

Introduction – Warren Cohen

- Assistant Professor of Professional Practice Department of Supply Chain Management.
- **40+ years** of industry experience in Supply Chain Management
- Retired from **Becton Dickinson (BD)** after 20 years.
 - Held various supply chain management positions including:
 - ✓ Vice President Global Transportation & Trade Mgmt. – **BD**
 - ✓ Head of Supply Chain Asia Pac, Based In Singapore - **BD**
 - ✓ Head of Supply Chain Latin America -**BD**
 - Vice President Supply Chain - **United Paper Mills (UPM)**
 - Director Materials Mgmt. – **BASF**
 - Mgmt. Positions Supply Chain – **Nabisco Brands, Avon Products**
- Education & Certifications:
 - Master of Sciences in Supply Chain Management
 - Bachelor of Sciences in Business Administration

Introduction – Warren Cohen

Affiliation with RBS:

- Advisory Board Member, Center for Supply Chain Management representing Becton Dickinson (2005 – 2007)
- Full time Associate Professor, Supply Chain Management (2018 – present)

Affiliation with Rider University:

- Lecturer Undergraduate Supply Chain Program
- Advisory Board Member, Center for Supply Chain Management representing Becton Dickinson (2012 – 2018)

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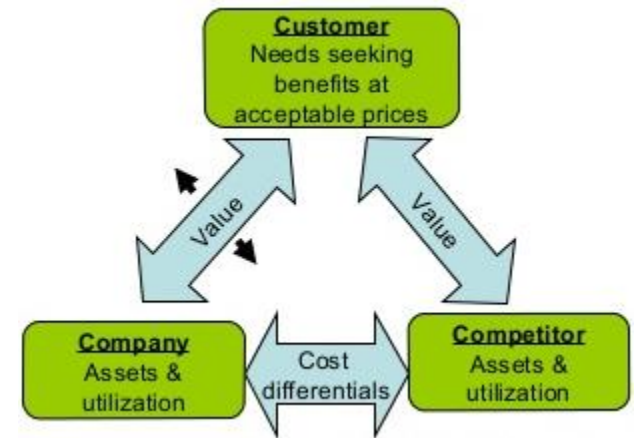
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What's Next for Supply Chain Management?

As the supply chain continues to evolve, it's critical for companies to **adapt to emerging technologies and strategies**

- The **pace of change** in supply chain management continues to **accelerate**, and it's only going to get faster.
- With the **explosion of e-commerce**, things are moving at internet speed in both the B2C and B2B markets.
- Supply Chain Management has transformed from an **often-overlooked cost center** into a **vital segment of operations** that can be turned into a **competitive advantage**.



“...A firm gains competitive advantage by performing these strategically important activities more cheaply or better than its competitors.”-----
Porter, M.E., *Competitive Advantage*,

What's Next for Supply Chain Management?

The supply chain is more diverse than ever before.

- New **technical innovations** offer the opportunity to reduce this complexity.
- Transforming the supply chain from technology-enabled to **technology-centric**.
- The enormously increasing **complexity** of markets as well as dynamically increasing **customer requirements** calls for **trend-setting action** from all industries.

Companies will continue to concern themselves with ongoing trends in the areas of **Artificial Intelligence (AI)**, the **Internet of Things (IoT)** and/or **Blockchain**.

What's Next for Supply Chain Management?

Chances are, the big picture will look similar to today's supply chain, but the details of how things get done will dramatically change.

- There won't be any excuse for not having **real-time inventory** and **fulfillment information**.
- Drones may be taking inventory in warehouses, and trucks may be self-driving to their destination, but it still comes down to getting the **right product** to the **right place** at the **right time**.
- Companies will have more **options** when it comes to **warehouse management technology** in the form of both **WMS solutions** and **automated robots**.

What's Next for Supply Chain Management?

The **capacity crunch** will likely continue, forcing companies to find more ways to **cut costs** and **avoid scaring off customers with rising prices**.

- One of the ways businesses might be able to save resources upfront is with **cloud-based SCM**.
- The **cloud market will continue to grow** as more businesses become less fearful.

Businesses will have to find new ways to stay competitive. New **technology** will likely become popular to help implement **distributed inventory**, allowing smaller businesses to keep up with Amazon.

The need for **security within the supply chain** will likely continue to be addressed as **AI** and **IoT** grow in ubiquity.

Logistics Labor Shortages

Logistics labor shortages will continue through 2021 and beyond.

Wages will continue to rise due to demand.

While the talent gap remains a significant challenge, solutions are starting to emerge.

- Companies need to be more **creative** about how they recruit and retain workers.
- Using a **proactive** and **multi-faceted approach** to recruiting and retention in tight labor markets.
- **Automating the recruiting process**, from online applications, pre-hire testing, onboarding, and increasing the quantity and quality of applicants for positions.
- Working closely with universities and colleges to **promote the career opportunities** available in supply chain management while helping prepare students to enter the industry.

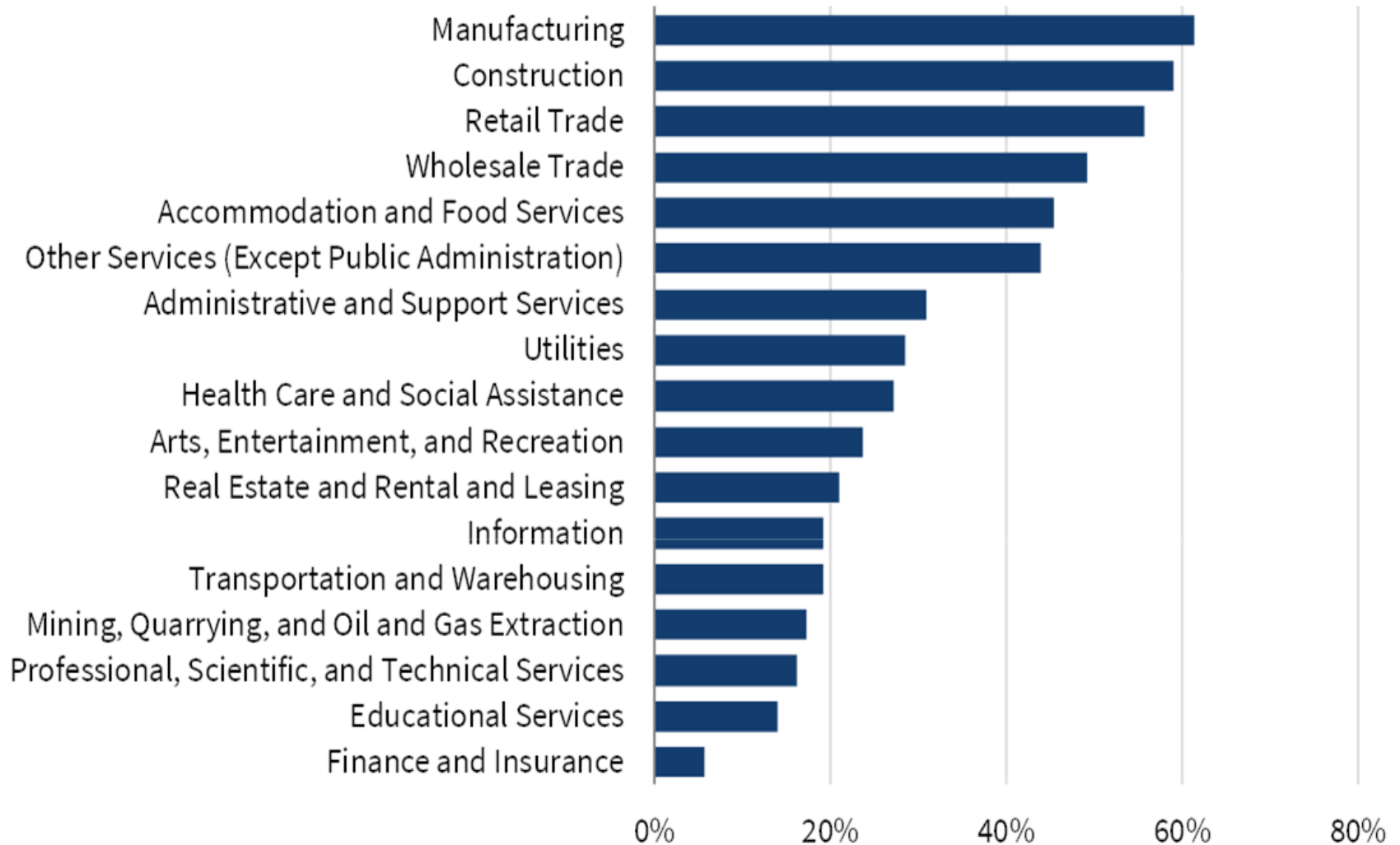
Logistics Labor - Transportation

Transportation is an area with **growing labor shortages** due to the rapid growth in online shopping that is creating strong demand for delivery drivers.

- The industry is facing a **record shortage** with an estimated 50,000 more drivers needed to meet demand, according to the American Trucking Associations.
- The lack of available drivers is rippling through the supply chain, causing a **bottleneck of goods** that is **delaying deliveries** and prompting some companies to **increase prices by as much as 20%**.
- **Driverless trucks** are one proposed long-term solution to the problem, but there are more practical solutions:
 - ✓ Increased Pay
 - ✓ Flexible Schedules
 - ✓ Benefits, etc.

Supply-Chain Disruptions By Sector

In the last week, did this business have domestic supplier delays? (percentage saying yes)



Sources: U.S. Census Bureau; CEA Calculations.





Transportation Management Systems (TMS)

Warren H. Cohen

Assistant Professor Professional Practice

Role of transportation in supply chain management

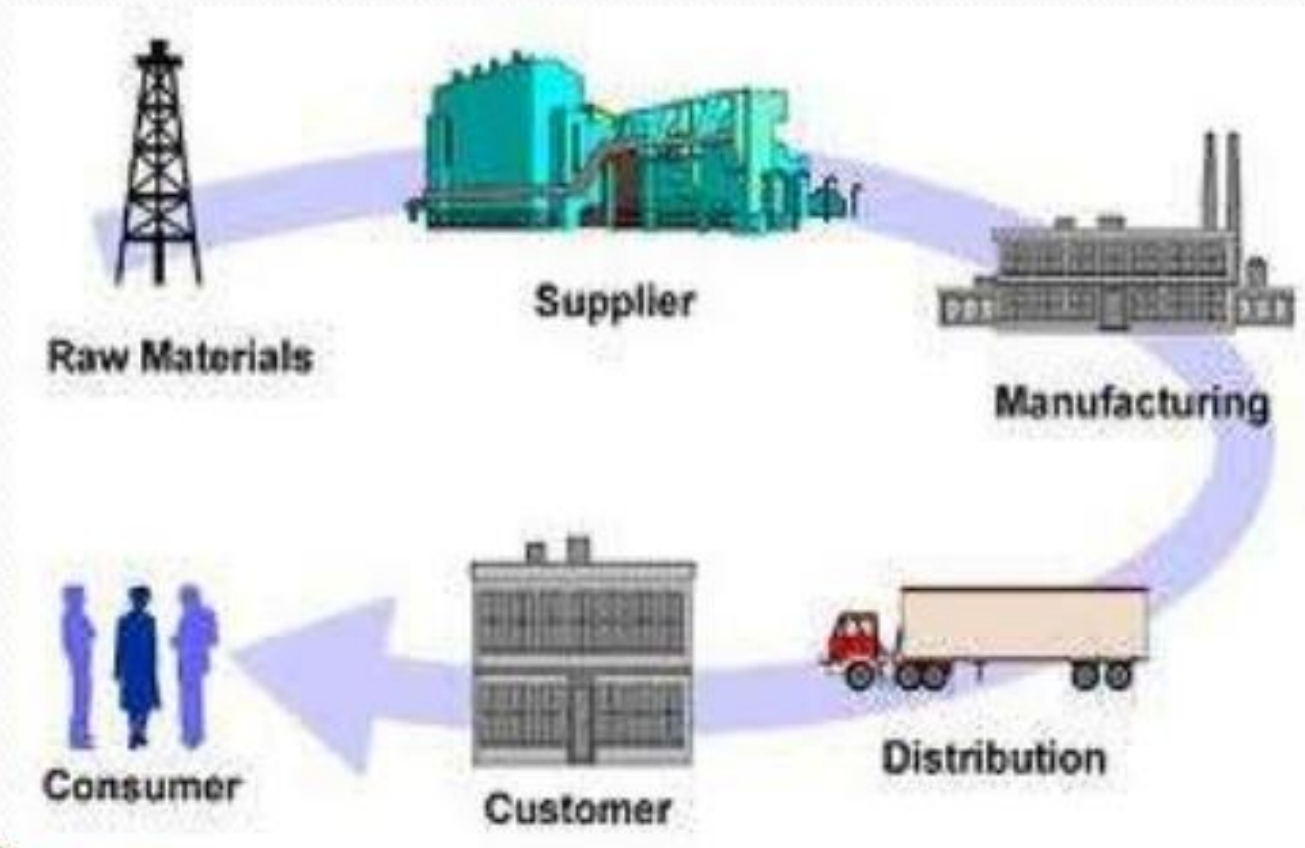
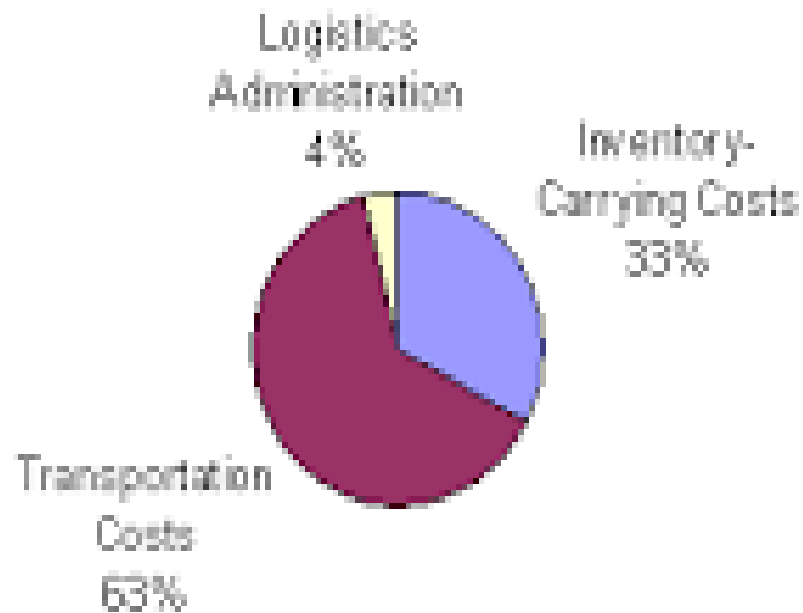


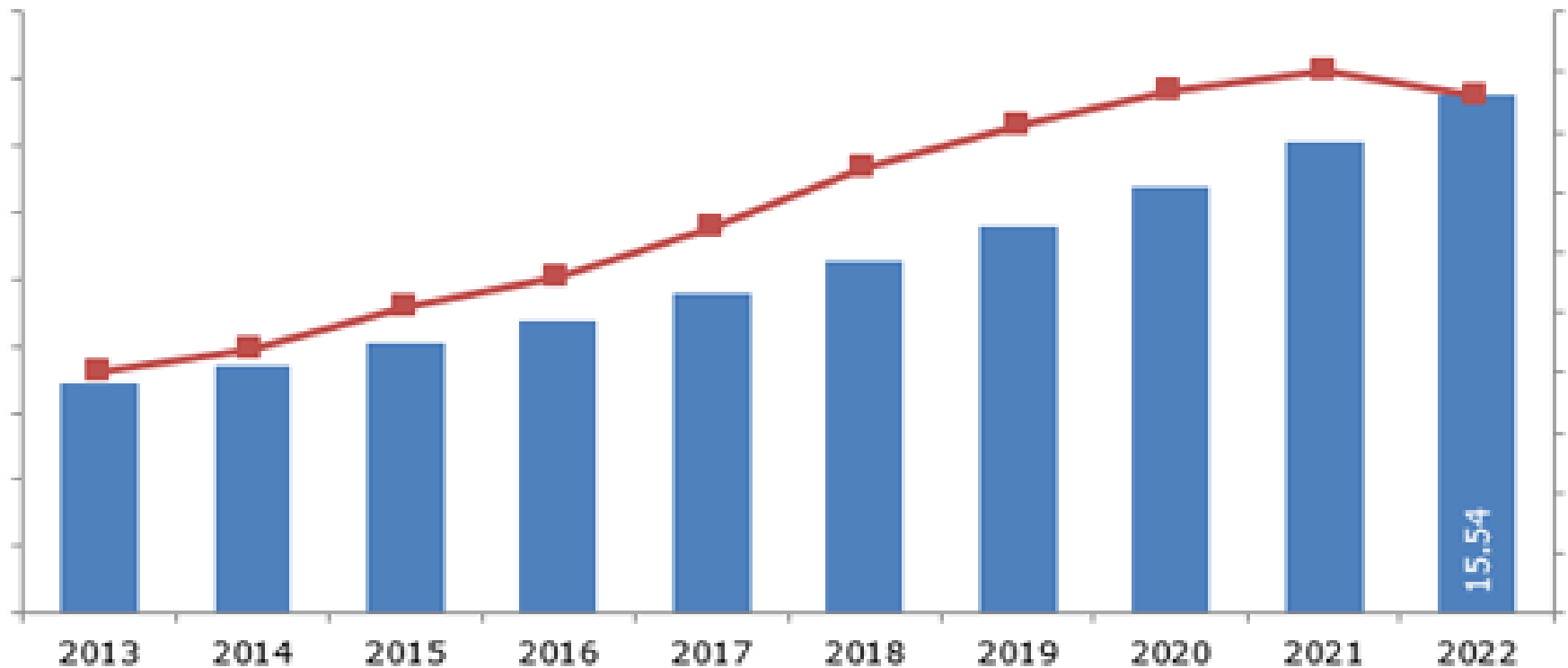
Chart 1 - Components of Logistics Costs



Logistics Costs and U.S. Gross Domestic Product

Transportation Management Systems Market to Reach US\$ 15.54 Bn By 2022

FIG. 2 Global Transportation Management Systems Market Revenue and Growth, 2013 – 2022 (US\$ Mn) (Y-o-Y %)



Source - Gartner Research



Transportation and Logistics Concept

Why Focus on Transportation Management?

Companies embark on a transportation improvement initiative to address cost, service and / or inefficient processes.

1. Reduce total landed costs -- not only concentrate on the cost to move goods but understand the cost to move, store, and handle items from order to delivery

2. Improve service to customers – enhanced visibility and adherence to delivery dates and KPI's; in terms that the customer, shipper and supply chain partners understand

3. Manage processes, not transactions -- recognize the importance of managing the global transportation network rather than managing each individual shipment

When Selecting a TMS...

Many factors are considered to make appropriate selection.

- Industry
- Integration to multiple systems
- Transportation spend
- 3PL use
- Level of resources sophistication
- Business requirements
- Transportation modes
- System functionality to be used (order management, planning, execution, freight audit and payment)
- Geographic scope: domestic vs. International vs. Regional Control Towers

Opportunity

As companies grow organically and via acquisition transportation costs will continue to grow

How do we keep the growth in transportation costs from being linear?

- Consolidation and optimization
- Cost based carrier and mode selection

Some companies are too big and complex for brute force transportation planning

Value Proposition

- ❑ Mode shift, opportunistic multi-stop shipments
- ❑ Opportunities for hundreds of thousands in potential monthly savings
- ❑ Visibility and realistic transit time calculation reduce inventory carrying costs



TMS Selection

There are many solutions in the market, all with advantages and disadvantages.

- Custom Development
- ASP/Niche Providers
- Best of Breed
 - The solution landscape has changed over the last few years
 - There is overlap with these solution providers
 - The devil's in the details
 - They will say they can do what you need – must push to understand how they do it

How does the TMS Work?

- Sits between an order management system and a warehouse management system to create a plan for shipping goods
- Supports transportation execution activities
 - Tendering
 - Booking
 - Status Monitoring
- A TMS uses freight tariffs, constraints and rules to propose a solution for a given set of shipping requirements.
- Generally using a heuristic approach to solving a large problem set in a short period of time

Options BD considered

SaaS

- On demand software, hosted model

Perpetual (on premise)

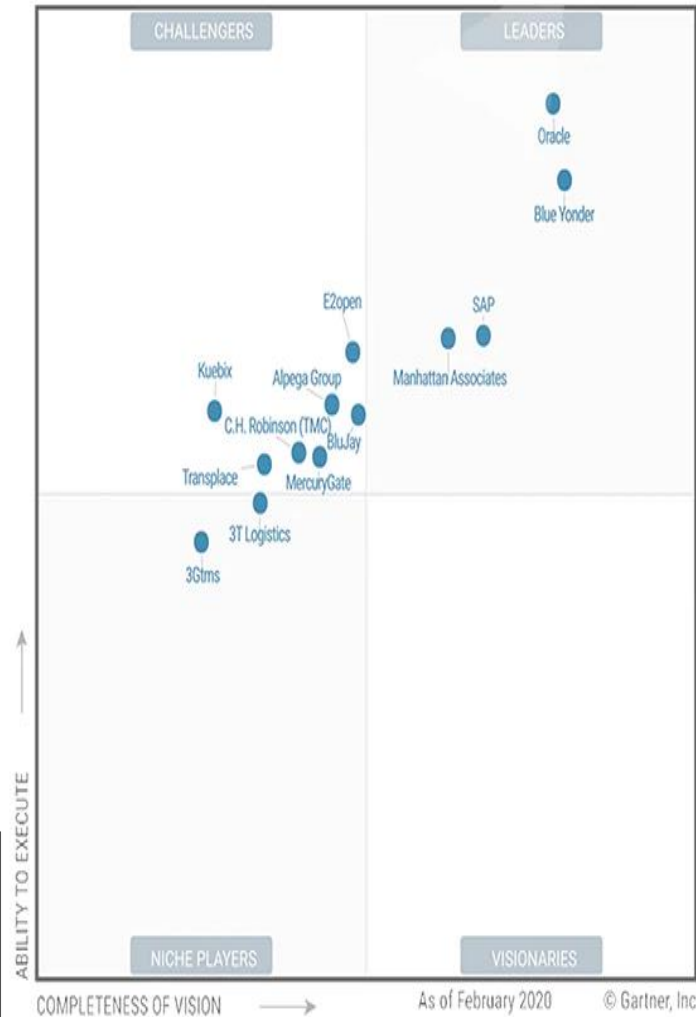
- Vendor software managed internally

3PL Model

- Fully outsourced model

SaaS Selection

Figure 1. Magic Quadrant for Transportation Management Systems



Source: Gartner (March 2020)

- Engaged PWC to create selection criteria
- Narrowed to 2 finalists
- Oracle and Blue Yonder as a cloud solution
- Both best of breed
- Unanimously voted to choose the Blue Yonder offering
 - More cloud experience
 - Single tenant offering
 - Modeling tool

Why Saas/JDA (Blue Yonder)

Single Tenant

Distinct Modeling Tool

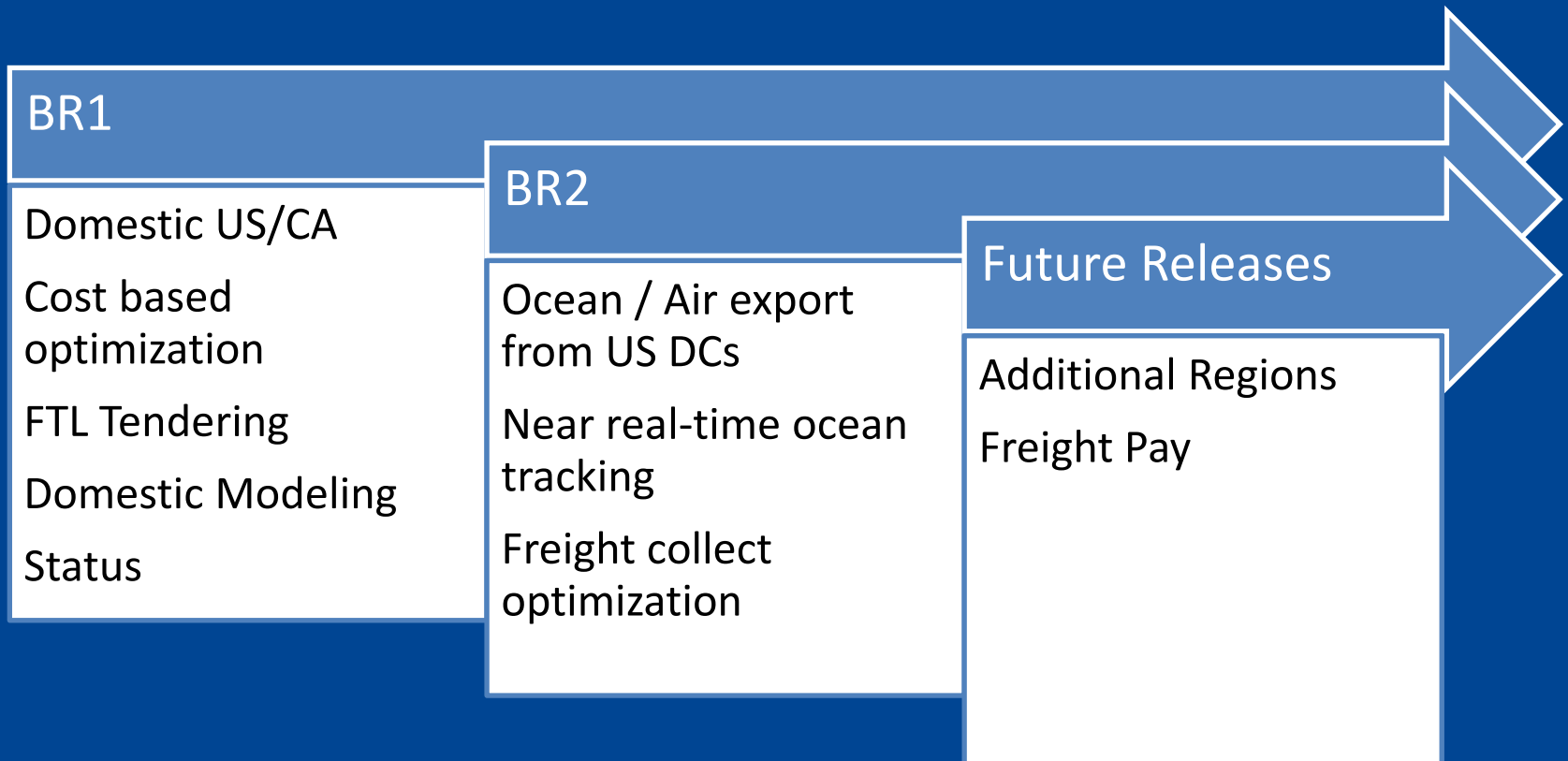
Able to demo our requirements

Services and software in one organization

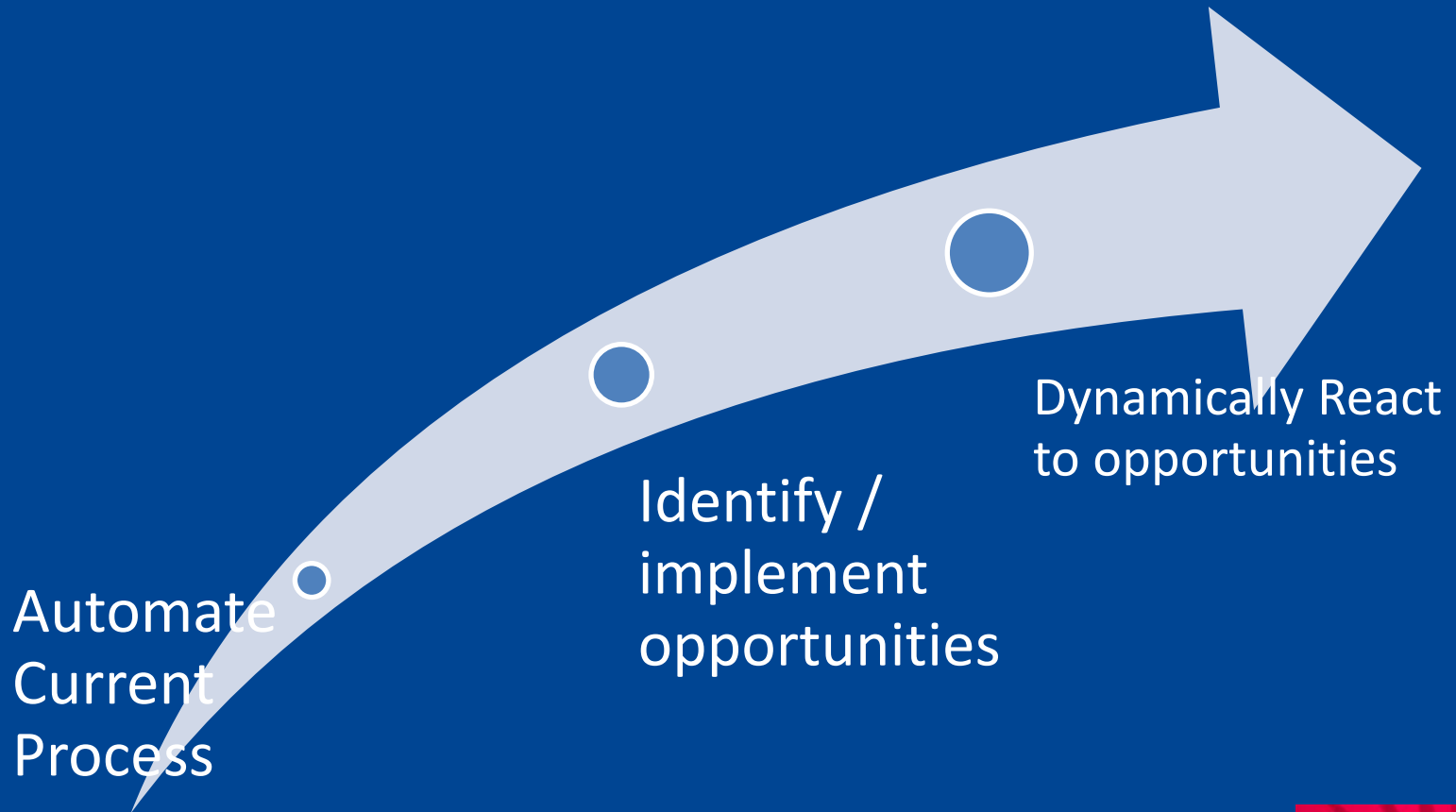
Implementation Strategy

Business releases
crawl, Walk, RUN!

Business Releases



Crawl, Walk, Run



TMS Architecture

System responsibilities

System connectivity



System task ownership

ERP (SAP)

- Order management, Finance, Planning

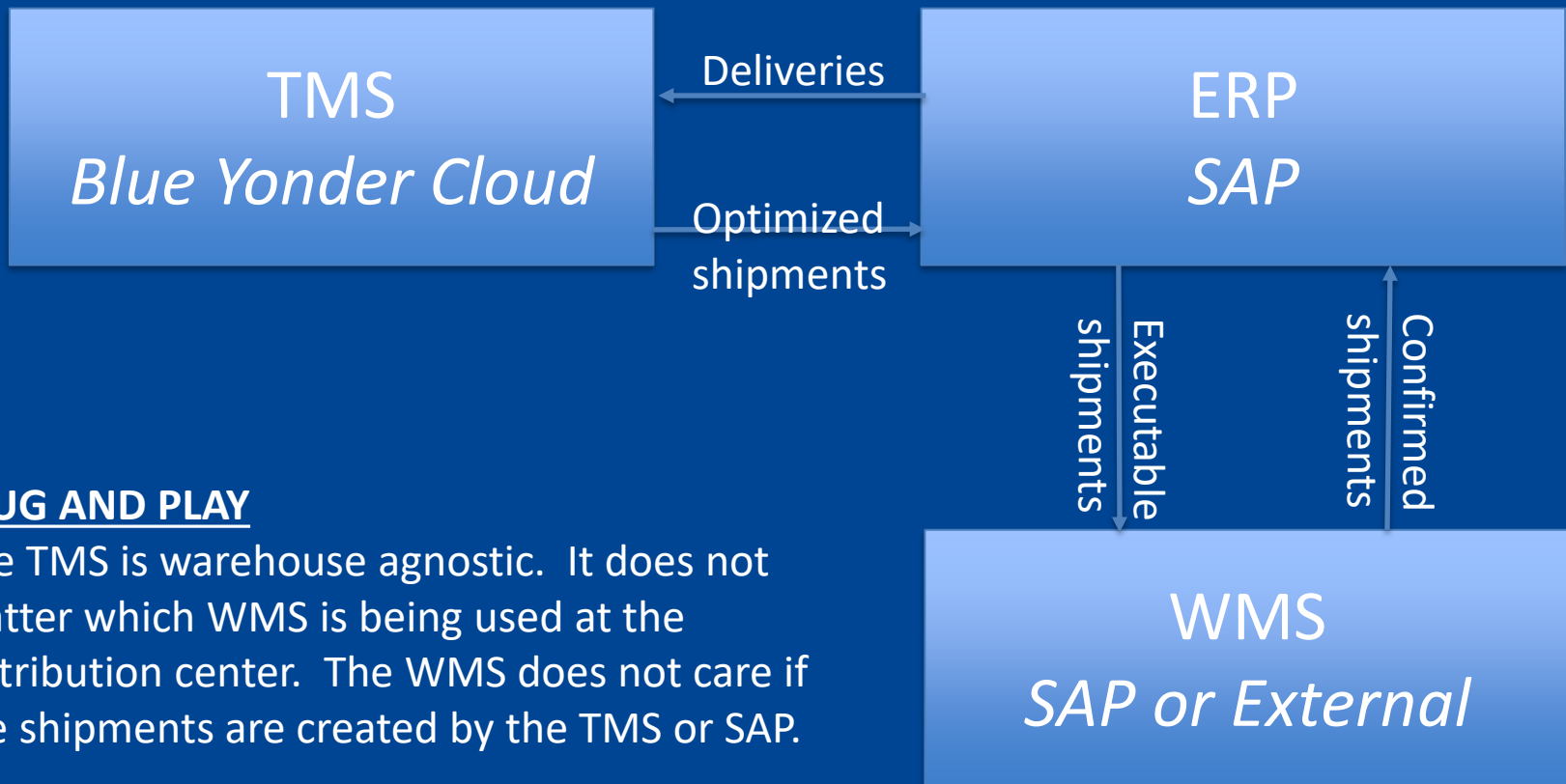
WMS

- Shipping, Receiving, Warehouse Operations

TMS

- Transportation proposal, tendering/booking, visibility

Architecture



PLUG AND PLAY

The TMS is warehouse agnostic. It does not matter which WMS is being used at the distribution center. The WMS does not care if the shipments are created by the TMS or SAP.

TMS Components

TM	Transportation Manager – Transactional basis for the TMS. Holds Shipments, Planned Loads, Tenders, Execution status
TP	Transportation Planner - the engine that consolidates delivers into shipments using carrier tariffs to make cost based decisions.
TMod	Transportation Modeler is the “What If” tool.
BA	Business Analyzer – the BI portion of the TMS.
TCSS	Temperature controlled sub-system. Uses weather forecast to determine if goods require temp controlled equipment. (Custom for BD)
TV	TransVoyant – Produces PTA estimates and ATA dates independent of the carrier

Lessons Learned

- “Light Go-Lives” were essential to our success.
 - Served as a final round of testing
 - Supported training with real production data
- **Master data is CRITICAL**
 - ERP data about customers and products was obvious
 - Tariff data was not centralized, no formal metadata prior to TMS
- Value Capture has been very difficult to express
 - Coordinated a FTL/LTL rebid with our TMS go-live
 - Reduced/realigned the number of carriers

Supply Chain Visibility

Gartner

50% +

Gartner predicts : BY 2021 - 2022, deployment of end-to-end supply chain

Visibility solutions will increase MORE THAN 50%



Need for Visibility

“Our biggest warehouse
by inventory volume is
the ocean”



Value of better visibility

- Customer satisfaction
 - Late ocean shipments could cause manufacturing shutdowns and customer critical shipment delays.
 - Early knowledge of late ocean shipments can be corrected by palletized air shipments to fill the gap
- Better predictability of ocean transit time and port situational awareness
 - More accuracy in inbound order timing
 - Reduced need for days of inventory

BD's Visibility Plans

Integrated – Blue
Yonder automated feed
of ocean shipments to
the TMS

Beta

Integrated

Actionable

Beta – Manual upload
of ocean data to TV for
tracking.

Actionable – automatic
alerts, better ocean
lane selection, “ports to
avoid” data.

TransVoyant

- Precise precision logistics (P2L)
- Generation of a PTA (precise time of arrival)
- This capability uses the IoT (Internet of Things) to generate extremely accurate forecasted arrival dates.
 - Ship heading, speed, location
 - Actual vs expected route
 - Port conditions and weather



Questions

