Introduction to Opus Foundations

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NETWORK FOR GREATER GOOD

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Introducing Opus Foundations

Learning Objectives

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

- Describe End-to-End Supply Chain Digitalization and Orchestration

- Summarize Opus Platform Foundations

- Envision the TraceLink Network and Opus Integration Foundations

- Feel comfortable explaining Supply Chain Orchestrations with MINT

Overview

Built on top of TraceLink's expansive digital Network, the Opus platform enables TraceLink's Multienterprise Information Network Tower (MINT) solution to digitalize all supply chain orchestrations through proven integration and data exchange processes.

Note: This guide corresponds to TLU Tech Talks presented live at FutureLink by TraceLink subject matter experts. All quotes in this guide are attributed to these experts.

📖 Introduction to End-to-End Supply Chain Digitalization and Orchestration

Digitalization increases accuracy, efficiency, productivity and speed through continuous and harmonized data flow and visibility with supply chain partners across all supply chain processes.

"Orchestration is the means by which we achieve integrated, intelligent, end-to-end supply chain management."

Orchestration builds on digitalization to improve how you plan, coordinate and execute supply chain activities across your end-to-end supply chain.

Orchestration enables us to:

- Coordinate the supply chain to efficiently move product from manufacturers to consumers.

- Synchronize procurement, manufacturing, distribution, and logistics across suppliers, distributors, regulators, and healthcare providers.

- Optimize medication delivery for cost-effective, and secure deliveries, enhancing visibility and responsiveness.

"Supply chain orchestration helps improve KPIs and minimize supply chain challenges."

Supply chain leaders have common objectives.

They want to reduce out of stocks and maintain lean inventory levels, achieve OTIF goals and eliminate failure to supply, and smoothly launch new products into new markets, all while reducing operational costs and improving service levels.

Supply chain leaders want to achieve these things in the midst of operational challenges with accurate forecasts, managing channel inventory, having timely visibility into production and order fulfillment across markets, and understanding and managing lead times.
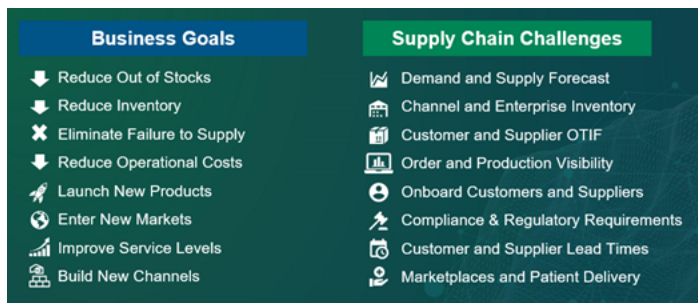
Hmmm...Something to think about:

What challenges does your company face with their manual supply chain processes?

"Orchestration impacts multiple operational capabilities across multiple supply chain partners."

Orchestration involves the integration of different processes and systems within your organization: planning, production, inventory, order management, distribution, transportation, and logistics.

But it doesn't stop with your enterprise systems within your four walls.
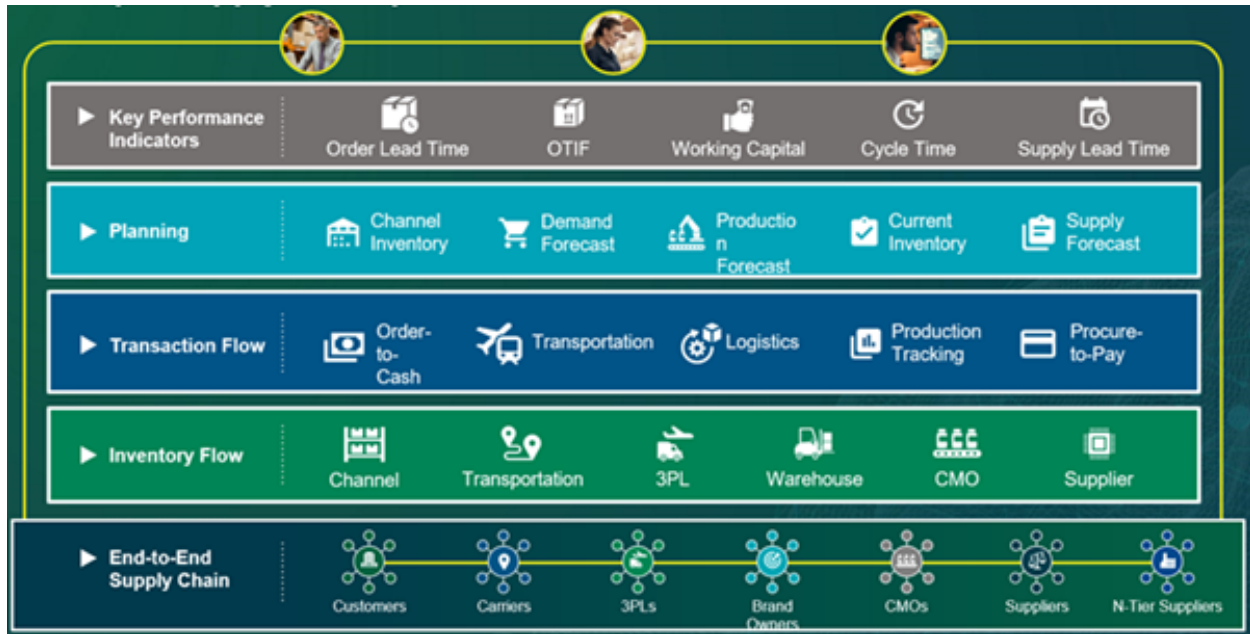
Ninety percent of the supply chain data you need resides outside of your enterprise. Orchestration needs integration across your supply chain partners, to integrate your processes, and achieve the continuous and harmonized data flow and visibility.

In order to do that successfully, supply chain orchestration requires clean, continuous, real-time data from all trading partners.

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"Digitalization fuels your enterprise systems with real-time, end-to-end supply chain information."

Here is a snapshot of the data that will fuel your enterprise systems in the context of your supply chain partner relationships and their business process orchestrations. Imagine if you could fuel your enterprise systems with this data, real-time, across the end-to-end supply chain?

"Real-time supply chain intelligence starts with supply chain network integration and digitalization."

Since you need the data, you need to integrate. What do you need to integrate?

- TraceLink's Network is where you and your supply chain partners are verified and onboarded by TraceLink's Network Team. This lets you easily leverage your connection to the Network in order to link to your supply chain partners and securely exchange information.

  Creating a series of point-to-point connections takes a lot of time and effort. Integration across all of the business transactions becomes greatly simplified with TraceLink's Integrate-Once model. You only need to focus on integrating with the format and method of the business transactions you need. Your supply chain partners can then focus on integrating with their format.

- TraceLink's Canonical data models provide the normalized source of truth, and the transforms let you each speak your own language.

  Huge efficiencies are gained when supply chain partners don't need to invest in and maintain each others format requirements.

- Orchestrations are enabled by Process Networks that provide the secure orchestration workspaces for the specific business transactions that make up your end-to-end business process with your supply chain partners.

  These secure orchestration workspaces are where you define the "who" and the "what" tailored to your business process execution model. They become the digital twin of your supply chain ecosystems.

- Lastly, the digitalization aspect of orchestration provides that clean, continuous, real-time data fuel across your end to-end supply chain that enables visibility and analytics.

  Data is referred to as "clean" because of the Integrate-Once Canonical data model, and it is called "real-time data" because the data flows are real time.

Hmmm...Something to think about:

How does your company benefit from quick integrations and linking to verified network entities? What steps can you eliminate from your processes if you don't have to worry about your partners' data exchange formats?

"TraceLink's Opus platform enables rapid integration to any system, process, or workflow by any customer or partner."

Opus Capabilities	Customer Benefits
No-Code Solution Configuration	Custom solutions for your business processes that maintain interoperability
Low-Code Multienterprise Apps	digitalisation and integration of all manual processes with partners
Collective Intelligence Across the Network	Integrated, real-time visibility across the end-to-end supply and demand network
Integrate Once, Interoperate with Everyone™	10x faster and cheaper to create digital links with zero cost for maintenance
Network Creation & Management	Identify and onboard *all* supply chain partners, not just your top 1-5 partners

All of this is powered by TraceLink's Opus Platform. Opus enables rapid integration to any system, process, or workflow by any customer or partner.

TraceLink has made significant investments in the company's core platform, and expanded it substantially. Some highlights of the platform:

- Includes some of our core established capabilities like our Network and Integrate-Once model

- Adds collective intelligence through the registration of data facts – from the applications and information sharing – that provides the basis for real time visibility and intelligence

- Includes the ability to create low code multienterprise supply chain apps

- Enables no code solution configuration to allow you to adapt your solutions to your business needs

"Your end-to-end orchestration journey can begin with any supply chain process."

With so many supply chain processes, with so many supply chain partners, is this feasible? Is there a specific place you need to start?

External Manufacturing: You might start with orchestrating outcomes in external manufacturing because you need to improve a function by digitalising and orchestrating the forecast planning process, PO process, inventory visibility at CMO sites, batch production, shipping and invoicing processes.

Logistics: You might start with orchestrating outcomes in logistics because you need to improve better insight into inventory levels by digitalising and orchestrating warehouse stock transfer movements, inventory visibility at 3PL warehouse locations, distribution orders to fulfill customer orders and shipment notifications.

Commerce: Or you might start with orchestrating outcomes in commerce with your direct customers because you need to improve order to cash processes by digitalising and orchestrating exchange of your product catalog, the PO process, shipment notifications, invoicing and return authorization processes. It really can start with any supply chain process, depending on where you sit in the supply chain and your needs.

How to Get Started: Supply Chain Orchestration Value Roadmap
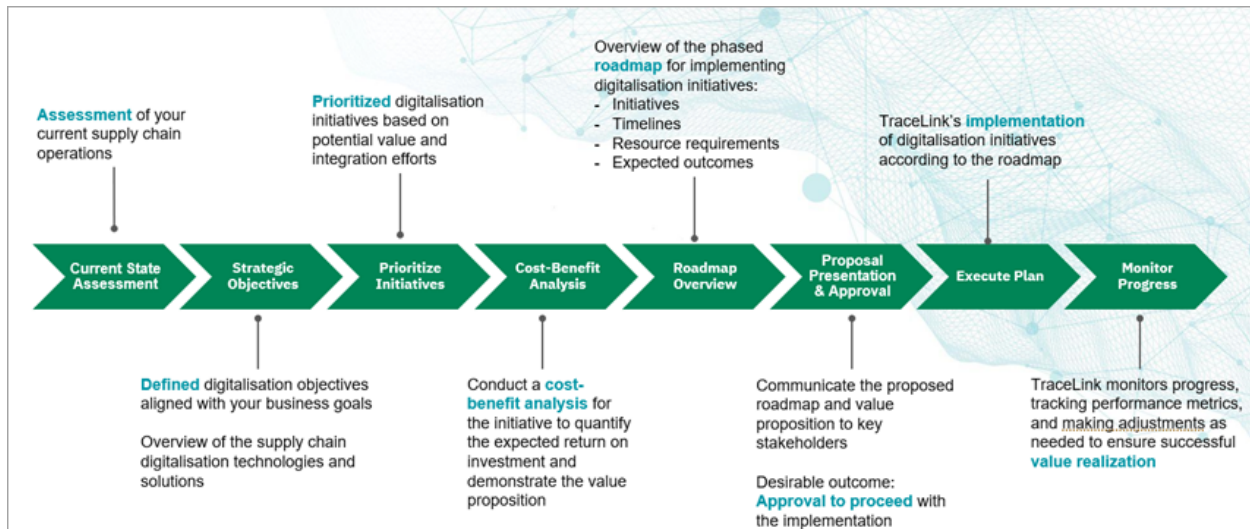
Hmmm...Something to think about...

When you plan your journey, tools like a Supply Chain Orchestration value roadmap can help get you started with:

- *Assessing your current supply chain operations*

- *Defining your digitalization objectives that are aligned with your business goals*

- *Prioritizing your digitalization initiatives based on value and integration efforts*

- *Conducting a cost-benefit analysis to quantify your expected ROI and demonstrate the value proposition*

- *Defining your roadmap, plan, needs and outcomes for your digitalization initiatives*

- *Communicating this plan and proposed value to your key stakeholders*

- *Execute, monitor your progress and track your performance metrics*

Key Takeaways

- Orchestration is the means by which we achieve integrated, intelligent, end-to-end supply chain management.

- Digitalization increases accuracy, efficiency, productivity, speed, and visibility.

- To successfully orchestrate and digitalize your supply chain, you need a true network of verified partners.

- TraceLink's Opus Platform, which sits atop TraceLink's proven Network provides rapid integration to any system, process, or workflow by any customer or partner.

📖 Opus Platform Foundations

Opus is the sole PaaS built on a network that supports supply chain orchestrations by enabling the seamless coordination within business process ecosystems using diverse applications, solutions, and integrations. This allows organizations to link systems and partners, facilitating real-time information exchange, improving supply chain efficiency and visibility across critical orchestrations like manufacturing, logistics, and procurement.

The key elements to enable orchestrations include applications, solutions, process networks and integrations.
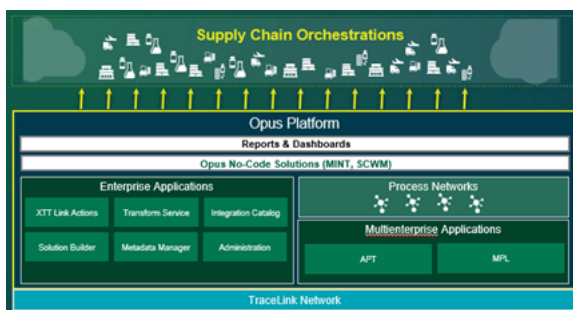
Opus Applications

Opus applications provide essential business functions, including workflows, that power integrations and solutions. Opus includes both enterprise and multienterprise applications, providing shared instances for business process execution.

Opus apps are "headless" (e.g. no UI) and are built by Opus Developers. A multienterprise app is a shared instance of an application where an owning company

exchanges data with supply chain partners on the TraceLink Network. This fosters orchestrations that encompass related business processes.

Opus Solutions

As apps are headless, Opus Solutions provide UX and configurations that extend application behavior, allowing organizations to address unique customer and partner (multienterprise) business requirements effectively.

Solutions harness TraceLink's comprehensive data model to create rich interoperable multienteprise solutions. And, they encompass business objects, workflows, pages, menus, roles and permissions, and policies making solutions robust, which allows for an accelerated delivery of a tailored user experience.

Process Networks

A Process Network is a business ecosystem within a multienterprise app, consisting of the app owner (TraceLink customer) and Linked Partners, all working toward a shared business goal.

Each network is configurable for both customers and partners, enabling secure data sharing and orchestration of business processes based on their roles and links.

While a Process Network is tied to a single solution, a solution can be used by multiple Process Networks, which caters to varying partner and owner needs. This enables customers to tailor their different orchestrations to satisfy the unique needs of different networks.

Opus Ensemble: The First Next Generation Solution

Opus Ensemble revolutionizes user interaction with a global UX that integrates user context, personalized settings, intuitive navigation, and company-specific context, which is available to all TraceLink users.

Explore the Opus UX through these key areas:

- **User Context**: Fixed at the top for reliable and familiar interaction instant access to your accounts, notifications, help, support, and essential context such as company name/logo and environment.

- **Navigation:** Guides you to solutions, networks, and processes, featuring browser-like tabs and TraceLink's unique network navigation, ensures streamlined and efficient user journey.

- **Main Content Area:** A rich, interactive space for effortless engagement and task execution.

- **Toolbar and Push Panel:** Quick access to key operations and information without impeding key information and actions in the main content.

Integrations

Integrations like Link Actions and Transforms simplify the exchange of complex transactional data across companies, driving real-time multienterprise-working partnerships, increasing visibility to optimize supply chain efficiency.

Facilitated by linked systems and partners on the TraceLink Network, these integrations involve the transfer of key business objects, such as purchase orders, invoices, or shipping notices, that traverse through specific workflows to support orchestrations (e.g. Commerce). Integration options include the UI, B2B Messages, and Link Actions.

Metadata Makes it Happen!

Rich metadata in Opus unlocks the ability to create multienterprise, no-code solutions, enabling the ability to get supply chain solutions to market, faster than before.

- Metadata provides information about Business Objects, describing its structure, characteristics, actions, and relationships. This helps systems and users better understand, manage, and interact with data relating to their business processes.

- This metadata-driven approach is the foundation to our object-centric design, focusing on business objects, their associated information (metadata), and actions (e.g., operations, workflows).

- Metadata makes the No-Code Solution Environment possible. You describe how you want the system to appear and behave, and the system uses metadata to know how to do it.

Opus Solution Environment (OSE)

The Opus Solution Environment (OSE) is a powerful no-code product used by Opus Solution Designers of all experience levels and diverse backgrounds. OSE enables users to configure business objects, workflows, menus, pages, roles, permissions, and policies to create company solutions in order to support their various, unique business challenges and requirements.

With its intuitive drag-and-drop interface, OSE empowers everyday professionals to address specific business needs without requiring formal programming expertise.

Opus Catalogs

Opus catalogs offer a searchable repository of various solution offerings, empowering discovery and reuse by customers and partners.

The **Standard Catalog** contains pre-installed solutions provided by TraceLink and are available for any company to use out-of-the-box.

The **Marketplace Catalog** is a globally shared catalog, where customers can retrieve TraceLink Solutions, Link Actions, and Transforms readily available to solve multienterprise challenges.

The **Company Catalog** contains the core objects used or configured by the company, enabling them to easily tailor solutions to their unique requirements. By starting with a foundation from a Marketplace or Standard option, they gain a key accelerator for configuring their solutions.

Note: Solutions, Link Actions, and Transforms are accessible via the Marketplace Catalog through Opus's Platform Capabilities.

Key Takeaways

- ○ **Only Multienterprise Platform:** The Opus Platform is designed to support multienterprise applications and supply chain orchestrations, enabling seamless collaboration across businesses through various apps, solutions, and integrations.

- ○ **Flexible Applications, Solutions, and Integrations:** Applications provide core business functionality and solutions extend and configure behavior to address specific organizational needs, while various integration options facilitate the exchange of business data across companies.

- ○ **No-Code Design Environment:** The Opus Solution Environment (OSE) allows for the configuration of business objects, workflows, pages, menus, roles and permissions, and policies through an intuitive, no-code interface.

- ○ **Faster Time to Market:** OSE accelerates solution development with TraceLink's rich data model, delivering faster time to market with cost-effective, no-code design capabilities.

- ○ **Searchable Repositories:** Standard, Marketplace, and Company Catalogs offer a repository of core elements—such as Solutions, Link Actions, and Transforms—empowering discovery, usage, and configurability.

📖 TraceLink Network and Opus Integration Foundations

The TraceLink Network is the foundation that makes integrating systems and linking to partners possible.

The Network

A foundational building block of the **TraceLink Network**, is the idea that each company has a single digital twin of each entity on the TraceLInk Network. This is possible because TraceLInk uniquely identifies and authenticates each entity on the TraceLink Network. Since there is only a single instance of each company, you can ensure that when you are connecting and exchanging data on the TraceLink network that it is the correct entity on the other side.

TraceLink's Network is Supported by Network Success Management

The next building block is **TraceLink's Network Success Management**. This is global team that is dedicated to management of the TraceLink Network. The NSM team is responsible for onboarding and maintaining Network entities and their connections to TraceLink. This team supports both Customers and Partners with their connections to TraceLink. By having a team that is dedicated to maintaining the network connections they act as an augmentation to your internal teams reducing the onboarding, maintenance and overall support costs.

TraceLink's Network Enables B2N Integrate Once

The third building block to TraceLink is our **Business to Network Integration Once** methodology. As mentioned earlier, since there is only ever a single version of you on the network. As a result, you only ever have to integrate one time for each transaction regardless of the number of partners. You only have to integrate once, and you can do so in whatever format you like. You can use X12, or iDOC or even a custom integration.

This innovative model means you no longer have to build point to point connections for each partner. Unlike other Networks, it is only possible because of the other building blocks beneath it, the single digital twin on the Network and our dedicated network team who supports it.

TraceLink's B2N Integrate Once Permits Interoperate with Everyone

So, you built your integration but how does that work with the partners and what they expect to see? That is where the next building block comes in, **Interoperate with Everyone**.

TraceLink uses a canonical model which translates the data into a shared format that can then be shared out in whatever format the partner wants. The canonical model eliminates the need to do timely and costly mapping for each partner. It also means that you are isolated from changes the partner makes. For example, if the partner upgrades their ERP system you don't have to change anything about how you are communicating with them, TraceLink will just update their integration with no impact to your integration.

TraceLink's Interoperate with Everyone Facilitates Linking

The next building block is **Linking**. Linking is the simple configuration step of creating a link between two entities on the Network to start exchanging data.

Once you and your partners have completed the other building blocks (being added to the network, and building each one of their integrations), the next partner that wants to come along and start exchanging data simply has to link up. After Linking, they can start exchanging data right away. This means you can onboard hundreds of partners in a few easy steps. Since it is so easy and quick you no longer only have to do it just for the big guys you can connect up all your partners regardless of size or technical capabilities.

TraceLink's Linking Configuration Empowers Multienterprise Applications

The last building block in our Tower of Success is TraceLink Multienterprise applications. Multienterprise applications, like MINT, allow customers and trade partners to have a shared view of their business processes.

Before, you were sharing excel docs which could be different on each user's computer. Now, if you use Google Sheets you can both have the same view with real time updates. MINT acts similarly. Everyone has the same real time view of the data. Using MINT also helps to solve the security concern with giving external people access to your internal system. TraceLink manages this through the roles and permissions they are given as part of the Link you create between the two parties.

This shared view of the data allows for better business orchestrations.

The Tower of Success

Multienterprise: Everyone has the shared view of the data.

Linking: You scale your business through configuration.

Interoperate with Everyone: Everyone maps in their own format.

B2N Integrate Once: You have a single integration to TraceLink.

Network Success: You get a dedicated Network Success Team

The Network: You are one company on the TraceLink Network.

Key Takeaways

○ TraceLink creates a single digital twin for each company on the Network.

○ Each company only needs to integrate once in their own format.

○ Multienterprise apps allow a shared view into the orchestration.

📖 Supply Chain Orchestration with MINT

We covered orchestration, how it helps you coordinate, synchronize and optimize supply chain activities across your end-to-end supply chain.

We also covered the role of digitalization as a key enabler to fuel TraceLink's enterprise systems with real-time, end-to-end supply chain information, and that real-time supply chain intelligence starts with supply network integration and digitalization. This is what TraceLink's Multienterprise Information Network Tower solution, or MINT, focuses on.

"MINT is the digitalization solution that integrates supply chain networks to optimize service, cost and cash across end-to-end supply chain orchestrations."

MINT enables you to:

- Create networks with supply chain partners

- Integrate with supply chain partners and digitalize transactions across shared business processes

- Include all supply chain partners leveraging TraceLink B2N Integrate-Once™ model

- Monitor progress, status and performance of processes and partners

"MINT enables data exchange with all supply chain partners through flexible modes of integration with the Integrate-Once^{TM} model."

With our Business-to-Network Integrate-Once model, MINT enables inclusion across all supply chain partners, regardless of their capability levels.

Companies can interact system to system, system to person, or person to person using any method or format:

- Each company can connect with their method, whether that's through asynchronous messaging, API integration with enterprise systems, or using the Web UI.

- When integrating, each company can use any format, whether it is EDI X12, EDIFACT, IDoc, XML, JSON or custom flat file.

- Complex and difficult point-to-point integrations are eliminated, and each party on the Network maintains their single connection to the TraceLink Network, and leverages their format of choice without having to worry about what their supply chain partner has chosen.

By enabling all supply chain partners to be connected, and not just a select few, the greatest value can be achieved to improve supply planning and make decisions on accurate and timely data.

"MINT powers your end-to-end orchestration journey across all supply chain processes."

MINT enables a number of orchestrations with supply chain partners, spanning from:

- **External Manufacturing** between the MAH and CMOs

- **Direct Supply** between the MAH and their direct material suppliers

- **Logistics** between the MAH and their third party logistics providers

- **Commerce** between the MAH and their customers in the supply chain

- And more orchestrations in the future

"MINT for External Manufacturing orchestrates outcomes to ensure supply plans are more accurate, and products predictably ship on-time and in-full."

MINT for External Manufacturing integrates MAHs and their Contract Manufacturing partners to optimize planning and ensure on-time delivery, by sharing forecasts, receiving PO commitments, achieving manufacturing and inventory visibility and tracking delivery.

- Improve collaboration on forecast plans to increase predictability and reliability

- Maintain visibility to inventory levels to ensure production is not disrupted

- Quickly and efficiently confirm POs and delivery schedules to enable accurate supply planning

- Maintain visibility into production completion and delivery dates to ensure supply meets demand

- Streamline invoice and payment process for contract services to enable smooth flow of operations funding

"MINT for Logistics orchestrates outcomes to achieve the highest order fulfillment performance."

MINT for Logistics integrates MAHs and their Logistics providers to achieve the highest order fulfillment performance, by digitalising and orchestrating warehouse stock transfer movements, inventory visibility at 3PL warehouse locations, distribution orders to fulfill customer orders and shipment notifications. MINT for Logistics enables the following:

- Improve planning and replenishment by aligning on inventory levels at Logistics Partner warehouses

- Ensure complete visibility to finished product transferred from CMOs to Logistics partners

- Provide accurate customer order data to Logistics Partners to ensure timely and accurate fulfillment

- Track when customer orders are fulfilled by Logistics Partners to ensure highest customer service levels

- Optimize Order-to-Cash processes outsourced to Logistics Partners in specific markets and close monthly and quarterly sales financials on time

"MINT for Commerce orchestrates outcomes to improve product availability and customer service levels."

MINT for Commerce integrates MAHs and their Direct Suppliers to ensure material availability for on-time manufacturing, by digitalising and orchestrating exchange of your product catalog, the PO commitment process, shipment notifications and demand signals. MINT for Commerce allows you to:

- Improve collaboration on forecasts and inventory availability, increasing predictability and reliability of supplier deliveries while reducing safety stock inventory

- Ensure alignment with suppliers to improve planning and reduce late or missed shipments

- Quickly and efficiently confirm POs and delivery schedules to enable accurate supply planning

- Coordinate material deliveries with Logistics partners and CMOs and ensure complete visibility

- Generate timely and accurate payments for materials to maintain trust and good supplier relationships

"MINT orchestrations and workflows can be configured and tailored to meet your specific business and supply chain needs."

In order to make these orchestrations yours, and optimize them to your supply chain processes, you need the ability to configure them. This is where Opus Solution Environment comes in.

With Opus Solution Environment, you can configure your orchestrations and make solutions specific to your supply chain needs. You can specify which transactions you need, rearrange or rename the screens and data fields, add field logic to meet your requirements, modify workflows to include additional steps, and create new user roles to ensure permissions and security.

"Reports and Dashboards provide visibility into your supply chain performance to improve KPIs and identify supply chain challenges."

We talked about orchestrations needing not just data flow, but also data visibility. MINT Orchestrations provide out-of-the-box reports and dashboards to give you that visibility.

This is powered by Opus Reports & Dashboards, which enables you to:

- Modify the provided reports and dashboards to suit your needs

- Define your own reports using no-code queries and report definitions

- Define your own dashboards using no-code charting tools that operate on the report data

- Arrange reports and dashboards on pages to tell your orchestration stories

- Share reports and dashboards, with data protected by user permissions and roles

Key Takeaways

- MINT is the digitalization solution that integrates your supply chain networks to optimize service, cost and cash across your end-to-end supply chain orchestrations

- By supporting a wide range of transactions and data formats, MINT powers diverse supply chain orchestrations

- Reports and Dashboards for MINT provide actionable visibility into your supply chain orchestrations