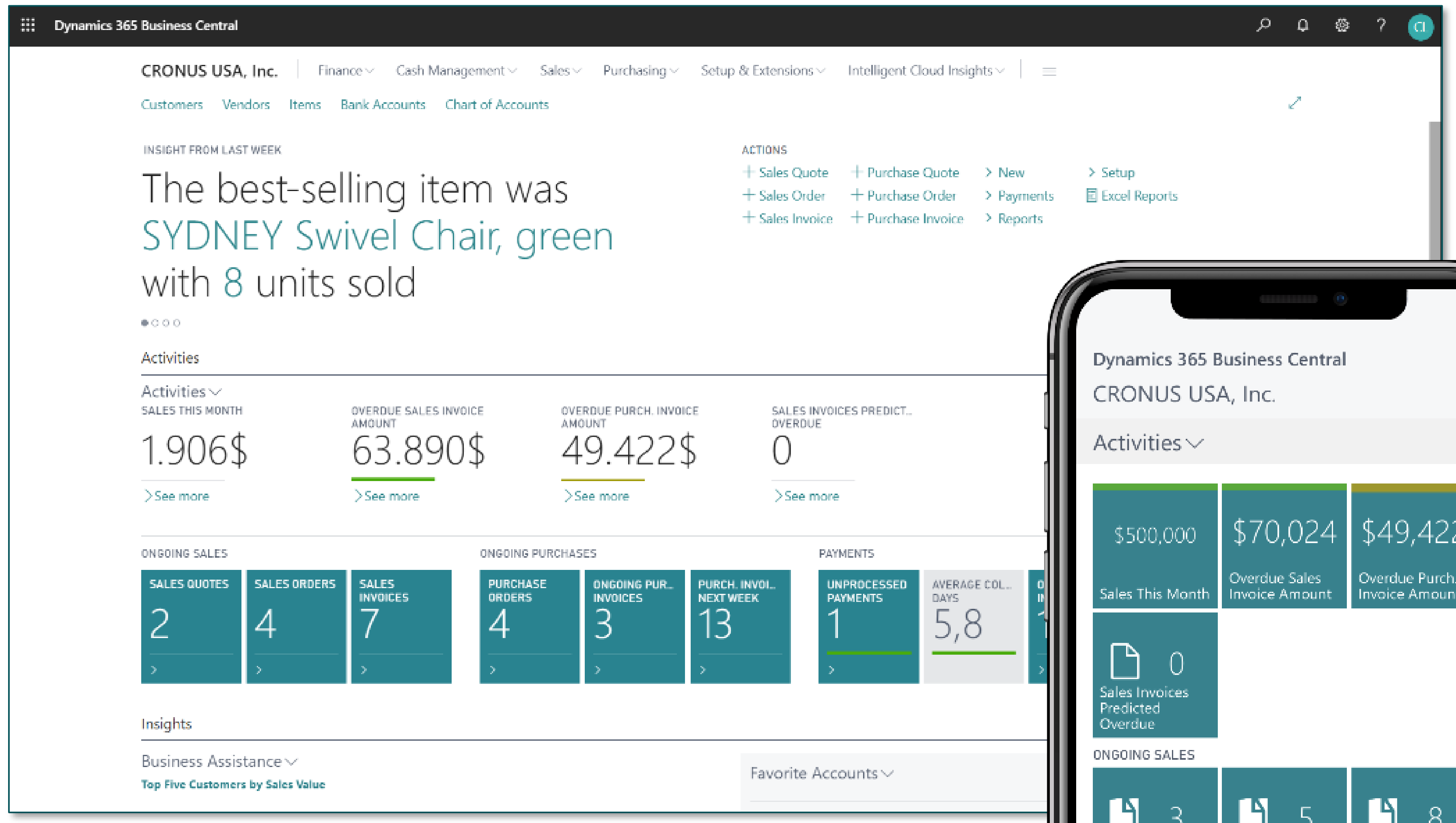
When you are passionate about
Microsoft Dynamics NAV/365 Business Central

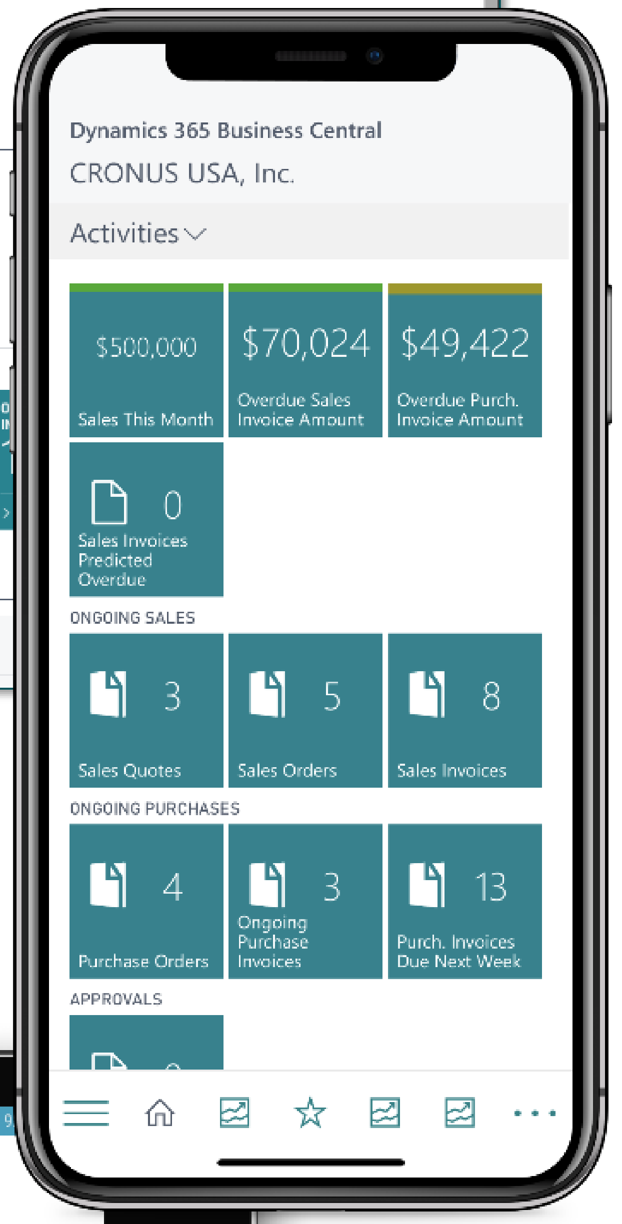
Modern Clients

Business Central Modern Clients



Any modern browser (or Windows 10 PC via app)

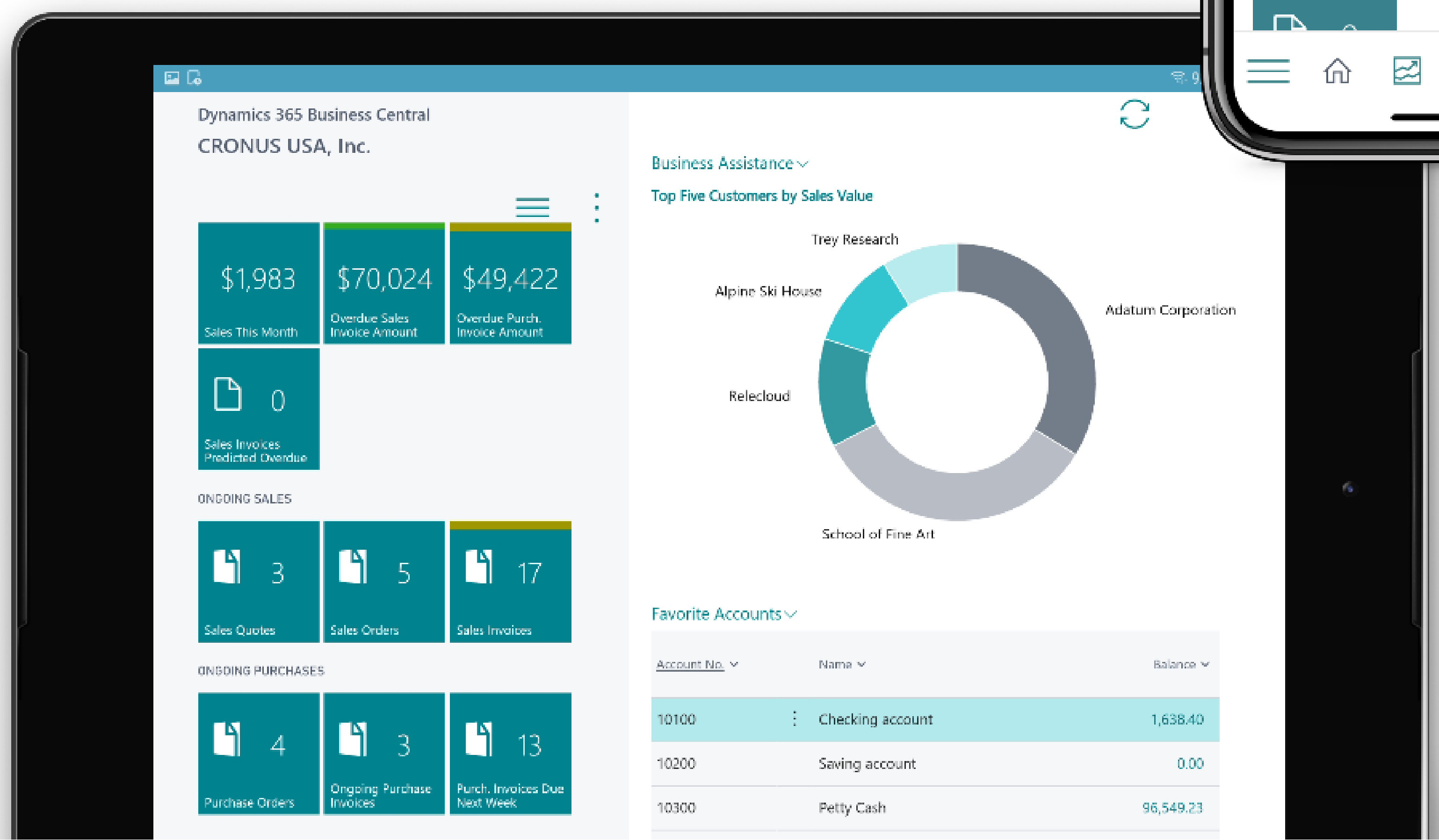




Outlook

Excel

Windows, Android or Apple tablet



Android or iPhone

About Windows Client (RTC)…

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- Discontinued, **but no impact** on existing installations
- Will be maintained till the end of the support cycle
- Included in Business Central April 2019. Can still be sold until October 2020.
- Want to know more? Look for a FAQ from us coming shortly.

Objectives

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1. Consultant journey
2. Working smarter
3. Developing for Modern Clients
4. What's next

Working with Modern Clients - consultant journey

Why does role tailoring matter?

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"In NAV, it was possible to configure profiles by making use of configuration mode. This way, you can change the lay-out of pages for each group of users, such as bookkeepers, warehouse workers…

In Business Central, there doesn't seem to be a configuration mode…It is not efficient to change the designs of hundreds of pages user by user!

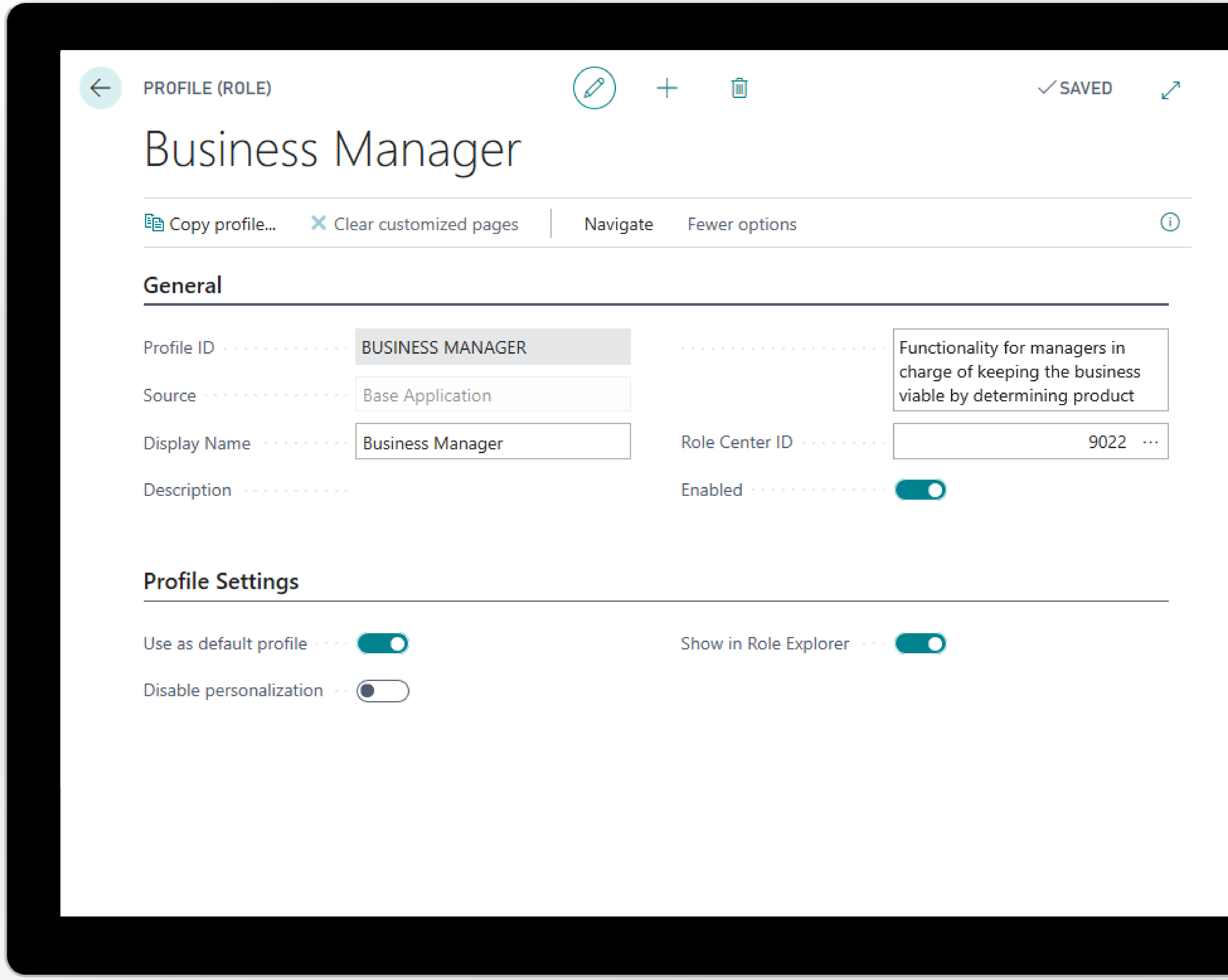
Are we the only partner who finds this a huge problem?"

https://experience.dynamics.com/ideas/idea/?ideaid=b72077ad-2bd6-e811-b96f-0003ff68b04e

What is a role?

What is inside a Role?

- Name and description etc.
- Role center
- Navigation
- Settings
- Customizations
- Extensions



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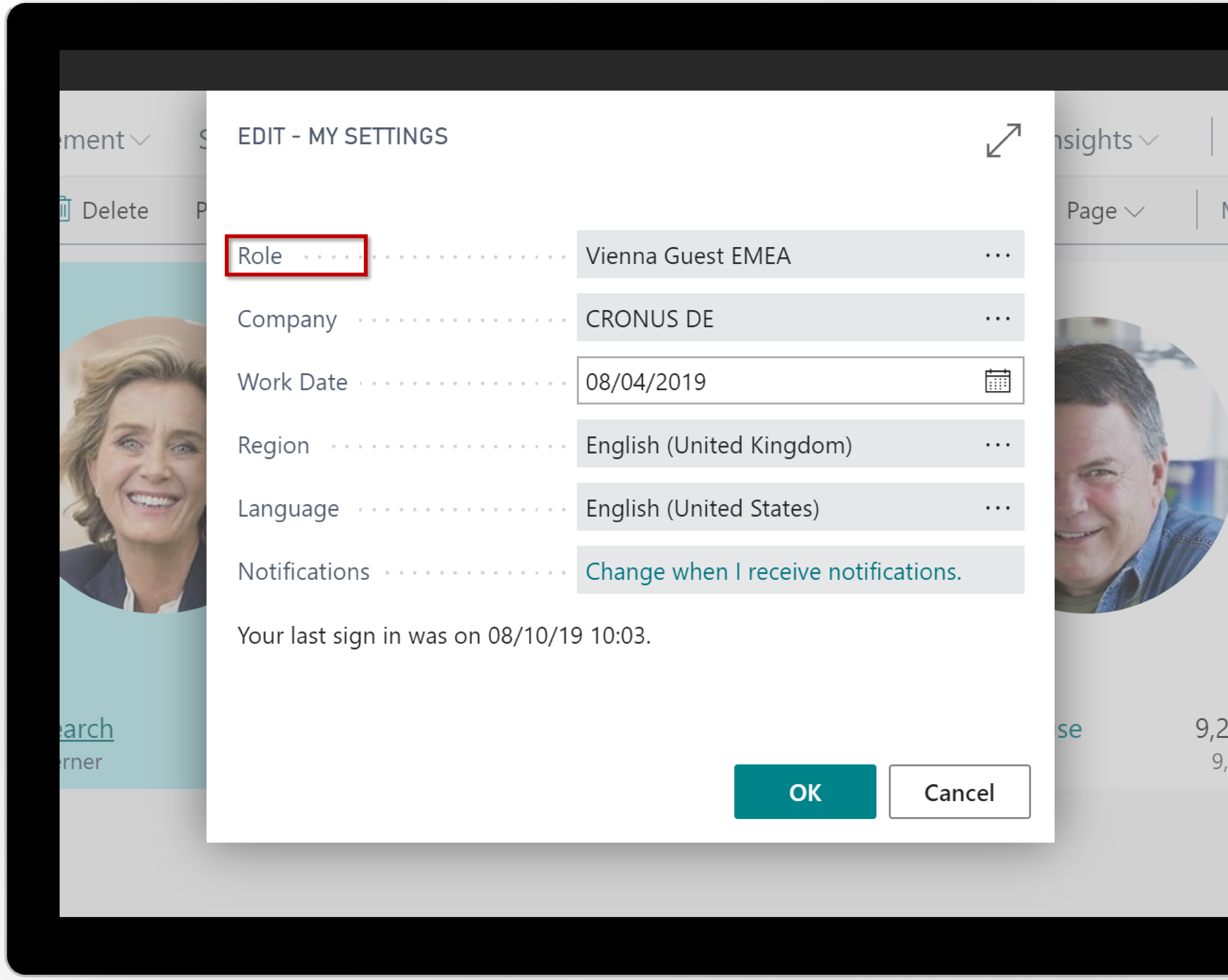
End user sees “Role”, except some Admin tasks

- Assign users to roles
- Use My Settings to change
- Note: Alt+T



Role Explorer - Explore Business Central beyond limits

Why not to use menu suite/departments again?

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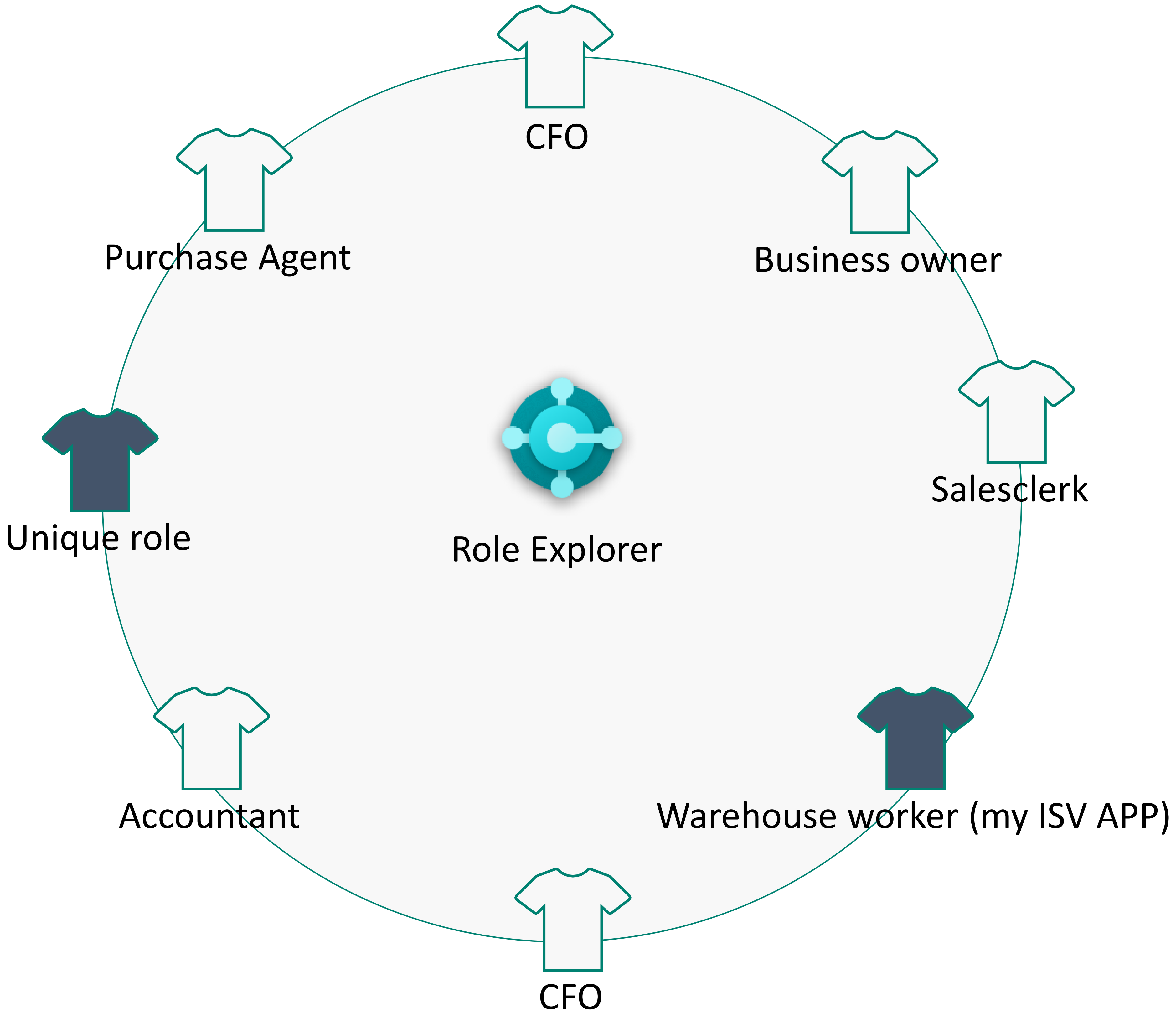
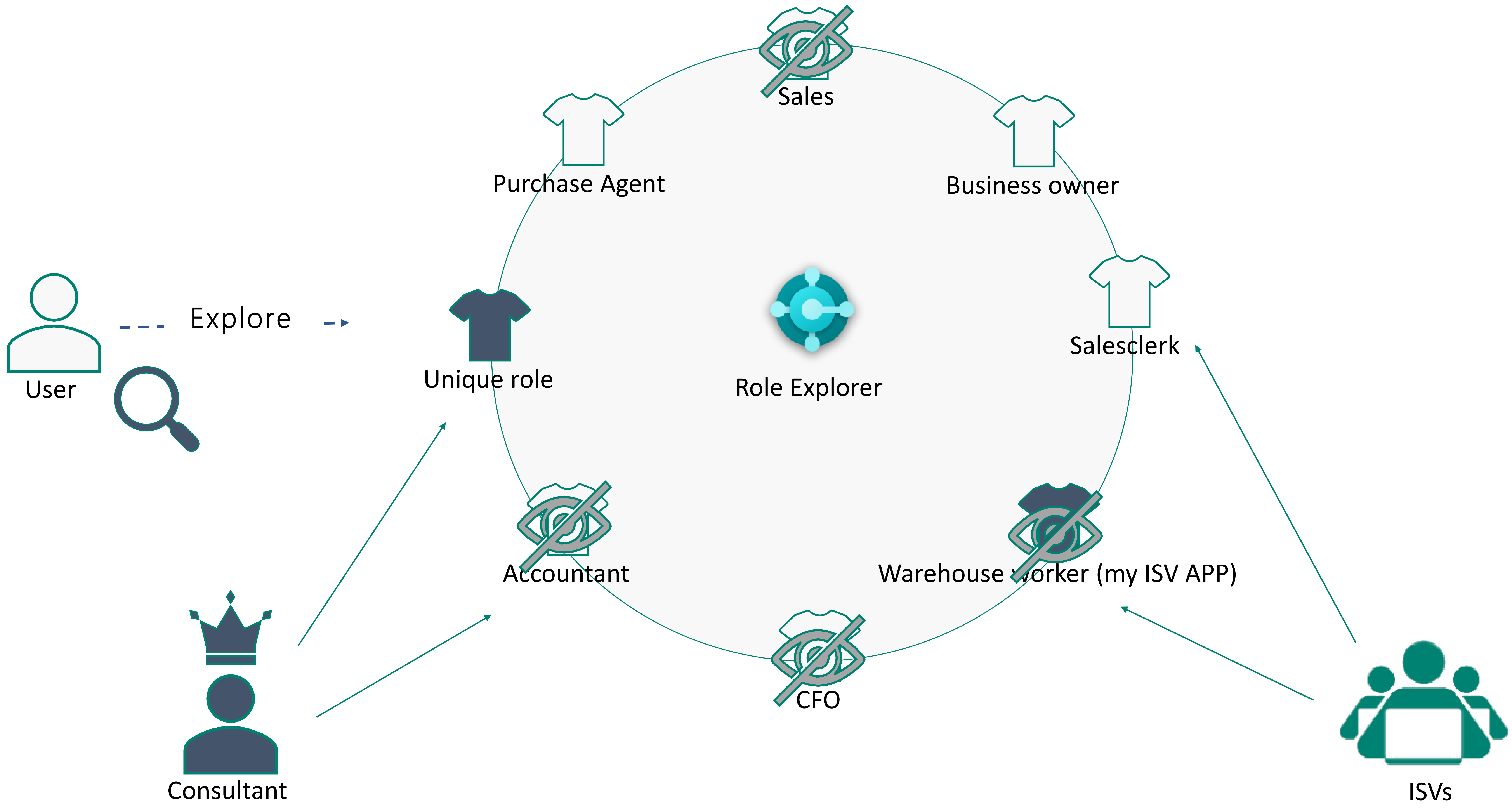
Every ERP user expects an intuitive data layout, within our domain in order to find information fast

- Money (AR, AP, GL)
- People (Vendors, Customers, Contacts)
- Products (Items, Services)
- Financial Reports
- Administration tasks etc.

All Roles combined will cover it all. We want to keep things simple



Role Explorer – explorer all in one view



https://docs.microsoft.com/en-US/dynamics365/business-central/ui-role-explorer

Tell me for *search*, Role Explorer for *exploring*…

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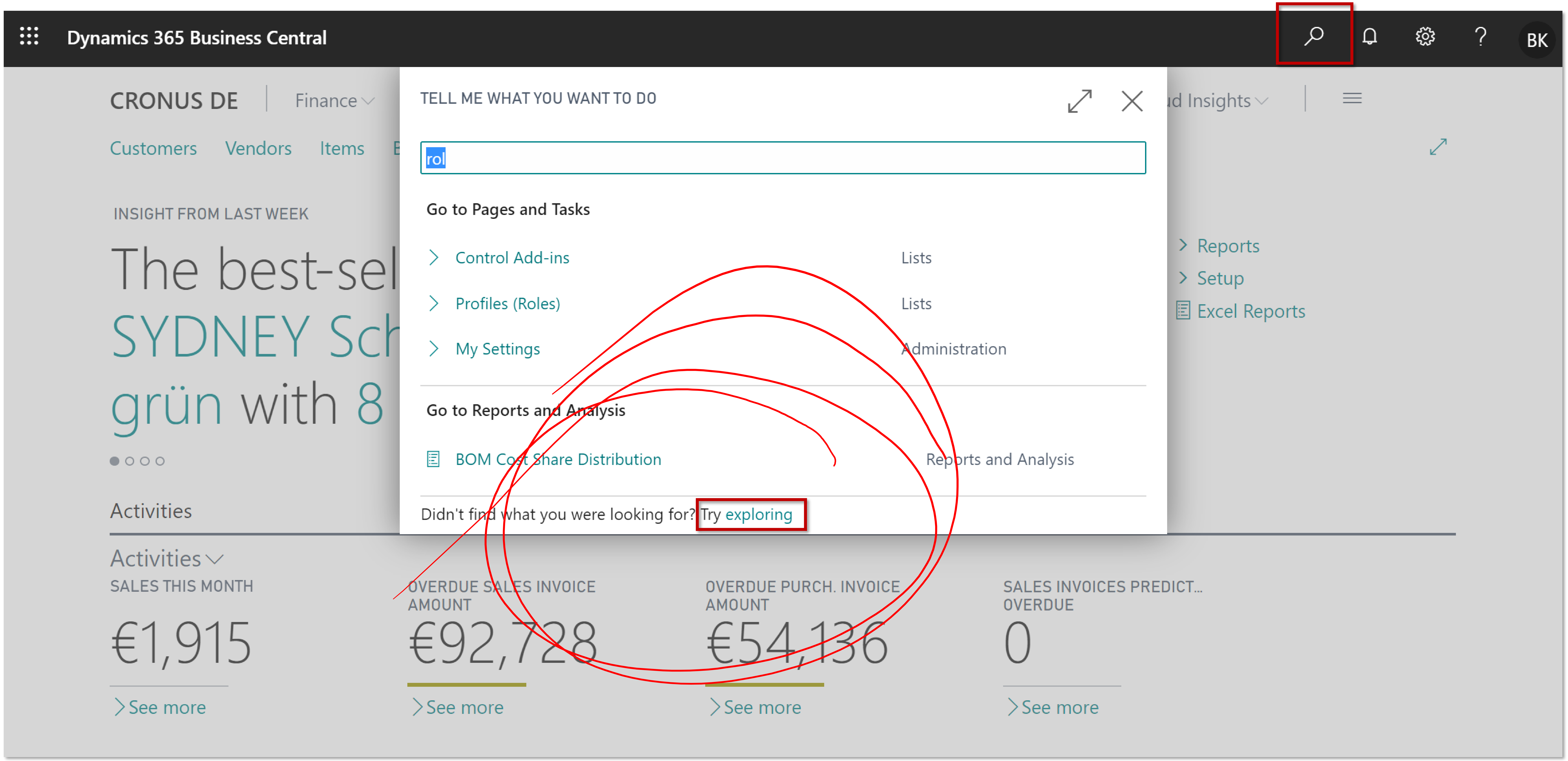


Role tailoring – self serve tools to empower consultants

Code free customizations with Modern Clients

My changes

User-made customizations

Personalization Mode

Changes for a specific Role

Page customization made by user for a specific Role

Page customization for a Role that is part of installed extension

NEW in 2019

Role Customization

My org changes for ALL users

Page extension
(coming from any App with source extension as a dependency)

Page extension

[...]

Base page (coming from System Application, Base App, ISV Apps)

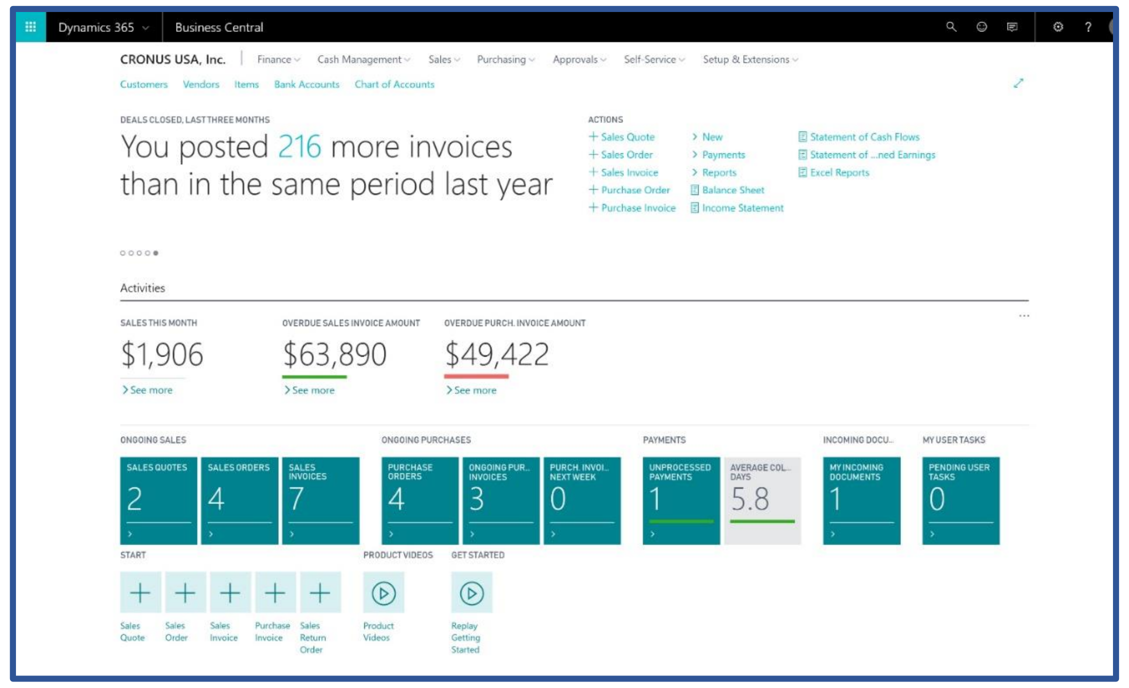
Sandbox Designer

Code free customizations – all together

How does it all come together!?

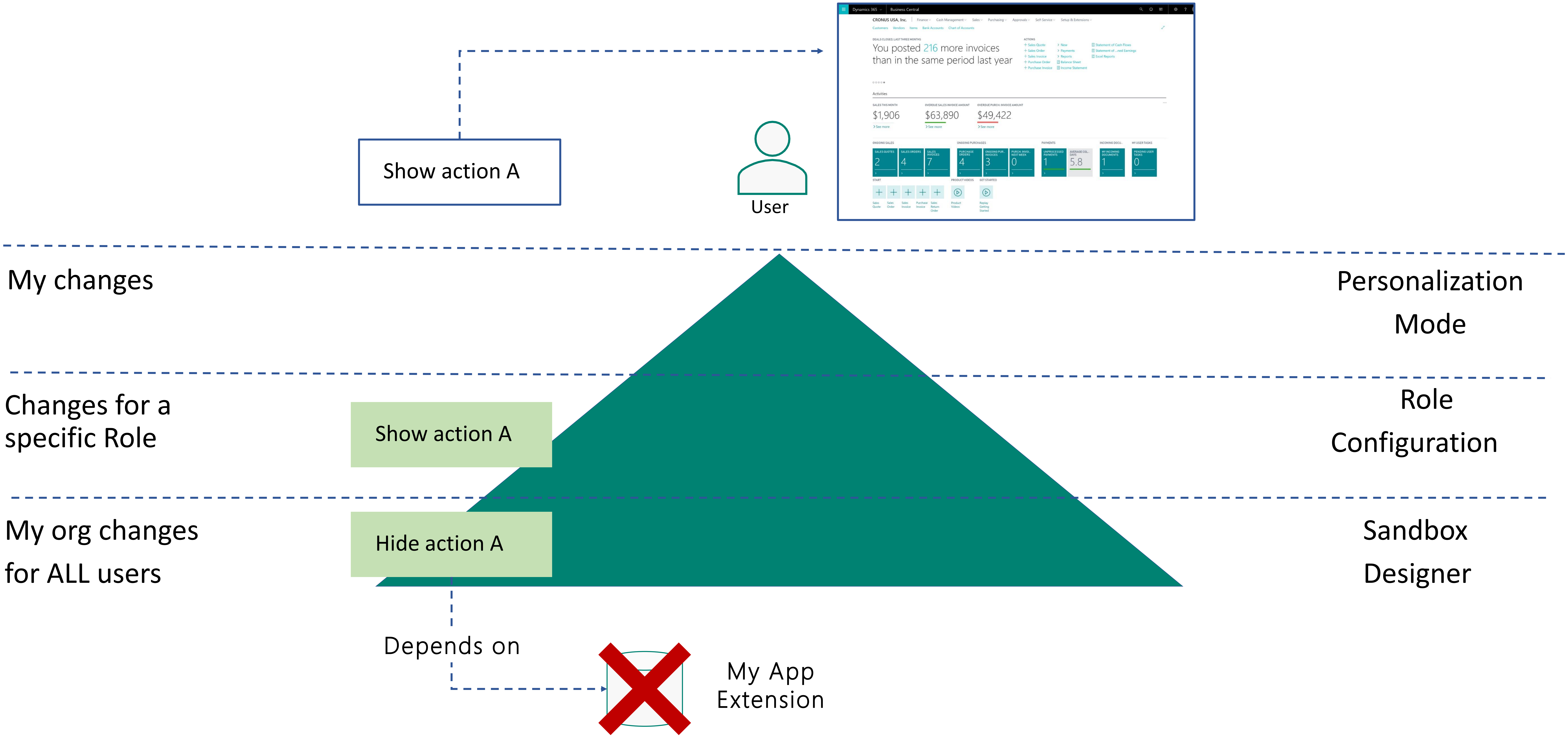
Consultant

User



My changes	3	Personalization Mode
Changes for a specific Role	2	Role Customization
My org changes for ALL users	1	Sandbox Designer

Keep things simple – soft dependencies to get predictable outcome.



Role customization – Cloud ready. Running AL behind a scene

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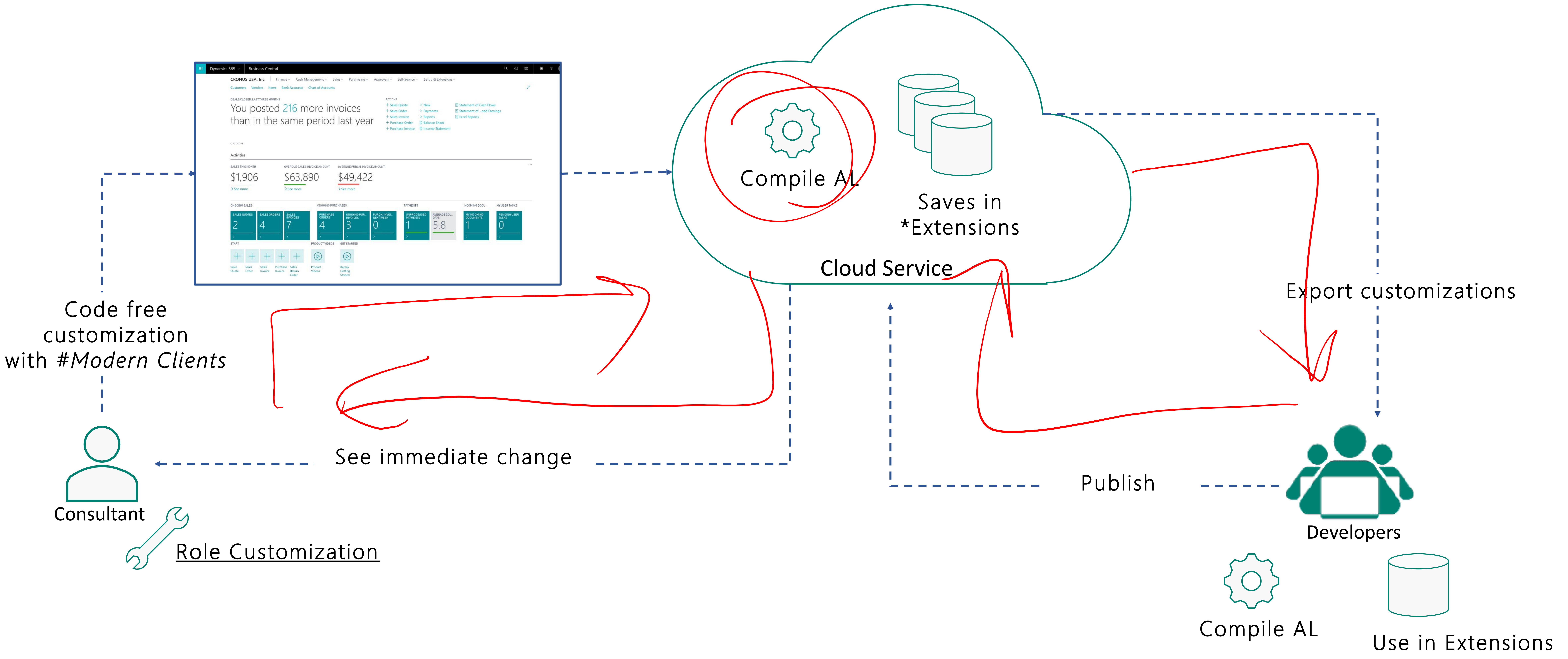
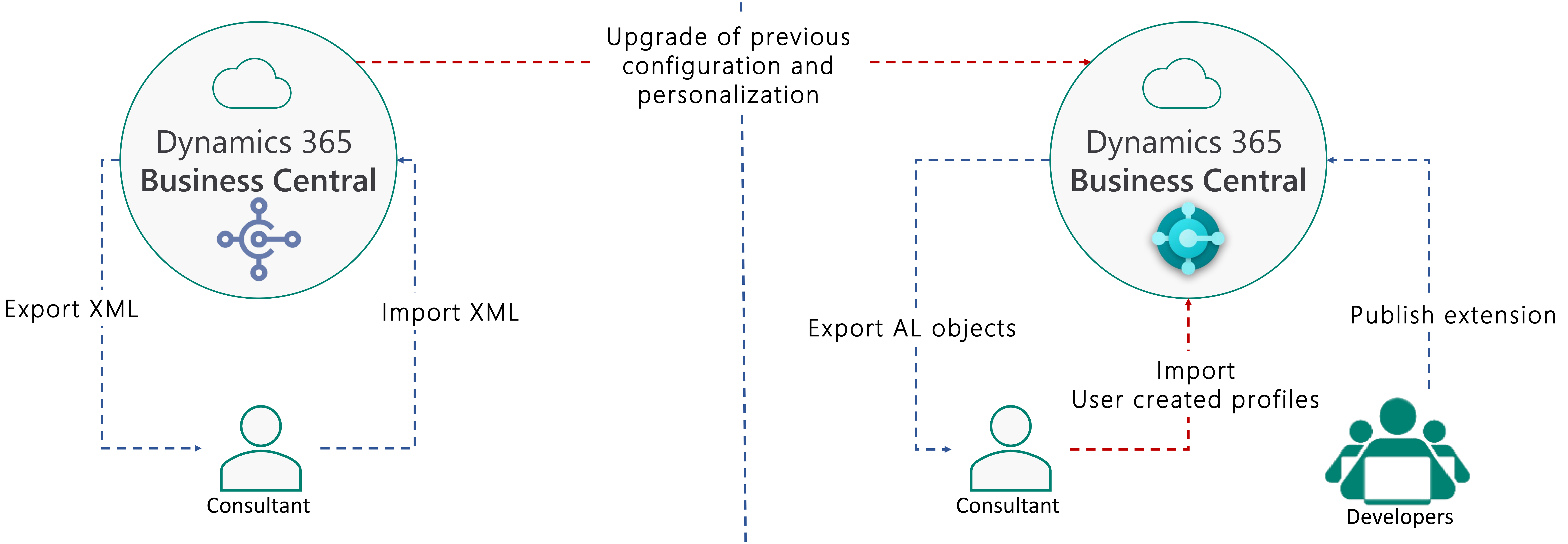


Role tailoring behind a scene

How does role (profile) import/export story is different from NAV/BC14.x

XML definition with a specific format

Cloud ready. Running AL behind a scene



Upgrade & Profiles as AL objects

- Profiles are AL objects
- Page customizations are also AL objects.
- No upgrade to change profile
- No upgrade for V1 configurations, but they are still in the database

```
profile NavTechDaysUser
{
    CaptionML = ENU = 'Nav Tech Days Role';
    Enabled = true;
    ProfileDescriptionML = ENU = 'Nav Tech Days Role';
    Promoted = true;
    RoleCenter = 9022;
    Customizations = myRoleSpecificCustomization;
}
1 reference
pagecustomization myRoleSpecificCustomization customizes "Business Manager Role Center"
{
    layout
    {
    }
    actions
    {
        modify("Purchase Quote")
        {
            Visible = false;
        }
    }
}
```

https://github.com/microsoft/ALAppExtensions/blob/master/BREAKINGCHANGES.md#base-application

Design (which table to use)

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Before

Table 2000000178
All Profile

Table 2000000177
Tenant Profile
→ Profiles created by the user or extension

Table 2000000172
Profile
→ Profiles provided by Microsoft/ISV

Now

Table 2000000178
All Profile
- → All Profile is the preferred one to use for read operations
- → We discourage to insert into it during install or upgrade: all the profiles should now come as AL objects. You can use it for any CRUD operation in your normal code.
- → You can (but shouldn't) use Tenant Profile in very specific cases, e.g. insert during upgrade/on-install if you need to create a profile on-the-go

Table 2000000177
Tenant Profile
- → Every profile is here
- → The reason we still have AllProfile is mainly for convenience: it translates fields in the right language, and it unpacks some fields that in the Tenant Profile table are stored in a BLOBs

Call to action and learn more

- Use Role Explorer and provide feedback
- Pre-sales: Show & do role customization on live systems!
- Role tailoring: Get up to date what you can do with modern clients now
- Consultants, power users are empowered as never before

http://aka.ms/bcnocode

Working smarter with Modern Clients

Shared layout in Views

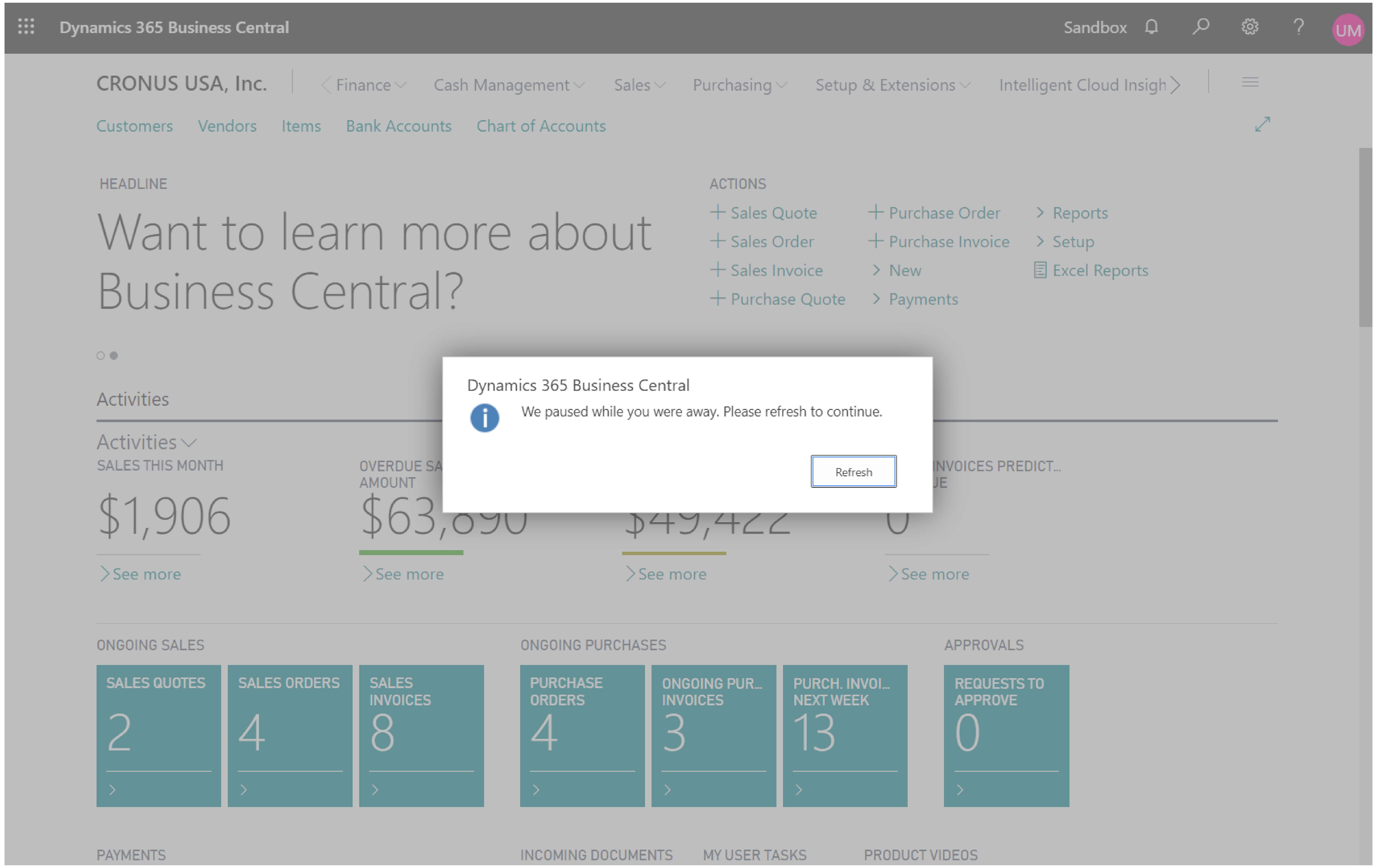
```
view(SharedLayoutView)
{
    Filters = where(Inventory = filter(> 0));
    OrderBy = ascending(Description);
    SharedLayout = false;
    layout
    {
        modify(Description)
        {
            Width = 42;
        }

        modify(Control1)
        {
            FreezeColumn = Description;
        }

        modify("Assembly BOM")
        {
            Visible = false;
        }
    }
}
```

Demo – being even more productive

Session Timeout



Business Central online

- The duration of a client session timeout has been expanded to **2 hours** for Business Central online

On-premises

- Administrators continue to have control over timeout, which defaults to 20 minutes

https://docs.microsoft.com/en-us/dynamics365-release-plan/2019wave2/dynamics365-business-central/longer-timeout-period-server-connection

Multitasking across pages

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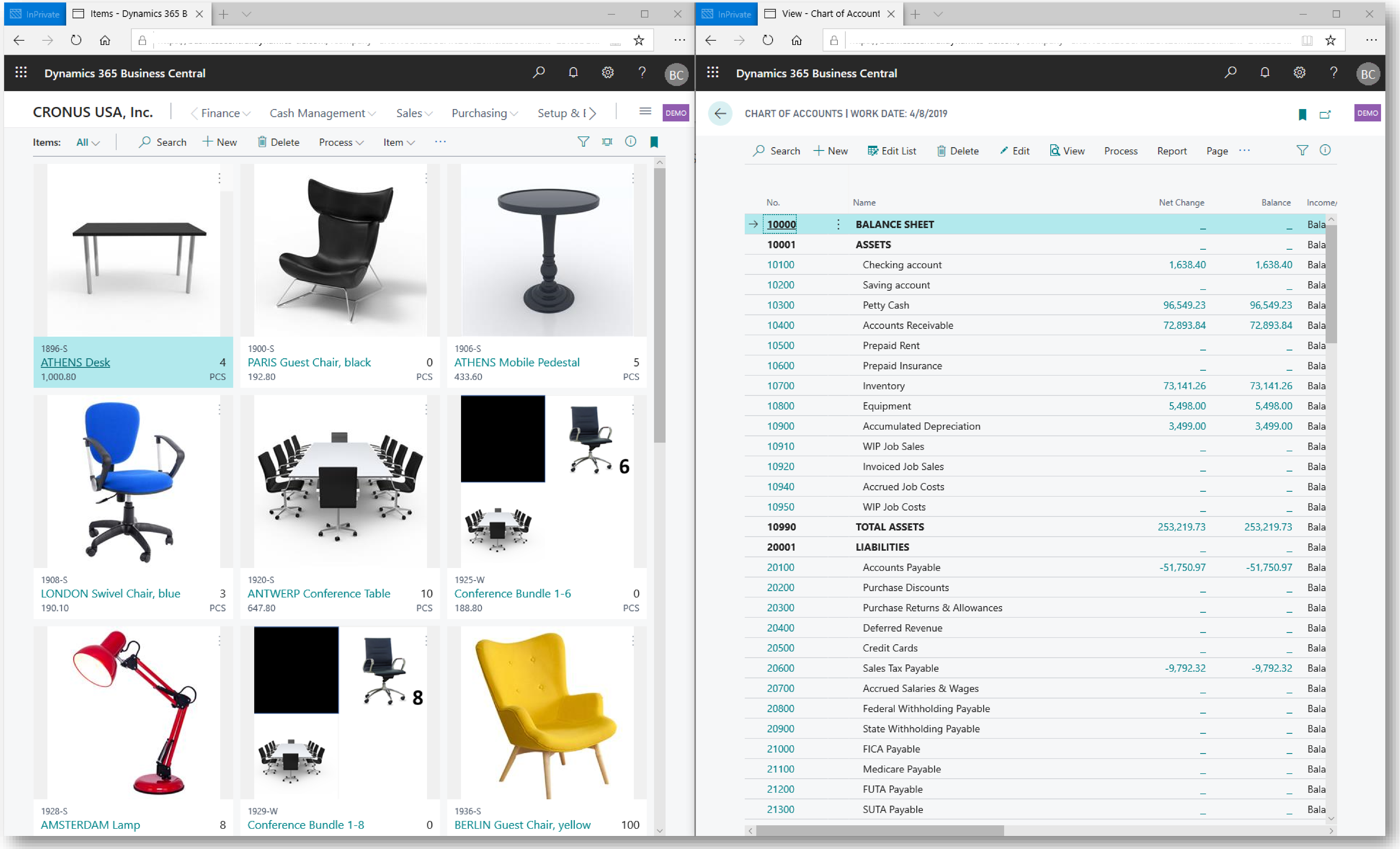
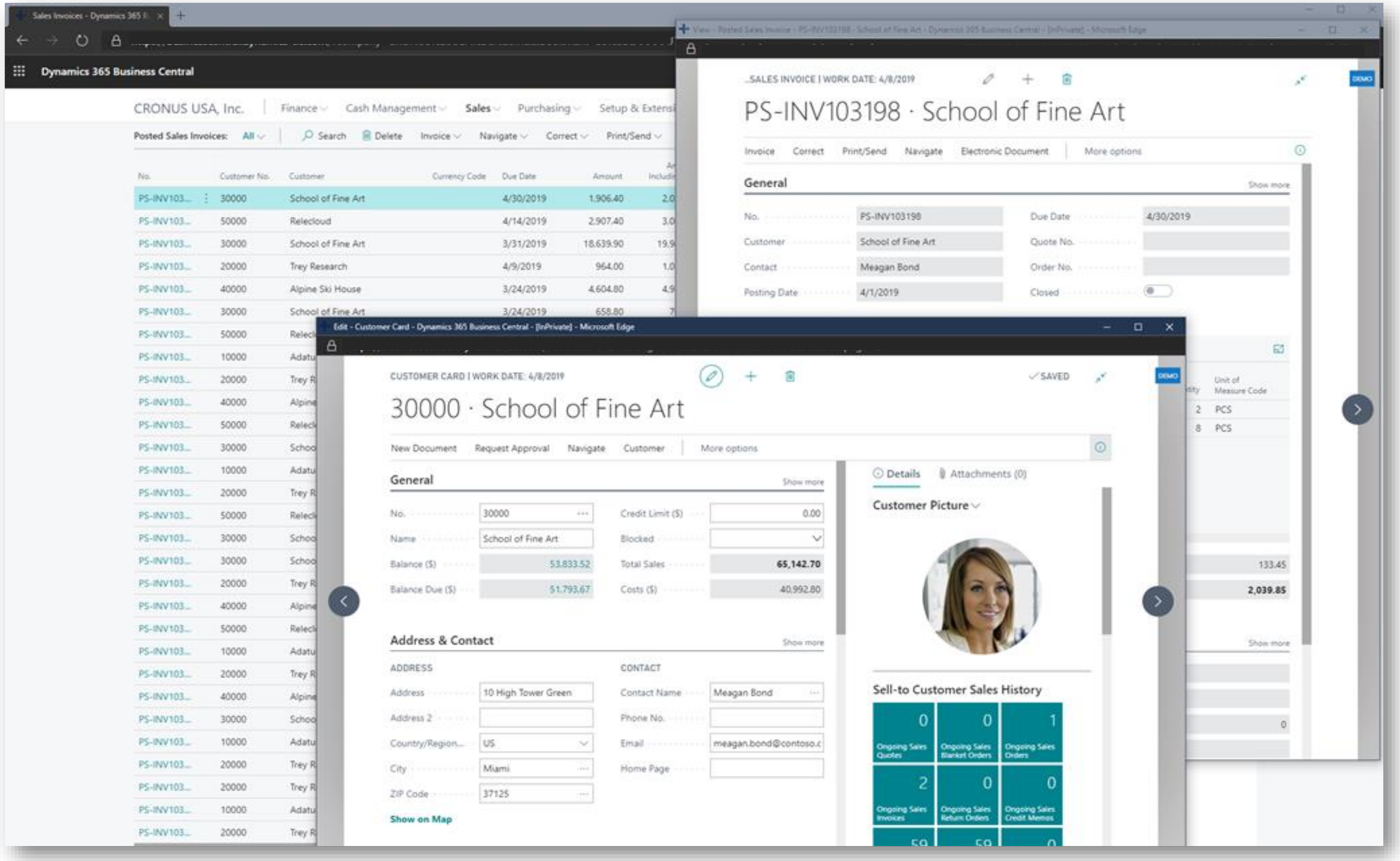


New browser tab

- Open several browser tabs or windows while working with the same company
- Work concurrently on any two or more pages without blocking each other
- Each browser window acts as another connection or session

https://docs.microsoft.com/en-us/dynamics365-release-plan/2019wave2/dynamics365-business-central/multi-tasking-across-multiple-pages

Multitasking across pages



Open a page in a new window

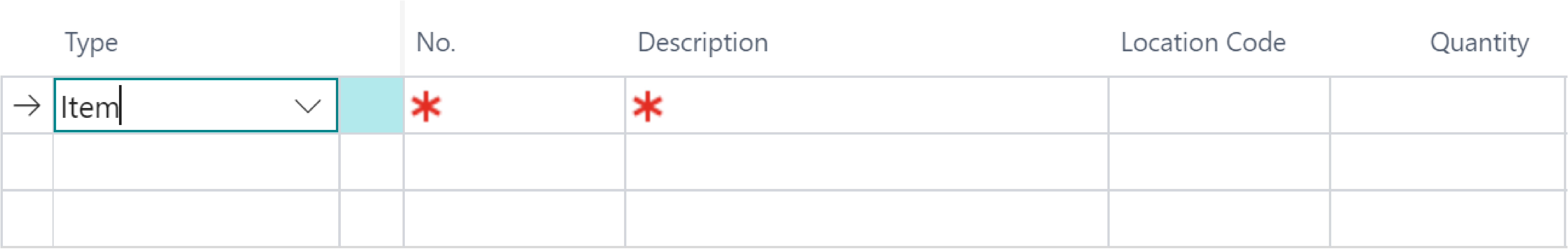
- Pop out a card or document into a smaller, connected window
- Enhance productivity by working with multiple screens or by placing the new windows on top of each other on one screen
- In many cases, the data will synchronize between windows

https://docs.microsoft.com/en-us/dynamics365-release-plan/2019wave2/dynamics365-business-central/multi-tasking-across-multiple-pages

Uninterrupted data entry

Data entry challenge

- User keystrokes are ignored while OnValidate trigger is running
- User is confused why keystrokes are sometimes lost
- User is forced to work in Type > Tab > Wait > Type pattern



Adding a sales line...

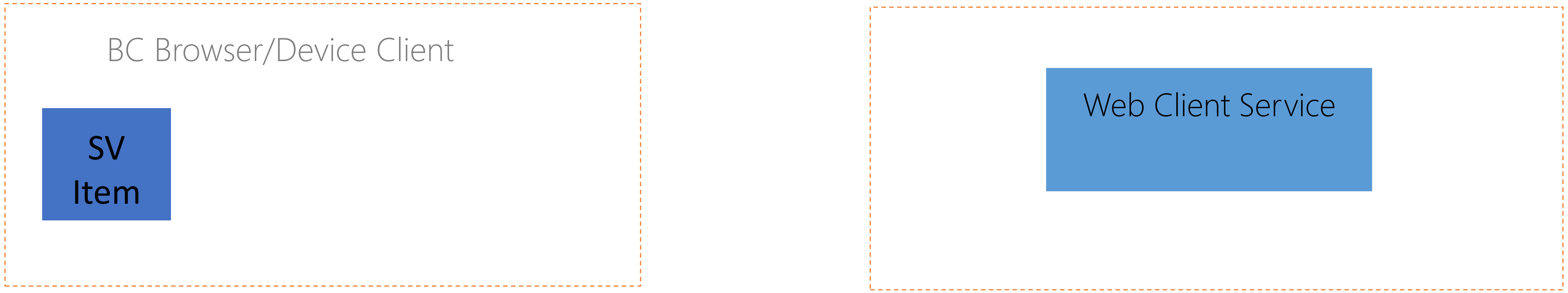
	Type	No.	Description	Location Code	Quantity
→	Item	*	*		

BC Browser/Device Client

Web Client Service

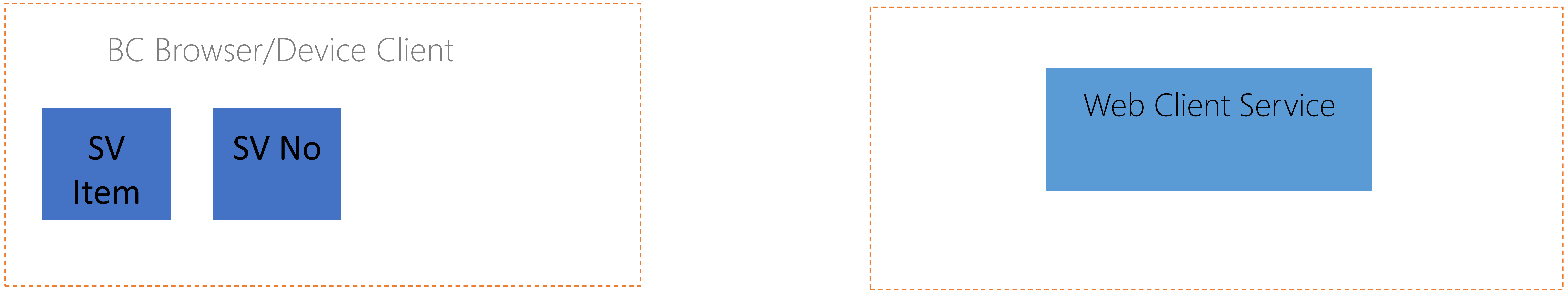
Adding a sales line…

Type		No.	Description	Location Code	Quantity
→ Item		*	*		



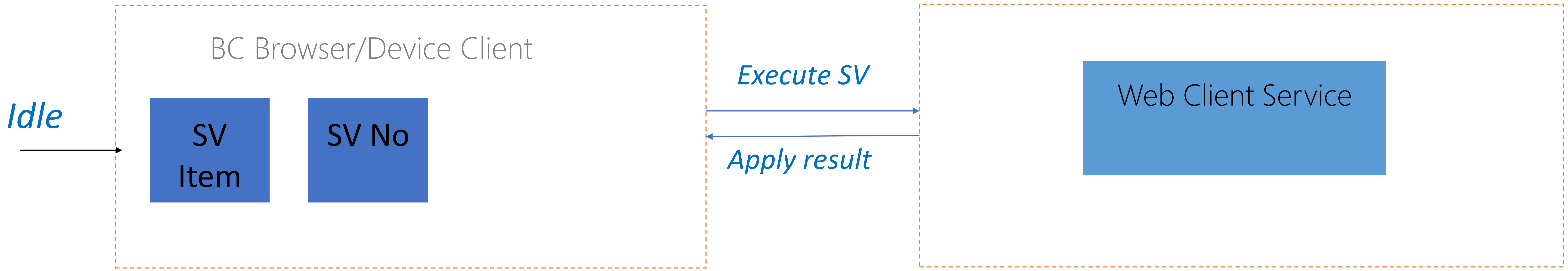
Adding a sales line…

	Type		No.	Description	Location Code	Quantity
→	Item	⋮	1896-S			*



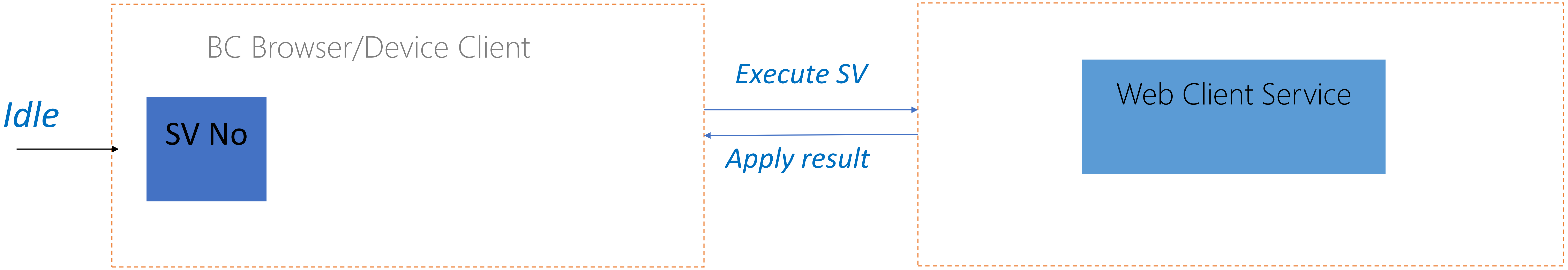
Adding a sales line…

Type	No.	Description	Location Code	Quantity
Item	1896-S			*



Adding a sales line…

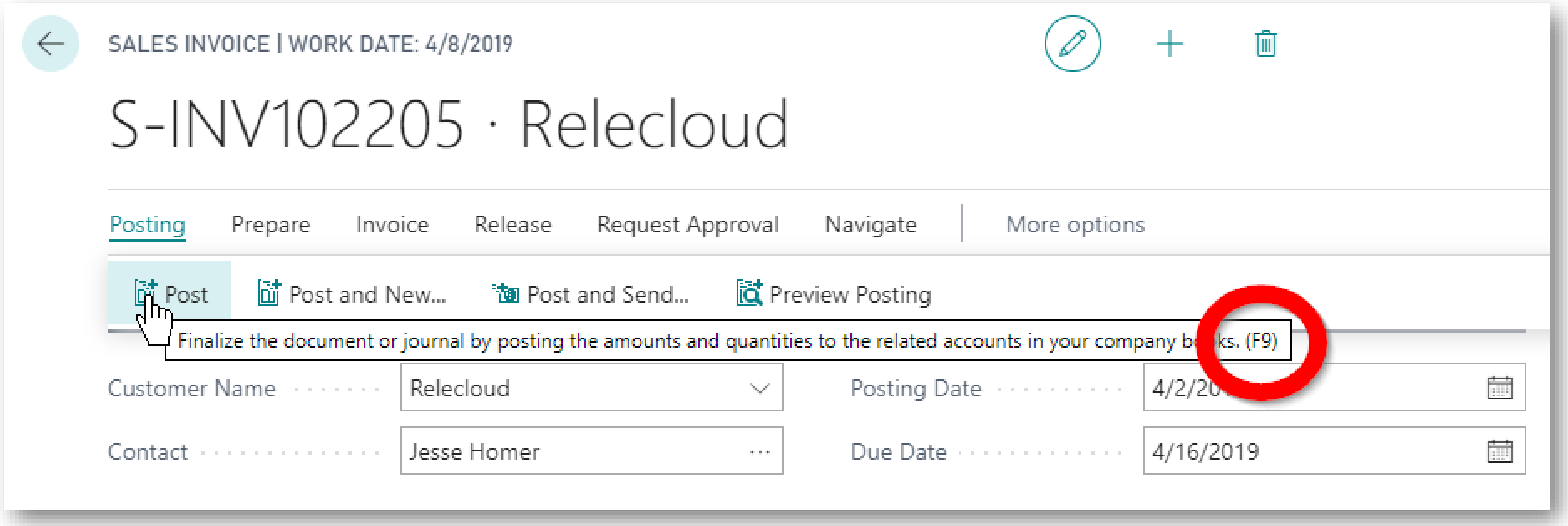
	Type		No.	Description	Location Code	Quantity
→	Item	⋮	1896-S			*



Adding a sales line...

	Type	No.	Description	Location Code	Quantity
→	Item	1896-S			

Application keyboard shortcut support



- Application developers can specify keyboard shortcuts for actions in the base application and their own objects in their extensions
- Developers can enable shortcut keys through the **ShortcutKey** property in AL
- Enhance the predefined list of keyboard shortcuts in Business Central with your own
- This supports auto update of the tooltips

https://docs.microsoft.com/en-us/dynamics365-release-plan/2019wave2/dynamics365-business-central/full-keyboard-shortcut-support

New system keyboard shortcuts

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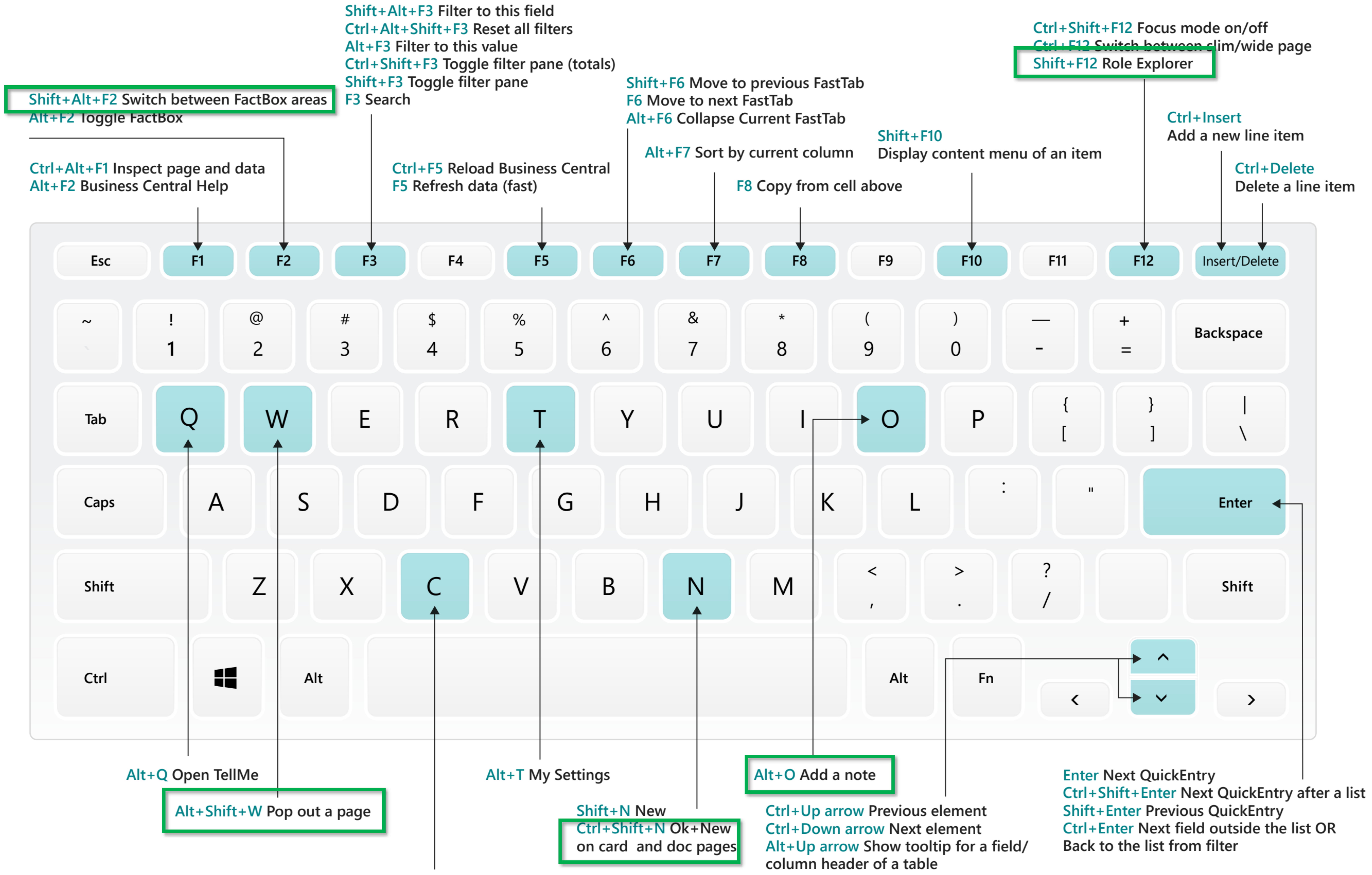
Business Central Keyboard Shortcuts



Updated keyboard shortcuts map

Additional shortcuts:

- Pop-out a card or document: Alt +Shift + W
- Add a note: Alt +O
- Role Explorer: Shift + F12
- Many more at https://aka.ms/bckeys

New cheat sheet - Productivity Tips

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- Basics of the user interface
- Most important keyboard shortcuts
- Most important tips on filtering and data entry
- Available as PDF download: **aka.ms/bcproductivity**

Business Central - Productivity tips

General functions
Keyboard shortcuts

Ctrl+F1
Business Central Help

Alt+T
My Settings

Alt+Q
Open Tell Me

F5
Refresh data

Shift+F12
Role Explorer

Alt+N
Create a new record

Alt+Shift+N
Close a newly created record and create a new one

Alt+Shift+W
Pop-out a page to a separate window

Ctrl+Alt+F1
Inspect page and data

Alt+O
Add a new note for the selected record

Alt+F2
Toggle FactBox area

Ctrl+F12
Switch between slim/wide page

Data in lists
Keyboard shortcuts

Alt+F7
Sort column in asc/desc order

Shift+F3
Toggle filter pane; focus on data filters

Alt+F3
Filter on selected cell value

Ctrl+Shift+F3
Toggle filter pane; focus on totals filters

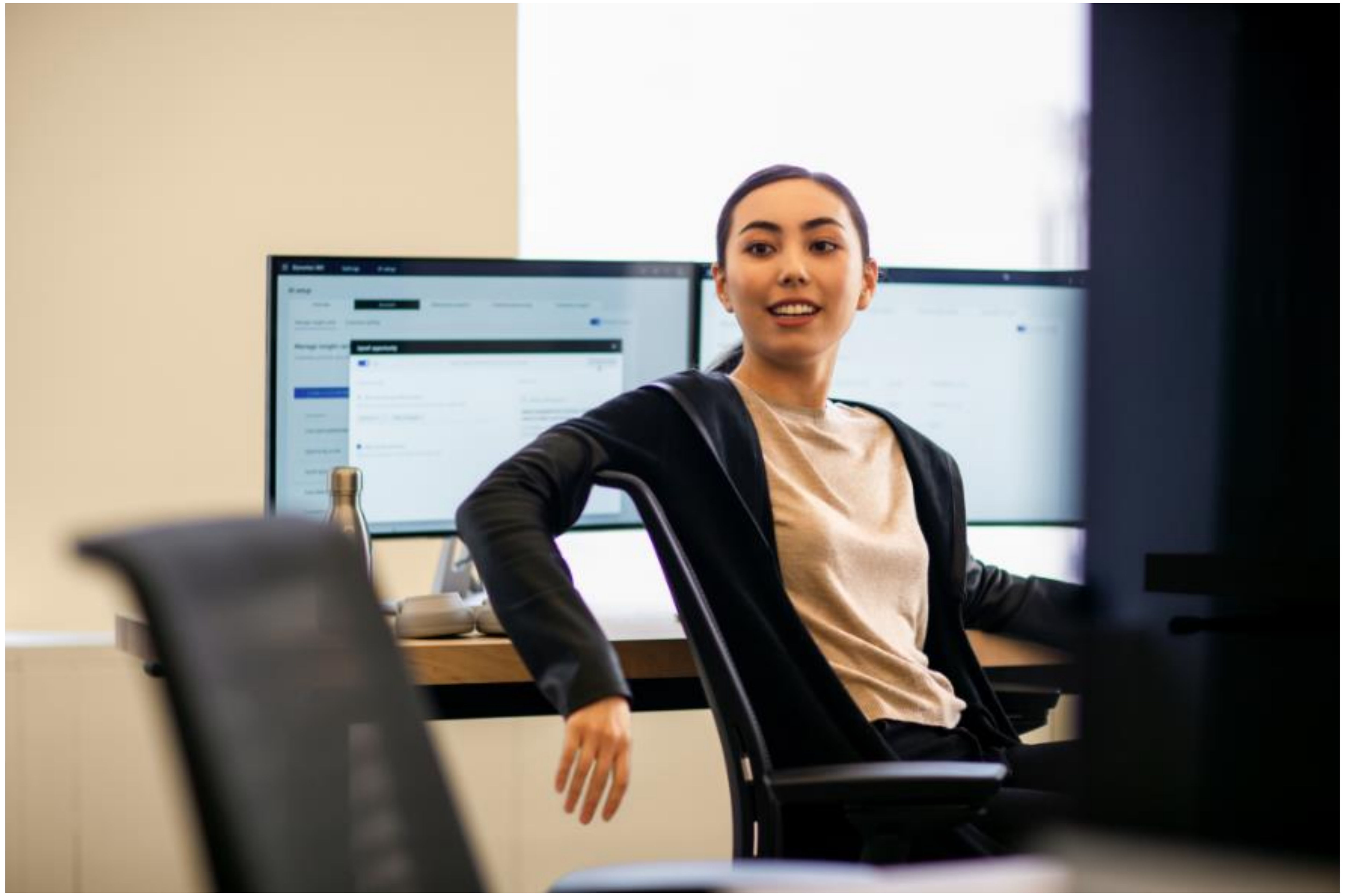
F3
Toggle the search box

Shift+Alt+F3
Add filter on selected field

Ctrl+Enter
Change focus from filter pane back to list

Ctrl+Alt+Shift+F3
Reset filters

Developing for Modern Clients



Loading UI asynchronously with Modern Clients

Some calculations and queries are expensive…

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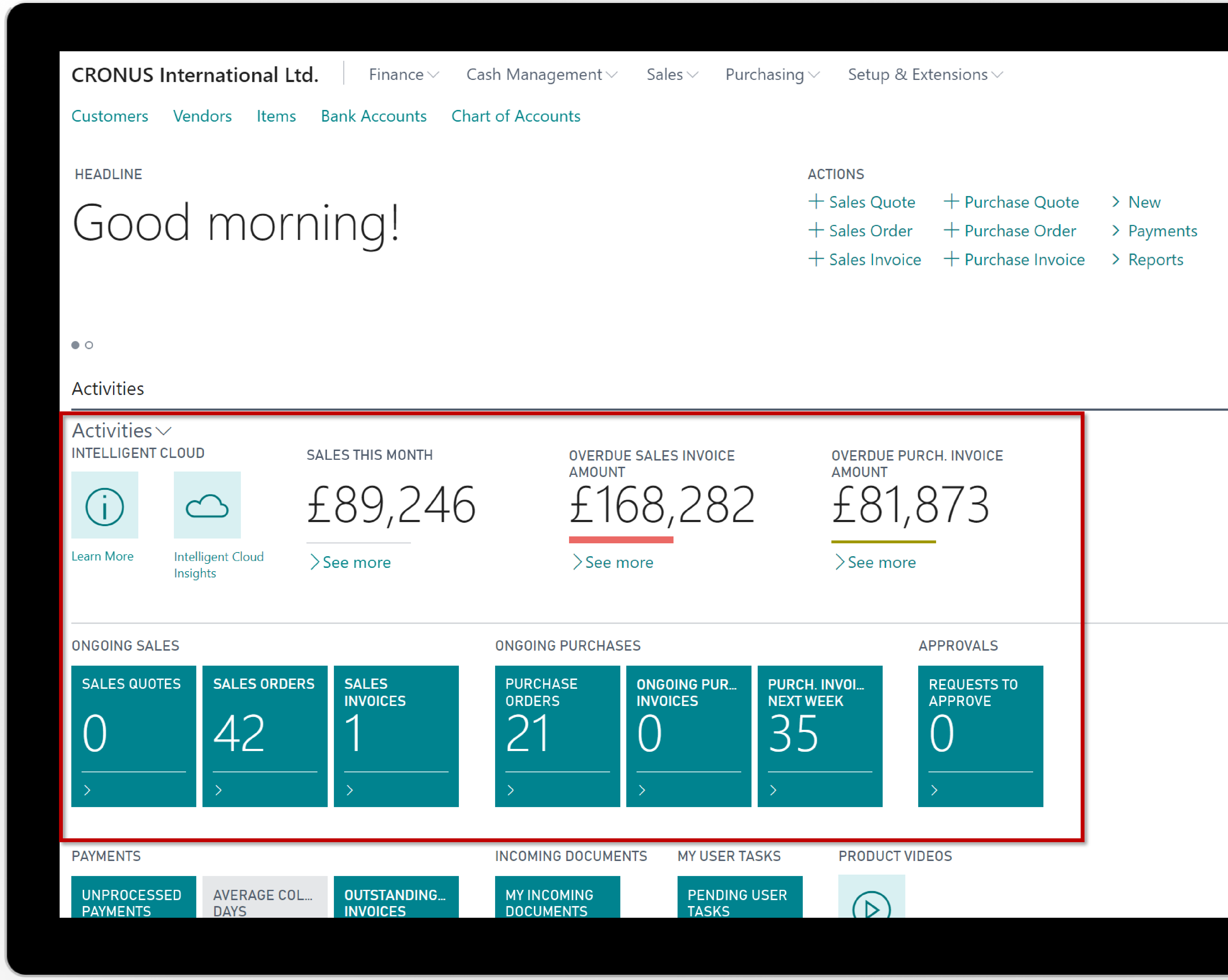
Waiting while your page is loading is the most annoying thing for the user

BI & total calculations takes time to run, especially on large dataset

Today: The UI is waiting for calculations to complete. And user waits ages….



Communication with other systems may take time

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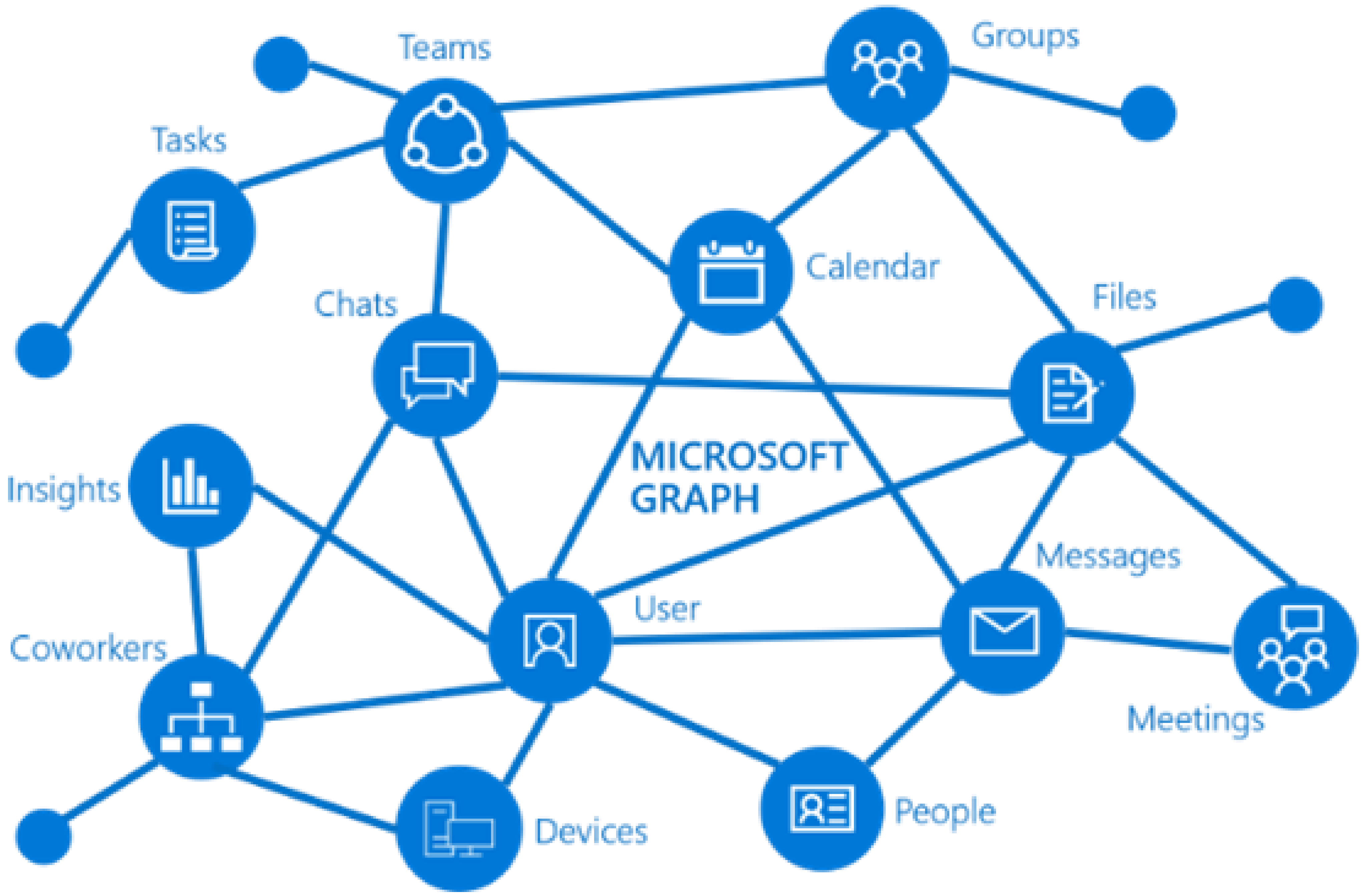
- Response time may be slow
- E.g. Any AL HTTPClient call blocks the UI thread waiting for the result
- Today: The UI is blocked



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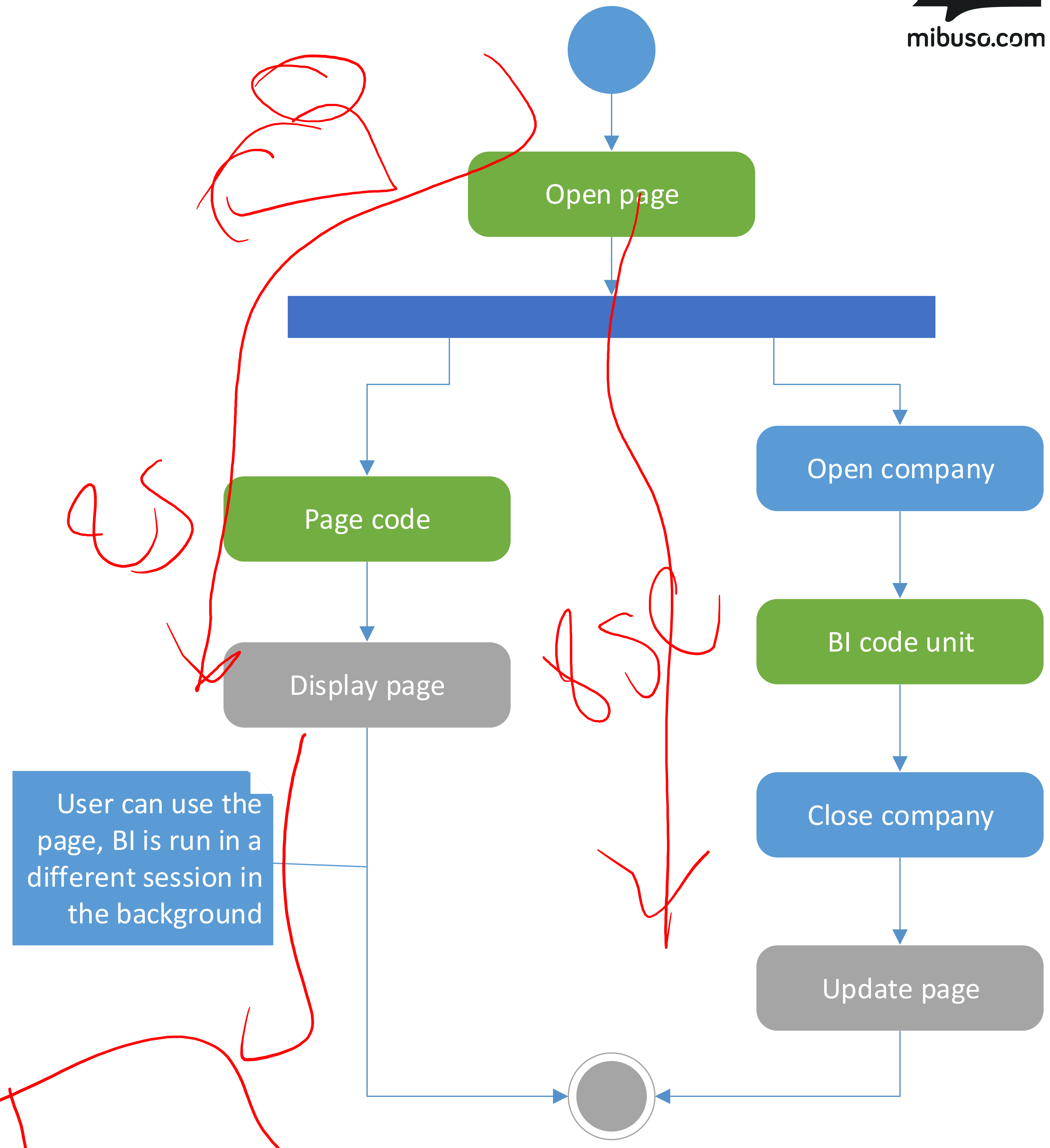
Loading UI asynchronously - wait less, do more

Welcome Page Background Task (aka PBT)

- Run a code unit as a read-only child session of the page session.
- On completion, invokes a trigger on the parent Page.
- UI is refreshed instantly
- If page is closed before the task completes, or if the page record changed, then the task is cancelled.



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Important! OpenCompany triggers

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Child sessions opens company

- Any code subscribed to OpenCompany events/triggers will be invoked
- Any database write will prevent child sessions to start
- If an extension makes OpenCompany slower, then all the child sessions will be impacted by that

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::LogInManagement, 'OnBeforeCompanyOpen', '', false, false)]
0 references
procedure OnBeforeCompanyOpen()
begin
    // Excluding child session
    if Session.CurrentClientType = ClientType::ChildSession then
        exit;

    // Normal session
end;
```

Loading UI asynchronously - AL

How to use a Page Background Task (PBT)

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- **Create the code unit to run in the background**
- Add on the page the call to “Enqueue” it as a PBT
- Add on the page the completion trigger to update the UI
- (Optional): Add on the page the error completion trigger to handle in a specific way errors

```
codeunit 95103 PBTDataSumConcatRow
{
  TableNo = PBTData;

  trigger OnRun()
  var
    RecId: Code[10];
    Result: Dictionary of [Text, Text];
  begin
    if not Evaluate(RecId, Page.GetBackgroundParameters().Get('RecId')) then
      Error('RecId couldnt be parsed');

     if not Get(RecId) then
      Error('PBTData record ID %1 was not found', RecId);

     Result.Add('Sum', Format(IntA + IntB + IntC));

     Page.SetBackgroundTaskResult(Result);
  end;
}
```

How to use a Page Background Task (PBT)

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- Create the code unit to run in the background
- **Add on the page the call to "Enqueue" it as a PBT**
- Add on the page the completion trigger to update the UI
- (Optional): Add on the page the error completion trigger to handle in a specific way errors

```
var
        3 references
        TaskSumId: Integer;

trigger OnAfterGetRecord()
var
        TaskParameters: Dictionary of [Text, Text];
begin
        if (TaskSumId > 0) then
            Currpage.CancelBackgroundTask(TaskSumId);

        TaskParameters.Add('RecId', '100');

        CurrPage.EnqueueBackgroundTask(TaskSumId, 95103, TaskParameters,
            1000, PageBackgroundTaskErrorLevel::Warning);
end;
```

How to use a Page Background Task (PBT)

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- Create the code unit to run in the background
- Add on the page the call to “Enqueue” it as a PBT
- **Add on the page the completion trigger to update the UI**
- (Optional): Add on the page the error completion trigger to handle in a specific way errors

```
trigger OnPageBackgroundTaskCompleted(TaskId: Integer; Results: Dictionar
var
begin
    if (TaskId = TaskSumId) then begin
        Evaluate(RecordSumAsync, Results.Get('Sum'));
    end;
end;
```

How to use a Page Background Task (PBT)

- Create the code unit to run in the background
- Add on the page the call to “Enqueue” it as a PBT
- Add on the page the completion trigger to update the UI
- **(Optional): Add on the page the error completion trigger to handle in a specific way errors**

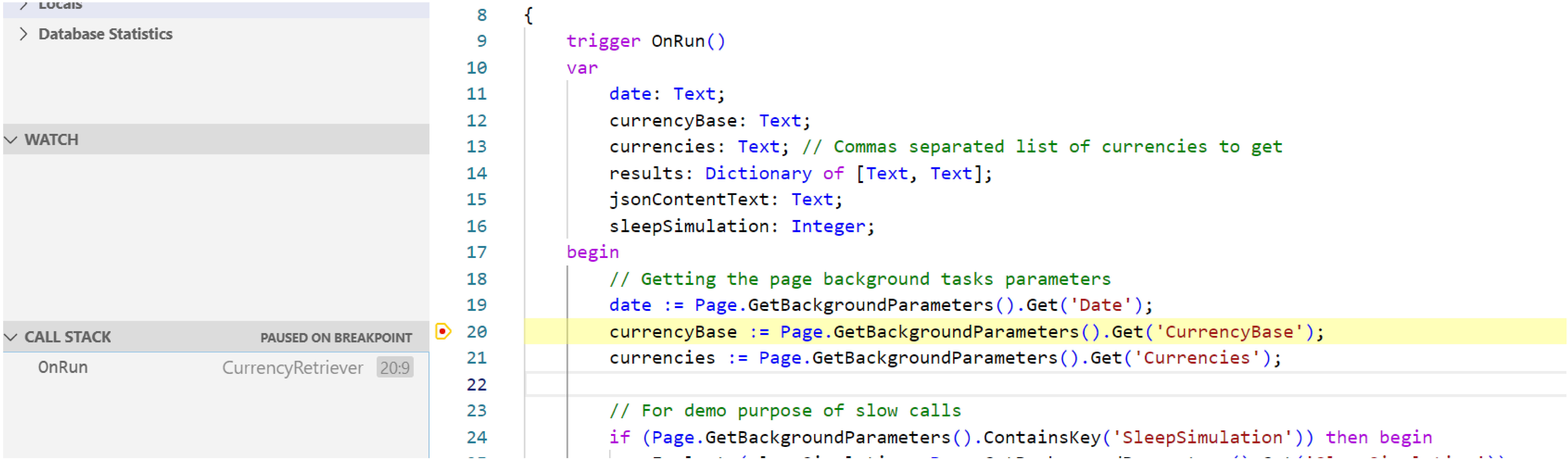
```
trigger OnPageBackgroundTaskError(TaskId: Integer; ErrorCode: Text; ErrorText: Te
    ErrorCallStack: Text; var IsHandled: Boolean)
var
    PBTErrorNotification: Notification;
begin
    if (ErrorText = 'Could not parse parameter WaitParam') then begin
        IsHandled := true;
        PBTErrorNotification.Message('Something went wrong. The start and finish 
        PBTErrorNotification.Send();
    end

    else
        if (ErrorText = 'Child Session task was terminated because of a timeout.'
            IsHandled := true;
            PBTErrorNotification.Message('It took to long to get results. Try aga
            PBTErrorNotification.Send();
        end
end;
```

Debugging

In the 2019 wave 2 release only one session can be debugged at a time

If a breakpoint hit in a child session, the child session will become the debugged session



Call to action and learn more

- Use page background tasks to offload heavy calculations
- Build responsive UI, so user don't need to wait
- Learn more how code and adopt page background tasks today

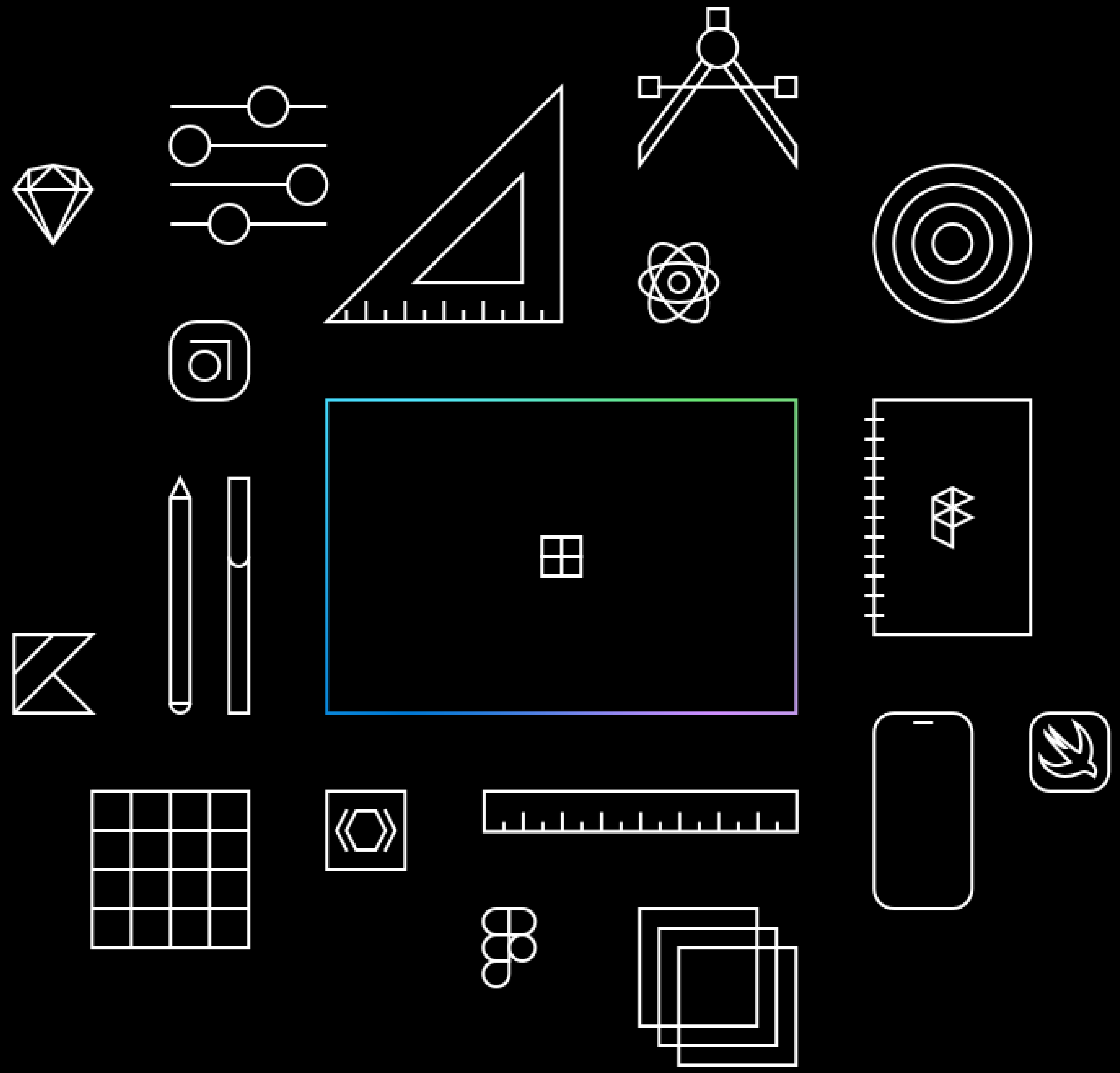
Page background tasks

Developing client add-ins

Hard to start with web?

- If you don't have an opinion on which framework fits your needs best, start with stack we are already using in production:
  - TypeScript
  - ReactJS
  - Sass (Syntactically Awesome Style Sheets)
  - Webpack
  - Microsoft UI Fabric (Office Fabric)

Microsoft UI Fabric



+ many additional Microsoft sites and products

Follow best practices

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Use Business Central add-in style guide

Be a good neighbor

Provide minimum useful experience first, complexity when needed

https://docs.microsoft.com/en-us/dynamics365/business-central/dev-itpro/developer/devenv-control-addin-style

Demo – web experiments

What's next for Modern Clients

Business Central Roadmap – Modern Clients

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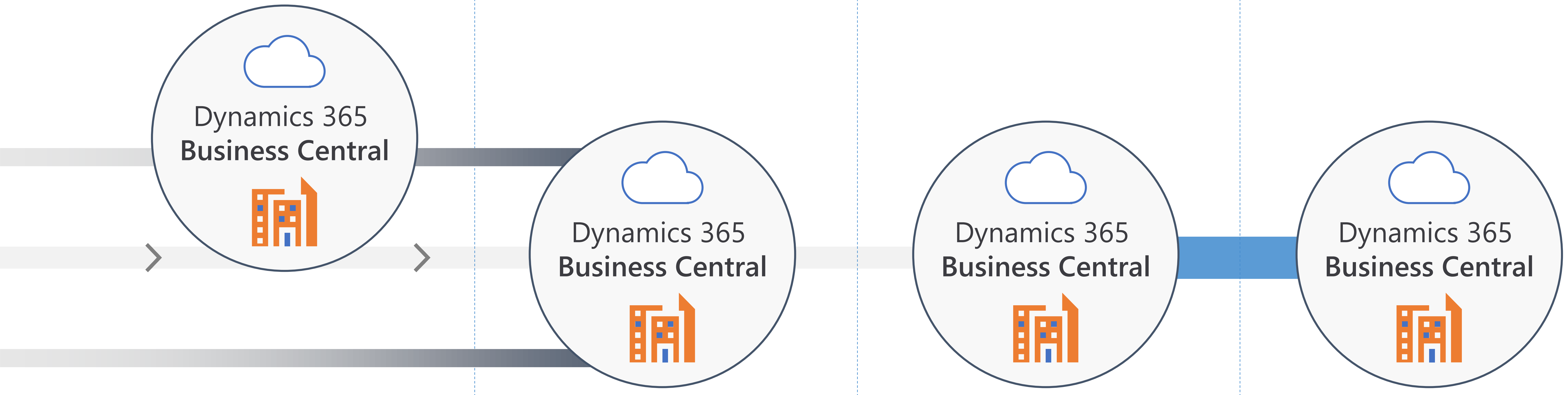
APRIL 2018	OCTOBER 2018	APRIL 2019	OCTOBER 2019	2020	2021

Dynamics 365
Business Central
(Cloud)

Remains available
to sell until
October 2020



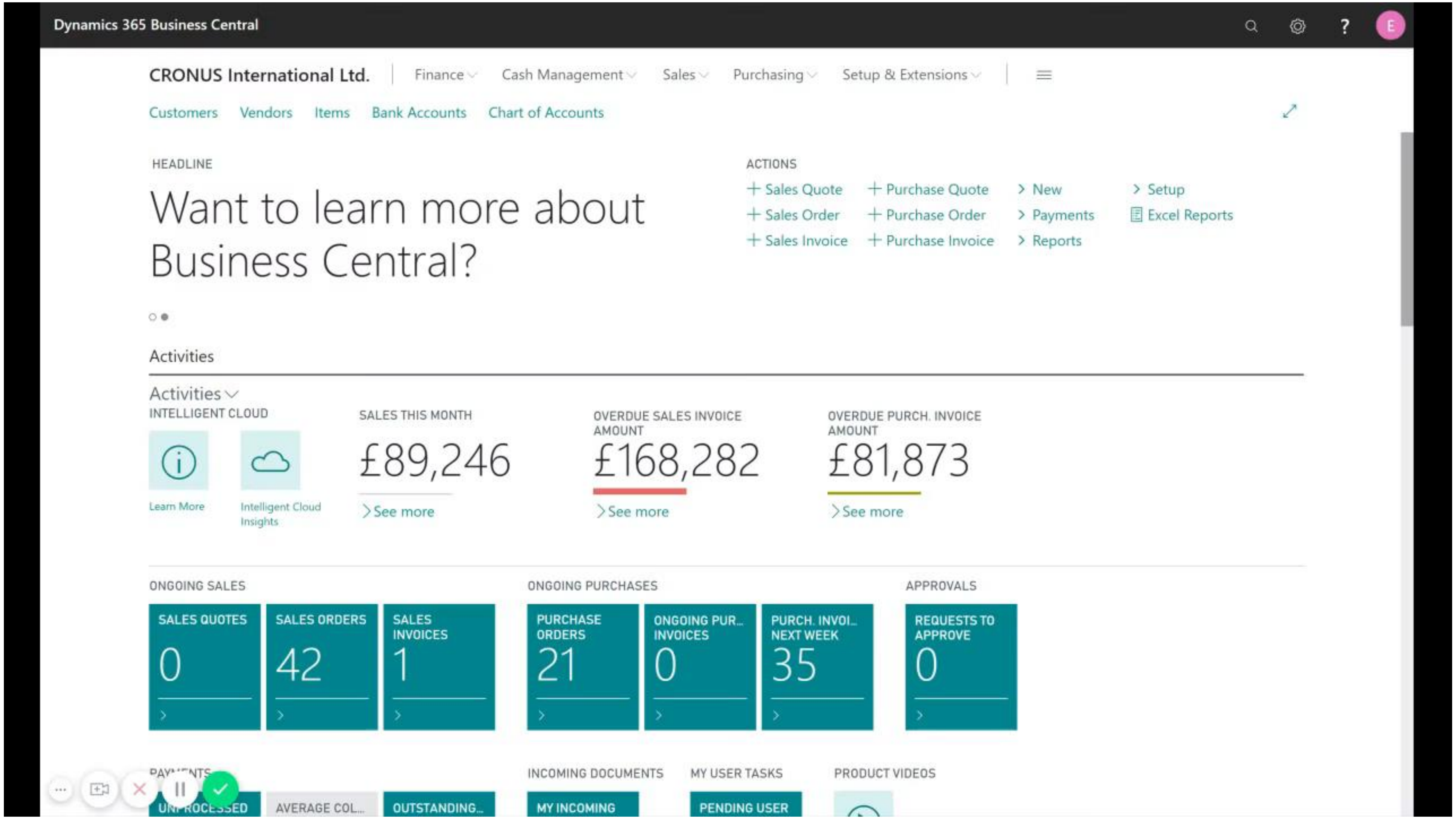
- Service fundamentals
- Modern Client
- VS Code + AL
- Enhanced migration tools

Future investment areas

- Data Entry Performance
- Fast rendering
- Print
- Complex pages
- Hierarchical grid
- Role customization
- Personalization
- Reporting
- No breaking changes
- World-class service

Sneak peak of what’s coming

Find in Role Explorer



Role Explorer is coming to your region

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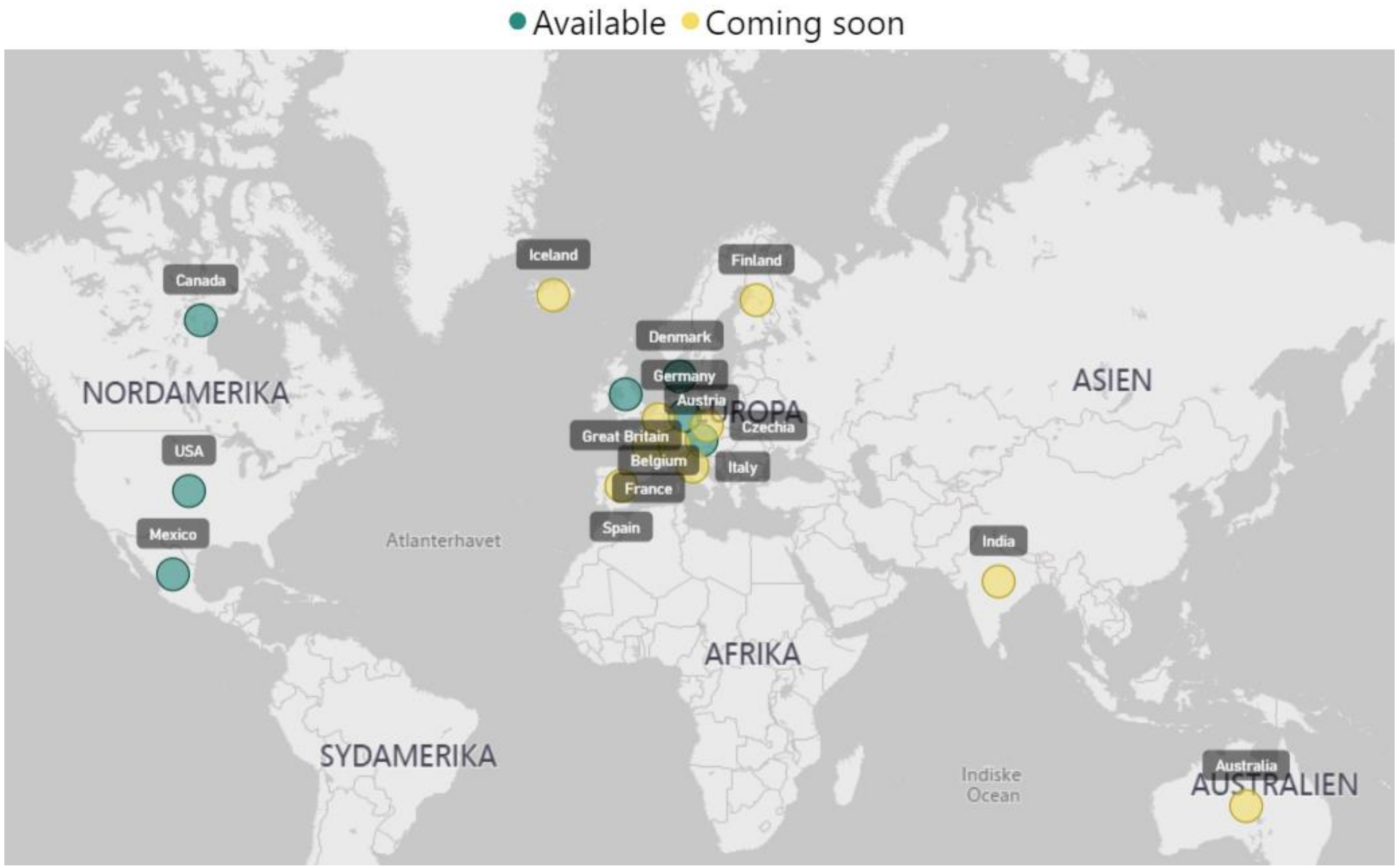
Already Available:
- US, CA, MX, GB, DE, AU, DK

Coming soon with minor updates:
- AT, BE, CH, CZ, ES, FI, FR, IS, IT

Coming Next:
- Remaining supported countries



Tree Views

NAV TECH DAYS 2019
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CRONUS International Ltd. | Sales | Purchasing | Inventory | Posted Documents | Setup & Extensions

Chart of Accounts Overview: All | Open in Excel

Reminder: your work date is 1/28/2021 Use today | Change to... | Turn off reminder

No.	Name	Income/Balance	Account Type	Net Change	Balance
1000	**BALANCE SHEET**	Balance Sheet	Heading	_	_
1002	**ASSETS**	Balance Sheet	Begin-Total	3,514,658.95	3,514,658.95
1003	**Fixed Assets**	Balance Sheet	Begin-Total	1,128,689.52	1,128,689.52
1005	**Tangible Fixed Assets**	Balance Sheet	Begin-Total	1,128,689.52	1,128,689.52
1100	**Land and Buildings**	Balance Sheet	Begin-Total	953,007.95	953,007.95
1110	Land and Buildings	Balance Sheet	Posting	1,479,480.60	1,479,480.60
1120	Increases during the Year	Balance Sheet	Posting	147.73	147.73
1130	Decreases during the Year	Balance Sheet	Posting	_	_
1140	Accum. Depreciation, Buildings	Balance Sheet	Posting	-526,620.38	-526,620.38
1200	**Operating Equipment**	Balance Sheet	Begin-Total	99,811.44	99,811.44
1210	Operating Equipment	Balance Sheet	Posting	582,872.18	582,872.18
1220	Increases during the Year	Balance Sheet	Posting	25,116.00	25,116.00
1230	Decreases during the Year	Balance Sheet	Posting	_	_
1240	Accum. Depr., Oper. Equip.	Balance Sheet	Posting	-508,176.74	-508,176.74
1300	**Vehicles**	Balance Sheet	Begin-Total	75,870.13	75,870.13
1310	Vehicles	Balance Sheet	Posting	49,473.91	49,473.91
1320	Increases during the Year	Balance Sheet	Posting	87,000.00	87,000.00
1330	Decreases during the Year	Balance Sheet	Posting	_	_

Q&A

Any Questions?