TECHX

Asia's Largest

AI & Cloud

Conference 2024

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Chennai Trade Center, Chennai
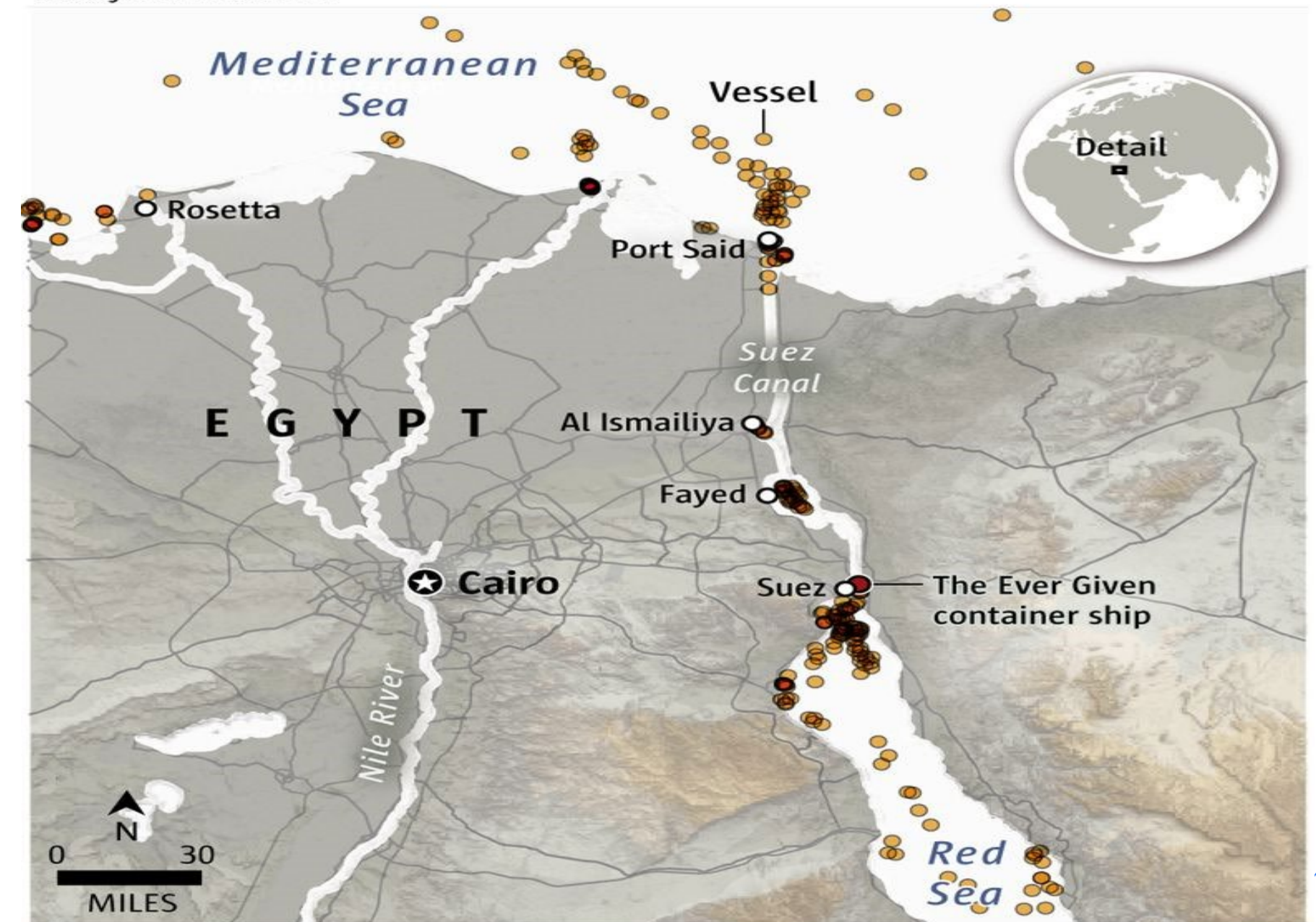
Building the Future

Data Strategies for Modern Supply Chains

Ganesh Kaliappan
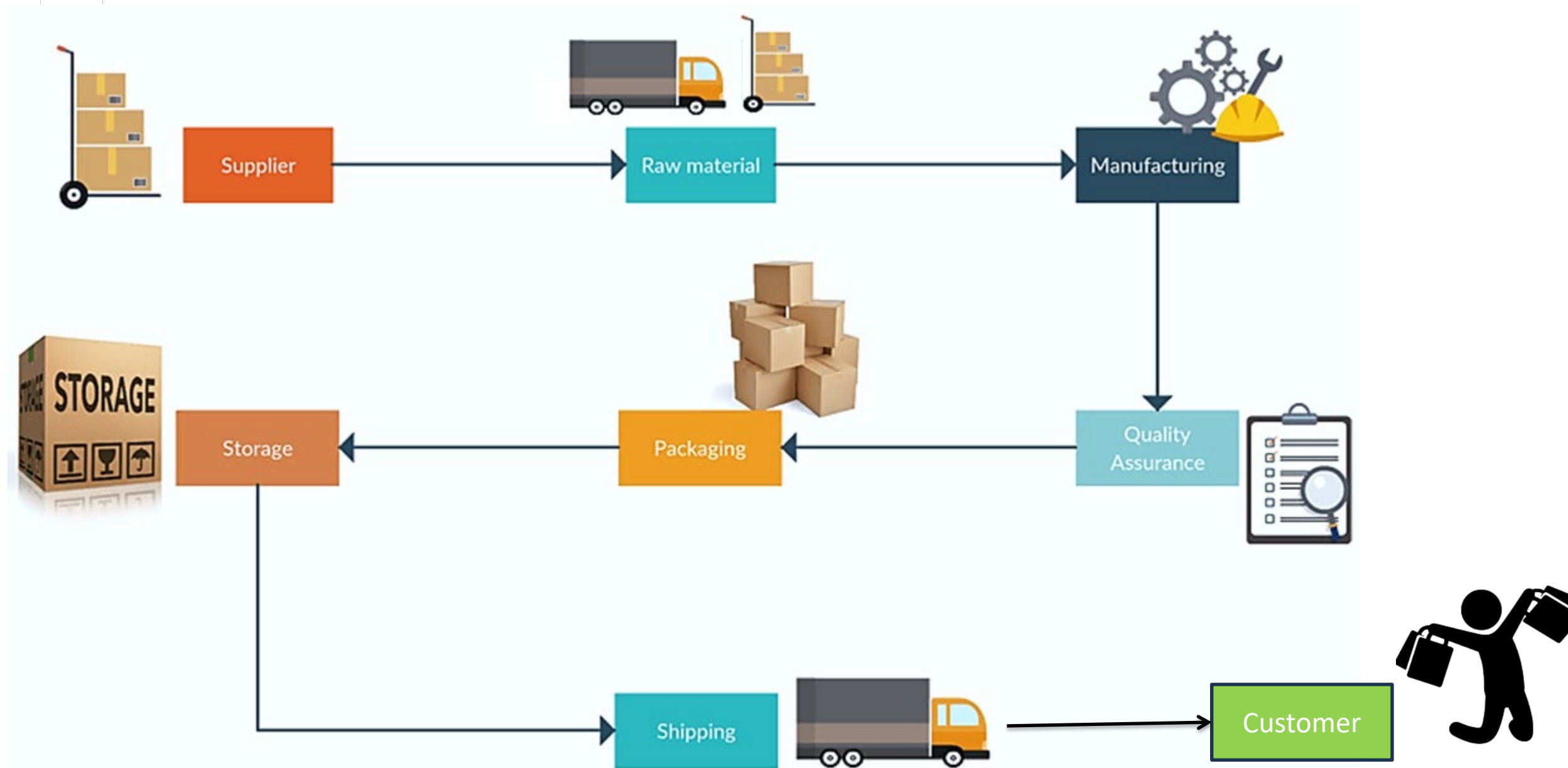
Data Engineering Leader
Advanced Analytics CoE
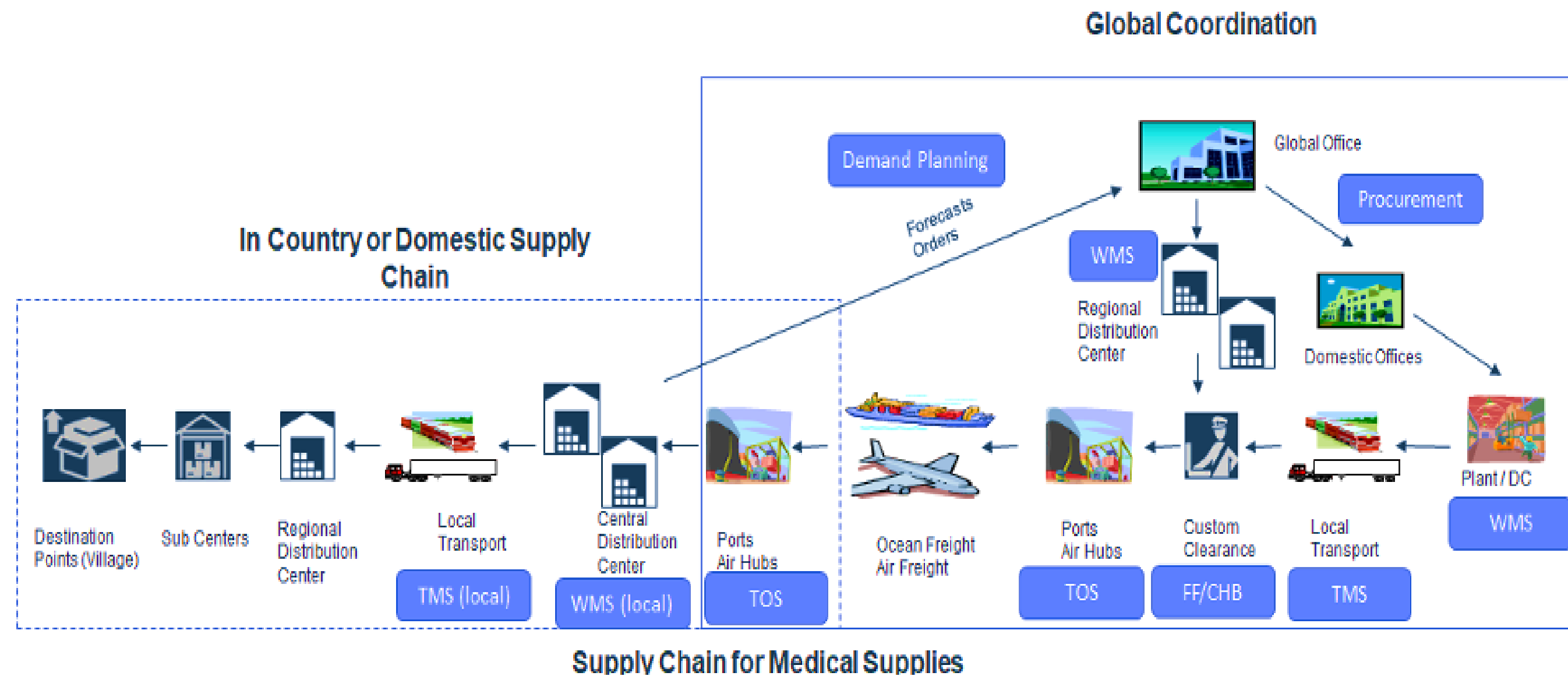Integrated Supply Chain- **Philips**

Supply Chain Management

Supply chain management refers to the coordination of a business's entire production flow, from sourcing raw materials to the delivery of the finished item.

Global Supply Chain

The global supply chain is a complex network that consists of numerous suppliers, manufacturers, distributors, retailers, wholesalers, and customers.

Global Coordination

Demand Planning

Global Office

Procurement

Forecasts Orders

WMS

Regional Distribution Center

Domestic Offices

Plant / DC

WMS

In Country or Domestic Supply Chain

Destination Points (Village)

Sub Centers

Regional Distribution Center

Local Transport

Central Distribution Center

Ports Air Hubs

Ocean Freight Air Freight

Ports Air Hubs

Custom Clearance

Local Transport

TMS (local)

WMS (local)

TOS

TOS

FF/CHB

TMS

Supply Chain for Medical Supplies

Importance of Data in supply chain

The critical role of data

Data is still one of the core challenges facing supply chain management

Each day millions and millions of date records are generated across the supply chain from multiple systems

The proliferation of digital technologies, IoT devices, and advanced tracking systems have compounded the problem.

Accurate data provides the insights needed to anticipate these changes and adjust supply chain strategies accordingly
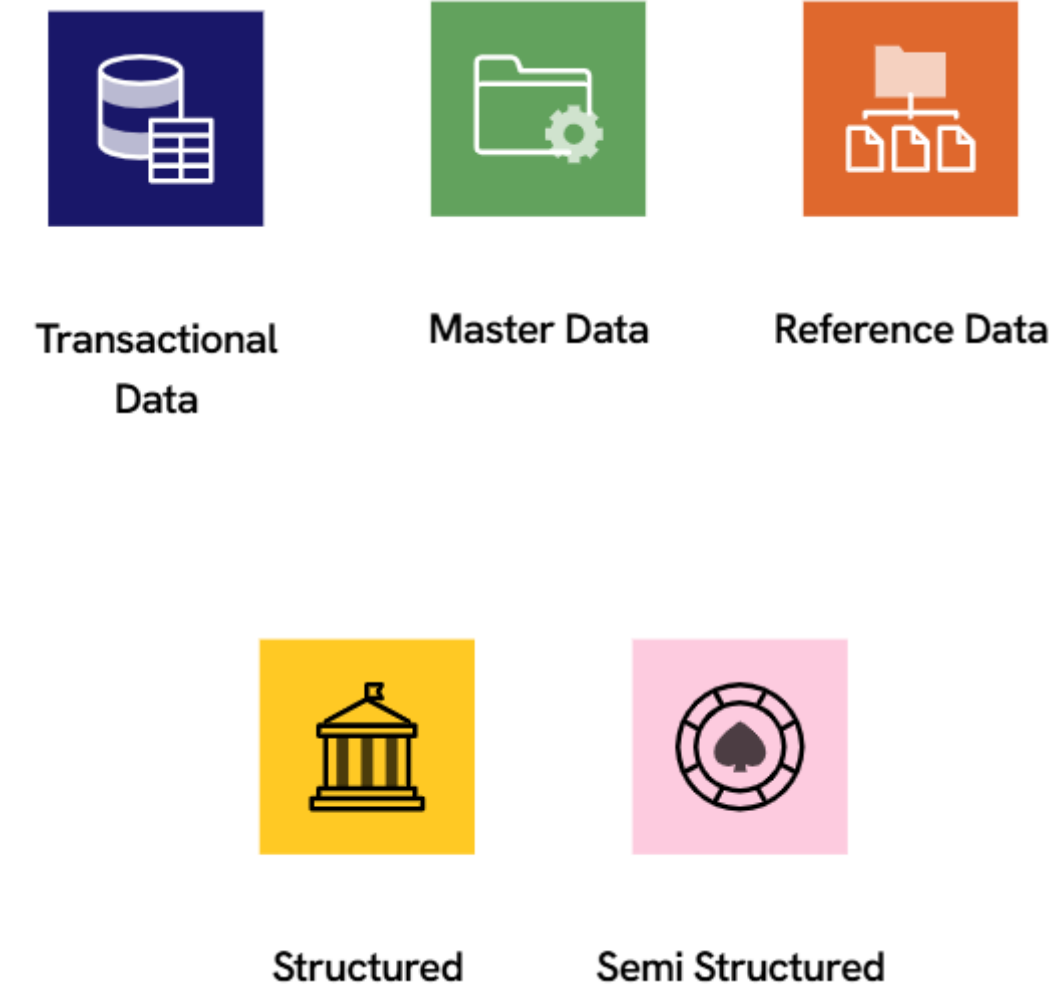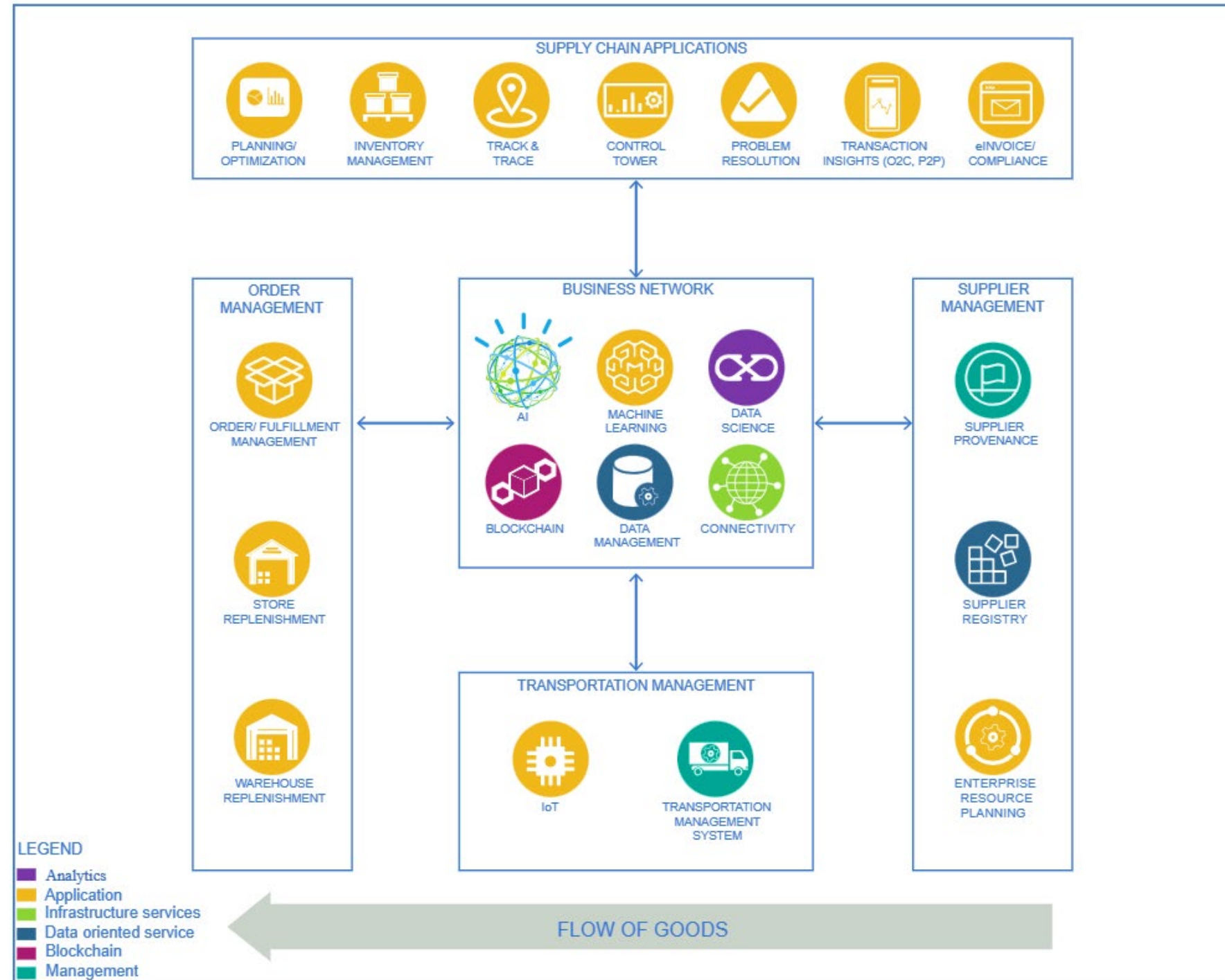
More accurate planning

Better risk management

Bring more visibility of the supply process

Ability to make informed decisions

Supply chain landscape

Challenges in supply chain Data

1

Data Silos

Isolated data storage prevents information sharing across departments, leading to conflicting data and poor visibility. For instance, lacking real-time sales data can cause procurement teams to order incorrect amounts of raw materials.

2

Visibility and Transparency

Achieving end-to-end transparency requires advanced technologies and collaborations to reduce delays and inefficiencies.

3

Data Accuracy and Integration

Managing diverse data sources is challenging. Ensuring data accuracy and seamless integration is vital for informed decision-making.

4

Flawed Forecasting

Traditional forecasting processes resemble a game of telephone, leading to chaotic results from uncoordinated departmental estimates.

5

Data Overload

Excessive data can overwhelm decision-making. Implementing tools to filter and analyze data is necessary to focus on relevant insights.
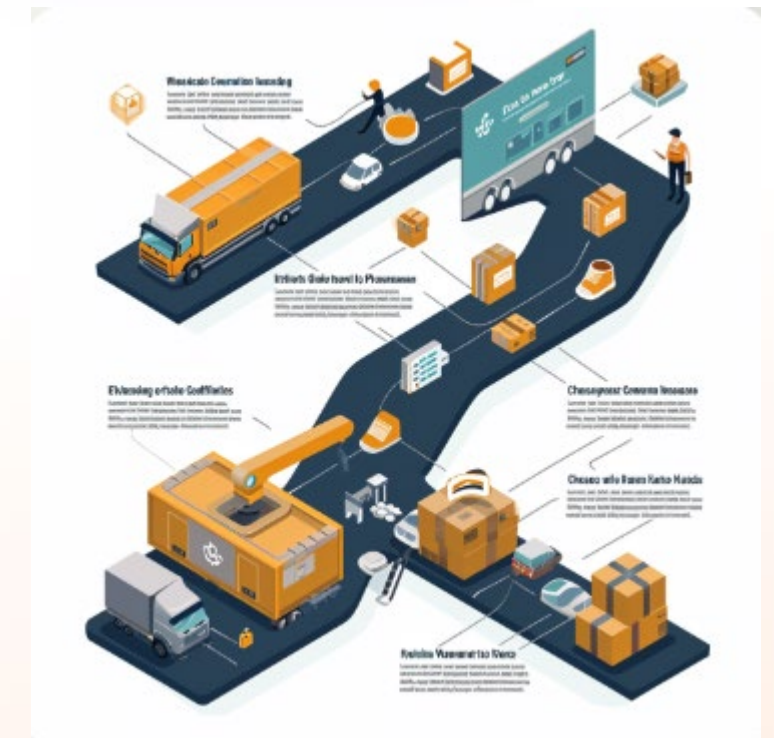
6

Human Error

Manual data entry is prone to mistakes, such as typos or misinterpretation, leading to inaccuracies that can disrupt supply chain operations.

7

Complex Networks

Modern supply chains involve multiple partners and require robust communication and risk management to coordinate effectively.

Modern Supply chain Challenges

1 | **Lack of Vision:** Limited end-to-end visibility and real-time response capabilities.

2 | **Volatility in customer demand**: Rising Customer Expectations: Demand for engaging experiences.

3 | **Omnichannel Engagement**: Difficulty in delivering seamless experiences.
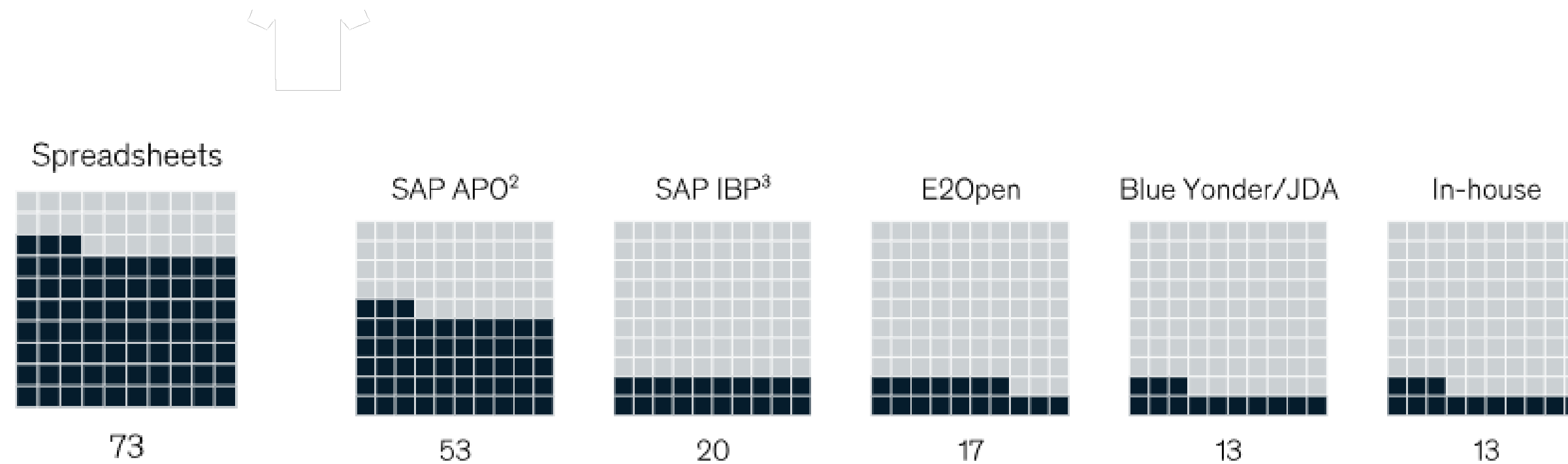
4 | **Global Complexity**: Regulatory compliance and geopolitical issues complicate operations.

Fact Check

Top 6 planning IT systems in use,[1] % of respondents

Spreadsheets	SAP APO[2]	SAP IBP[3]	E2Open	Blue Yonder/JDA	In-house
73	53	20	17	13	13

Spreadsheets remain the top method for supply-chain planning.

Consequences of Poor Data Management

Data Management impacting Supply chain in multiple fronts

Operational Inefficiencies/Cost Increase

Poor data management leads to delays in production and delivery, causing stockouts and increased costs from rework or last-minute shipping.

Dissatisfied Customer

Accurate data is essential for effective decision-making. When data is unreliable, companies react to issues rather than proactively manage them, resulting in financial losses and damaged customer trust.

Missed Opportunities

Ineffective data practices can erode a company's competitive edge, hindering innovation and optimization of supply chains, leading to lost sales and reduced market share.

Regulatory and Compliance Risks

In industries like pharmaceuticals, poor data management can result in non-compliance with regulations, leading to legal issues, fines, and damage to reputation.
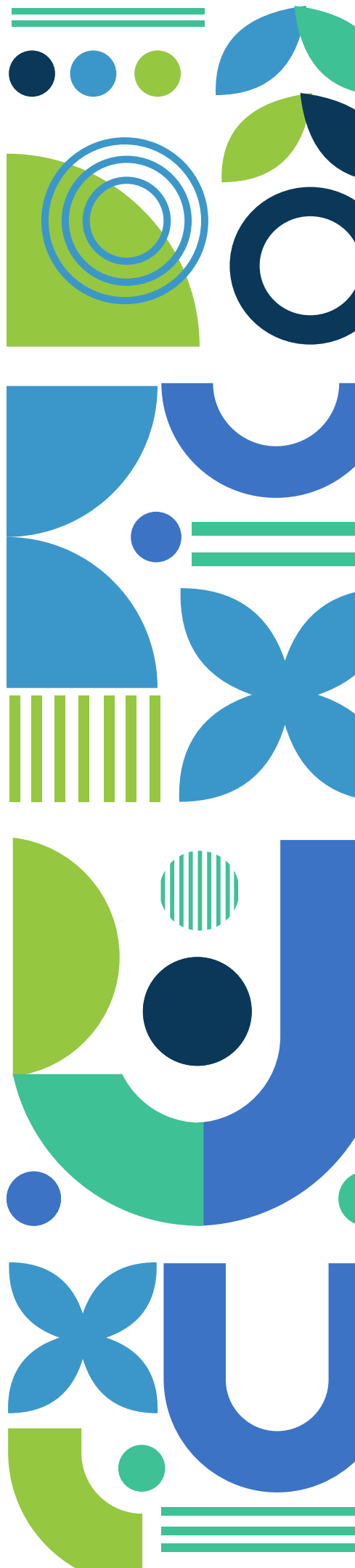
Data Strategies for Modern Supply Chain
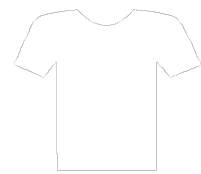
01

Integrate end-to-end supply chain data

Integrate **end-to-end supply chain data** to build a Unified Data Platform to enable analytics solutions

02

Build integrated Business Models

Build scalable business data models/Products to achieve a fully integrated single source of truth for the Master data, Business KPIs and Workflows across organization to drive actionable insights with an end-to-end view.

03

Establish a data governance

Establish a data governance and quality process to ensure that data is secure, accurate, accessible and facilitating effective decision-making across the organization.

04

Empower Business users

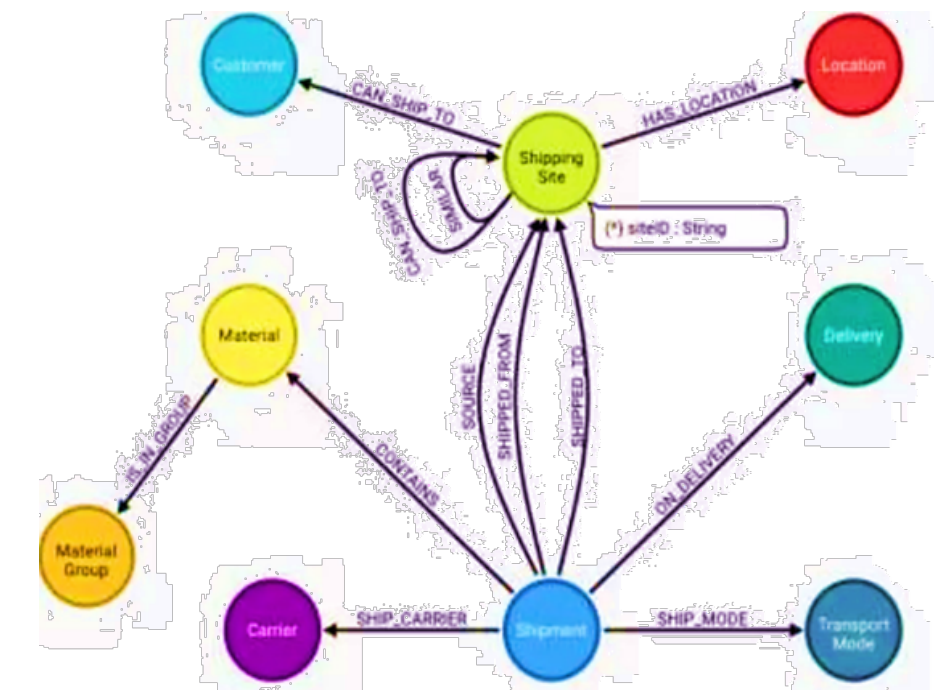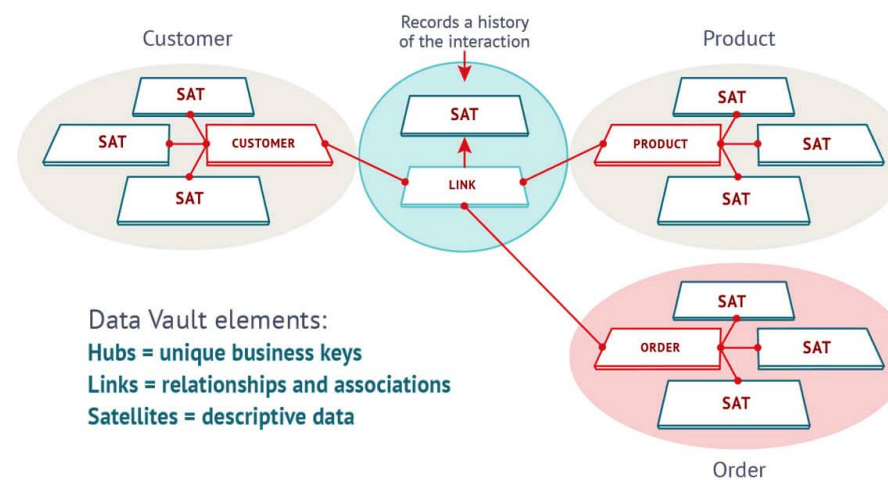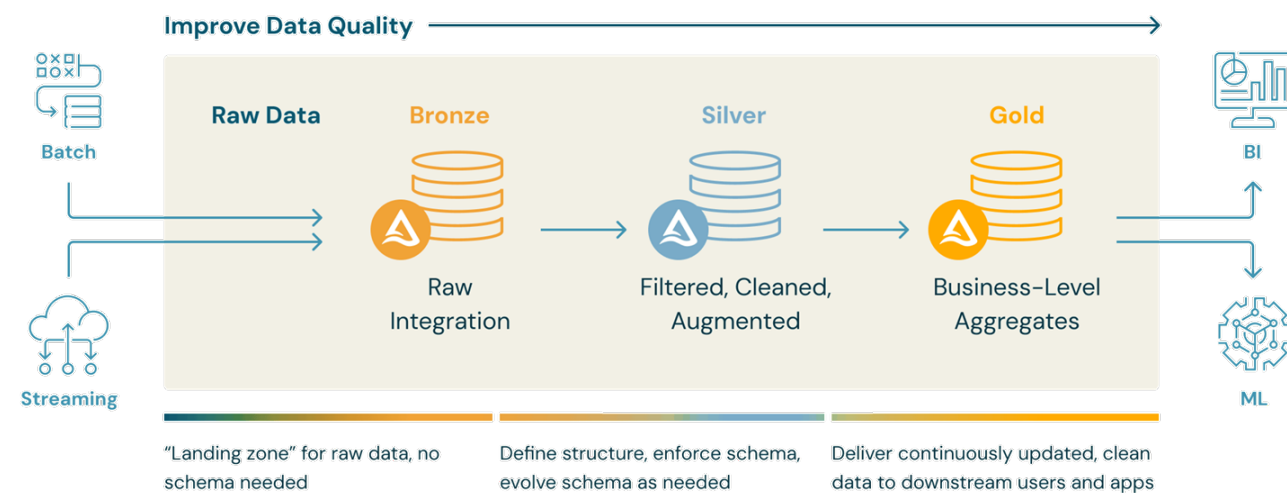Empower business users with data and enhanced insights through self-service capabilities.

Modern Data Architectures -1

Modern Data Architectures

| Medallion architecture | Data Vault 2.0- Modelling Technology | Graph DB |

Medallion architecture:

Improve Data Quality →

Raw Data — Bronze (Raw Integration) — Silver (Filtered, Cleaned, Augmented) — Gold (Business-Level Aggregates)

Batch, Streaming → BI, ML

"Landing zone" for raw data, no schema needed

Define structure, enforce schema, evolve schema as needed

Deliver continuously updated, clean data to downstream users and apps

Data Vault 2.0:

Customer — Records a history of the interaction — Product

SAT, CUSTOMER, SAT, SAT — SAT, LINK — PRODUCT, SAT, SAT

ORDER, SAT, SAT — Order

Data Vault elements:
- **Hubs = unique business keys**
- **Links = relationships and associations**
- **Satellites = descriptive data**

Graph DB:

Customer, Location, Shipping Site, Material, Delivery, Material Group, Carrier, Shipment, Transport Mode

CAN SHIP TO, HAS LOCATION, (*) siteID : String, SOURCE, SHIPPED FROM, SHIPPED TO, ON DELIVERY, IS IN GROUP, CONTAINS, SHIP CARRIER, SHIP MODE
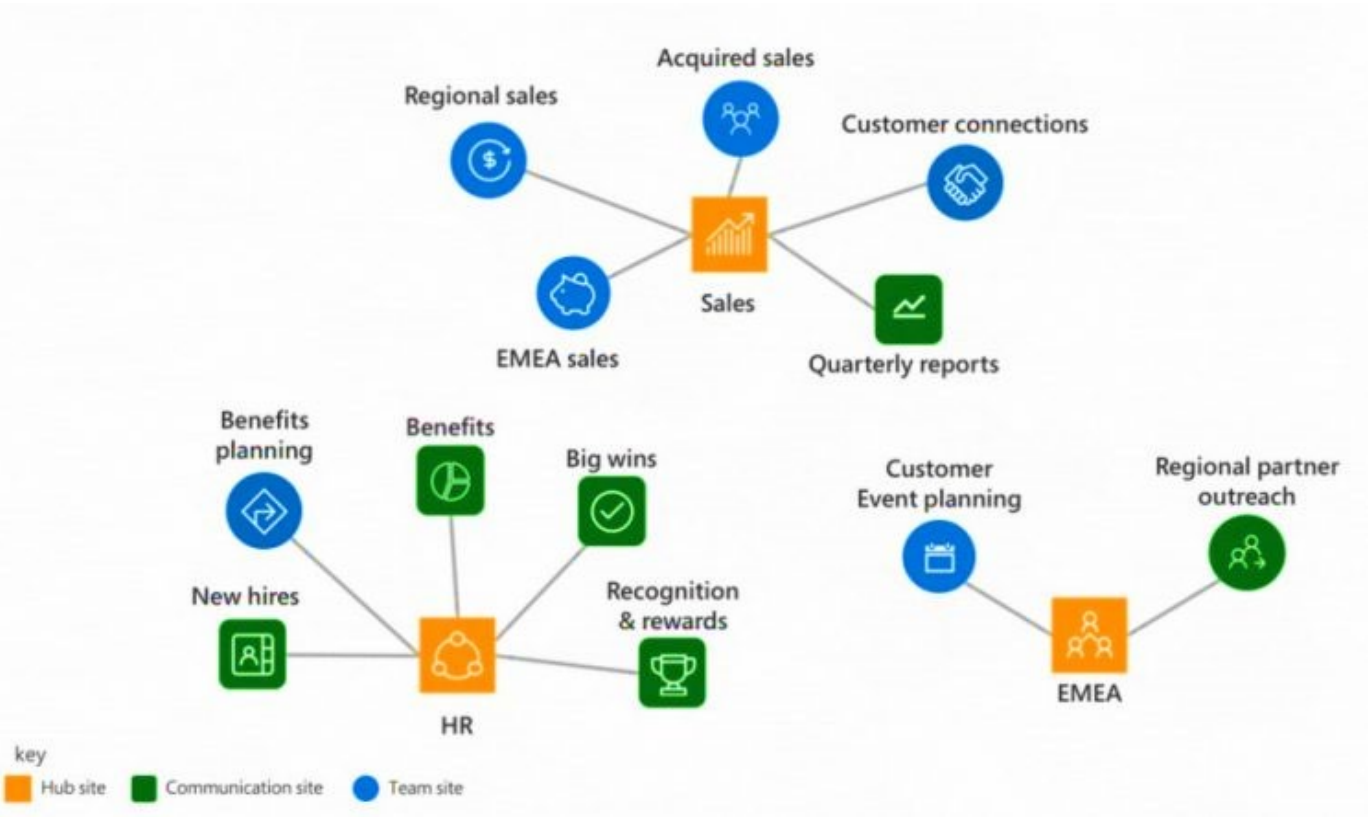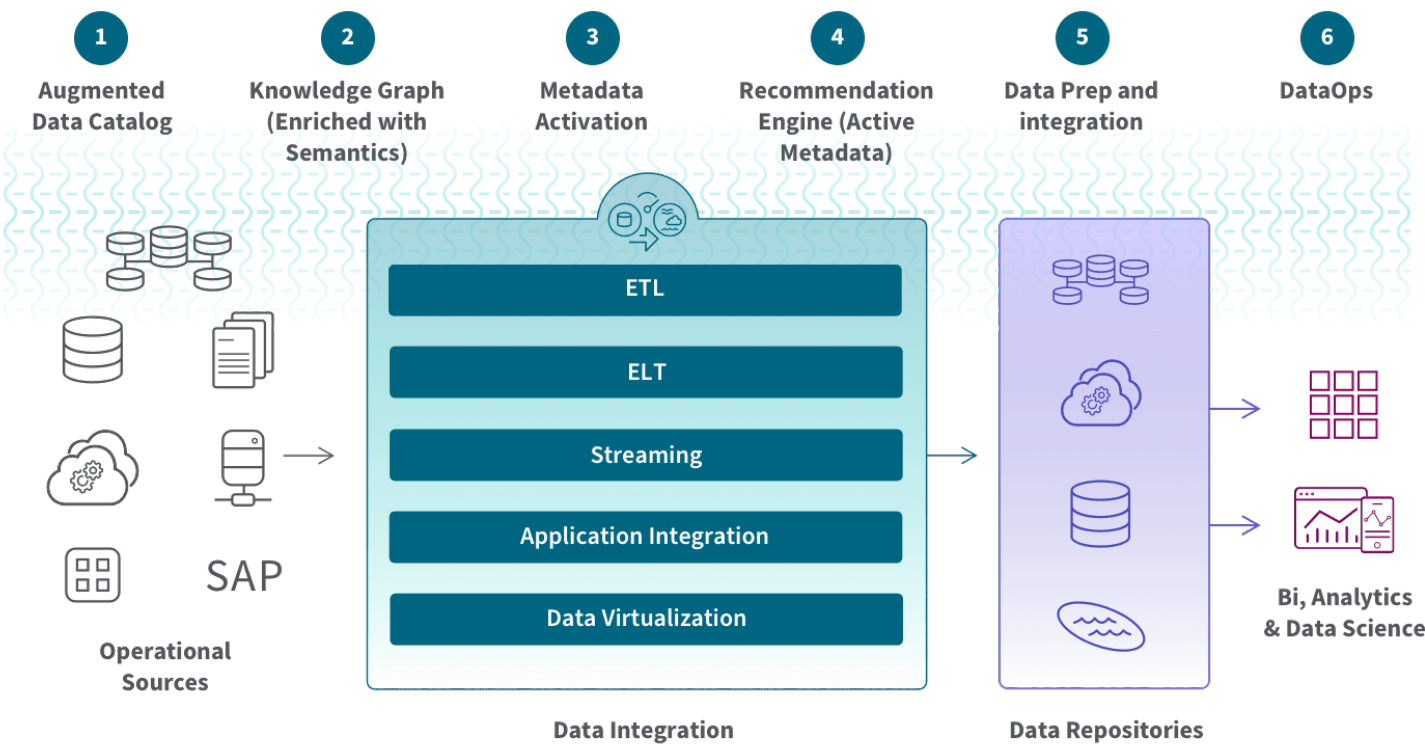
Modern Data Architectures -2

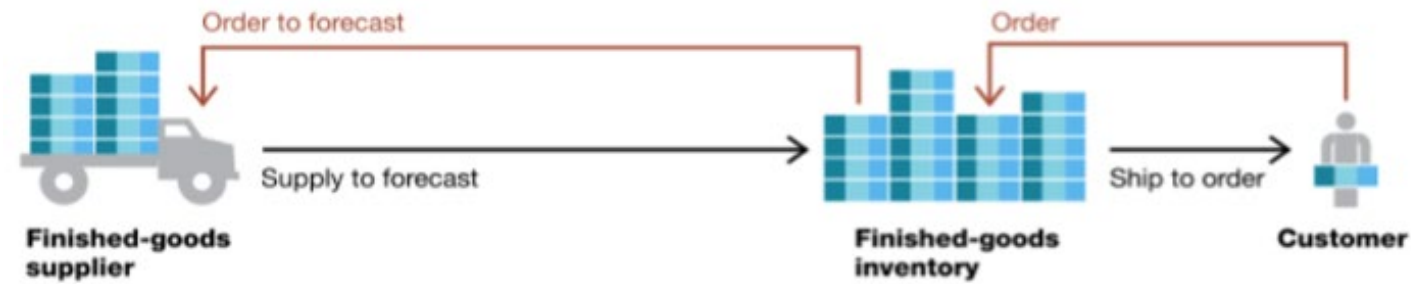Modern Data Architectures

Data Mesh

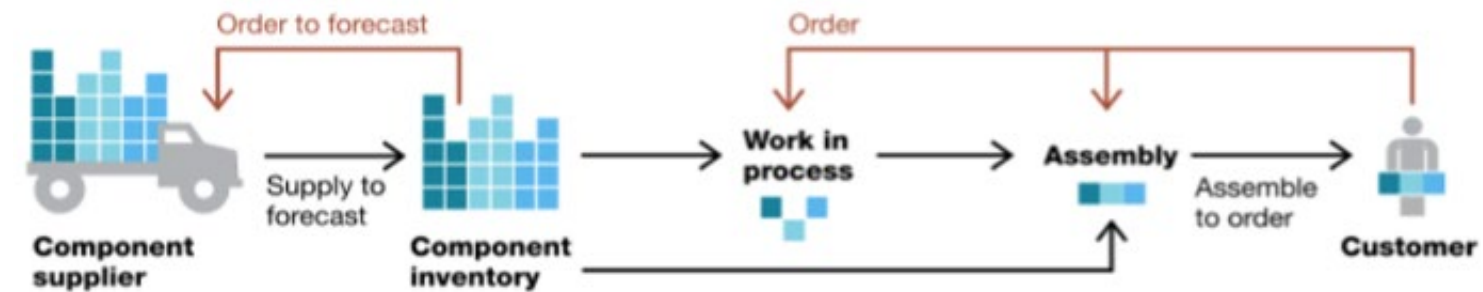## Data Fabric

Case Study : A Leading Computer Manufacturing

Overview:

Transforming Supply Chains for Enhanced Market Position

Key Strategies:

➢ **Segmented Approach:** Tailored solutions for different customer segments.

➢ **Customer-Centric Priorities:** Focused on speed, choice, and cost efficiency.

➢ **Zero/Low Inventory model :** Stocked for very minimum time in the supply chain life cycle

Conclusion:

The company's innovative supply chain strategies and customer-centric approach have established it as a leader in the computer hardware market.

So Data-driven supply chain strategies are essential for success and innovation

Future of Data in Supply Chains

Key Trends Shaping the Future of Supply Chain Management

Integrated AI and Analytics

Internet of Things (IoT)

Supply chain control tower

Digital twin of supply chain
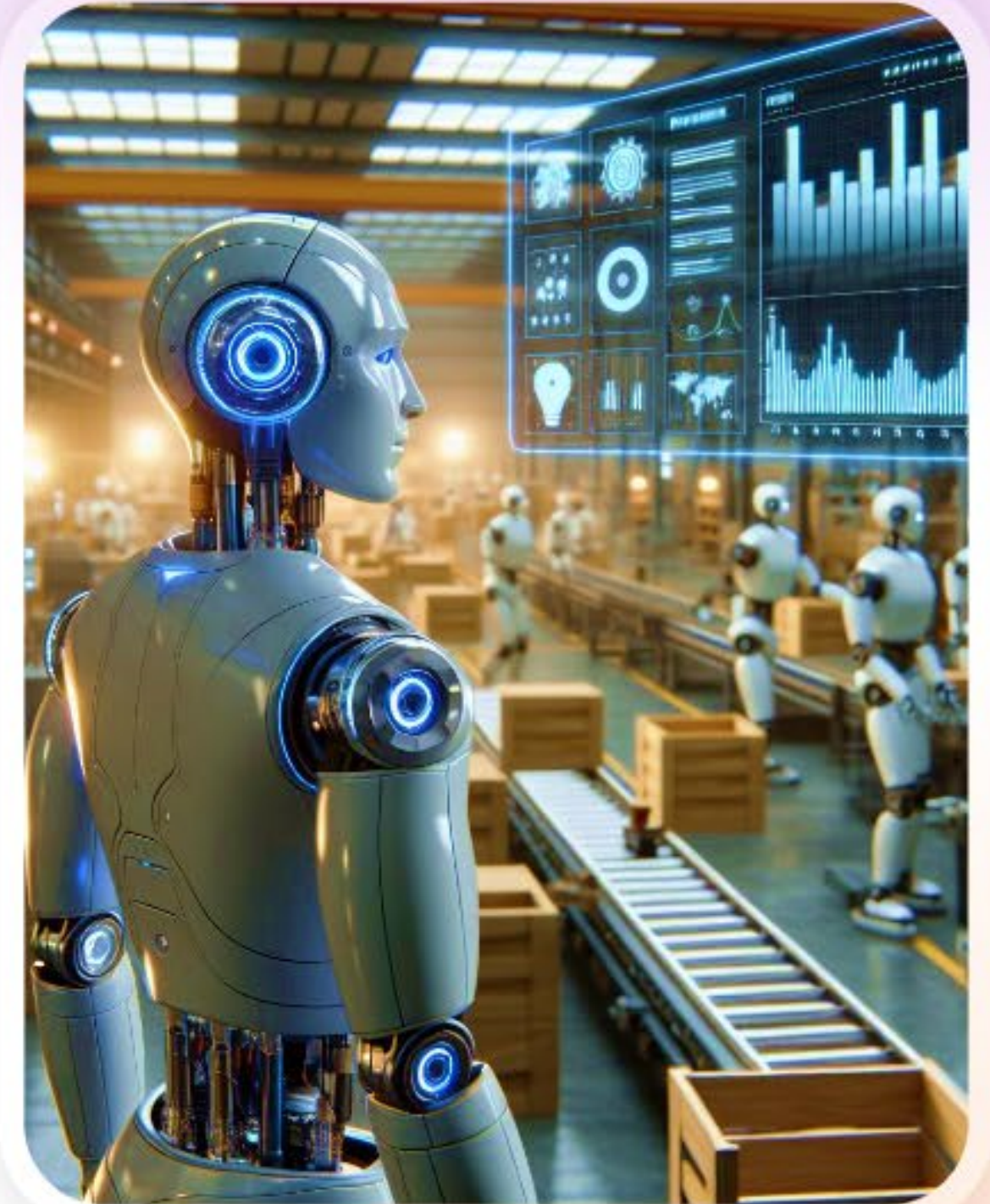
Gen AI in supply chain

Hyper Automation

Immersive Experiences (VR)

Edge Ecosystems

Blockchain Technology

Benefits of Data Driven Culture in Supply chain

- Overall Cost savings
- Customer trust
- Optimize supply chain
- Reduce Risk
- Efficient Inventory management
- Innovate supply chain
- Enables staying ahead of competition

Conclusion

In a world where data is abundant, the ability to make data-driven decisions distinguishes leading organizations from the rest.

Don't let imperfect data be the enemy of good digitization

By fostering a data-driven culture by adopting the needful data strategy and investing in the right tools and technologies, your organization can unlock its full potential and achieve sustained success in the digital age.

The Future belongs to companies that are data-powered, where data doesn't only guide decisions, it **drives** them

THANK YOU!

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