

Supply Chain Risk and Resiliency in the Age of Uncertainty

How to Adapt Your Supply Chain to New Realities

Supply Chain New & Evolving Risks

“Every major disaster shakes loose the old order.” – Rebecca Solnit, NYT

Bruce McIndoe | President of McIndoe Risk Advisory LLC | August 2020



“The most massive, and disruptive global event since World War II.”

- Angela Merkel

Most Important Problems for Humankind

1. Global Shock – Nuclear War, **Biological**, Natural
2. Climate Change
3. Technological Disruption

These problems require global cooperation and governance.

Future Megatrends: Drivers and Disruptors



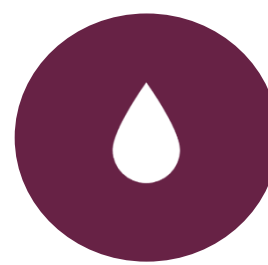
**GLOBALIZATION/
NATIONALISM**



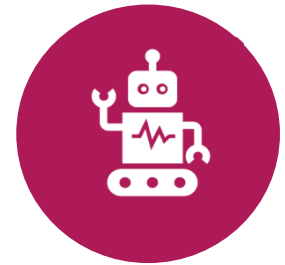
**DEMOGRAPHIC
DYNAMICS**



**CLIMATE
CHANGE**



**RESOURCE
SCARCITY**



**TECHNOLOGY
INNOVATION**

Globalization/Nationalism



- **De-Globalization**
- **Un-Coupling from China**
- **Supply Chain – On/Nearshoring, Sureshoring**
- **Asian Slump**
- **Aggressive China**

Demographic Dynamics



- **7.6B Today to 10B in 2050**
- **Developed World:** Lower Growth Rates and Aging Populations
- **Developing World:** High Growth Rates and “Youth Bulge”
- **Rapid Hyper-Urbanization** (Megacities)
- **Urban vs. Rural Experience**
- **Mass Migration** – Driven by conflict or economic realities

Climate Change



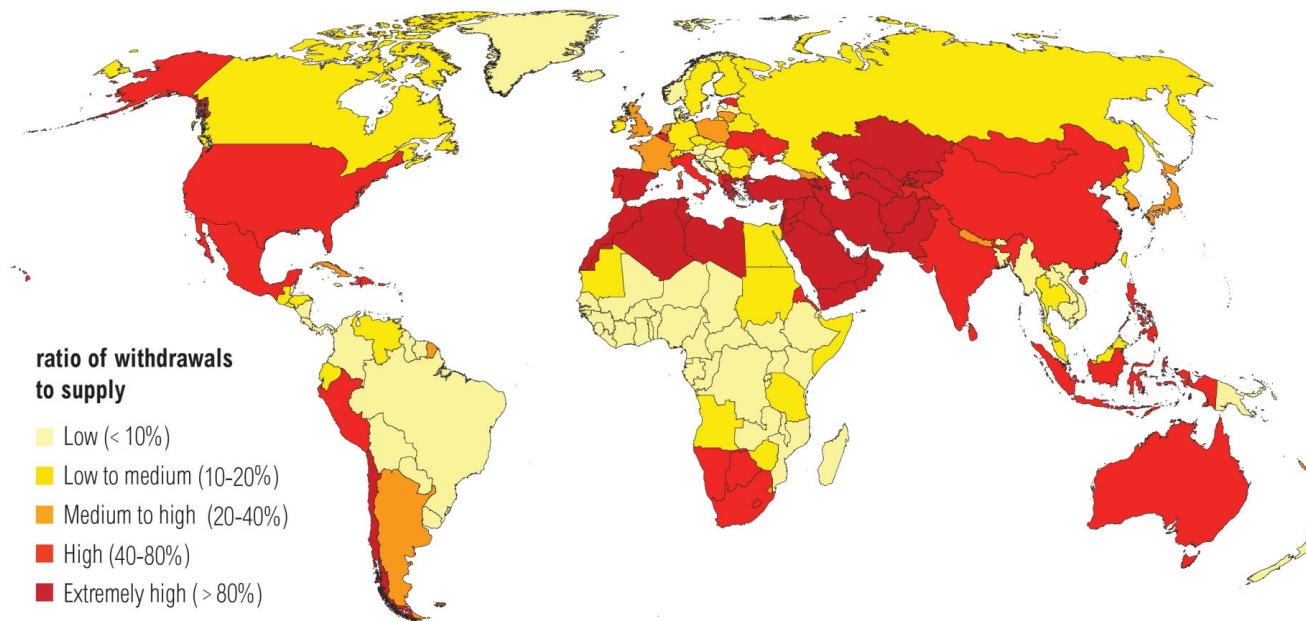
- **Increasingly Complex Weather Patterns**
- **More Severe Weather Incidents Shifts in Arable Land** – crop failures, abandoned farms, migration
- **Shrinking Coastlines** - Compounded by immigration and assimilation pressures
- **Climate Change** - Slowing

Resource Scarcity



- Increased conflict & political tension
- Securing resources domestically and internationally
- More Regulation & Protectionism

Vulnerabilities Driven by Shortages – Water 2040

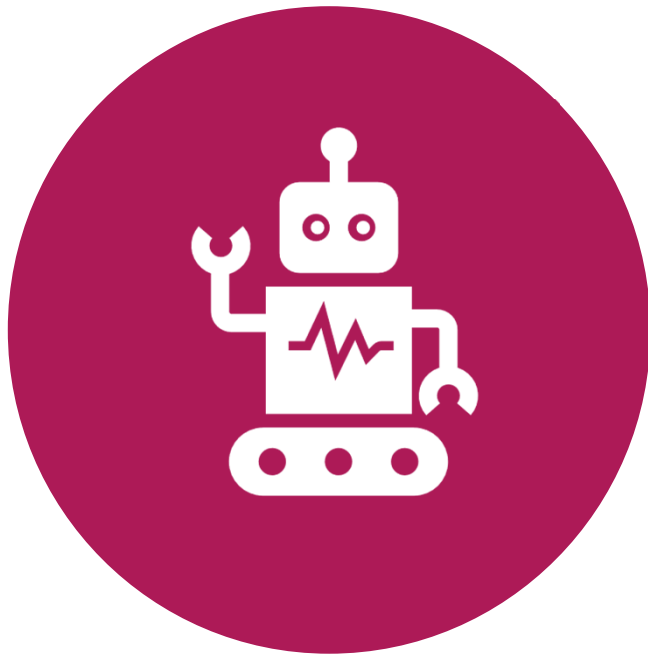


Resource Scarcity – Reasons for Hope



- **Water Technology** – Solar Desalination, Moisture Conversion, Urban Design, Conservation/Demand
- **Advanced Farming** – Aeroponics, Protein Production, etc.
- **Power Gen/Storage Technology** – Move from fossil fuels, battery advances, distribute production/storage
- **Materials Advancement** – Alternative Supply, Parts on Demand (3D Printing)
- **Modular Recyclable Materials** - Reuse/Reduce

Technology Innovation



- **Advanced Materials and 3-D Printing**
- **Robotics and Genetic Manipulation**
(Hacking the Human)
- **Ubiquity** – IoT and “Universal Access” Broadband by 2027
- **Artificial Intelligence (AI) and Machine Learning (ML)**
- **Biofuels and Energy Storage**
- **Quantum & Nanotechnology**

Global Realignment & Entrenchment

United Federation of the Americas?

United Federation of the Americas

- **Wealth** - US 8X GDP/P \$64,767 vs China \$8,033
- **Demographics** – 1.1B - Labor force blending
- **Resources** – South America, Canada, Arctic
- **Innovation** – Best schools, track record
- **Technology** – On par with China
- **Protected** – Military and Natural (2 oceans)
- **Climate Resiliency** – Summer/Winter balance



Building Supply Chains for an Uncertain Age

Technology, Process, and People

Michael Hugos | Co-Founder of SCM Globe Corporation | August 2020



Should We be Responsive or Efficient?

<i>Supply Chain Drivers</i>	Responsiveness	Efficiency
1. PRODUCTION	<ul style="list-style-type: none">- Excess capacity- Flexible manufacturing- Many smaller plants	<ul style="list-style-type: none">- Little excess capacity- Narrow focus- Few central plants
2. INVENTORY	<ul style="list-style-type: none">- High inventory levels- Wide range of items	<ul style="list-style-type: none">- Low inventory levels- Fewer items
3. LOCATION	<ul style="list-style-type: none">- Many locations close to customers	<ul style="list-style-type: none">- Few central locations serve wide areas
4. TRANSPORTATION	<ul style="list-style-type: none">- Frequent shipments- Fast & Flexible modes	<ul style="list-style-type: none">- Few large shipments- Slower and cheaper modes
5. INFORMATION	<ul style="list-style-type: none">- Collect & share timely and accurate data	<ul style="list-style-type: none">- Cost of information drops while other costs rise

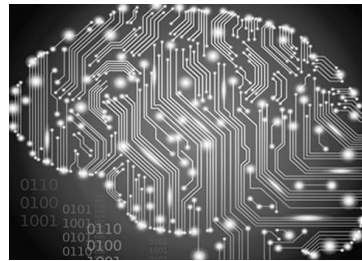
New Technology Offers Many New Opportunities



Industrial Robots



Warehouse Automation



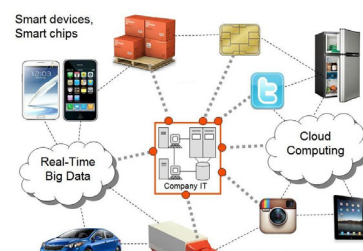
Artificial Intelligence



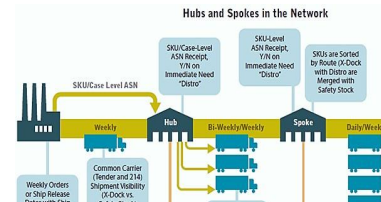
Delivery Drones



3D Printing



Internet of Things

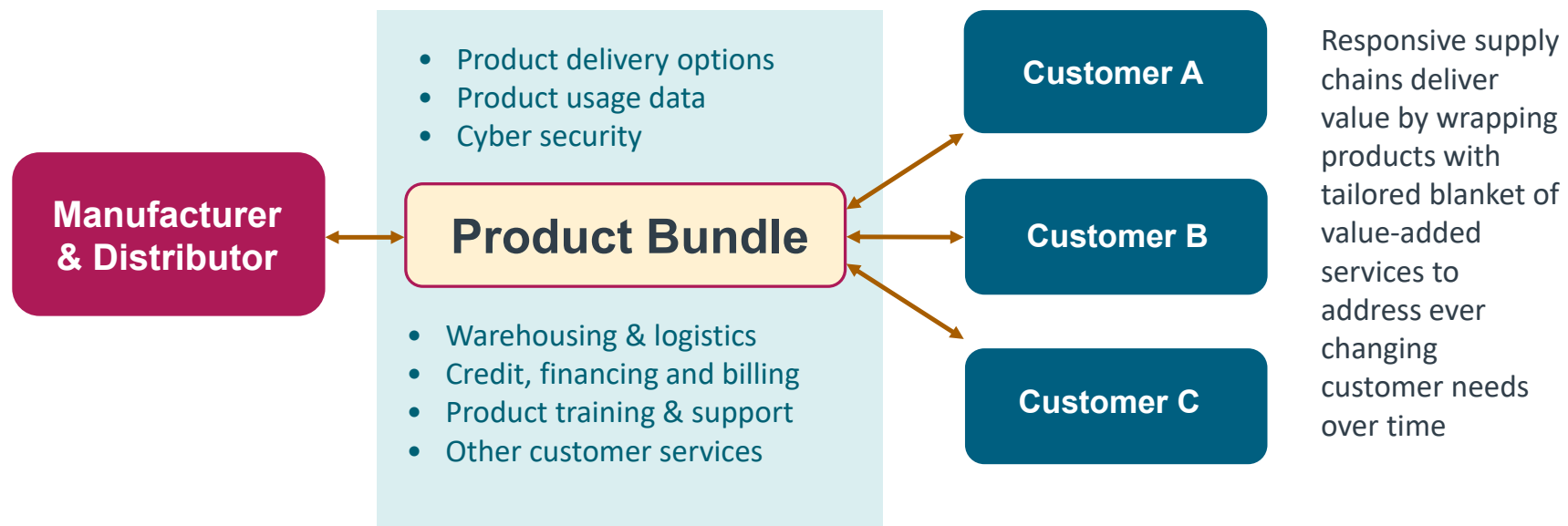


Simulation and Optimization

Two Basic Options:

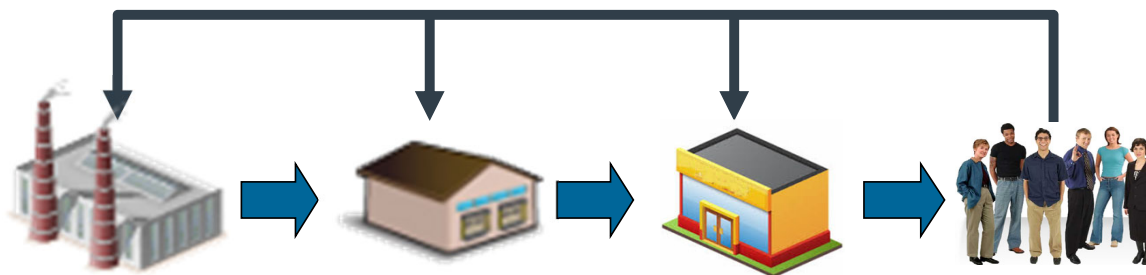
- **Efficient:** Improve existing operations
- **Responsive:** Always changing to deliver new products and services

Responsiveness Combines Products with Services



Real-Time Data for Continuous Response to Change

Real-Time Data: Forecasts, Sales, Inventory, Customer Feedback



Flow of products and services

Robust electronic connections (EDI, XML etc.) to share data

Continuous data collection, validation and loading into common databases visible to all parties

*Connect – Communicate – Collaborate – **fix problems and seize opportunities!***

Collect & Share Data to Attract Customers

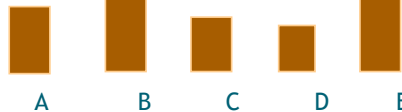
KPI PERFORMANCE SCORE CARD

Plan vs
Actual

Wk 1 Wk 2 Wk 3 Wk 4

Order Fill Rate

%

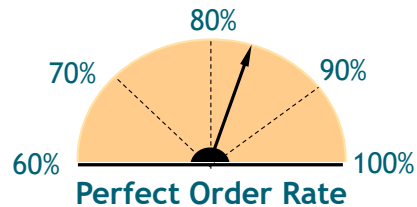


Supplier On Time Delivery Rate

Plan vs
Actual

Wk 1 Wk 2 Wk 3 Wk 4

Inventory Turns



Perfect Order Rate

Purchase Reports

525 N Lamar Chicago, IL Team A

<u>Item Nbr.</u>	<u>Description</u>	<u>UOM</u>	<u>Purchases</u>	<u>%</u>
A1234	Glvax dape	Case	24,358.39	14.2
12A45	Bevldx Qrt	Roll	22,019.34	11.9
U1234a	Tex urodon	Case	20,123.04	9.4
989824	Appl wazru	Case	18,223.57	8.5
BAC121	Rea nonrtq	Pack	17,567.12	8.3
1266VX	Mosbxqr Q	Pack	16,772.57	7.2
34ZZa12	Eog vramx	Roll	15,878.13	5.3

Sales budget and IT budget merge!

Easy to use – Updated every day

Combine Strengths of People and Computers



- Let computers do routine tasks – **EFFICIENCY**
- Empower people to be creative – **RESPONSIVE**
- “Combine the swelling numbers of mid-skilled workers with ever-cheaper technology to create value.” **Erik Brynjolfsson and Andrew McAfee**
MIT, Race Against the Machine

Freestyle Chess Example

- ✓ Talented amateurs using simple apps to explore moves
- ✓ Beat chess grandmasters and other players with more powerful and complex apps
- ✓ “Human strategic guidance combined with the tactical acuity of a computer was overwhelming.” **Gary Kasparov**
- Continually improve skills & technology based on experience – **EVOLVE!**

Three Requirements of Responsiveness



Winning teams share traits

1.
Information Sharing
OBSERVE
(**TECHNOLOGY**)

With winning supply chains

2.
Authority to Act
ACT
(**PROCESS**)

3.
Stake in the Outcome
WIN
(**PEOPLE**)

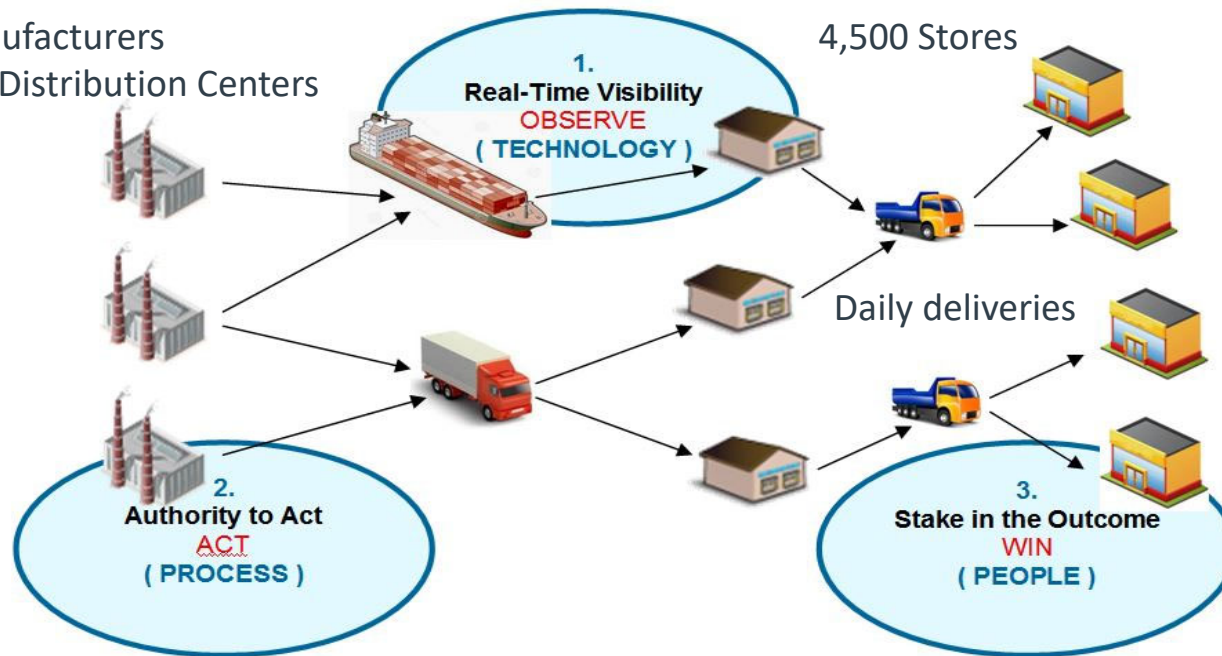
Responsive supply chains need people to act **quickly** and **collaboratively**

Without waiting to be told what to do... how might this be done?

Are there useful examples to learn from?

Case Study: Responsive Retail Supply Chain

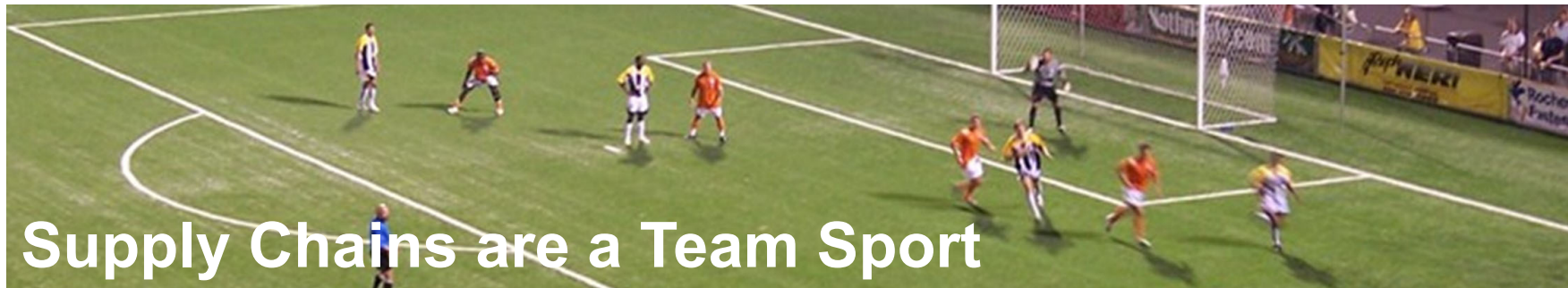
40 Manufacturers
and 26 Distribution Centers



If everyone can see what is happening, has authority to act, and a stake in the outcome...

They will collaborate to forecast, produce, and deliver products when and where needed!

Reinventing the Supply Chain




Supply Chains are a Team Sport

- Running supply chains calls for people from Operations, Procurement, Transportation, IT...
- AND supply chains include people from Sales, Finance, Marketing, R&D, Customers
- Each person has a specific function yet people must see across functions and play as a team
- *Give people visibility, authority to act, and stake in the outcome – **work toward common goals!***

Supply Chain Insight for this Decade

- **Best profits exist in tailored bundle** – products and services combined to meet specific needs of individual customers (bundle always evolving to respond to ever changing needs)
- **Efficiency alone is not enough** – must also be responsive to evolving risks and changing customer needs and desires (efficiency requires predictability which is hard to find)
- **Combine strengths of people and computers** – use real intelligence to guide artificial intelligence, keep people in the loop (Boeing 737 MAX autopilot example)
- **Use KPIs and real-time scorecards** – everyone knows the score and can see what needs to be done (Transparency / Authority to Act / Stake in the Outcome)
- **Electronic connections and personal connections** – both required to deliver top notch service (people do the thinking, computers do the calculating)
- **Money is made in many small adjustments** – every hour, every day, every week
- **Supply chains become a team sport** – successful companies seek each other out



Supply Chain Risk and Resiliency in an Age of Uncertainty

Paul Kaeley | CEO Siemens Advanta US | August 2020



Covid-19 is
re-shaping
operations

Building a **resilient
Supply Chain** for
the digital age
is key!

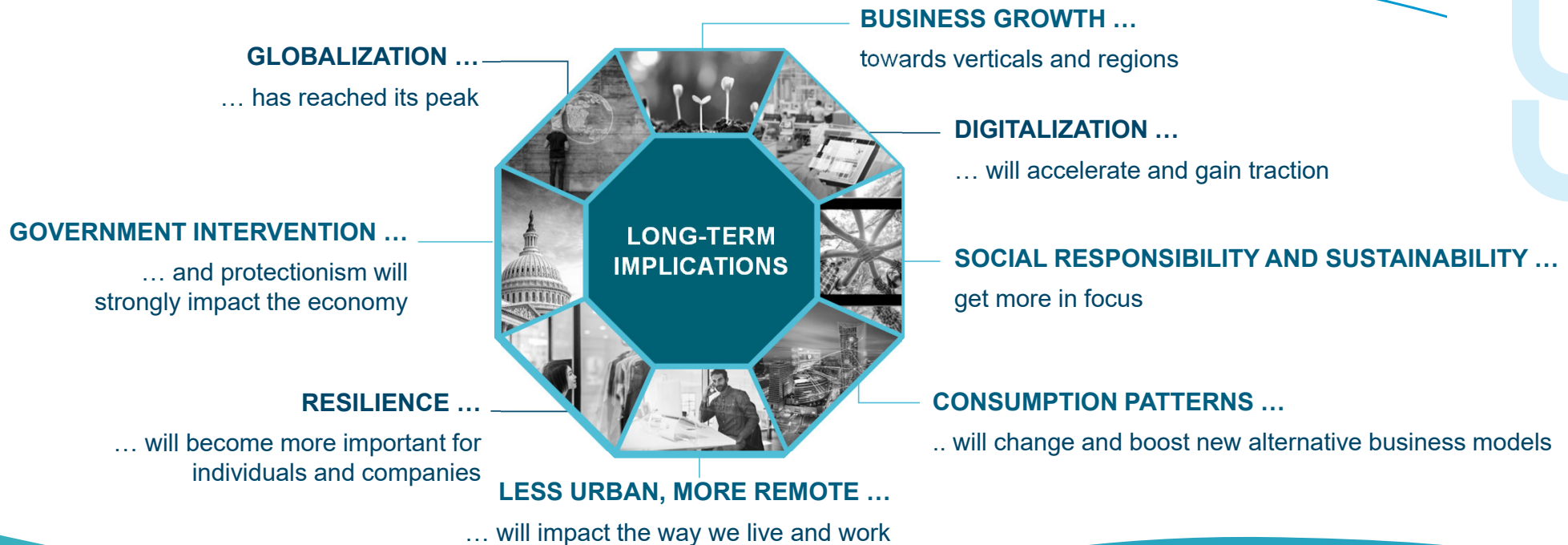


COVID 19 revealed weaknesses in all supply chains



DISRUPTIONS
of operations
are often
impossible
to predict, but
HAPPEN with
REGULARITY

Several trends will stay to shape how operations grow



Supply Chain Leaders expect ongoing transformation of value chains

Trend GLOBALIZATION

73%

Encountered problems in the **supplier footprint** that require changes in the future

Trend GLOBALIZATION

75%

Faced issues in the **production and distribution footprint** that require changes in the future

Trend RESILIENCE

93%

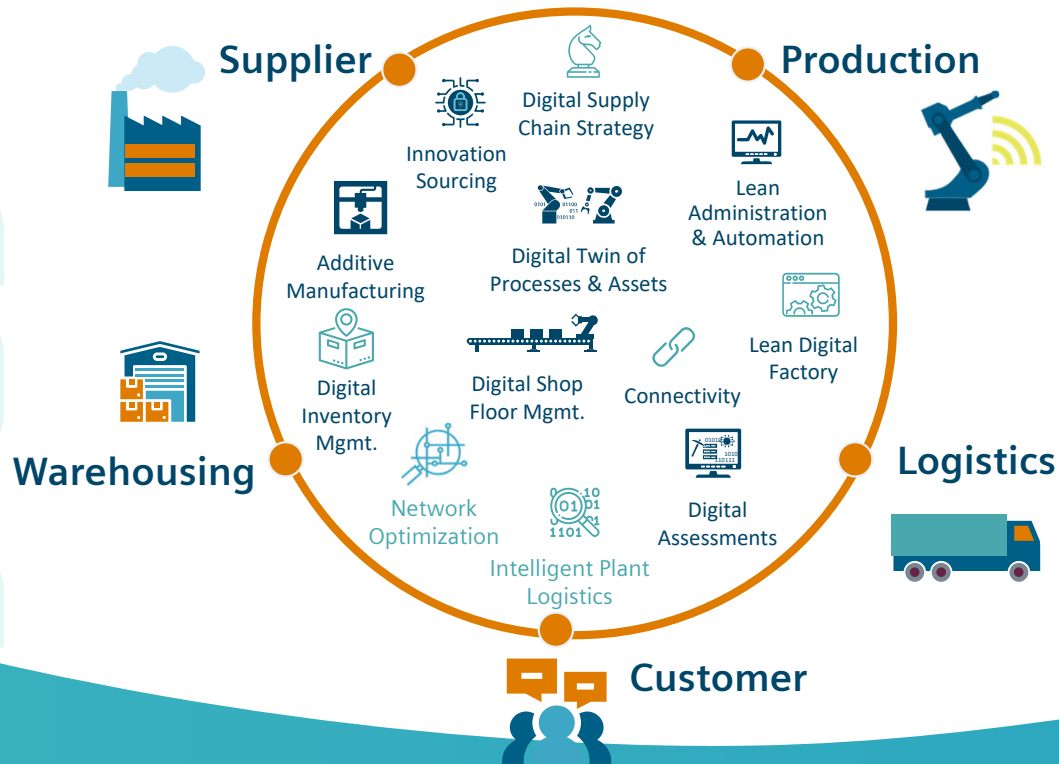
Plan to increase the **level of resilience** across their supply chain

Trend DIGITALIZATION

85%

Struggled with insufficient **digital technologies** in the supply chain

Key elements for a future supply chain



1 ... to become more **resilient**

2 ... to be ready for the **digital age**

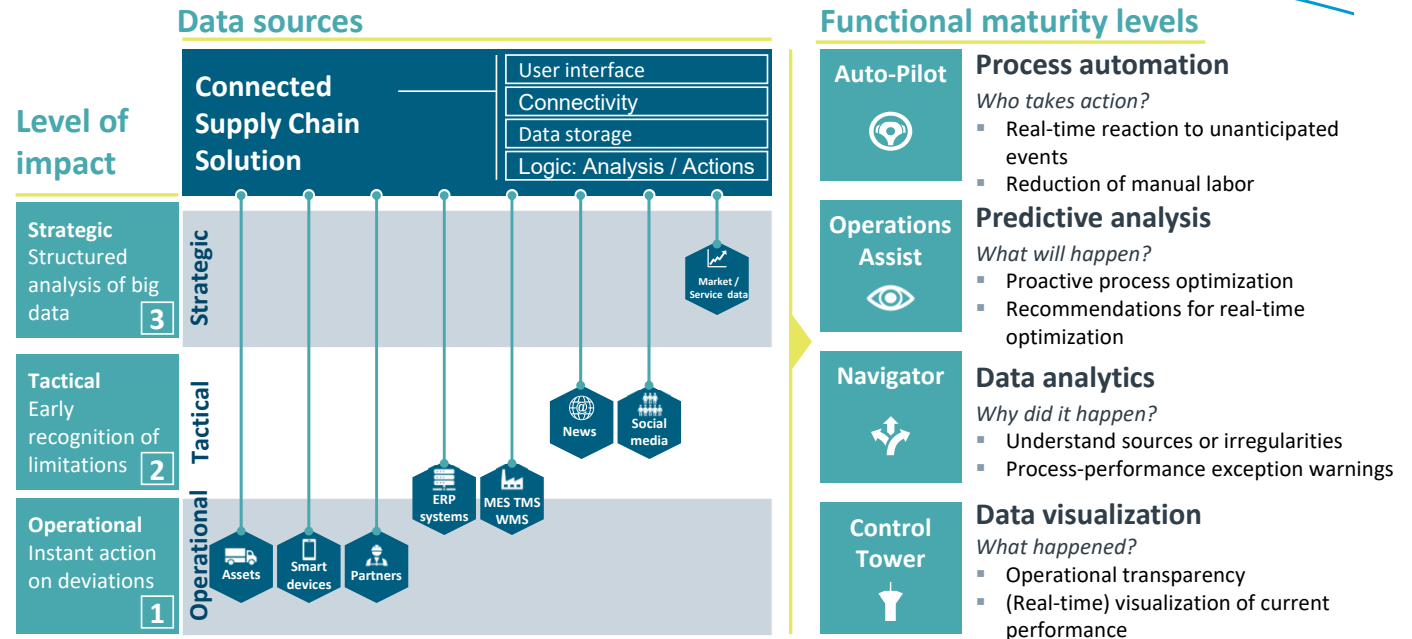
3 ... to stay sustainably **profitable**

Our concept of a Connected Supply Chain



Key questions

- How can I **leverage the information** generated by all systems and tools **in my supply chain**?
- What **benefit** brings data to my supply chain?



Project reference Connected Supply Chain

GLOBAL TRUCK MANUFACTURER



CUSTOMER CHALLENGES



Multi-faceted system environment & limited visibility



Mass customization & delay in parts supply



Siloed organization

Key Activities

- Digital Quick Check
- Development of Connected Supply Chain concept
- Business case calculation (ROI)

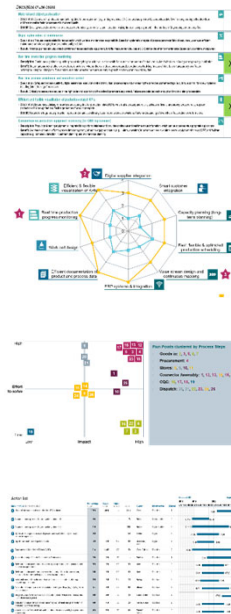
Results & next steps

- Baseline, evaluation of business impact, future-state and roadmap
- Proof of concept
- Fast implementation in an agile manner



SIEMENS ADVANTA

How to get you started with our Digital Supply Chain Quick Check



1 Scan digital topic fields



Baselining and positioning on Functional Maturity Level

2 Identify digital/automation potentials



Benefit/Impact for your Supply Chain

3 Evaluate action fields



Design of key elements for a future Supply Chain

4 Plan actions and implementation



Roadmap and implementation support

Key Take-Aways

Disruptions happen with regularity –
prepare your supply chain for the next!

Existing trends - **De-Globalization, Digitalization and Resilience** - are
accelerated by Covid-19

Supply Chain Leaders see an
**immediate need to become more
resilient**

Elements of a future supply chain enable a
smooth **interaction of all the supply chain players**
by leveraging digitalization

The modular Connected Supply Chain
approach **integrates process partners
via one common source of information**

Start small and scale big, e.g. with the Digital
Supply Chain Quick Check



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Your partner of
choice

Thank You