DYNAMICSCON PRESENTATION

DynamicsCon LIVE

POWERED BY
DUG

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What Can Our Business Do With APIs?

- What are Business Central **APIs**?

- Why are they so valuable?

- How can you **automate** business processes and **integrations** using Business Central APIs?

- How can APIs help make your business processes faster and more efficient?

What Is An API?

- **Application Programming Interface**
- **Import** or **Export** Data
- **Trigger a Process, Send/Receive a Notification**
- **Alternative to File Downloads or Manual Processes**
- **"Web API" or "Web Service"**
- **URI, JSON, XML, OData, OAuth, Postman**

APIs - Send or Receive Data

- **Send sales orders to 3PL warehouse vendor to fulfill**
- **Send inventory quantities to ecommerce system**
- **Send vendor invoices to AP automation service**
- **Receive customers & orders from ecommerce system**
- **Receive purchase receipts from 3PL warehouse**
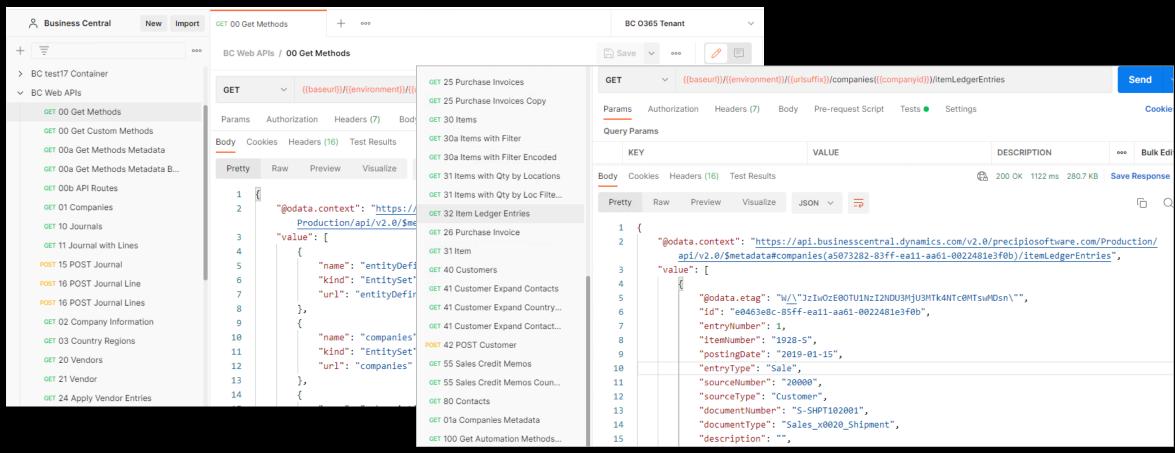- **Receive order tracking info from 3PL warehouse**

"Web Services" vs. "Web API v2.0"

Object Type ↑	Object ID	Object Name	Service Name ↑	Publi...	OData V4 URL
Query	260	Dimension Set Entries	DimensionSetEntries	☑	https://api.businesscentral.dyn...
Query	267	FA Ledger Entries	FALedgerEntries	☑	https://api.businesscentral.dyn...
Query	270	G/L Budget Entries	G/LBudgetEntries	☑	https://api.businesscentral.dyn...
Query	261	G/L Entries	G/LEntries	☑	https://api.businesscentral.dyn...
→ Query	265	Item Ledger Entries	ItemLedgerEntries	☑	https://api.businesscentral.dyn...
Query	103	Item Sales and Profit	ItemSalesAndProfit	☑	https://api.businesscentral.dyn...
Query	102	Item Sales by Customer	ItemSalesByCustomer	☑	https://api.businesscentral.dyn...
Query	268	Job Ledger Entries	JobLedgerEntries	☑	https://api.businesscentral.dyn...

https://api.businesscentral.dynamics.com/v2.0/acme.com/Production/ODataV4/

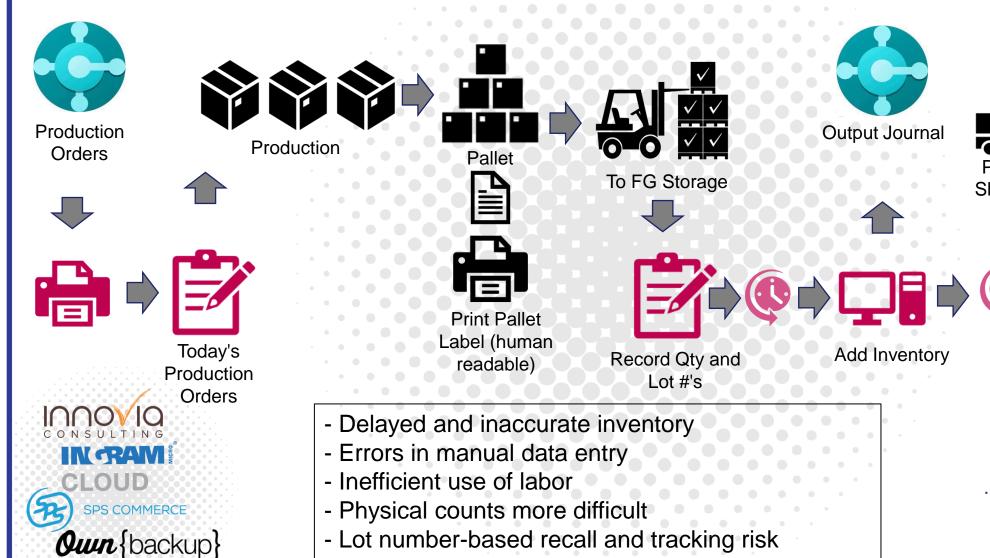**Company('CRONUS')/ItemLedgerEntries**

"Web Services" vs. "Web API v2.0"

https://api.businesscentral.dynamics.com/v2.0/acme.com/Production/api/v2.0/

companies(a5073282-83ff-ea11-aa61-0022481eff0f)/itemLedgerEntries

Plant Not-omation

Production Orders

Production

Pallet

Print Pallet Label (human readable)

To FG Storage

Record Qty and Lot #'s

Output Journal

Add Inventory

Physical Shipment

System Shipment

Today's Production Orders

- Delayed and inaccurate inventory
- Errors in manual data entry
- Inefficient use of labor
- Physical counts more difficult
- Lot number-based recall and tracking risk
- *Hidden but real costs*

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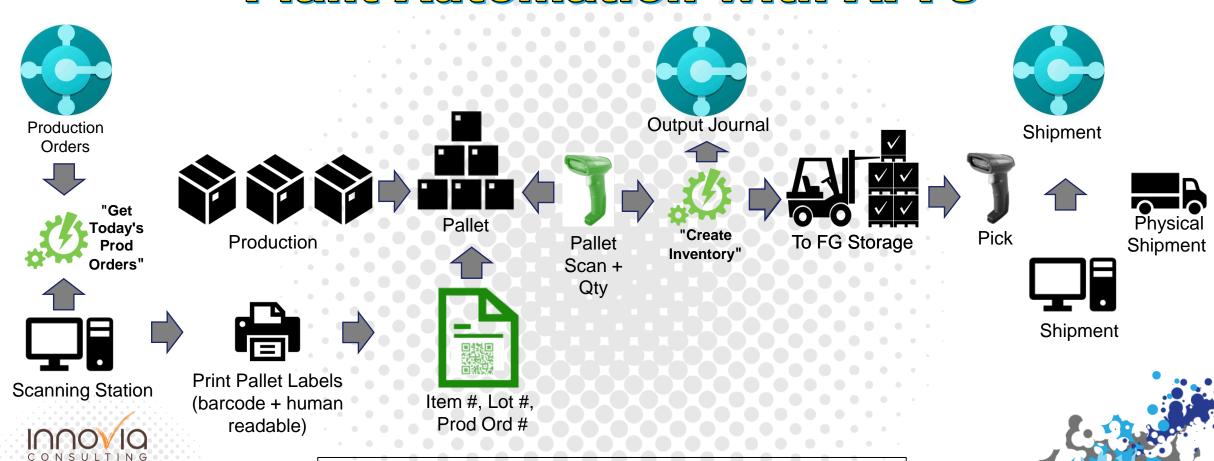
Plant Automation with API's
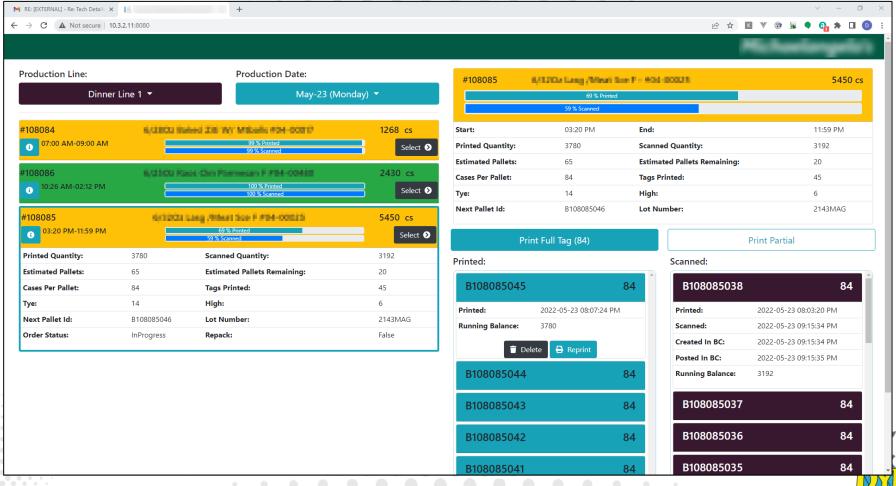
- Paperless process (except pallet label)
- Automated transactions with higher data accuracy
- Real-time inventory
- Synchronized system & physical shipment
- **Automation investment a known cost**
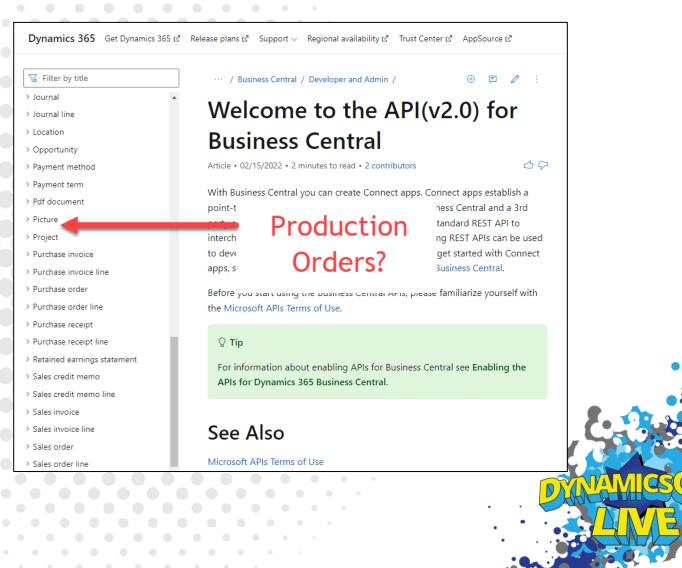
Finished Goods Automation IRL

- User interface for printing bar coded pallet tags, scanning into inventory, monitoring progress, and
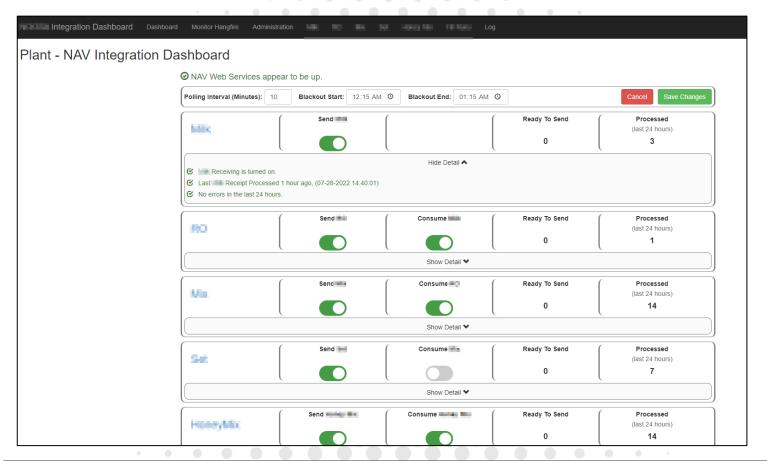- API calls built into this this application (custom)

API Gaps / vs. Web Services

- The BC API does not have all pages and functions available yet
- Query functions may limit fields returned from a table
- Options:
    - Use web services
    - Develop custom API's
-

Secret Sauce - Consoles

Provides end-user control over automations without IT assistance:
- Start / Stop / Pause processes, correct and reprocess errors.
- Alerting via email or other methods for errors or problems
- Without a console, you have an integration. With a console, you have an integration <u>application</u>.
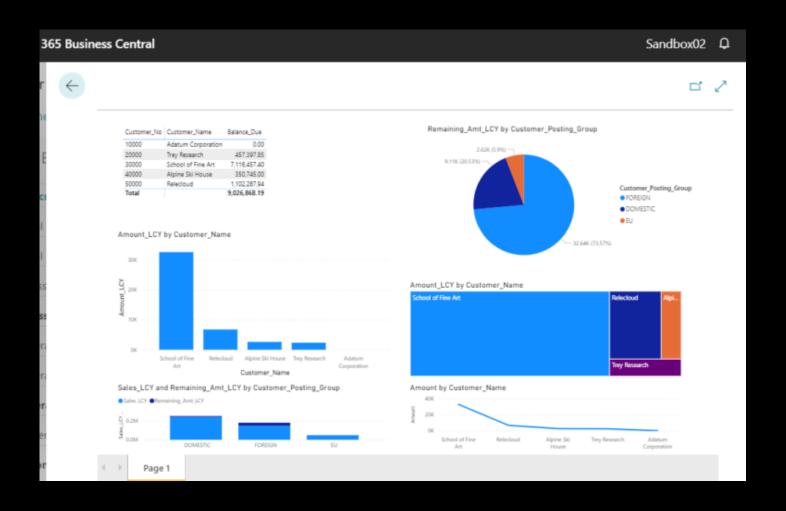
"Data Out" from BC Scenarios

Item Quantities by Location

Power BI Reporting

How to embed a Power BI report into Dynamics 365 Business Central: https://yzhums.com/4637/

Integration Tools

- **Power Automate**
- **Third Party integration tools**
- **eCommerce / Omni-Channel platforms**
- **ISV solutions (AP Automation, Warehouse Mgmt)**

Data Warehouse Loads Use Case

Company 1:
- Items
- Customers
- Sales Orders
- Sales Shipments
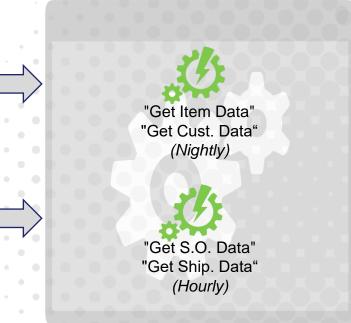
Company 2:
- Items
- Customers
- Sales Orders
- Sales Shipments
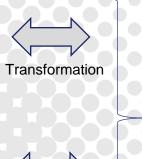
Company 3:
- Items
- Customers
- Sales Orders
- Sales Shipments

A P I   L a y e r

"Get Item Data"
"Get Cust. Data"
(Nightly)

"Get S.O. Data"
"Get Ship. Data"
(Hourly)

API Application Server

Transformation

Transformation

SQL

Cloud Data Warehouse (Azure, AWS, Google, etc.)

Reporting / Visualization Tools (Power BI, Tableau, Looker, etc.

- Read-only API use case; database table data from BC
- Enables multi-company dashboards and reports
- Frees data from BC interface (and licenses)

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Data Warehouse Load Console

- Read-only API use case; database table data from BC

- Enables multi-company dashboards and reports

- Frees data from BC interface (and licenses)

- Allows end-user to start, stop, reschedule, and monitor errors or issues

Data Load Schedules

Nightly

Schedule: 0 45 2 * * * - At 02:45 AM, every day

Next Run: 02:45 AM tomorrow

Vendors

| Acme | Full | Run Now |
| WidgetBuilders | Delta | Run Now |

History

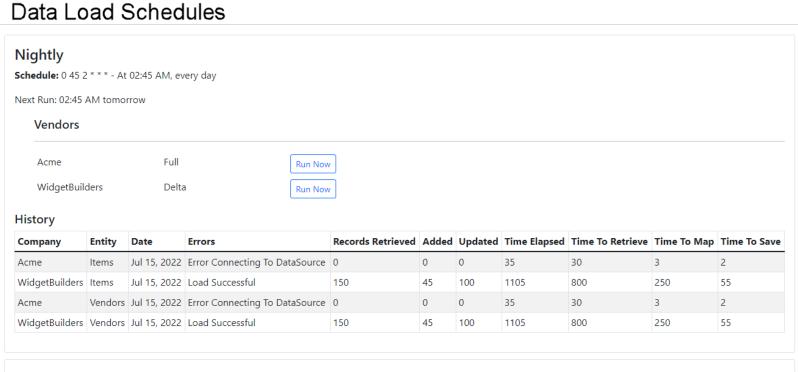| Company	Entity	Date	Errors	Records Retrieved	Added	Updated	Time Elapsed	Time To Retrieve	Time To Map	Time To Save
Acme	Items	Jul 15, 2022	Error Connecting To DataSource	0	0	0	35	30	3	2
WidgetBuilders	Items	Jul 15, 2022	Load Successful	150	45	100	1105	800	250	55
Acme	Vendors	Jul 15, 2022	Error Connecting To DataSource	0	0	0	35	30	3	2
WidgetBuilders	Vendors	Jul 15, 2022	Load Successful	150	45	100	1105	800	250	55

Hourly

Schedule: 0 30 * * * * - At 30 minutes past the hour, every hour, every day

Next Run: 02:30 PM Today

Sales Order Shipments

| Acme | Delta | Run Now |
| WidgetBuilders | Delta | Run Now |

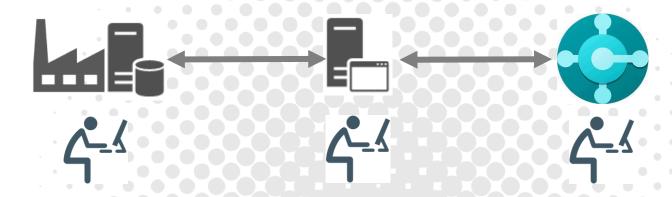# What Can Our Business Do With APIs?

Questions?

Appendix / Bonus Content
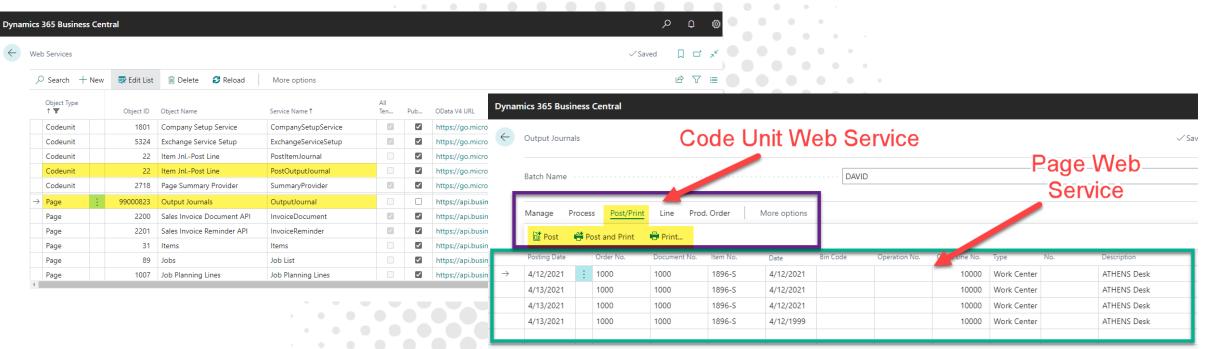
One Possible Architecture

- Plant automation developer (or other system)
- Capture plant data to database in usable format

- .NET Developer
- App Server (on-prem or cloud) to host custom code / API calls

- BC Developer
- Create custom API's or Code Units as needed

- Leveraging BC API's or Web Services often requires custom coding on source system, for formatting and managing API calls or on BC for Code Unit calls.
- Value proposition is in direct relation to number of transactions processed / risk of manual error.

Plant Automation with API's

- To process a transaction, you'll most likely need to call more than one API / web service

- Automated transactions with higher data accuracy
- Real-time inventory
- Synchronized system & physical shipment

Sample Output Journal API Call Code

```csharp
public OutputJournal BuildOutputJournal(Pallet p, ProductionOrder o)
{
    if (o.IsFinished)
    {
        throw new ApplicationException($"Production Order {o.ProductionOrderNumber} is Finished.  Cannot add output journal.");
    }
    var mountainTime = TimeZoneInfo.FindSystemTimeZoneById("Mountain Standard Time");

    var postingDate = TimeZoneInfo.ConvertTimeFromUtc(DateTime.UtcNow, mountainTime);

    var outputJournal = new OutputJournal()
    {
        Posting_Date = postingDate,
        Posting_DateSpecified = true,
        Document_No = p.ProductionOrderNumber,
        Output_Quantity = p.Quantity,
        Output_QuantitySpecified = true,
        Unit_of_Measure_Code = "CS",
        Order_No = p.ProductionOrderNumber,
        Item_No = p.ItemId,
        Location_Code = _defaultLocationCode,
        Lot_No = o.IsRepack ? o.LotNumber : p.LotNumber,
        Bin_Code = _defaultBinCode,
        Operation_No = o.OperationNumber.ToString(),
        Order_Line_No = o.ProductionOrderLineNumber,
        Order_Line_NoSpecified = true,
        Gen_Bus_Posting_Group = o.PostingGroup,
        Gen_Prod_Posting_Group = o.PostingGroup,
        Document_Date = o.IsRepack ? o.OriginalDocumentDate.Value : postingDate,
        Document_DateSpecified = true
    };
    return outputJournal;
}
```

- Variables hold production order number, quantity output, lot number and all other fields that would be required if a user was typing in data into the Output Journal

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