OPUS Solution Designer

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OPUS Solution Designer

Learning Objectives

At the end of this guide, you will be able to:

- Summarize OPUS No-Code Fundamentals.

- Explain the features of OPUS Ensemble and OPUS Solution Environment.

- Discuss the concept of OPUS Workflows.

- Evaluate various OPUS Integration options.

- Describe OPUS Reports and Dashboards capability.

Overview

Orchestration Platform for Universal Solutions (OPUS) Solution Designers create and configure no-code solutions to solve unique multienterprise business challenges. Using the powerful features of the OPUS, you can leverage flexible workflows, multi-modal integration options and data visualization.

![tracelink logo](tracelink. NETWORK FOR GREATER GOOD)

OPUS No-Code Fundamentals

With the OPUS Solution Environment (OSE), anyone can create no-code solutions to support their company's unique business needs.

📖 Personas

There are three main categories of Solution Designer personas:

- OPUS Developers

- OPUS Solution Designers (Solution Partner)

- Solution Developer (Customer)

They all use OSE to accomplish their goals, though their goals differ slightly.

Opus Developer

Opus Solution Designer (Solution Partner)

Solution Developer (Customer)

So, let's look at those differences:

- Standard Solutions, built by OPUS Developers, can be used out-of-the-box and integrated with enterprise systems and partners using transforms and link actions

- Marketplace Solutions, built by Solution Partners, can be published in the Marketplace Solution Catalog making it available to customers

- Company Solutions, built by OPUS customers, can be tailored to a company's unique business requirements – while still maintaining "Integrate Once, Interoperate with Everyone" tenet.

Your end users will benefit from above, for example:

- Use standard solutions immediately upon deployment, a common need for compliance applications because it is important to stay up-to-date with the latest regulatory requirements and most companies don't want to insert extra time in their validation processes and risk not being ready when the mandates take effect in production.

- Use company solutions, which might be based on the standard solution, a marketplace solution, or built from scratch, which have been tailored to their company's specific needs.

- Because of the Opinionated User Interface on OPUS, both your company's users and your partners users will have an easy to use consistent user experience across all solutions regardless of which type of solution they are interacting with. This is critically important for global enterprises with many supply chain partners because training is kept to a minimum.

Metadata Driven Approach

Metadata forms the foundation for the rich, no-code OSE.
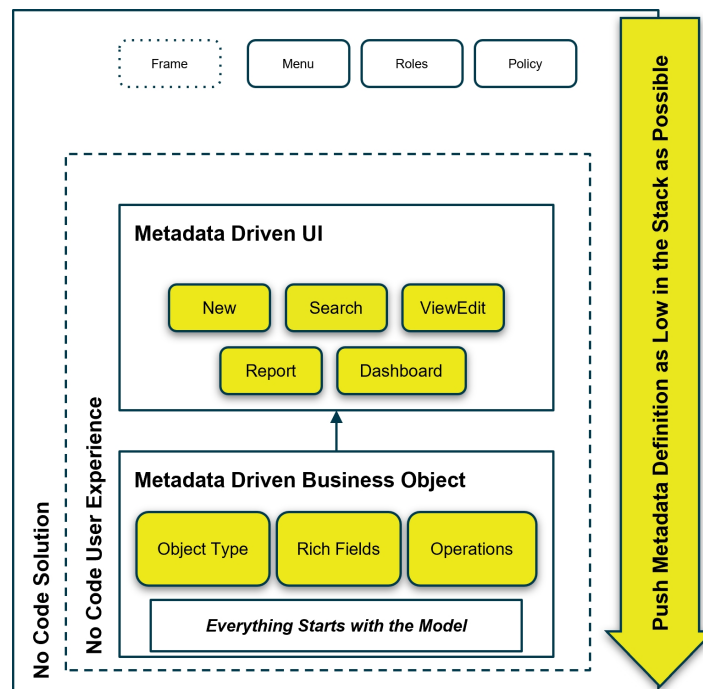
There are many no-code systems across various industries and while each targets a specific problem space, there are many characteristics in common:

- They use metadata to drive / fine tune behavior (especially related to user interface).

- They also optimize around challenges that are of particular importance for their industry.

As already mentioned, TraceLink uses metadata to enable its no-code capabilities and then pushes these metadata definitions as far down in the stack as possible. There are three main layers of the stack:

- **Business Object Metadata**: The Business Object layer is where we define objects types, fields, and operations; which form the foundational characteristics and behaviors for an application.

- **User Interface Metadata**: The User Interface layer is next, this is where standard page types (which are all precoded) are configured for each business object. These configurations define which fields and operations are to be exposed to users based on those which are available from the business object layer.

- **Solution Metadata**: The Solution layer is last, this is where we tie together and fine tune specific experiences for users with defined authorizations using menus, roles, and permissions.

Most no-code systems out there have a similar approach / layers to their metadata definitions as described above. Where they differentiate themselves is in the features they build which are specifically targeted for the industries they serve.

In CRM for example, there is Salesforce which focuses on the sales pipeline and turning opportunities into sales with accuracy and high levels of predictability and confidence regarding what the final numbers will look like.

Most IT professionals working with software are likely familiar with Atlassian's JIRA (defect tracking and software project management tool) which focuses on tightly integrating various source control, test automation, and other software development systems.

For TraceLink, its all about multienterprise applications which are needed for B2B data exchange between supply chain partners. TraceLink optimizes for data that needs to be integrated across many disparate partners and systems whose technologies and capabilities vary dramatically.
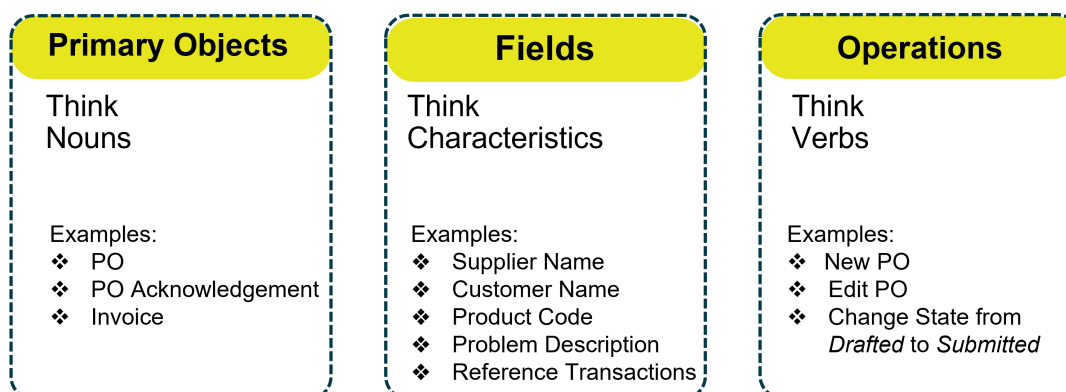
📖 Business Transaction Objects (BTOs)

MINT's Business Transaction Objects (BTOs) enable frictionless orchestration of complex supply chain processes out-of-the-box.

Business Objects Layer

Let's take a closer look at the Business Object layer. We define and configure:

Primary Objects	**Fields**	**Operations**
Think Nouns	Think Characteristics	Think Verbs
Examples: ❖ PO ❖ PO Acknowledgement ❖ Invoice	Examples: ❖ Supplier Name ❖ Customer Name ❖ Product Code ❖ Problem Description ❖ Reference Transactions	Examples: ❖ New PO ❖ Edit PO ❖ Change State from *Drafted* to *Submitted*

- **Business Objects**: The Business objects refers to the things users manage and are familiar with. Business Objects represent the domain of an application such that users intuitively know what to do when working with them. For example, Purchase Orders, Invoices, Quality Review Documents, etc.

- **Fields**: The fields refers to the characteristics of the business objects. For example, Supplier Name, Customer Name, Product Information, etc.

- **Operations**: The Operations refers to the actions a user can perform on a given business object. For example, buttons on the screen like Create New PO, Edit PO, Submit PO, etc.

Capabilities that are specific to the B2B Domain:

- **Lookup By Reference (LBR)**: It is a very common capability, it is a way to relate two different objects in the system, usually done using what is called a "foreign key to another table". Many systems have this concept.

- **Lookup By Value (LBV)**: LBV, on the other hand, is something we invented specifically for B2B use cases based on our customers experience.

Why Lookup By Value (LBV) is Important

We optimize for data that needs to be integrated across many disparate partners and systems whose technologies and capabilities vary dramatically.

Think about an invoice that includes references to the authorizing PO#123 and ASN#456. These referenced transactions may or may not be in the system at the time the invoice shows up. This might be because the PO or ASN transaction data are exchanged via email attachments and the clerical data entry into the company's system hasn't occurred yet, or they may be stored in some file cabinet, or it got stuck somewhere in the B2B infrastructure.

Regardless, it is important to recognize that one transaction may reference data that isn't in the system at the time it is being referenced. Therefore, using a hard relationships like LBR is impossible. Still the user needs to take the information from the invoice; specifically PO#123 or ASN#456 and use it to check some other system, file cabinet, or email inbox attachment, so they can review it and confirm whether or not the invoice should be paid.

LBV is also important if you're entering a purchase order through the UI, for example, and you need to fill in some address information. The data you need may or may not be located in your partner master data and it may or may not be accurate.

The way LBV works in this situation is similar to any type-ahead field. The user types a few characters and the system retrieves matching records for the user to select. However, rather than creating a hard relationship to that master data record, the UI pre-populates a set of **related** fields (e.g. street address, city, state, etc.) and then lets the user edit the information as needed.

📖 User Interface Layer

Object metadata driven pages and navigation reduce design and development effort and govern a consistent UX across solutions, focused on business objects and information.
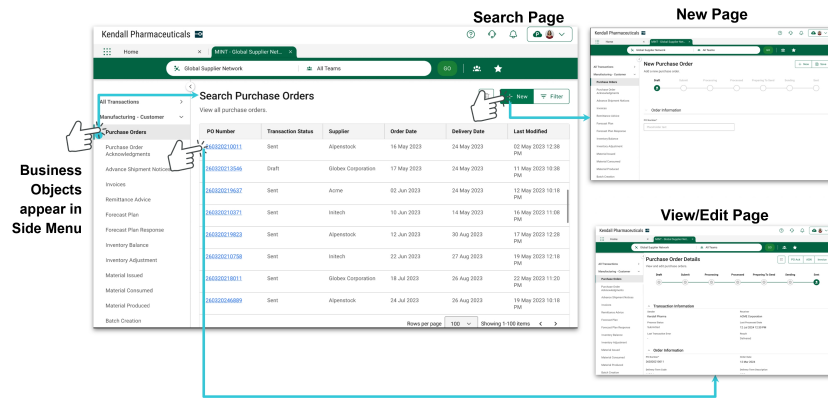
Business Objects are those things that a user (in the given domain) intuitively knows how to work with (Purchase Orders, Invoices, Government Reports, etc.).

These **Business Objects** appear in the left navigation menu and launch either a Search page or a Dashboard or Report page. Reports & Dashboards are covered in a different section of this guide.

- ■ **Search Page**

  For the Search page, the Solution Designer defines which of the Fields from the Business Object are to be presented in the search results table (via drag-n-drop).

  Once this is done, the Search page knows that clicking on the PO Number field takes the user to the View/Edit page and clicking on the New Operation takes the user to the New page. The Solution Designer does not need to define these or any other screen/page navigation. It is built into the OPUS's Opinionated User Interface.
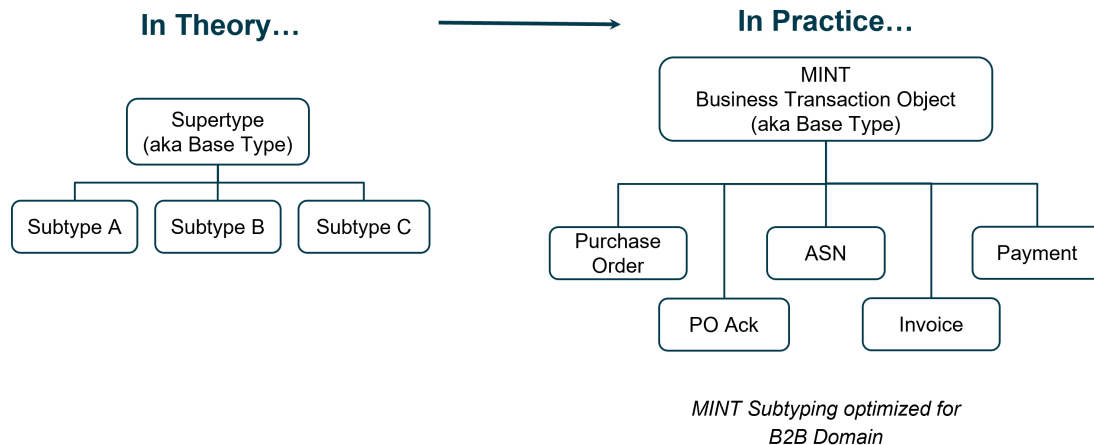
- ■ **View/Edit and New Pages**

  On the View/Edit and New pages, much like on the Search page, the Solution Designer also drags the fields they want the user to interact with on those pages. They can define multiple view/edit or new pages based on how many different roles they plan to support (company users vs partners or users who only submit Raw Material POs versus other types of POs).

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📖 Subtyping with Company Objects

Subtyping with Company Objects is a key accelerator for multienterprise solutions without compromising interoperability.

In Theory… → **In Practice…**

```
                                          ┌─────────────────────────┐
      ┌──────────────────┐                │          MINT           │
      │    Supertype     │                │ Business Transaction    │
      │  (aka Base Type) │                │ Object (aka Base Type)  │
      └──────────────────┘                └─────────────────────────┘
           │                                    │
   ┌───────┼───────┐              ┌─────────┬───┼──────┬───────────┐
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│Subtype││Subtype││Subtype│   │Purchase││  ASN   ││        ││ Payment │
│   A   ││   B   ││   C   │   │ Order  │└────────┘│        │└─────────┘
└───────┘└───────┘└───────┘   └────────┘          └────────┘
                                   ┌────────┐    ┌────────┐
                                   │ PO Ack │    │Invoice │
                                   └────────┘    └────────┘
```

*MINT Subtyping optimized for
B2B Domain*

Subtyping is a notion in programming language theory where a subtype, which is a data type is related to a supertype (or base type in TraceLink terminology) based on the notion of substitutability, where program elements such as functions and subroutines that are written for the supertype will still operate if given the subtype instead.

Usually, these supertypes/base types are abstract in nature and are used to implement common behaviors across all subtypes to be created. Then any specialized subtype behavior can be implemented for each subtype as needed.

How MINT Uses Subtyping

TraceLink defines the MINT Business Transaction Object (BTO). The logic written for the BTO Base Type is everything needed to understand the B2B transaction processing pipeline; which includes:

- Inbound transformation from any external system submitted via appropriate transport protocol (AS2, sFTP, HTTPS).

- Determining target recipient (either enterprise system or partner).

- Making the transaction's canonical available to the business application for processing (including interacting with the transaction specific data via the User Interface).

- Outbound transformation which is then sent to any external system via appropriate transport protocol (AS2, sFTP, HTTPS).

The above processing steps are complex and we have implemented them in such a way that they can be applied to any B2B Transaction without the pipeline having knowledge of the transaction specific business information.

Now that the BTO has implemented the B2B Transaction Processing pipeline logic, all that is left to for MINT to implement a new B2B Transaction is:

- Define the transaction's canonical. This is something that we have been doing for years and are very good at. TraceLink researches each transaction type across numerous systems and standards such that a single canonical contains all possible data elements.

- Define the BTO subtypes (sent PO, received PO, etc.) for each transaction which includes the transaction's canonical data and a flattened user interface friendly view.

- Write a few transforms based on the enterprise systems our customers and their partners use.

📖 Metadata-Driven Components and Workflows

Metadata-driven components and workflows reduce design and development effort with pre-defined object operations and workflows.
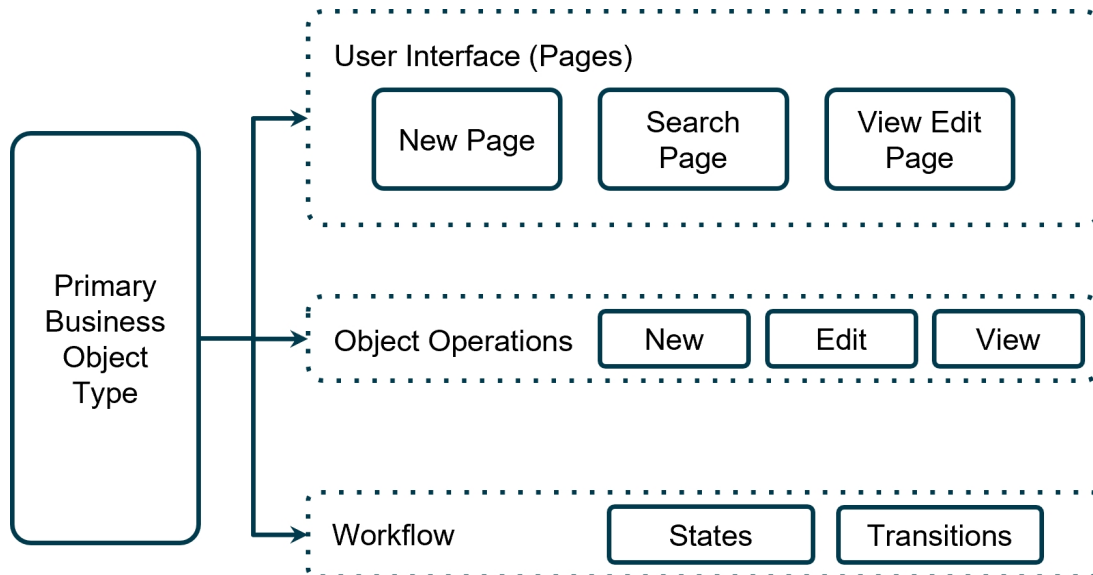
The Business Objects have characteristics specifically Fields, Groups, and Collections.

Examples of each are:

- **Simple Fields** - Supplier Name, Due Date, Problem Description, etc.

- **Groups of fields** - Ship To Address, Ship From Address, Product Information, etc.

- **Collections of groups or fields** - an array or list of Transaction Identifiers, Order Item Details, Impacted Products, etc.

Fields, Groups, and Collections on a page automatically behave based on their metadata properties, greatly reducing development and design effort for pages within a solution.

Once these characteristics are defined for a Business Object (base or subtype), they can be leveraged in the User Interface layer by simply dragging and dropping them on the screen to indicate which fields and in what order they are to be displayed to users. Their behavior is built into the field definition via field properties (e.g. a date field knows to present date picker, City displays a list of valid choices based on the State that is selected in another field, etc.)

Additionally, Business Objects support Operations. There are Standard Object Operations that nearly every base business object supports; such as, New, View/Edit, Search as well as many others. These standard operations are pre-aligned to the various page types and drive the navigation between those pages. This built in navigation is yet another capability that, not only reduces the effort required to build a Solutions User

Interface; but also drives consistency across all solutions such that users require minimal to zero training.

The last layer of the OPUS no-code solution environment is the Solution itself. This layer is where we tie together and fine tune the specific experiences for users. In addition to the authorization, discussed earlier, which is defined using menus, roles, and permissions; Business Objects also have defined Workflows which can be configured by adding substates and transition. These configurations enable customers to fine tune their business processes without the adding complex logic.

📖 Page Types

Page types provide a clear structure with object details, sections, fields, and consistent button placement, simplifying navigation and user actions across all page types.
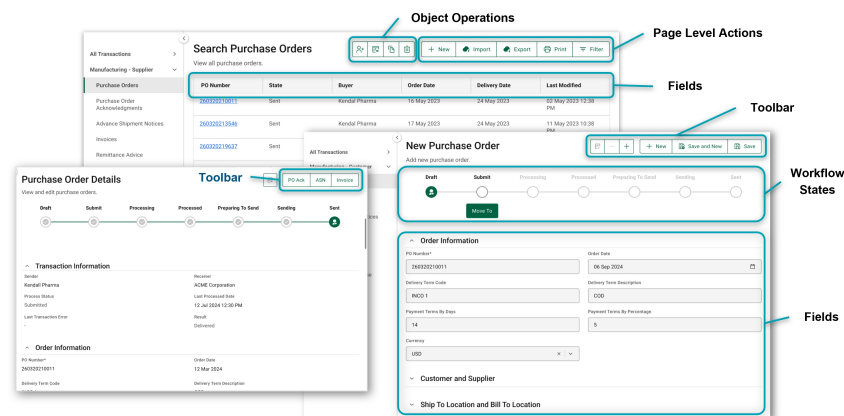
Let's dive a level deeper into the anatomy of a page. We'll continue to use Search, View/Edit, and New since those are the page types we've been discussing thus far.

Each page has the following main sections:

- **Content Area:** this is where the fields are displayed.

  For Search, the fields are presented in tabular form and each of the columns has built in capabilities like sorting and the ability to filter the rows based on the content. For View/Edit and New, the content area is where you will see and interact with the fields for a business object.

These content areas are organized when the pages are configured via drag-n-drop solution builder. The Workflow appears in the content area, this is because it is just another field with built in behavior. Users can interact with the workflow field and move business objects through their process in a very intuitive manner.

- **Toolbar:** this is where page level actions (e.g. print, filter, export) are presented along with the object operations that are supported (e.g. new, copy, create from, etc.).

📖 Foundation for Reports and Dashboards

This opinionated UI also lays the foundation for Reports and Dashboards, enhancing the future supply chain intelligence.
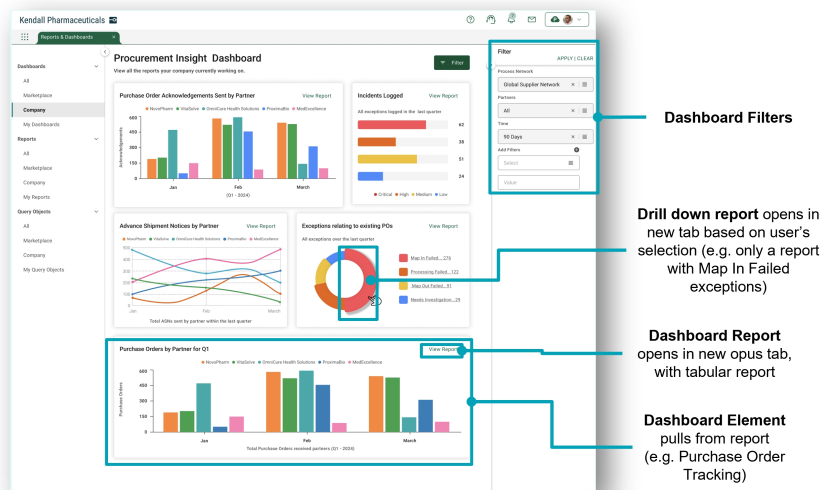
Just like the network pages we've been discussing (search, view/edit, and new), the Reports and Dashboard pages are also opinionated and have predefined navigation and behavior built into them.

For example:

- Ability to filter how much of the data to report against.

- Clicking a specific area of a chart opens a new tab with a table showing only that data pre-filtered.

- Clicking View Report opens entire dataset with a table showing the data in tabular report instead of a chart.

Interesting...

The left navigation menu contains Reports, Dashboards, and Query Objects. These might seem like odd "business objects" when compared to Purchase Orders and Invoices, until you realize these ARE the business objects of the "Report Builder" application.

In the future: Solutions will also have the ability to include Reports and Dashboards along with the rest of their configured pages.

Key Takeaways

- **Unified No-Code Environment:** Standard, Marketplace, and Company Solutions all utilize the same no-code Solution Design Environment with drag-and-drop editing and an opinionated UI, simplifying the creation and configuration of solutions.

- **Metadata-Driven Development Framework**: No-code development and design starts with metadata definitions at the Business Object (Noun), Field (Characteristic), and Operation (Verb) level, which build up to user interfaces like pages (new, search, edit) and finally entire solutions with menus and navigation.

- **Business Objects and Navigation**: Business Objects, represented in the left navigation menu, link users to Search, Report, or Dashboard pages, with consistent options to either create new records or view/edit existing ones via a structured and intuitive UI flow.

- **Configuration with Subtyping and Workflow Extensions**: Subtyping allows tailored object types (e.g., MINT subtypes for PO and Invoice from a BTO), and workflows can be extended with substates, allowing customers adapt solutions to specific business needs.

- **Page Structure and Consistency**: Pages follow a clear structure with menus, page titles, sections, fields, and operations/buttons arranged consistently reducing design and decision overhead, making user actions intuitive and easy to learn across any solution.

OPUS Ensemble & OPUS Solution Environment

Metadata drives the no-code configuration capabilities, including the configuration of business objects, fields, operations, pages, and menus.

Three important concepts to remember are:

- All aspects of solutions from Objects to user experience to access are built with metadata

- Tracelink Solution Developers use the same metadata and use the same "interface" you will use.

- All aspects of a solution are configurable.

📖 No-Code Configuration Capabilities

Let's look at the OPUS UI through the eyes of the end user.

Once the user selects the Process Network and clicks **Go**, the user is interacting with the solution. They start with the left hand side which we call Side Menu. Users can see links to their Business Objects. When they click the business object in the Side Menu it brings up a page. Below is a search page. On top of the page, users see the available operations on the page. When the users click on the operations, a contextual push panels appear on the right side.

Configurable Aspects

Note that the numbers correspond to the image above.

1. **Pages in the Content Area**: There are three kinds of pages; Search, New and View/Edit. A page can be configured by dragging and dropping Fields. All you need to do is drop a Field and everything else, like what kind of field to show, what kind of query to run, is automatically handled.

   If you want a column just drag and drop and Save the page. Search, New, and View/Edit pages are driven by the primary business object and its metadata. Solution Designers can organize this data using a drag-and-drop interface in the OSE.

2. **Toolbar**: On top of the page, the Toolbar hosts page level and object level operations. Page level operations are always automatically added to a page. You can hide page level operations if you do not wish to use them in your design. Object level operations can be added to the page. Just as you dropped a field, you can drop an operation, which shows as a button. Think of operations as an API on a Business Object. When you add that operation, the button and logic to invoke them are all automatically given to you.

3. **Push Panel**: Operation buttons may accompany additional interactions which appear on the push panel.

   Filter operations show fields for users. Export operations will allow users to specify the format. Imagine these as Inputs of an API. When you "drop" an operation, we automatically create push panels.

   You can also configure the push panels using the drag and drop interface. Depending on the page type (Search, New, View/Edit), panels can be configured to view and manipulate information, such as filter criteria on a filter panel.

4. **Side Menu**: You can organize the required business objects with menus. Menus appear on the left side. Clicking the menu brings up the page. Roles restrict which menu items the users can see. Solutions also have advanced capabilities called policies which allow more granular restriction to data access.

Solutions and Catalog

Standard and Marketplace solutions deliver immediate value out-of-the-box, while Company solutions offer extensive configurability to meet specific needs.
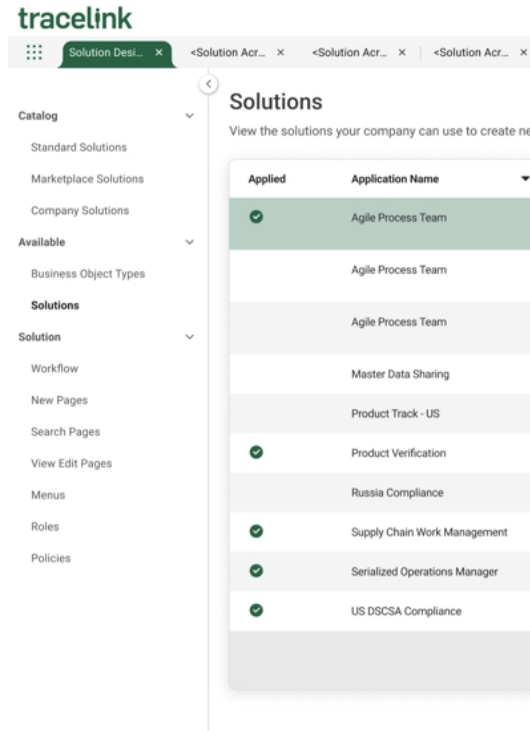
A Solution is the "box" in which all the functionality is grouped and managed. Each OPUS App has its own Solution.

There are three classes of solution: Standard, Marketplace, and Company.

Standard Solutions

Standard Solutions are developed by OPUS Developers. These are preinstalled with the App. Any customer who licenses the app gets this by default. Standard solutions solve the common use cases. There is only one standard solution for a given app.

06-Mar-25

- Available in: Standard Catalog

- Created by: TraceLink's OPUS Developers

- Configurable by customers: No

- Details:

    - Preinstalled, providing baseline functionality for common business needs.

    - Includes predefined pages, menus, roles, workflows, business objects, and policies.

Marketplace Solutions

Marketplace Solutions are developed by our Partners and Tracelink Professional Services. Our partners understand various use cases of segments of our customers. So partners can develop and publish Marketplace solutions. Each partner can publish multiple solutions for the app.

- Available in: Marketplace Catalog

- Created by: Solution Partners, TraceLink Professional Services, and TraceLink Product Development teams

- Configurable by customers: Must be saved to the Company Catalog before configuring.

- Details: Offers broad range of functionalities designed for various orchestrations.

Company Solutions

Company solutions provides the power for companies to make their own modifications. Imagine these are exclusive copies for the company which other companies do not get to see.

A company solution can be created by saving a Standard or Marketplace solution. Once saved they can configure the solutions and start using them right away. Our partners can help our customers to create company solutions and configure the solutions for them.

- Available in: Company Catalog (after saving from Standard or Marketplace)

- Created by: Customers, Solution Partners

- Configurable by customers: Yes

- Details:

  - Tailored to the specific needs and orchestrations of a company.

  - Allows configuration of pages, menus, roles, workflows, business objects, policies, and notification templates.

  - Flexible and adaptive to align with the company's operational and strategic goals.

In summary, our Solution Catalog empowers customers to be up and running from day one with a Standard Solution—or, if needed, they can spend a few hours or days making any changes to address their specific business use cases.

Our internal developers use the same OSE to build Standard Solutions. This means that both our partners and our customers have access to the same powerful tools and capabilities that we use internally.

📖 Access and Permissions

Menu items and pages are securely governed by roles, permissions, and policies ensuring users have access only to relevant information and operations.
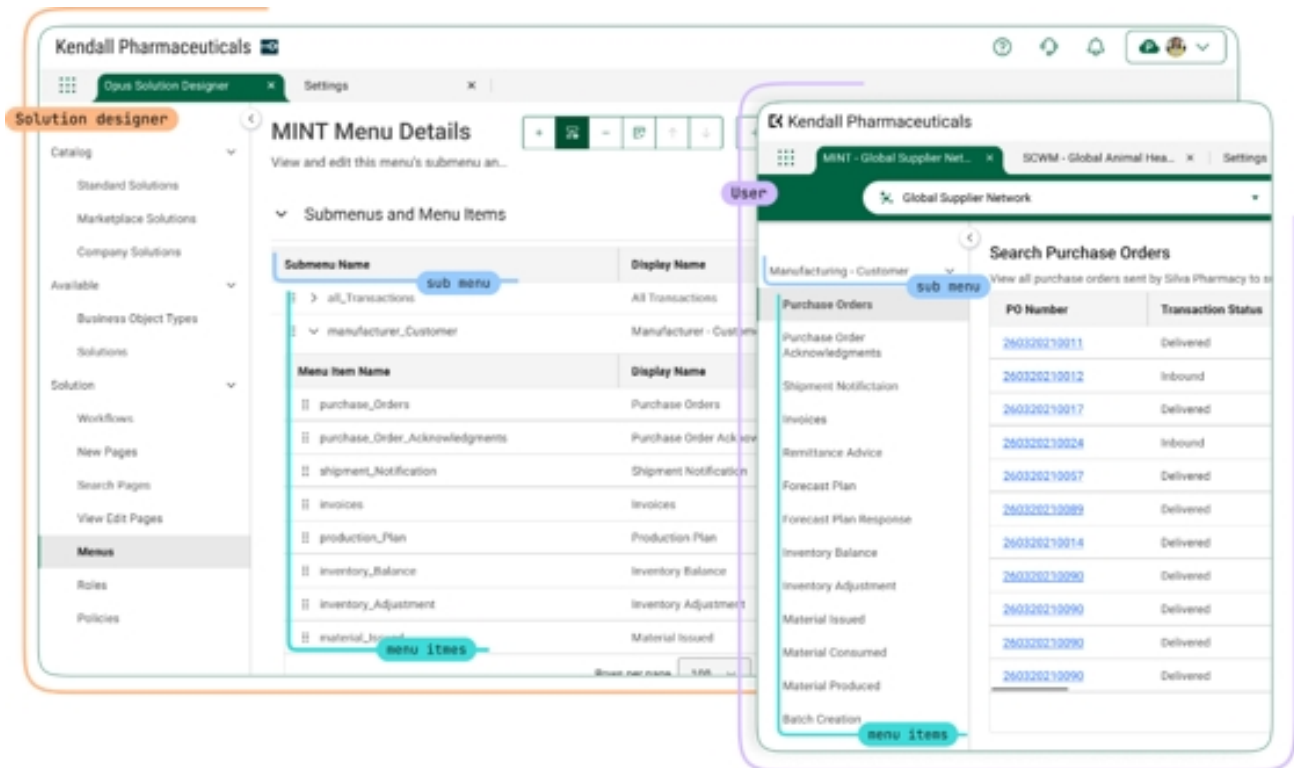
The Side Menu consists of two key elements: Sub Menus and Menu Items. Sub Menus are used to group related Menu Items together, while Menu Items typically launch a Business Object's Search Page. In essence, the Side Menu acts as the bridge that connects the end users to the specific pages they need to access. This menu becomes contextual based on the Process Network the user selects, adapting dynamically to their needs.

The OPUS Solution Environment (OSE) enables you to:

- Design Menus that connect directly to pages.

- Create Roles to manage user permissions.

  For each role, you can pick and choose which menu items are visible and which business object operations the users in that role can access.

Once you've set these up, you can easily create configured menu experiences. For example:

- You can create a unique side menu for different internal users based on their roles.

- You can design distinct menu experiences for two different partners within the same process network.

- And even within the same partner, you can create different side menu experiences for different partner users depending on their specific needs.

OSE gives you complete control over the user experience, allowing you to tailor side menus and access in ways that best support both internal teams and external partners.

Key Takeaways

- **Metadata-Driven Configurations**: Metadata powers no-code configuration for objects, operations, pages, and fields, streamlining company solution configuration.

- **Immediate Value & Flexibility**: Standard and Marketplace solutions provide out-of-the-box value, while company solutions offer deep configurability to meet specific needs.

- **Roles and Permissions**: Menu items and pages (including object operations) are securely controlled by roles and permissions, ensuring users access only relevant features, making it easier to govern mutlienterprise use cases.

- **Streamlined Page Design and Navigation**: Pages are all metadata driven, minimizing design decisions and effort and keeping focus on effective data/content organization.

OPUS Workflows

Workflows enable businesses to streamline and automate processes, ensure consistency across like-objects, and adapt processes to specific needs, enhancing overall orchestration performance.
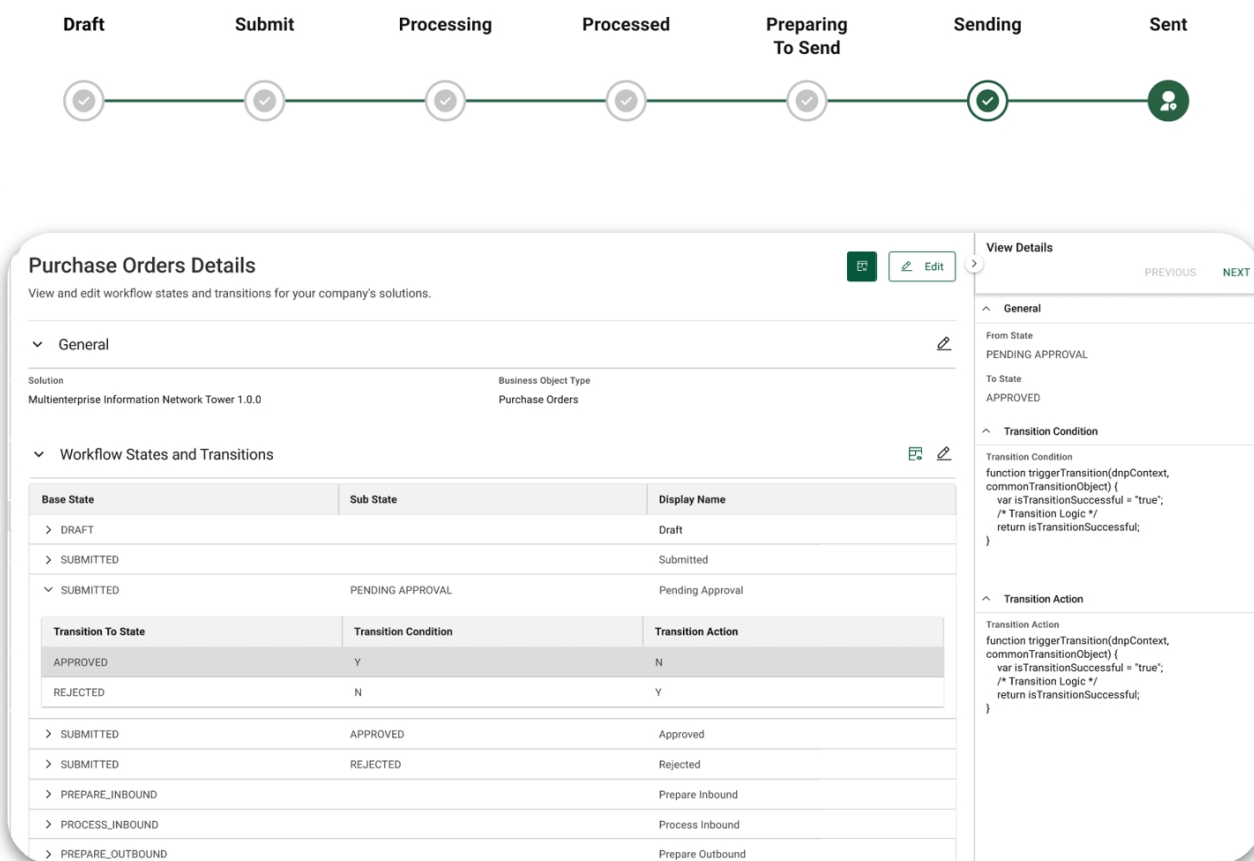
Workflows on OPUS are an important concept to understand. In this section, we'll cover what workflows are, how users interact with them and how to configure them in OSE.

Hmm...something to think about:

> *As you read through these concepts, think about how your business can use workflows to smooth your operations and add value to your business processes.*

Workflows do not sit on the same "plane of existence" as Business Objects. For example, an end user cannot create an instance of a workflow. They are *associated* to Business Objects and help drive the structure and experience of that object.

They also help drive a consistent experience across objects. Once end users are familiar with how an object with a workflow behaves and what that pattern looks like on OPUS, they are able to perform new business processes quickly and efficiently.

- On OPUS, all objects with workflows will be displayed the same way. This workflow component is visible at the top of any page for an object instance that has an associated workflow.

- OSE provides an interface to begin configuring your company workflows. This is where the OPUS experience can be tied into your business processes by automating and integrating with other systems.

📖 Standard Workflows vs Company Workflows

Standard Workflows provide out-of-the-box functionality while configurable Company Workflows adapt to specific business needs.
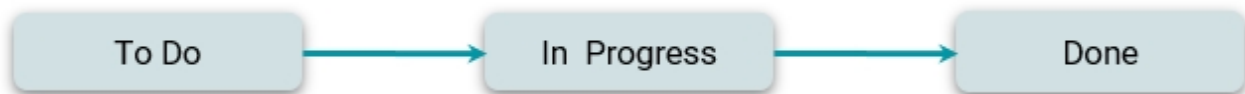
Example: Standard Workflow

Example: Company Workflow

Workflows are associated to Business Objects. This association and decision is made by the OPUS Developer and therefore is predefined for us out-of-the-box. We call these Standard Workflows.

A Standard Workflow is, by definition, a sequence of states and transitions. The OPUS Developer will be able to build powerful processes into each of these (that can't be changed).

If you choose to configure a workflow, it becomes a Company Workflow. This is where you can extend the functionality of the Standard Workflow to handle your specific business processes.

Substates and Transitions

You add substates which are associated to a base state. You add transitions between those substates and to/from other base states. You can add transition conditions and post-transition actions to those transitions. This capability is powerful and gives you the flexibility to meet your specific business needs.

There are rules for configuring substates and transitions, but the most important point is that the Standard Workflow transitions cannot be disobeyed.

For example, in the Standard Workflow "To Do > In Progress > Done," you can't create a transition from "Done" to "To Do." Likewise, you can't skip from "To Do" to "Done."

This is because the OPUS Developer has tied important application logic to these base states and transitions that are necessary for the app to function.

As Solution Designers you are extending from, not replacing with.

Configuring Business Object Workflows and Business Transaction Object Workflows

Solution Designers can configure Business Object Workflows and Business Transaction Object Workflows.

Example: Task Standard Workflow (Business Object)

Example: Purchase Order Transaction Workflow (Business Transaction Object)
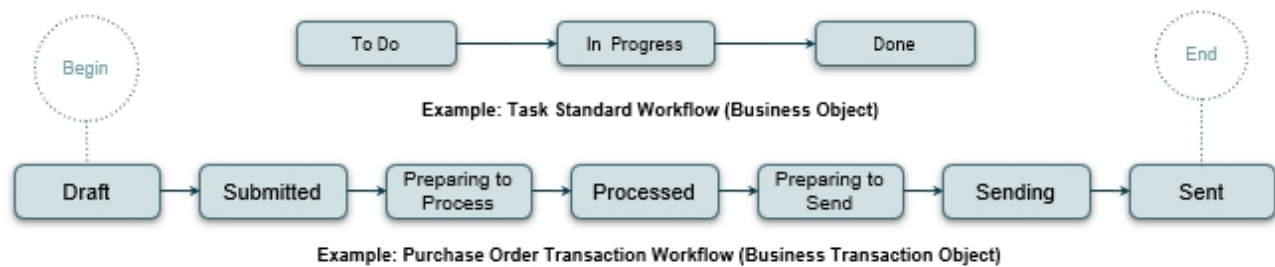
When configuring company workflows, there are two distinct types of Primary Objects.

One is a Business Object. These are our "traditional" objects and they tend to have simpler workflows. These workflows are interacted upon from a user interface.

The other is a Business Transaction Object. The workflows for these objects tend to be more complex and pack more of a punch with what they are doing. All business to business (B2B) transactions have a workflow defined like this.

Business Transaction Object Workflows

The most important characteristic of these Transaction Workflows is that they are processed automatically, from step-to-step, without intervention. Since this is built on OPUS workflows, the object instances will be persisted at every step and provide visibility into these processes at every step.

These are typically run without user intervention but if a step isn't able to complete because of missing information or if it does need user input, the transaction will pause and users will be notified.

Since these are modeled using our existing workflow definition and metadata, you can provide substates and transitions to these as well.

Hmm... Something to think about...

How will you use this powerful tool to extend complex processes and tie them to your business processes? What logic of your own can you inject? Where can you pause to allow user intervention?

📖 Configurable Workflows

Configurable Workflows enable fine-grained control with substates, transition conditions, and post-transition actions which offer more sophistication without additional application logic.

Condition = Can only move to **Done** when assignee is present

Example: Company Workflow for SCWM Tasks
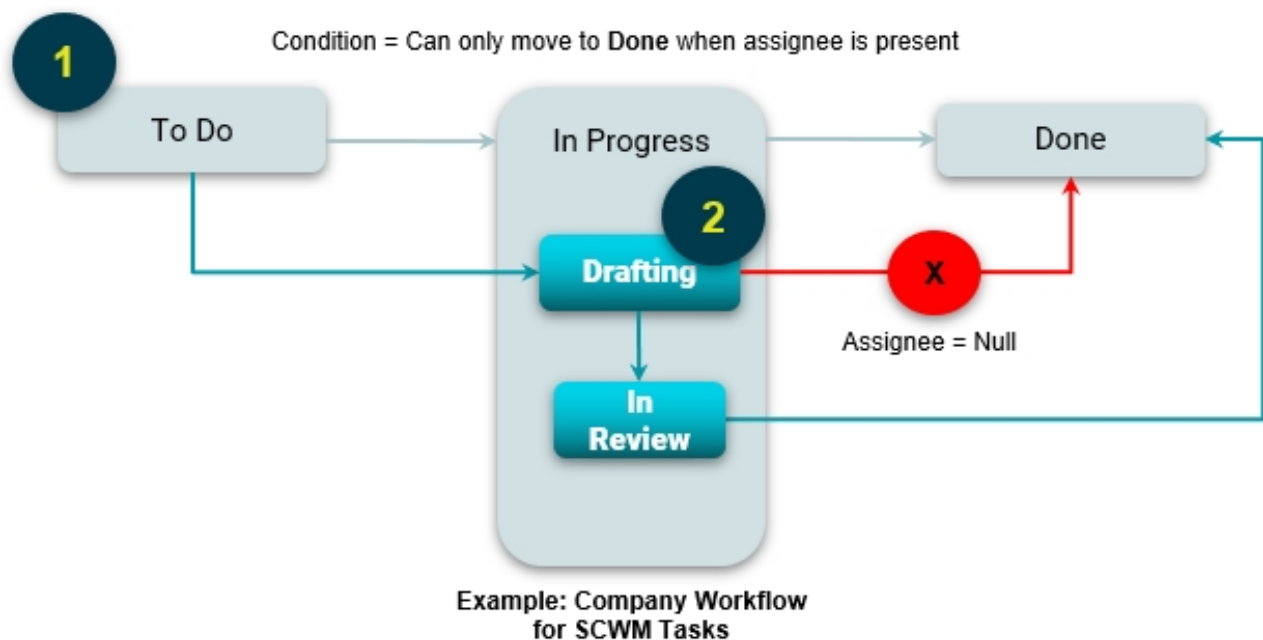
All standard workflows come with base states and base state transitions that define the lifecycle that an object type goes through. As mentioned before, these are defined by the OPUS Developers.

When you configure Company Workflows, you add substates to a base state which can provide additional insight in the context for your business.

From there you add transitions, which can be:

- From another base state to a substate

- From a substate to a substate

- Or from a substate to another base state

This means that any updates to your business processes can be made without the need for new application releases. The aim is to arm you, as Solution Designers, with enough

tools so you can enable your own business-specific processes and you streamline your business.

Note that, even if you have your own transition defined, any base state transition is still recorded. It's in this way that we ensure app business logic continues to execute even if you have configured your own transitions.

And on each of those transitions, you can configure transition conditions and post-transition actions.

At a high level, they are self-descriptive in what they are:

- Transition conditions are logical conditions that are tied to a transition and define whether or not the transition can be performed. For example, a particular attribute must be populated or an attribute must be greater than a particular threshold. If these conditions aren't met, then the transition will be prevented.

- Post-transition actions are actions that you configure to happen after a transition occurs. You can send a notification, send an email, send an event to another application, create a file in the background, and so on.

Both of these are written in javascript at the moment so it requires more than just the introductory course in order to complete but we're going to expand on this capability in the future to make these more accessible.

Key Takeaways

- **Streamlined Process Management**: Workflows facilitate the structured movement of business objects through states and transitions, ensuring efficient process management.

- **Efficiency and Flexibility**: Workflows enhance business performance by automating processes, ensuring consistency, and allowing configuration to meet specific needs.

- **Out-of-the-Box and Configurable**: Standard workflows provide immediate functionality, while company workflows offer fine-grained control with substates, transition conditions, and post-transition actions.

- **Adaptable Workflow Design**: Solution Designers can configure workflows for both simple and complex business processes, ensuring alignment with unique operational needs.

- **Integration and Specificity**: Workflows integrate with other processes and include specific conditions and transitions, providing precise control and seamless data flow across business functions.

OPUS Integrations

TraceLink provides multi-modal integration options to support all your supply chain orchestrations.

📖 Flexible MINT Integration Options

Let's review some of the basic concepts related to integrations. Our goal is to provide the most flexible options for you to interact with MINT, and to give your partners the widest flexibility as well. This is where our multi-modal approach to integrations come in.

The three main methods of integration are:

- Leveraging Link Actions for API-based access to your external systems.
- File-based integrations using standard SFTP and AS2 connections.
- Directly in the MINT product UI.

Transforms tie all of these together.

- Our Transformation Catalog and engine is at the core of our Integrate Once model. Whether you leverage Link Actions, File Based transactions, or the MINT Product UI, Transforms allow that data to be converted into our Internal Canonical Format.
- All Transactions are modeled as business objects within the application, so the power of the canonical format allows for seamless integration regardless of input format or integration type.

📖 B2B Architecture and Canonical Approach

B2B architecture and canonical approach enable transactions across all systems and data formats.
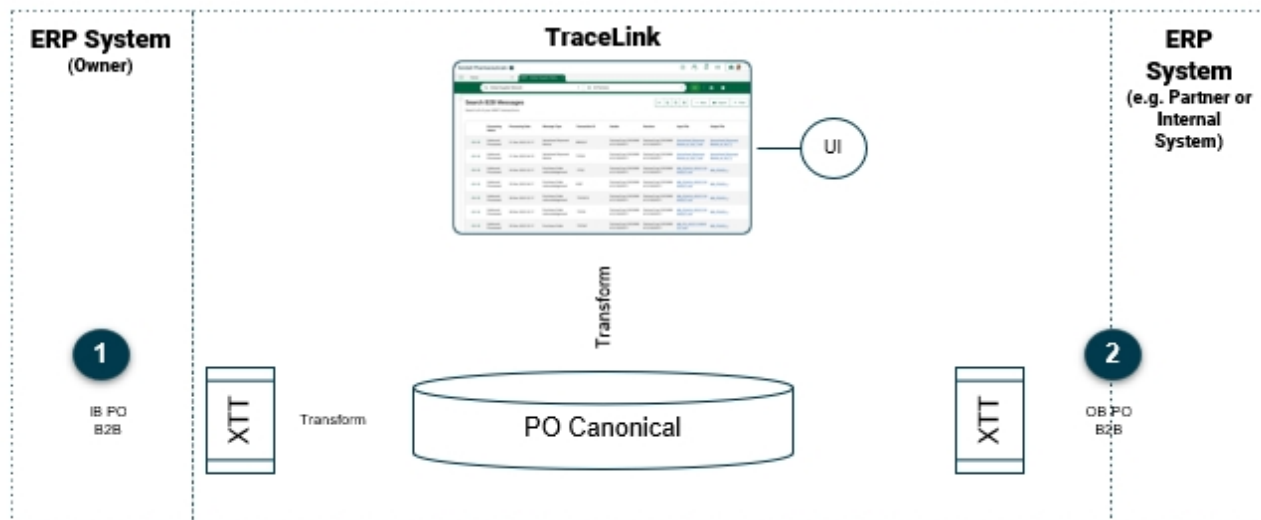
In the above image, on the left (1), we are depicting the start of a transactions journey from an ERP system. The manner at which you integrate is immaterial; transactions are processed through your XTT system, converted to canonical form, and available in your MINT interface. For you as the MINT application owner, you are able to determine the right integration method that works for your setup.

At the right side (2), you see your Partner's system. Another major benefit of these concepts is that your Partner is also able to choose the integration method that best works for them. There's no need for you and your partner to coordinate on data types, integration methods, etc. because this is all handled for you in the Integrate Once modes, using these powerful integration tools.

📖 Link Actions

Link Actions enable direct API integration with ERP systems, streamlining B2B Transactions for end-to-end digitalization.
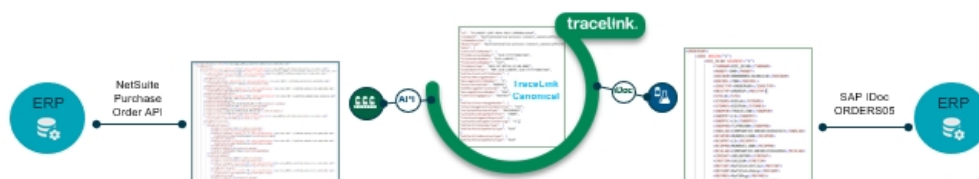
Let's say you have a Netsuite system where you maintain Purchase Orders that you'd link to sync to your MINT application. Let's also consider that you are unable to install your own middleware software nor do you want to make changes to you external systems. This is where Link Actions come in.

With a simple Link Action configuration (providing some key configuration parameters), you'll be able to start syncing date with your Netsuite system into TraceLink.

- Link Actions provide a wide variety of flexibility options to suite your needs.

- Firstly, for standard configurations, the setup is as simple as using a pre-existing Link Action, configuring credentials, and you're off. No extra software is needed on your side!

- If you have a more complex system, or some customization in your external system, Link actions has you covered here as well. With our powerful Javascript engine, you'll be able to write your own custom scripts to handle any need. The benefit here is that you never have to make costly updates in your external systems or worry about adhering to OPUS and Mint; Link actions allows you to leave your systems untouched, make configuration updates on OPUS, and continue on.

- Transactions generated via Link Actions conform to the same B2B Messaging model as any other transaction, so once the data has been ingested and transformed, it acts exactly the same as any other transaction from any other source within MINT.

Link Actions and Common Systems

Your Link Actions leverage many of the common systems.

- Link Actions can be configured and managed using the power of our No Code User Experience. You can use our out-of-the-box configuration, or configure it to the needs of your organization depending on what systems you use.

- Link Actions leverage our standard Catalog Model. There are a number of ways to manage your Link Actions.

  - The Marketplace catalog provides common use cases, so you can get up and running in minutes using one of our standard Link Actions for common system integrations The Marketplace catalog contains Link Actions curated by both TraceLink and you or your partners.

  - You are also able to manage your own company-internal catalog for any and all tailored Link Actions that you make within your organization. This allows you to quickly and easily manage the development, testing, and release process between your Validation and Production environments.

- The Configuration is straightforward. You just need to provide a few system-specific parameters and save. Your Link Action begins pulling data from your system immediately!

- Link Actions work bi-directionally. You can pull data from your system and push data to your system as needed.

Transforms

Transforms drive asynchronous integration, enabling efficient data exchange across systems and partners regardless of transaction format.

OPUS Transformations provide infinite flexibility and adaptability across all of your data ingestion needs, providing unparalleled integration options.

When managing your data within OPUS, data is transformed into a canonical data model that provides the single interoperable representation of your business processes. Transforms bridge your external business to the canonical data model representation.

The OPUS Marketplace Catalog provides instant access to a host of common data transformation options, allowing you to leverage common transformations provided by the TraceLink Network and your partners. You can also contribute and share Transformations across the network.

For the specific needs of your organization, the OPUS Company Catalog for Transforms provides a simple interface to develop, manage, and deploy your transformations across environments. OPUS Transforms provide a number of technologies to provide the maximum flexibility for your needs.

Asynchronous Integration

Transforms drive asynchronous integration, enabling efficient data exchange across systems and partners regardless of transaction format.

Transform Fundamentals:

- Transform and adapt any business process into OPUS-native Canonical format.

- Interact seamlessly with your partners, without the need for them to understand your internal formats, or you theirs.

- Transforms enable rich UI experiences, allowing you to fully configure the look and feel of your data as it is presented to members of your company and your partners.

Transform Catalog:

- Marketplace catalog provides access to a wealth of Transforms to suit many business needs right out of the box.

- Company catalog allows your company to create, manage, and promote transforms through the development, validation, and production deployment processes using the power of OPUS Workflows.

Transform Configuration:

- Transforms can be configured and used in many situations, from your standard data transformation to Canonical format, to business-process specific uses such as assigning certain data to a Process Network.

📖 MINT UI

The MINT UI enables companies without integrations to view and generate B2B messages as if fully integrated, ensuring seamless participation in business processes.
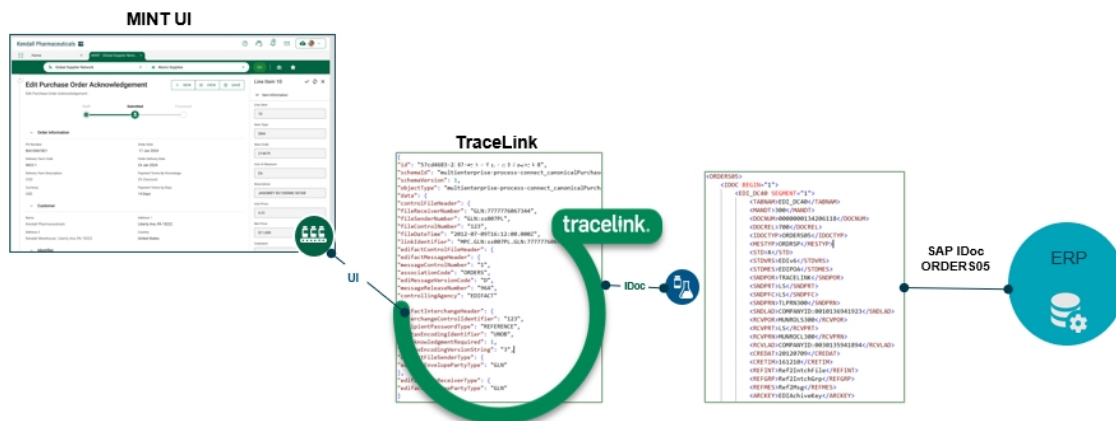
The Mint User Experience provides a simple, easy, and configurable way for your users and your partners to interact with your MINT application. Interacting with the MINT UI allows for the same bi-directional integration as any other method. If you generate a Purchase Order Acknowledgement for your partner in the MINT UI, it will use the same Transform, Link Action, or other integration model to interact with your systems or your partner's systems with no further configuration necessary!

In the MINT user experience itself, you will see your inbound and outbound messages represented in full as B2B Transactions You interact with them just like any other transaction, regardless of the method by which they were transacted.

Key Takeaways

- **Flexible Integration Methods:** OSE offers multiple integration options—Link Actions, file-based integrations, and the MINT UI—allowing businesses to choose the method that best fits their scale and complexity.

- **Real-Time API Integrations**: Link Actions enable efficient, real-time data syncing via APIs, minimizing manual intervention with built-in polling capabilities.

- **Adaptable File-Based Transforms**: Transforms automate large-scale data exchanges by mapping external formats (e.g., X12) to TraceLink's canonical format, ensuring recipients receive data in their preferred format.

- **Consistent Data Exchange**: Regardless of integration method, all transactions are converted into a canonical form, facilitating seamless interoperability.

- **Comprehensive Transform Catalog**: Out-of-the-box transforms for standard formats and support for partner-specific transformations are available, ensuring flexibility in data exchange.

- **Modeling Transactions as Business Objects**: Transactions are modeled as business objects, enabling applications to leverage standard OSE capabilities to define user experiences and processing logic.

- **Configurable Transaction Workflows**: Customers can extend transaction workflows using the OPUS Solution Environment (OSE), tailoring them to meet specific business process needs and orchestrations.

OPUS Reports & Dashboards

Reports and Dashboards provide access to multiple streams of data, such as Purchase Orders, ASNs, invoices, inventory balances, etc. all in one place. This enables all users to get quick and efficient access to the data they need without jumping into multiple systems or engaging numerous resources. The get the data in seconds versus days or weeks, when the data is stale.

Customers and partners alike can configure how they see the data, to gain visibility into their supply chain transactions.

Query Objects, Reports, and Dashboards harness orchestration insights across your end-to-end supply chain.
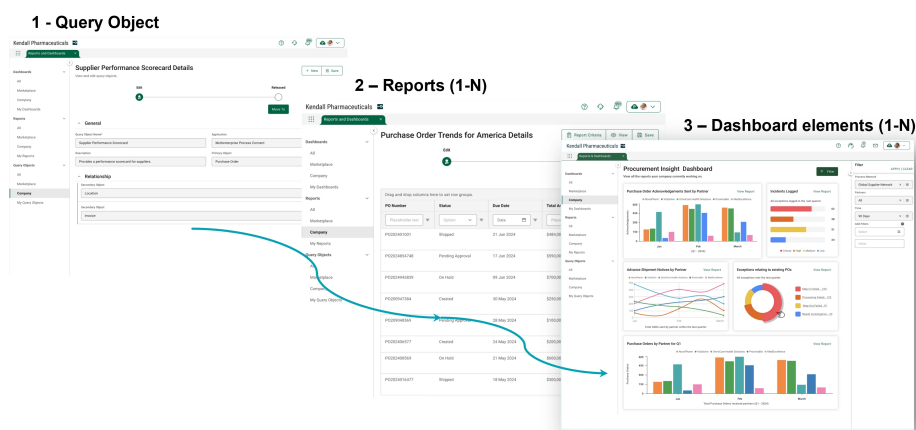
Users Leverage Report and Dashboards

Business users can leverage reports and dashboards to gain supply chain insights to support informed decision-making.

Reports and Dashboards are set up by TraceLink Administrators, but can be configured fully by business users. Reports and Dashboards provide a flexible and dynamic way to access the data, but the user is in control for how they consume it.

Partners are granted access to Reports and Dashboards by the owners and they only get visibility into the data being exchanged between them and the owner. The partner can look at the same data as the owner, in real-time, to drive faster problem resolution and decision making alongside the owner.
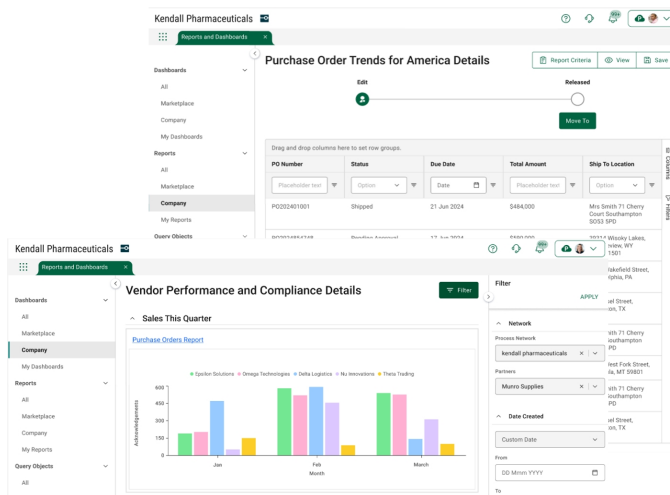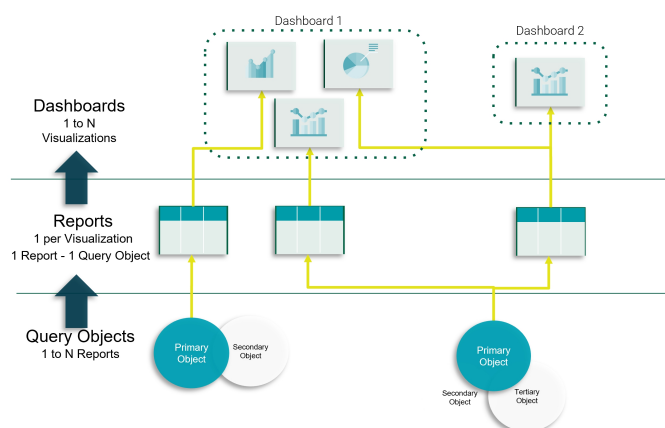
Hmm...Something to think about...

What data do you want to share with your partners through reports? How can you benefit from real-time data synchronicity with your partners?

📖 Dashboards

Dashboards visualize the flow of information from query objects to reports, harnessing data-driven insights across multiple process networks.

A Query Object defines the object (or objects) you are interested in getting data for (running a report). These objects are related and can represent important pieces of data in your orchestration, like POs, ASNs, an Invoices in Procure to Pay.

A Report leverages a single Query Object and generates a tabular version of the report. This is where the user can select the Process Network and Partner information telling the system which data to bring back. They are customizing the look and feel of the report, column layout and names, and also filtering the data to find exactly what they are looking for.

Dashboards can have 1 to N reports on the page, providing a quick-glance view of related information. Each report is visualized as mini table or a chart. A report can be represented multiple times on the same page, providing different visualizations side by side for the same data.

📖 Reports

Reports provide critical data insights and can be used to analyze business process activities.

Reports features include:

- No code configuration

- Add value independently and in larger dashboard context feeding dashboard elements

- Supports related objects

- Auto-generated search queries

- Simple filtering to limit columns (fields) and rows (records)

- Computed fields

- Interactive client-side result-set modifications handled in the browser for fast performance

- Report definitions are shared but executed under the context of the report consumer according to their company permissions.

- Data protected by user permissions and roles

📖 Query Objects

Query objects are essential data tools that can be configured to drive insights.
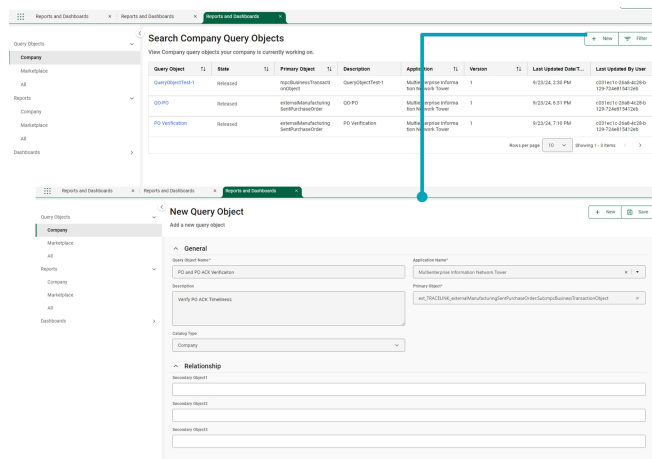
Query Objects serve as the cornerstone for generating reports and dashboards. A Query Object can connect up to four related objects together providing fast stitching of data in one place.

Query Objects can be crafted from scratch, but TraceLink will also provide Marketplace catalog Query Objects, Reports, and Dashboards so companies can get a head start with visualizing their data instead of worrying about a lot of setup.

Once a Query Object is set up it can be reused across reports. Query Objects are also versioned, enabling reports to be connected to the latest version, or to a specific version. This enables updates to reports and dashboards dynamically, without the need to start over.

📖 Report Criteria and Definitions

Report criteria and definitions are configurable and directly shape reports.

Report Criteria

With a Query Object in place, we now can leverage Reports to display our data in tabular format.

When creating a report, a user is not writing code or forming complex SQL queries. They are performing a few key actions, starting with the Report Criteria.

For example, you can select:

- The Process Network and Partner selection to determine the data set they are pulling from. You can quickly change your selection right in the browser to find the exact data set needed.

- Any filters you want to apply, such as order date on a PO, or product code for line items, which will limit the data you get back.

- The columns, or fields, you want to retrieve from the objects previously selected.

Once you click apply, the data is returned back to the table and you can move to the formatting of that data.

Report Definitions

Formatting the data is part of the Report Definition. This is where we are working purely in the browser, in a highly responsive environment. You can perform multiple actions against the data in real time such as:

- Changing column layouts, and hiding and showing columns.

- Modifying the names to make sense for their business needs

- Grouping the data by specific fields

- Filtering and Sorting the data right at the column level

- Performing fast and simple calculations without writing code, such as counts, summations, and even setting up computed columns that are persisted

Reports are also versioned, just like Query Objects. This allows more permanence with Dashboards, where you can leverage a specific version of a report, or pull in the latest one every time.

📖 Dashboard Details

Dashboards include rich and interactive visualizations that can be easily configured for preferred views.
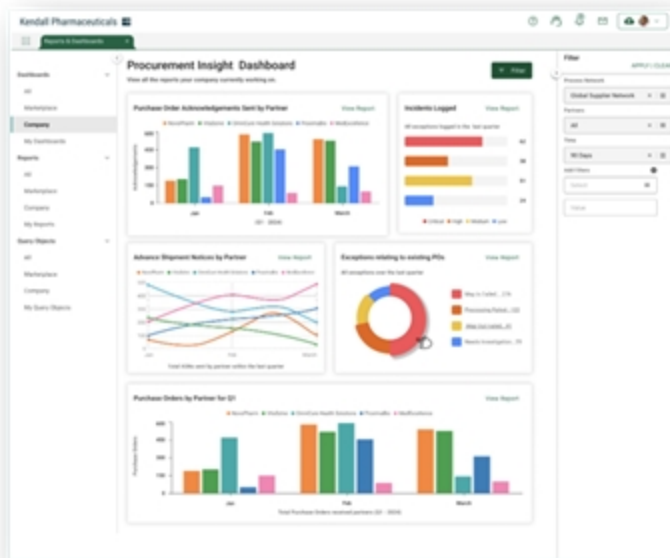
Dashboards Features:

- No code dashboards are collections of defined reports

- Maintains client-side interactivity

- Cross application view

- Reports linked to provide consistent view of data (1-N reports per dashboard element/visualization)

- 1-N dashboard elements per dashboard

- Data cached for performance

- Predefined filters established by Dashboard builders to allow filtering of data across the dashboard.

Predefined Elements

Dashboards are designed with predefined elements that enable users to navigate from a high-level view to more granular report data.
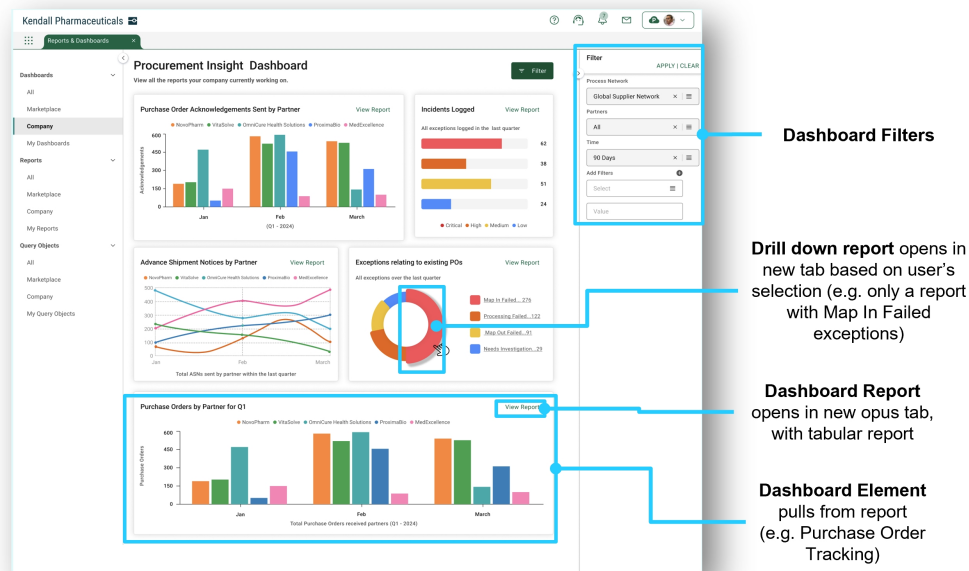
Creating Reports gives you access to data quickly across multiple objects such as POs, Invoices and ASNs. But, you probably want to visualize that data in more than just tabular

format. Additionally, you might want to see data from multiple reports in one place, such as Inventory data with Procure to Pay data.

This is where Dashboards come in. You can simply drag and drop multiple reports onto the dashboard and define how you want to visualize the data. You can choose to chart the information with common charting styles; including bar, stacked bar, pie, doughnut, line chart or even as a mini-table. You can even configure the details of the chart; titles, labels, legends, and even the color scheme, all without writing a line of code.

Each chart or mini-table is really a representation of an underlying report, and you can have multiple reports across the page. At any time, you can move from looking at a chart, to jumping into the report itself to find the information you need.

Dashboard Filters

Dashboards leverage operations that enable users to narrow results.
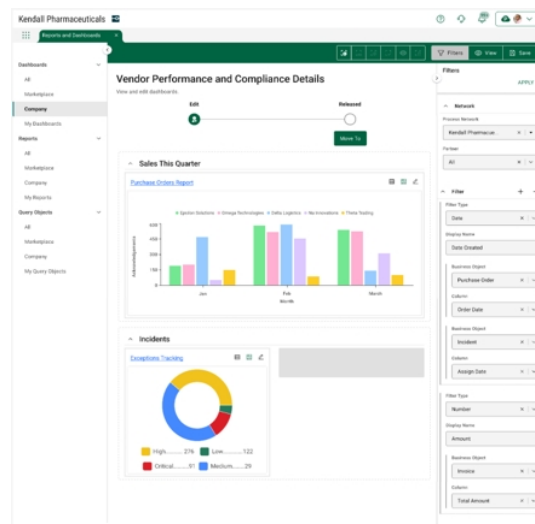
With all these sources of data in one page, you might want to narrow your view based on related factors, like a common product code or a due date.

One of the main ways to filter the data is by the Process Network and Partner selection, which prepopulates the networks/partners the user has access to.

As the creator of the dashboard, you can preselect the filters the users will have access to and can quickly wire those filters to the right reports, using the objects. Any report containing the object specific to the filter will be refreshed on the dashboard when the filter is used.

Key Takeaways

- **Administrators Configure Critical Insights**: TraceLink Administrators set up query objects, reports, and dashboards to deliver essential supply chain insights for informed decision-making.

- **Dashboards Visualize Orchestration Data**: Dashboards provide a clear view of information from query objects to reports, leveraging data across process networks for actionable insights.

- **Easy Access to Reports and Dashboards**: Reports and dashboards are conveniently located within the UI, integrated with other solutions for seamless navigation.

- **Configurable Reports and Criteria**: Reports and their criteria are fully configurable, allowing for detailed analysis of business processes.

- **Predefined Dashboard Structure**: Dashboards are designed with predefined elements and interactive visualizations, enabling users to navigate from high-level to granular data.