The Future of Supply Chain Management

Business and Industry Fall Conference

September 12, 2022

ncaCPA®

ECU COLLEGE OF BUSINESS

Unilever Knew How to Buy Software

In the early 2000s, I and others were pitching Unilever NA on some supply chain software. It involved supply chain visibility and QA/recall management across the supply chain network. Quite cool.

We had some of the basic building blocks, but by no means a full blown solution, or – more importantly - the full operational knowledge we needed to build the solution out. We spent the better part of an afternoon discussing and white boarding key requirements for this new system with a 3-4 person team from Unilever.

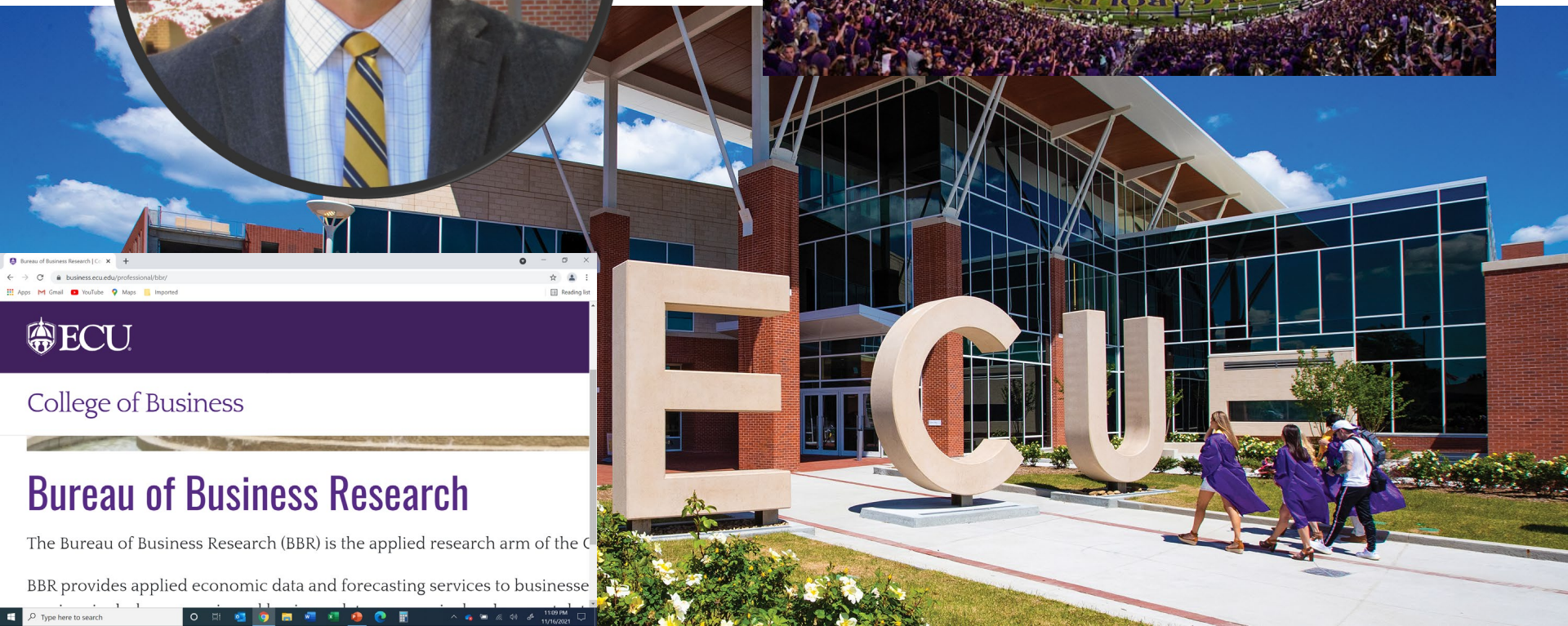
That team was led by a wonderfully funny and smart middle manager who had been at the company for at least 20 years. As we wrapped up the day, soon to leave for a group dinner at Carlucci's Italian restaurant in western Chicago, that manager said something like: "Ok, I think we have a basic framework here, but the big remaining issue is going to be about price."

Yes, we said excitedly, that will be a key, but we certainly will work with you to keep it reasonable, or whatever mumbo jumbo supply chain software vendors say in such a situation. Internally, our team is all thinking "Here comes a really big sale." The "buying signals" were obvious, as they say.

"Just to be clear," the Unilever manager said, "The question is this: Just **how much are you going to pay us** to teach you how to build this solution so you can eventually sell it to others?"

We all laughed - but got the message. We eventually secured a pretty good sale, but the point had been effectively made – and Unilever paid a lot less than it might have.

Jon Kirchoff Ph.D.
Associate Professor of Supply Chain Management
Research Associate – Bureau of Business Research



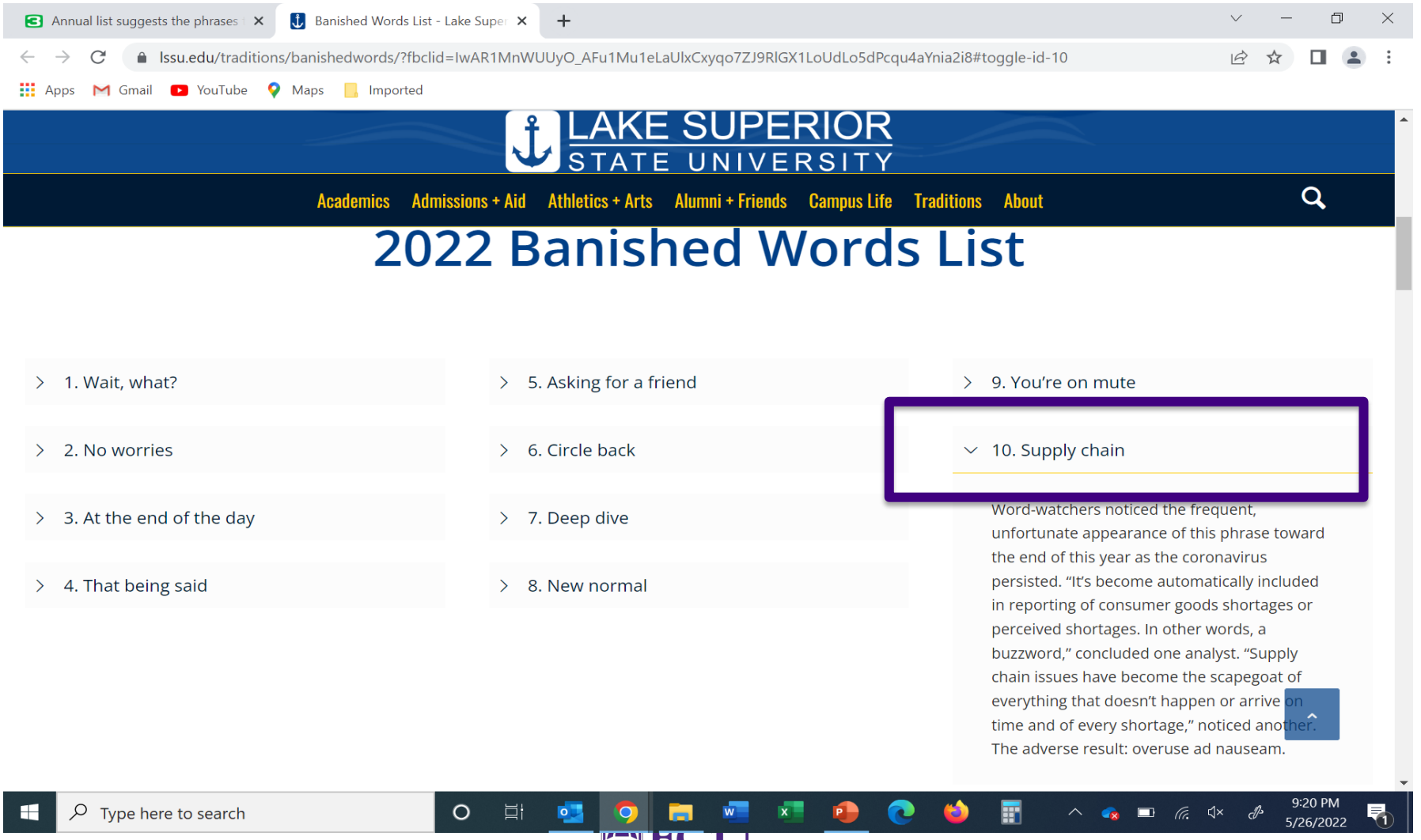
Jon Kirchoff Ph.D.
Associate Professor of Supply Chain Management
Research Associate – Bureau of Business Research

ECHOSTAR

THE HASLAM COLLEGE OF BUSINESS
THE UNIVERSITY OF TENNESSEE, KNOXVILLE

ECU COLLEGE OF BUSINESS

"SUPPLY CHAIN"



Non-Scientific Survey Question #1

How has your company been impacted by supply chain issues over the last two years?

(choose all that apply)

1. Delayed shipments.
2. Quality issues.
3. Customer service issues.
4. Inability to get product.
5. Other
6. Little to no impact.

ECU COLLEGE OF BUSINESS

The Supply Chain

Reverse Logistics

2nd tier Supplier

2nd tier Supplier

1st tier Supplier

Internal Supply Chain

Retailer/ Distributor

Consumer

Consumer

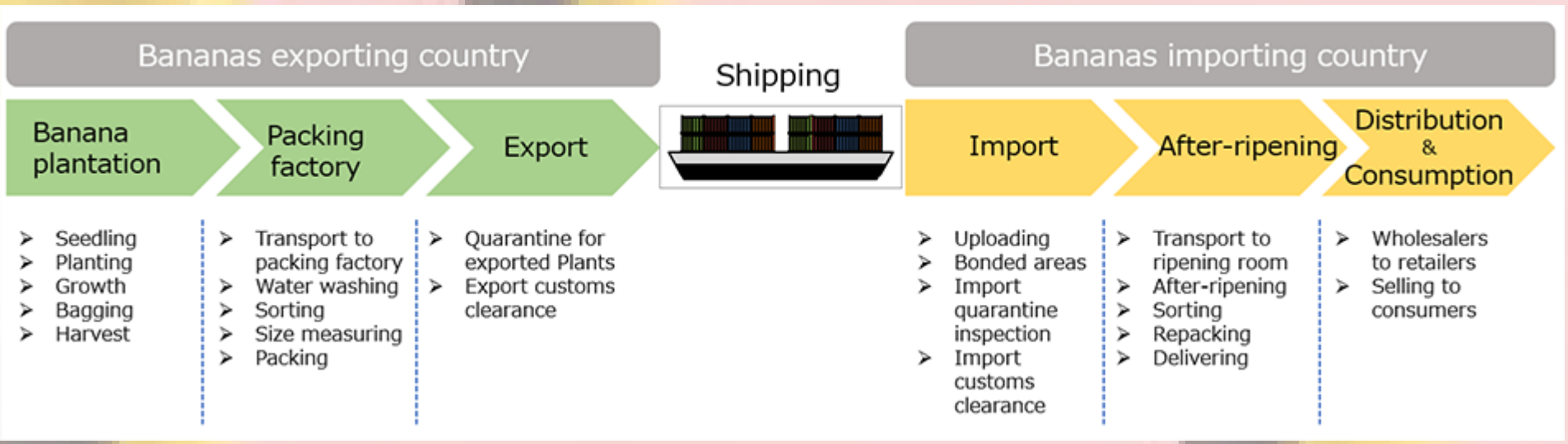
Raw Materials / Purchasing and Supplier Management

Finished Goods / Customer Service

Transformation / Production and Operations

ECU COLLEGE OF BUSINESS

Supply Chain Example: Bananas!



SUPPLY CHAIN MANAGEMENT

SUPPLY CHAIN MANAGEMENT (SCM) is the *active* management of all activities and relationships covering everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities.

The goals of SCM are the *conscious* effort of firms to:

- maximize customer value and achieve a **sustainable competitive advantage**.
- manage the supply chain in the most ***efficient*** **and** ***effective*** ways possible, balancing the two.

Supply Chain Management and Efficiency / Effectiveness

SUPPLY CHAIN MANAGEMENT (SCM) is the active management of activities and relationships covering everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities.

or efficiency

doing more with less, i.e., cost reduction

– Cost Efficiency

The goals of SCM are the conscious effort of firms to:

or effectiveness

- maximize customer value and **achieve a sustainable competitive advantage**.

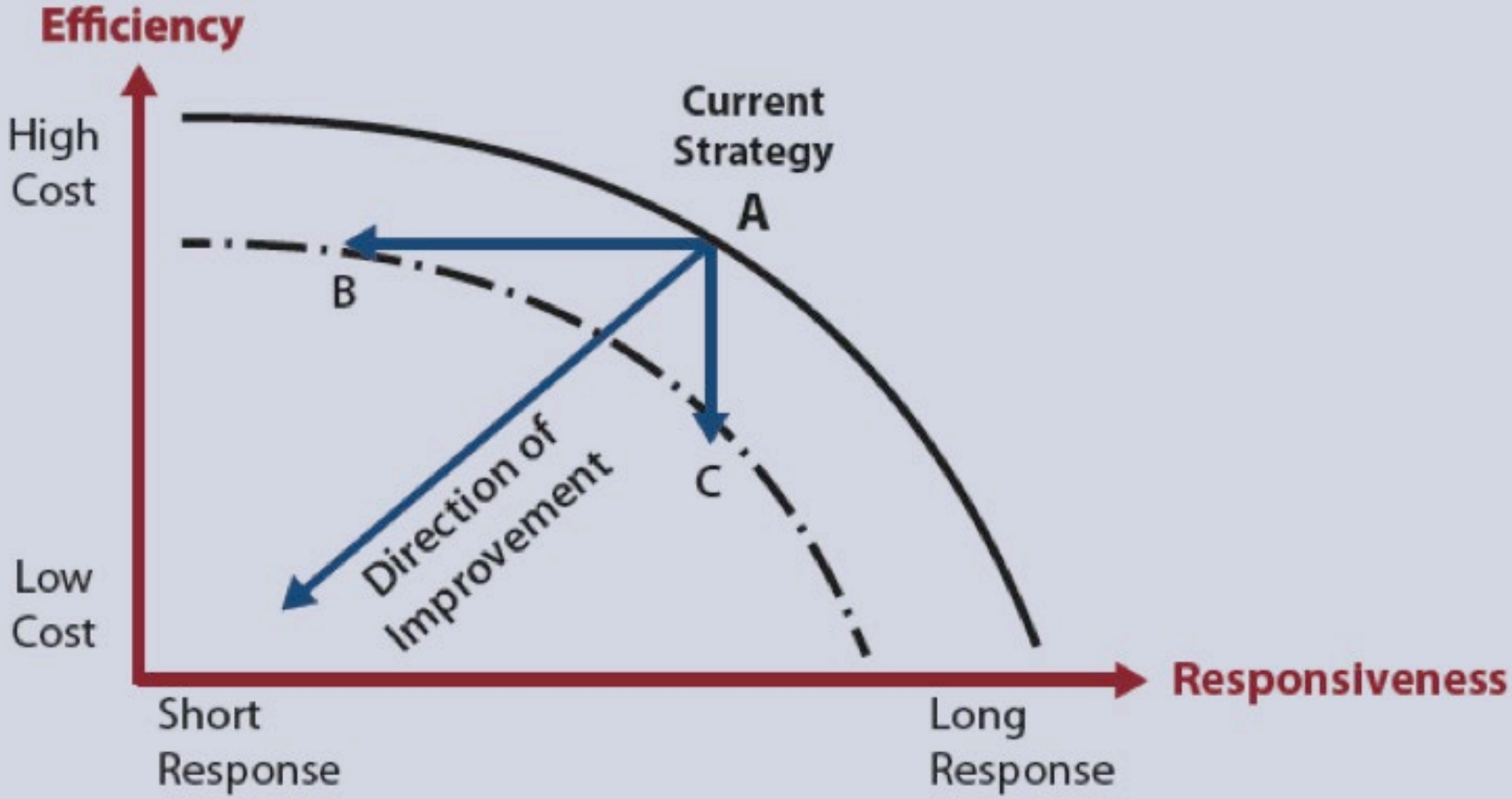
achieving goals, i.e., customer service – Customer Effectiveness

- manage the supply chain in the most ***efficient*** and ***effective*** ways possible, balancing the two.

The Efficiency / Effectiveness Tradeoff

Efficiency (cost)		*Effectiveness (service)*
Manufacturing Limitations	⟷	Flexibility
Transportation Speed	⟷	Responsive delivery
Inventory	⟷	Product availability
Global*	⟷	Domestic*

Trade-Offs: Responsiveness vs. Efficiency



The "Broken" Supply Chain?

"COVID-19 didn't break the supply chain, it simply accelerated changes already underway"

Yossi Sheffi – MIT Professor

Non-Scientific Survey Question #2

Are you concerned that supply chains will continue to be a problem for the foreseeable future?

1. Yes!
2. No, they will recover in the next year or two.
3. No, they have already recovered.
4. Not sure / let me think about it….

The Future of SCM

Five primary areas of supply chain management change and acceleration:

- Industry 4.0
- Global Scanner and Changing Global Strategies
- Risk Management
- Human Resource Management
- Supply Chain Mapping
- Customer Service and Relationship Management

The Future of SCM: Industry 4.0

"Humans have a waste problem. Of the $94 trillion global GDP, an estimated $25 trillion is operational waste endemic to supply chains. Much of this waste occurs before an end customer has a chance to see or purchase it." – Seth Page, ThroughPut Software COO

The Future of SCM: Industry 4.0

- Smart manufacturing or smart factories and the digital supply chain.
- The “cost of missing out”
- Advantages of smart manufacturing:
  - Speed
  - Integration across the supply chain
  - The four pillars: connectivity, collaboration, business intelligence, and security
  - Smart communication enables digitalization of the supply chain

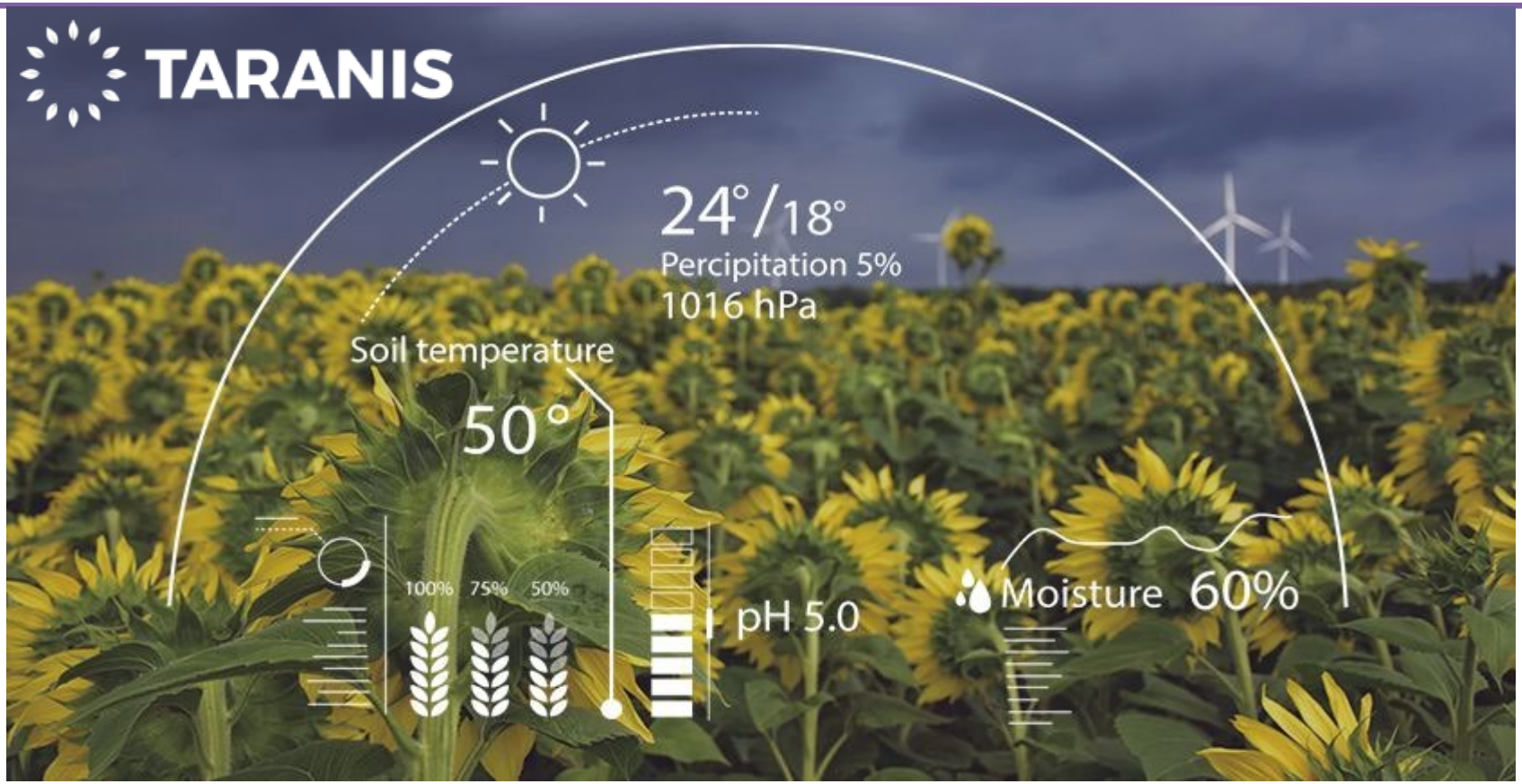
The Future of SCM: Industry 4.0

- Smart is a reference to network connectivity on embedded devices to analyze, model, and predict trends based on data.
- Smart SCM is the ongoing transformation of technologies, tools, and techniques that can lower energy consumption, improve productivity, safety, and processes, reduce in downtime, and make the supply chain more **efficient and effective.**

The Future of SCM: Industry 4.0

"(Internet of Things) enables predictive maintenance…..and can detect when a part is developing a fault"

The Future of SCM: Industry 4.0



"AI is helping the food industry increase transparency and visibility all along the supply chain"

HOW BLOCKCHAIN COULD MEND OUR FRACTURED GLOBAL FOOD SUPPLY

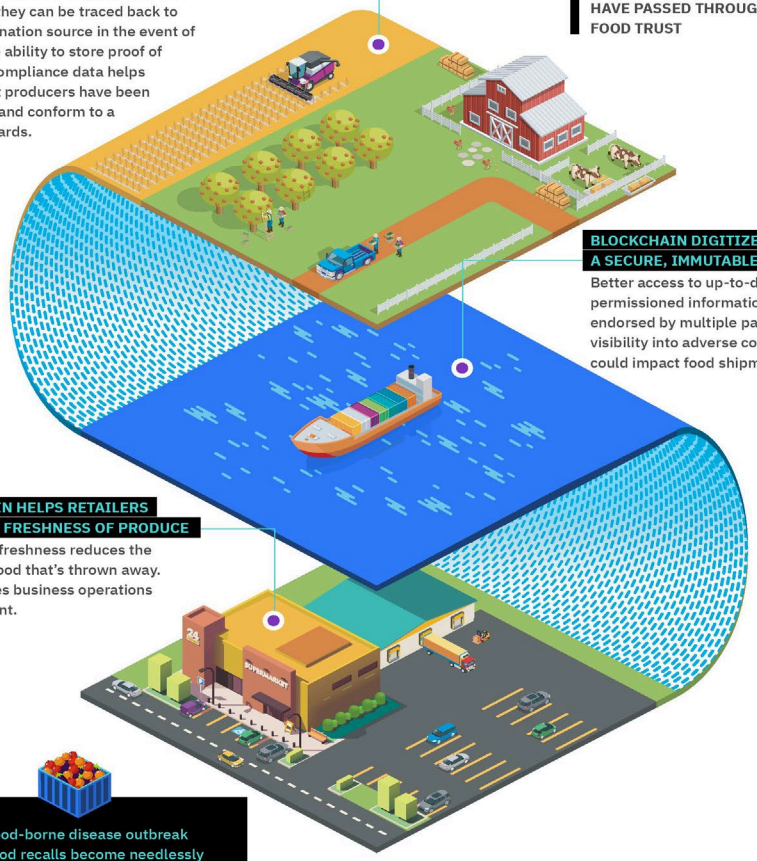
Ever open up a pack of blueberries only to discover that mold has already set in? Better food safety and freshness is just one benefit that can come from applying blockchain technology to the global food industry. By creating a decentralized ledger that records transactions in a global network, IBM Food Trust can be used to help participants find new ways to reduce food fraud, costly batch recalls and provide greater governance over the food ecosystem that suffers from a lack of transparency.

BLOCKCHAIN ENABLES FARMERS TO DOCUMENT THE SOURCE OF THEIR PRODUCE

This helps ensure the origin and source of foods so they can be traced back to the contamination source in the event of a recall. The ability to store proof of origin and compliance data helps confirm that producers have been fully vetted and conform to a set of standards.

MILLIONS

OF PRODUCTS SOLD TO DATE HAVE PASSED THROUGH IBM FOOD TRUST



BLOCKCHAIN DIGITIZES DATA ON A SECURE, IMMUTABLE LEDGER

Better access to up-to-date permissioned information that's endorsed by multiple parties increases visibility into adverse conditions that could impact food shipments in transit.

BLOCKCHAIN HELPS RETAILERS GAUGE THE FRESHNESS OF PRODUCE

Maximizing freshness reduces the amount of food that's thrown away. It also makes business operations more efficient.

When a food-borne disease outbreak occurs, food recalls become needlessly expansive because the source of contamination can't be immediately identified. Better tracking at this stage can help pinpoint the source of contamination, limit the number of consumers affected, and reduce global food waste.

RECALLS COST FOOD COMPANIES AN AVERAGE OF $10M, NOT INCLUDING BRAND DAMAGE AND LOST SALES.

BLOCKCHAIN CAN REDUCE THE TIME NEEDED TO TRACE THE SOURCE OF FOOD FROM 7 DAYS TO 2.2 SECONDS.

For more information, please visit ibm.com/food.

IBM

The Future of SCM: Industry 4.0 and the Digitally Dominant Paradigm*

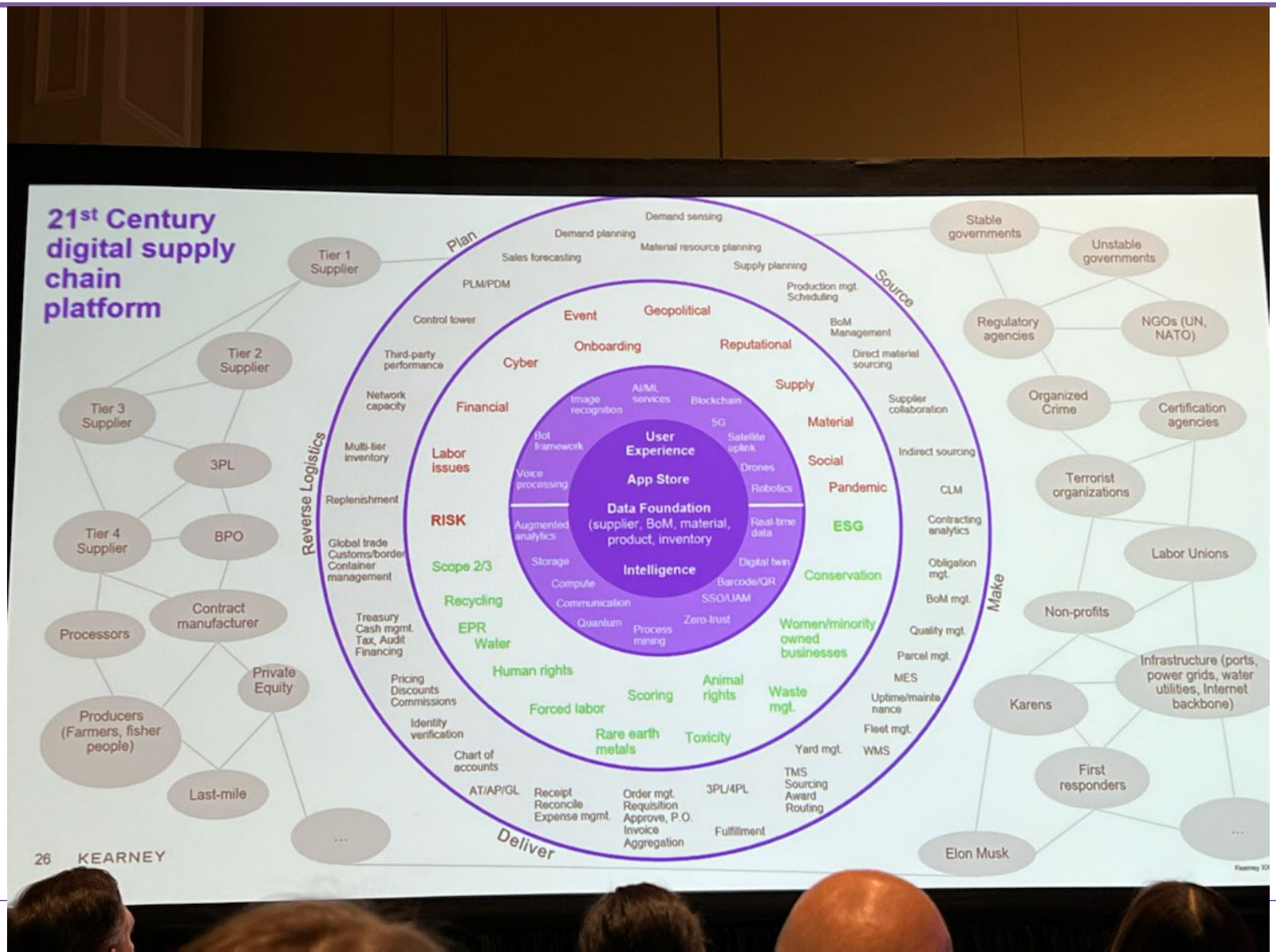
Time-based strategy in the digital world:
Seeing (acquiring), thinking (analyzing), and acting (operations)

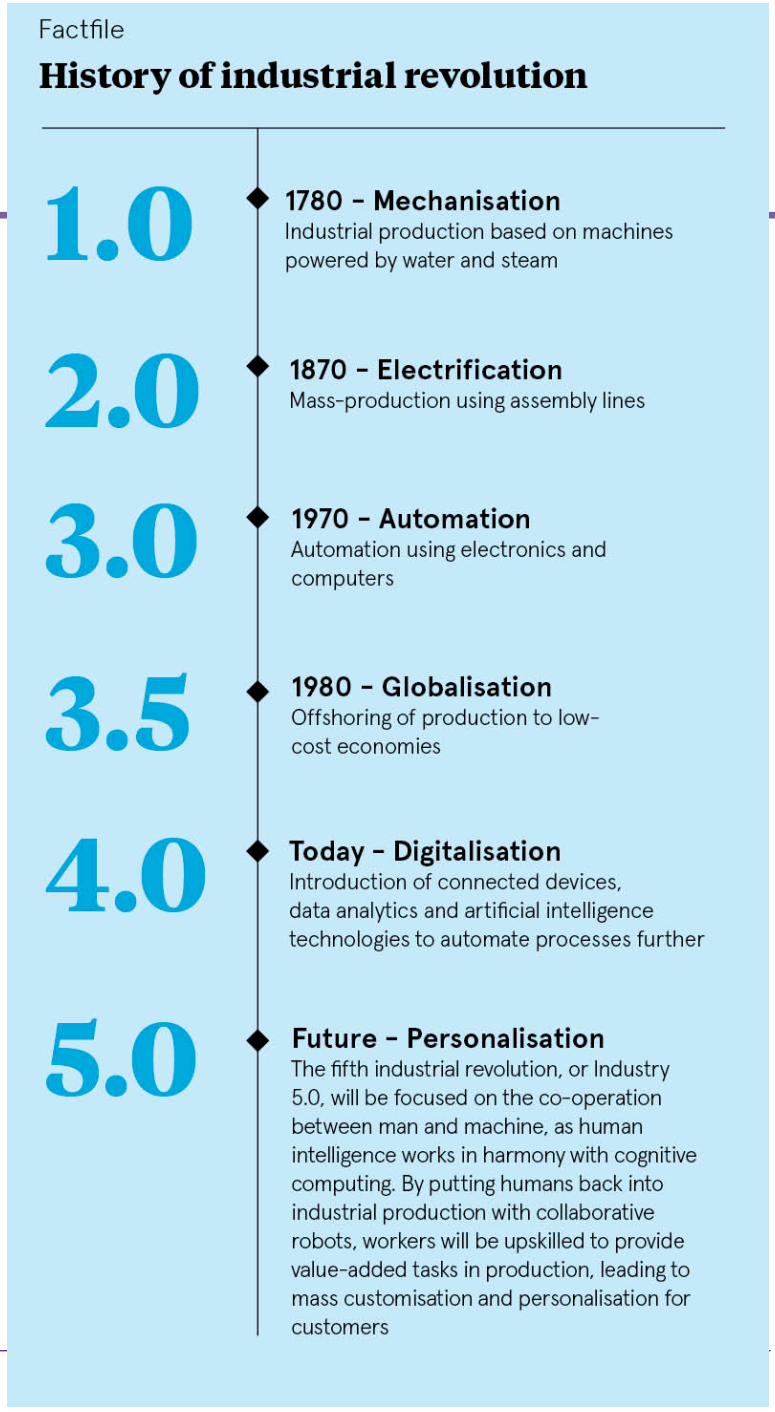
Manufacturing Limitations	⟷	Flexibility
Transportation Speed	⟷	Responsive delivery
Inventory	⟷	Product availability
Global	⟷	Domestic

*Stank, Esper, Goldsby, Zinn, Autry (2019)

ECU COLLEGE OF BUSINESS

The Future of SCM: Toward a Digital Platform





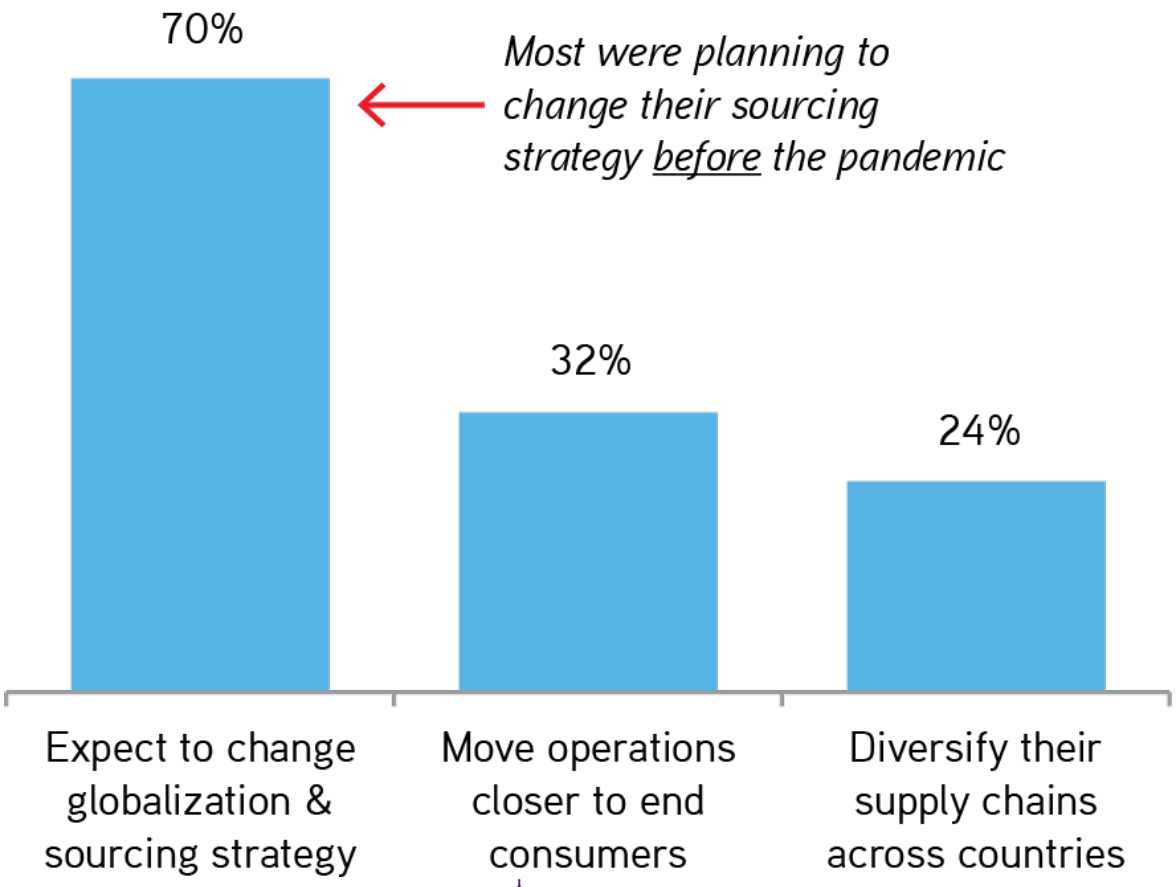
The Future of SCM: Industry 5.0

https://www.youtube.com/watch?v=rZSRHG_-h0o

ECU COLLEGE OF BUSINESS

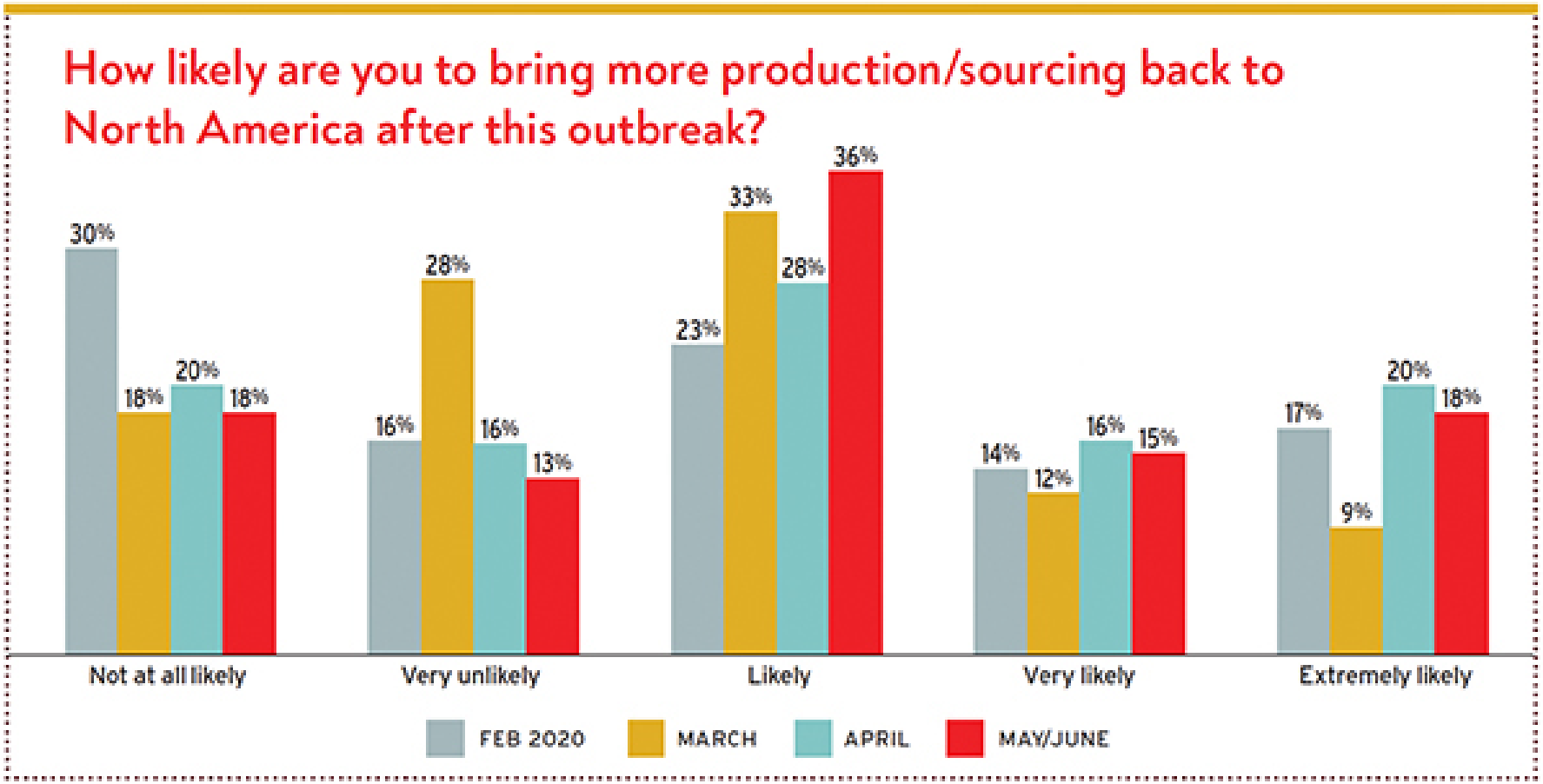
The Future of SCM: Changing Global Strategies

Global Executive Survey: December 2019, n=610



ECU COLLEGE OF BUSINESS

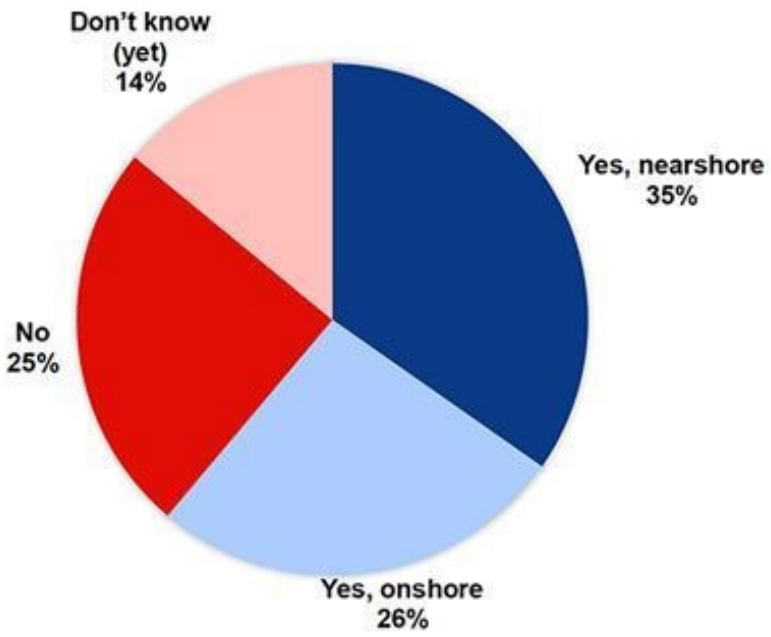
The Future of SCM: Changing Global Strategies



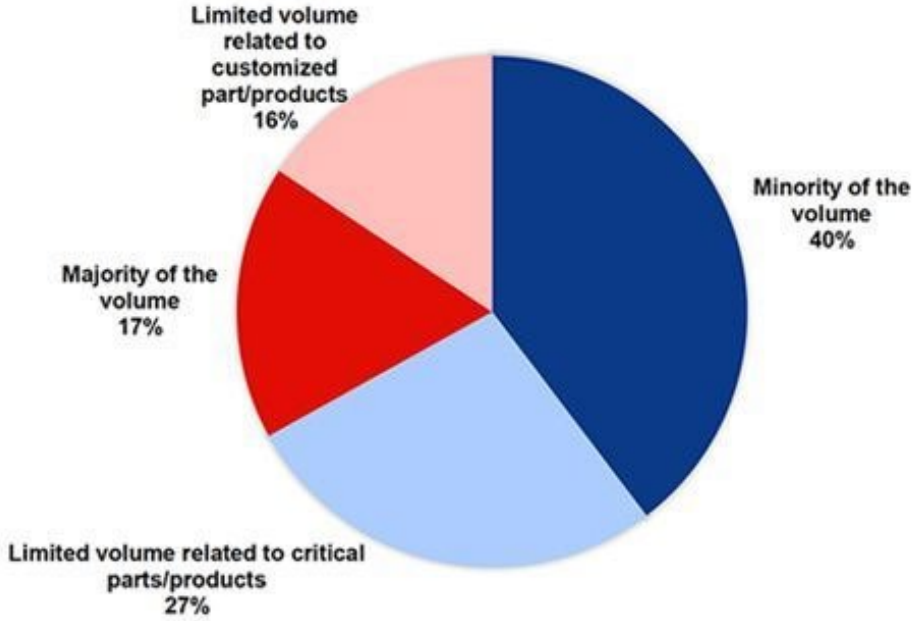
Source: Inbound Logistics March 2021

The Future of SCM: Changing Global Strategies

Over 60% is considering to onshore or re-shore in the next 3 years



However, onshoring/re-shoring for 'only' a part of the business



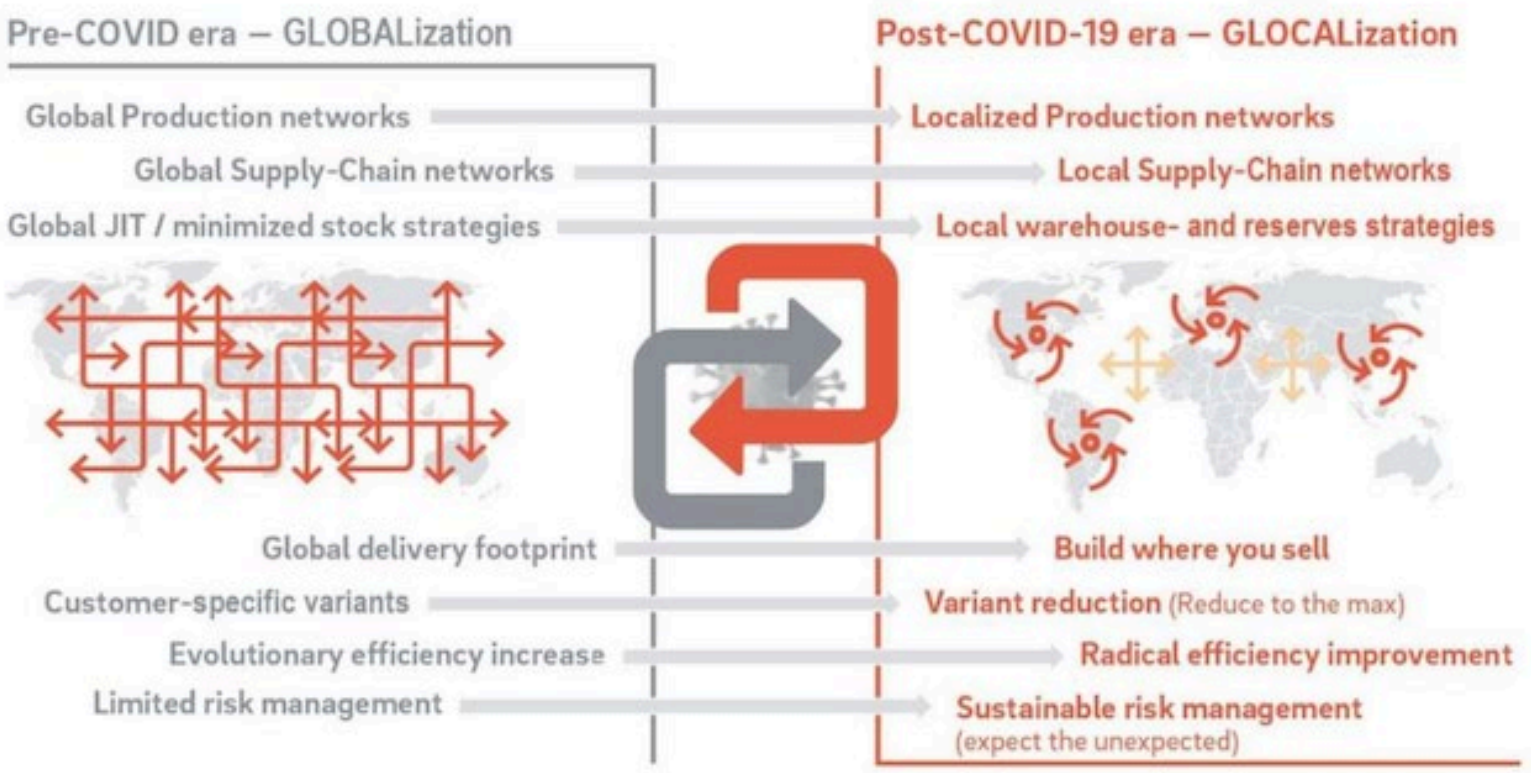
Source: Consultancy.eu March 2022

The Future of SCM: “Global Scanner”

Salomon has built a new shoe factory in France. Now it must also build a footwear supply chain in a country without one.

https://www.youtube.com/watch?v=RfXDY4HE0gY

Change in supply chain by post-Covid19

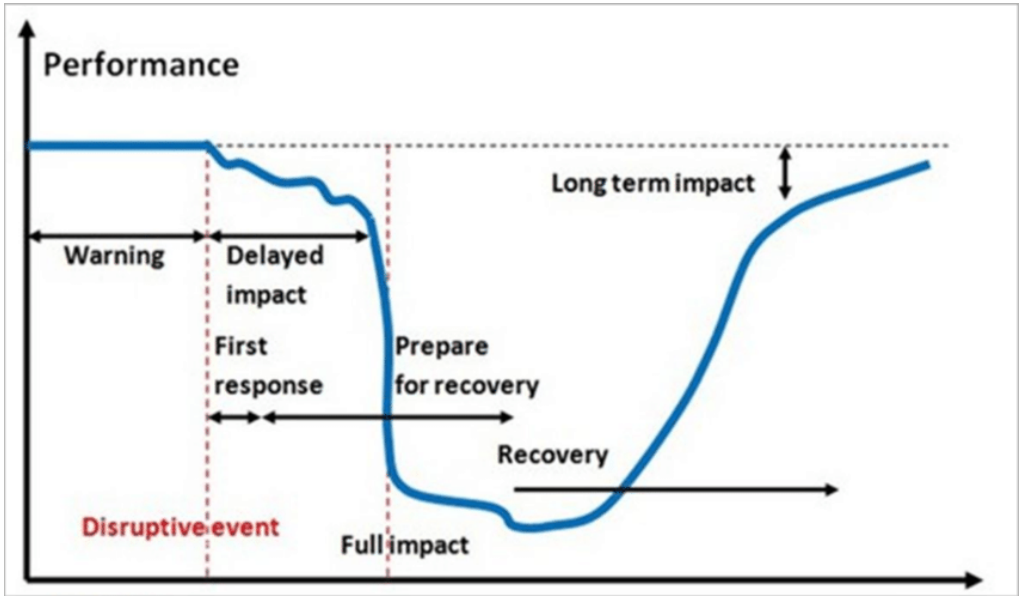


"Global Scanner"

Supply Chain Resiliency

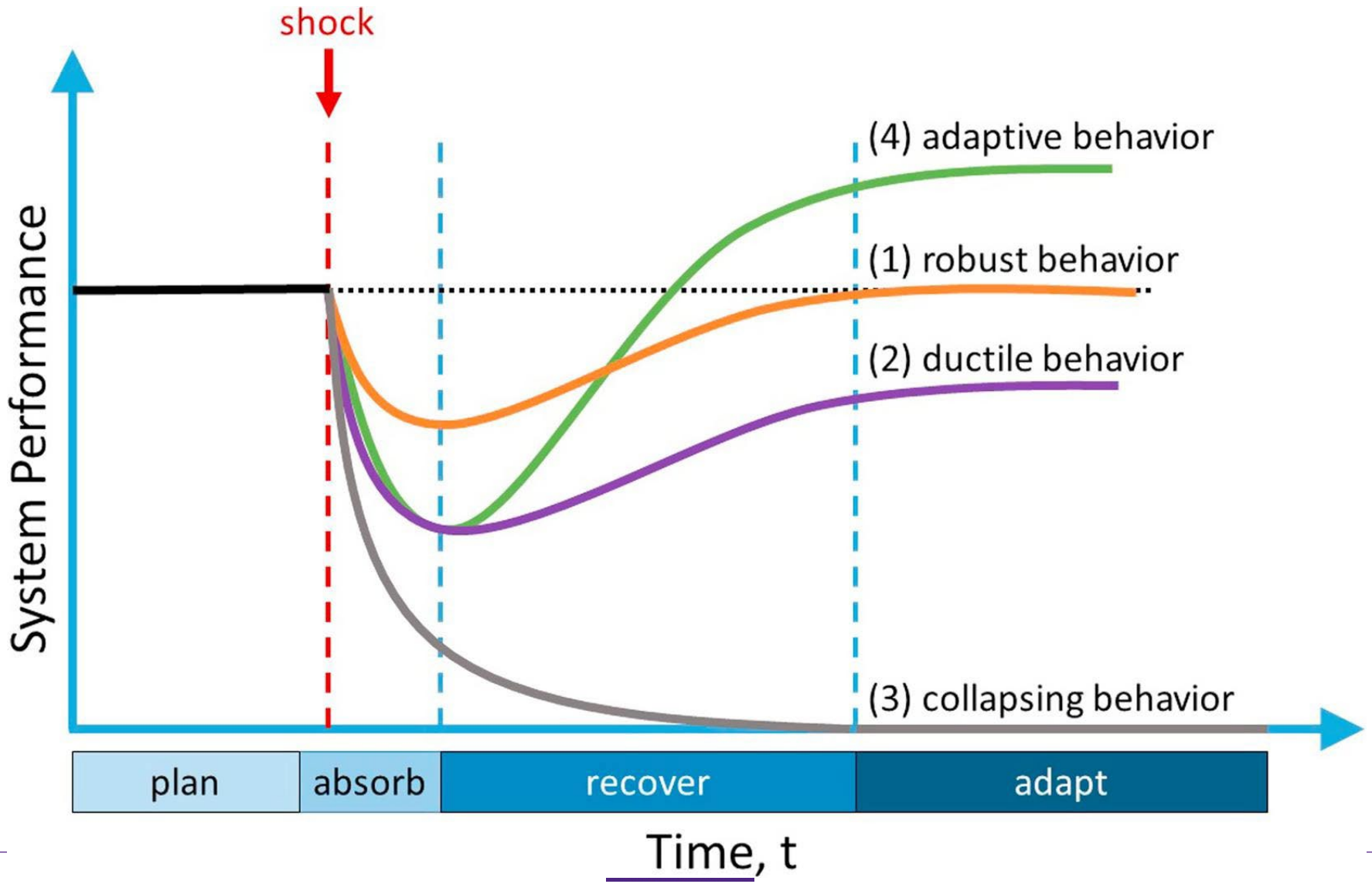
Recovery from a supply chain **disruption:**

- the degree, manner, and pace of restoration back to normal operations and functions after a disturbance.



All supply chain disruptions impact organizations; the shape of the impact curve, however, can differ.

Supply Chain Resiliency



Supply Chain Resiliency

The question of "how to assess the supply chain resilience" is challenging.

To understand the resilience of a system, it must be clearly defined – resilience of "what to what".

Barroso, et al. 2015

The Future of SCM: Human Resource Management

“(Iot)

The Future of SCM: Human Resource Management

“(Iot)

The Future of SCM: Risk Management and Resiliency

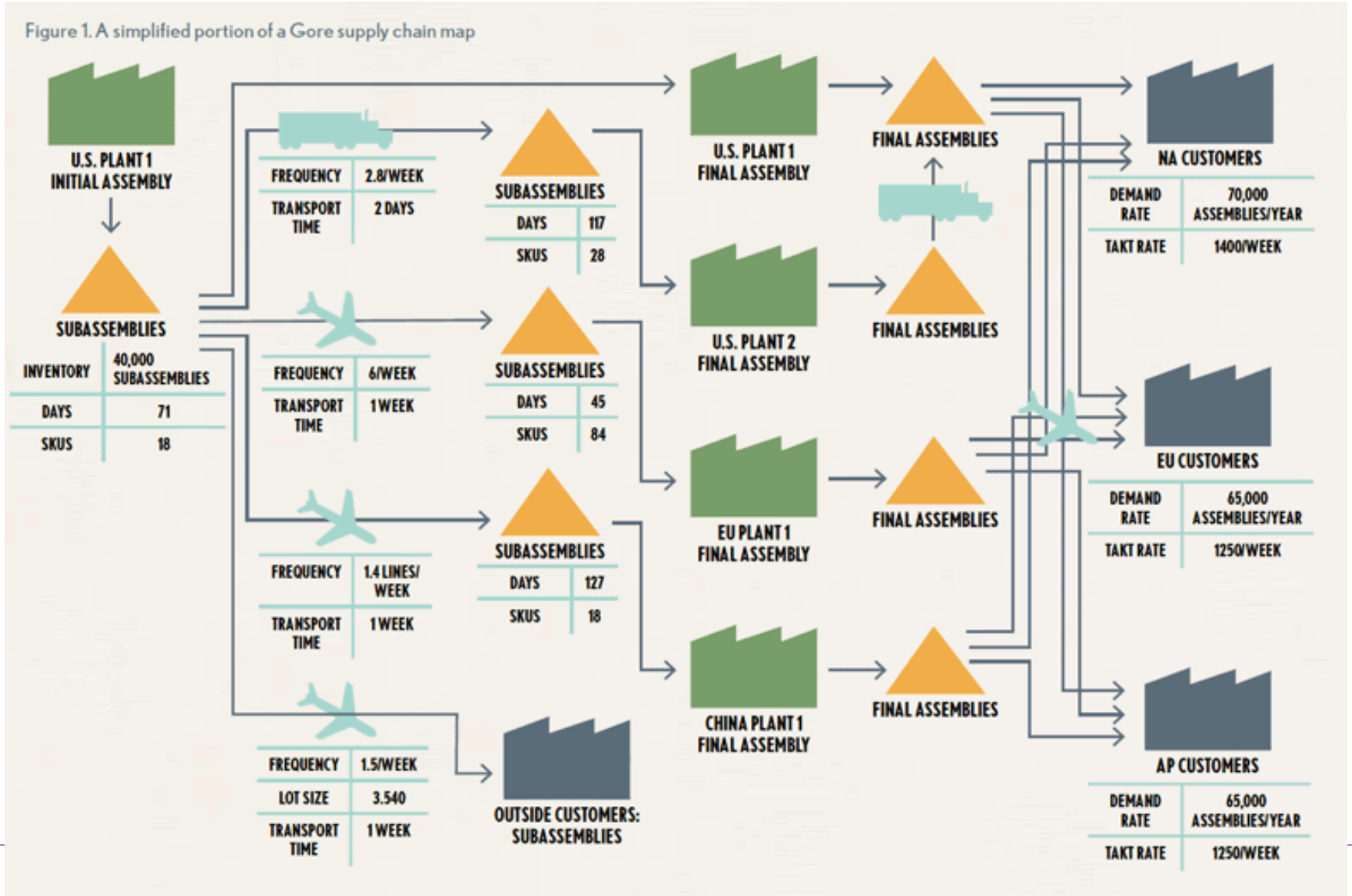
Supply chain mapping is critical to companies in all industries:

Supply chains are complex and involve geographically and industry dispersed organizations. Companies are challenged to maintain visibility of their entire supply chain. (Mubarik et al. 2021)

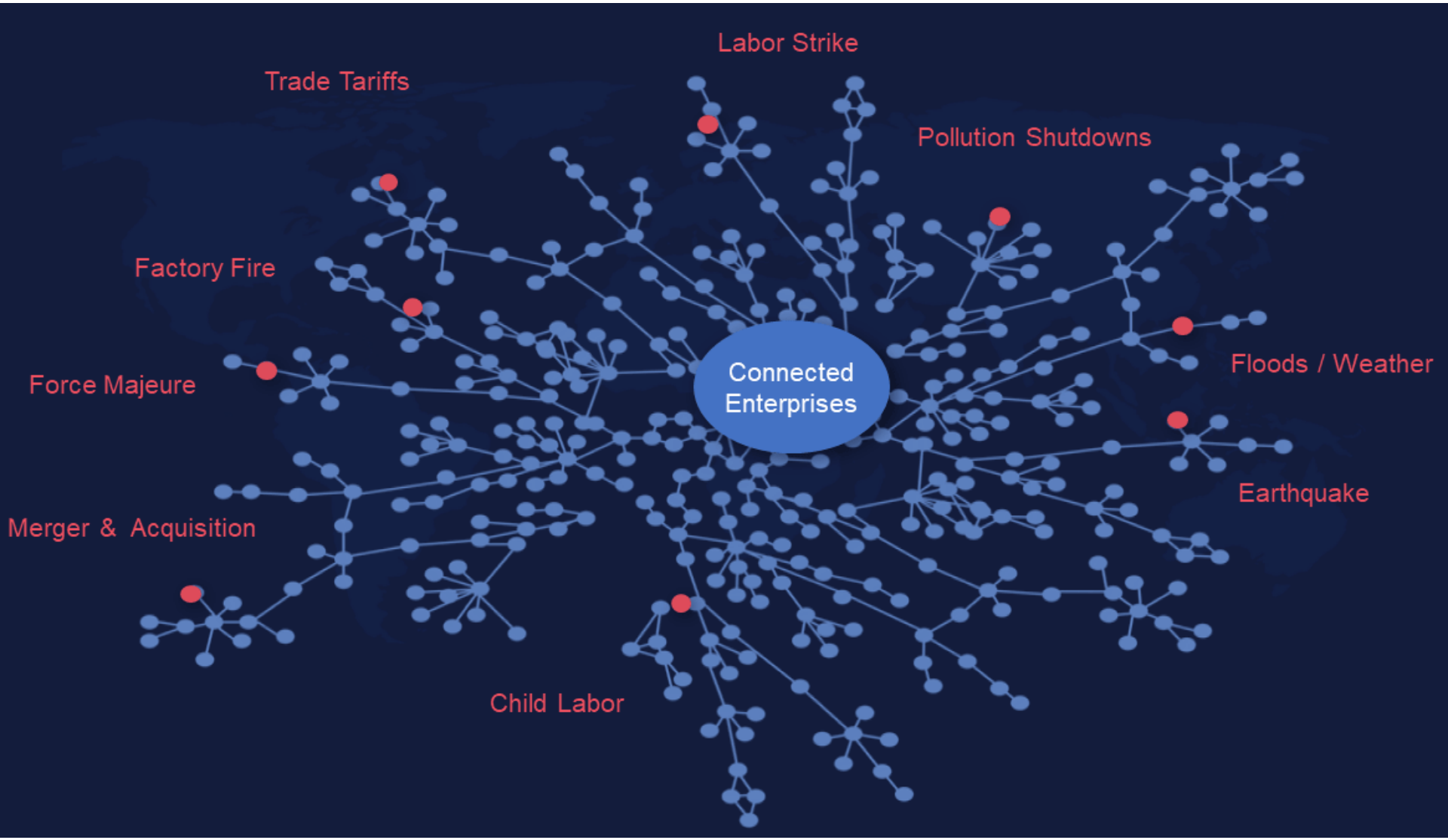
Defined:

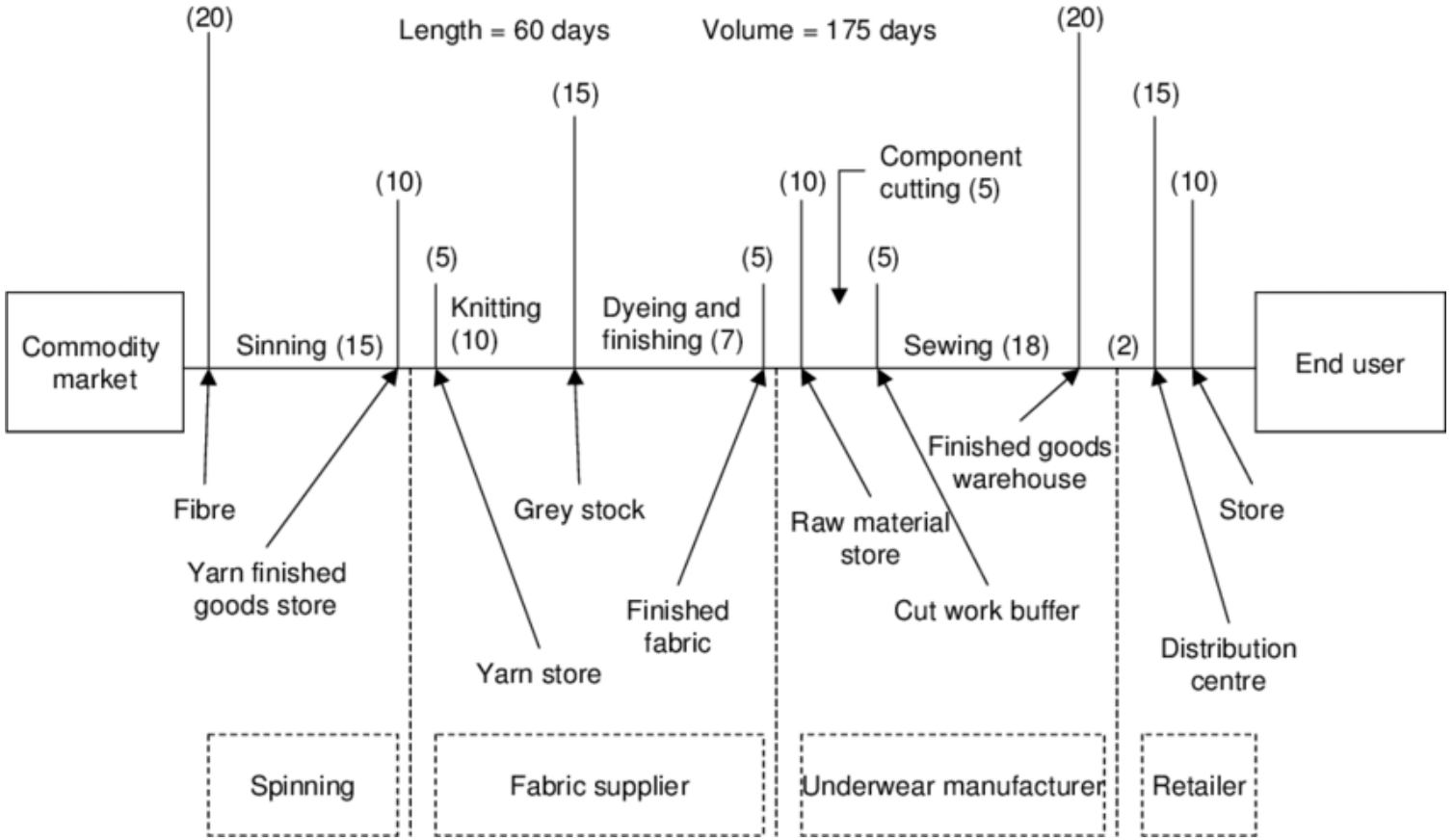
The linking of activities, actors, resources, and geography in order to ensure that the flow of products and information is visible across the entire supply chain networks.

The Future of SCM: Supply Chain Mapping



The Future of SCM: Supply Chain Mapping





The Future of SCM: Supply Chain Mapping and Efficiency

"All we are doing is looking at the timeline, from the moment the customer gives us an order to the point when we collect the cash. And we are reducing the timeline by reducing the non-value adding wastes. ”

Taiichi Ohno, father of Toyota Production System (TPS)

The Future of SCM: Customer Service and Omni-Channel Distribution

Figure 2: Omni-channel Retail Supply Chain

https://www.orderhive.com/blog/impact-of-omnichannel-business-on-supply-chain

The Future of SCM: Customer Service and Effectiveness

Availability

- "Out-of-stock inventory kills customer loyalty"

Visibility:

- "Last mile" (53% of delivery costs)

Flexibility:

- Consumers demand options (products, fulfillment)

Returning:

- 40% increase in returns between 2019 and 2020

Non-Scientific Survey Question #3

Are ?

1. Y
2. No, t
3. No,
4. Not su

The Future of SCM: Relationship Management

In Sum....

- Shorter supply chains
- Strong human capital
- Risk management and Resilience
- Smarter supply chain through digitization

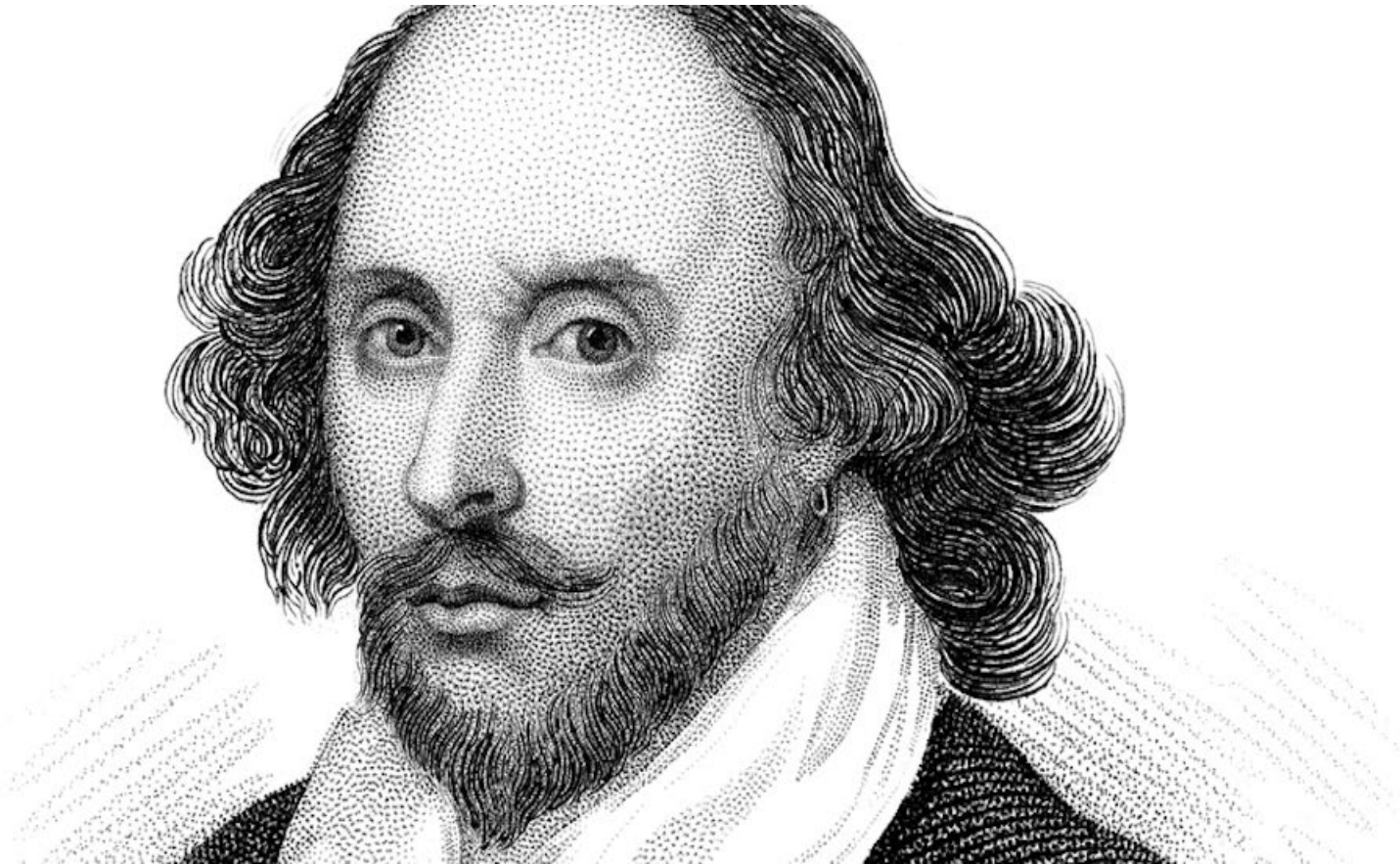
Each has associated trade-offs

Torsten Pilz – Honeywell CSCO

The Future of SCM

"If you can look into the seeds of time and say which grain will grow and which will not, speak then unto me."

– Banquo from Shakespeare's *Macbeth*



Thank You!
Questions?

ECU
COLLEGE OF BUSINESS