

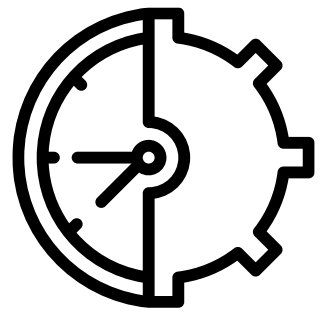


Enhancing the Automotive Supply Chain in Response to Semiconductor Shortages

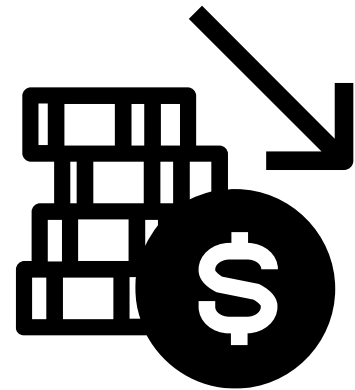
Team 14

Introduction

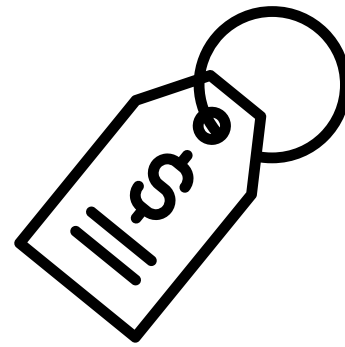
The semiconductor shortage crisis started in 2021, caused by the pandemic and its impact on global supply chains. The automotive industry was directly affected by this since chips are a crucial element in vehicles.



Production delays

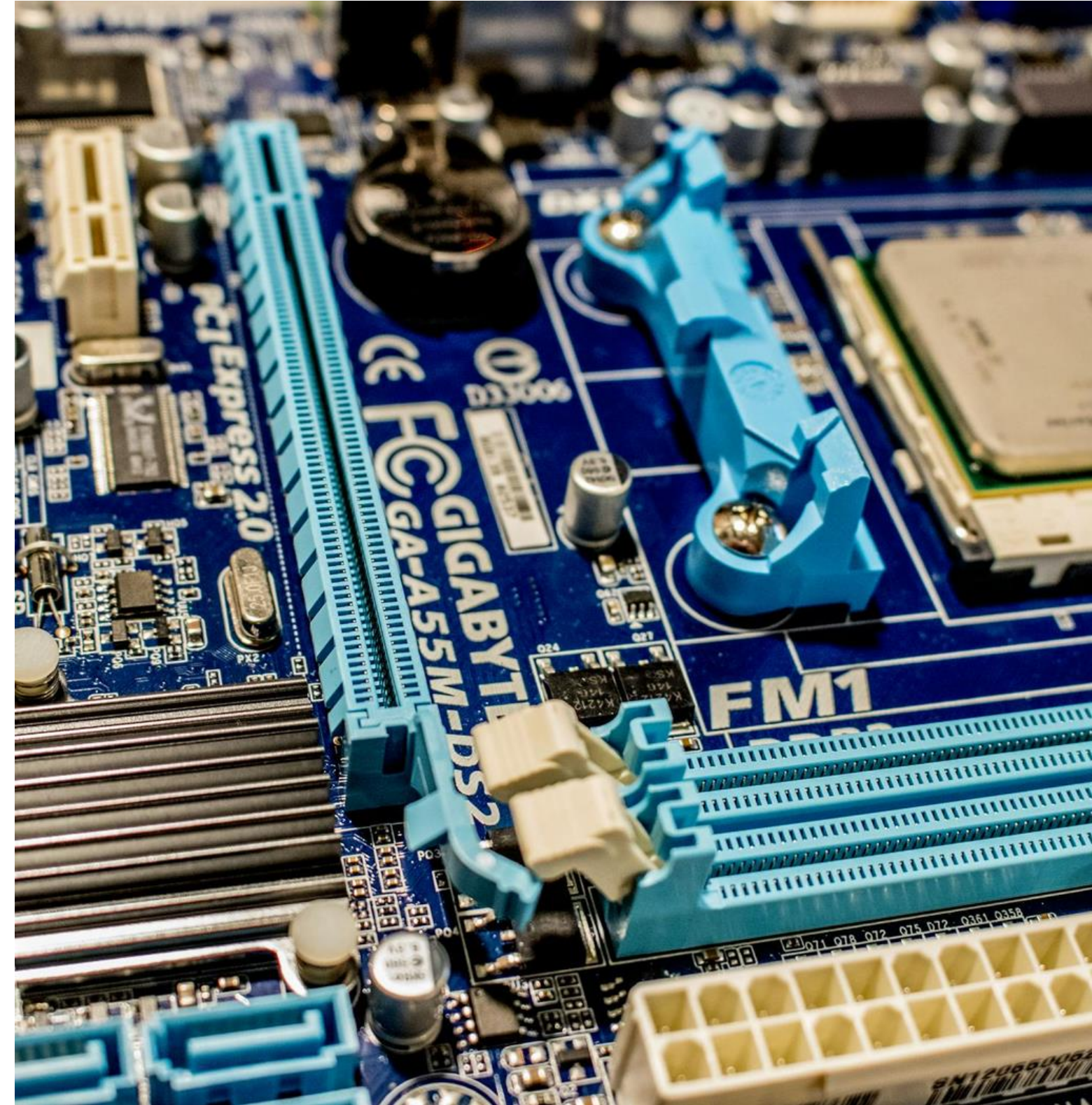


Revenue loss

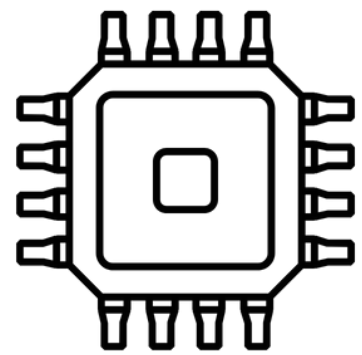


Rising prices

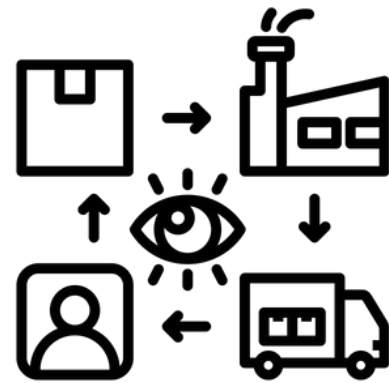
The crisis shed a light on the importance of supply chain transformation and the necessity of digitalization and collaboration between moving parts.



Background



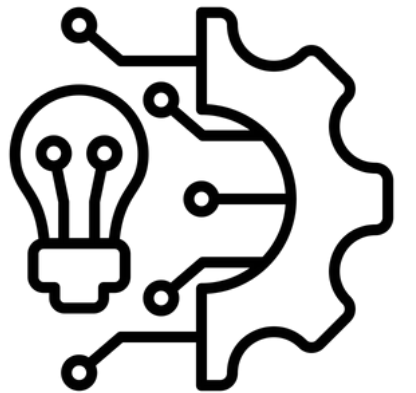
**SEMICONDUCTORS
SHORTAGE**



**SUPPLY CHAIN
VISIBILITY**



**DIGITAL
TRANSFORMATION**



**ADVANCED
TECHNOLOGIES**

Current Supply Chain Situation

Automotive Semiconductor Demand Forecasting Challenges



- Unclear technology roadmaps for predicting chip needs in new vehicle models
- Complexity from frequent changes to custom vehicle orders mid-production
- Limited visibility into semiconductor content across vehicle components/features

Just-In-Time Supply Chain Visibility Gaps



- Lack of end-to-end supply chain transparency on chip usage and inventory
- No standardized data sharing between automakers, suppliers, and chipmakers
- Minimal advanced analytics for semiconductor supply/demand monitoring

Automotive Chip Supply Lead Times



- 4-month minimum lead time if manufacturing capacity available
- 18+ months if capacity expansion required for automotive-grade chips
- 3+ years to build new semiconductor fabrication plants for automakers

Competition From Consumer Electronics

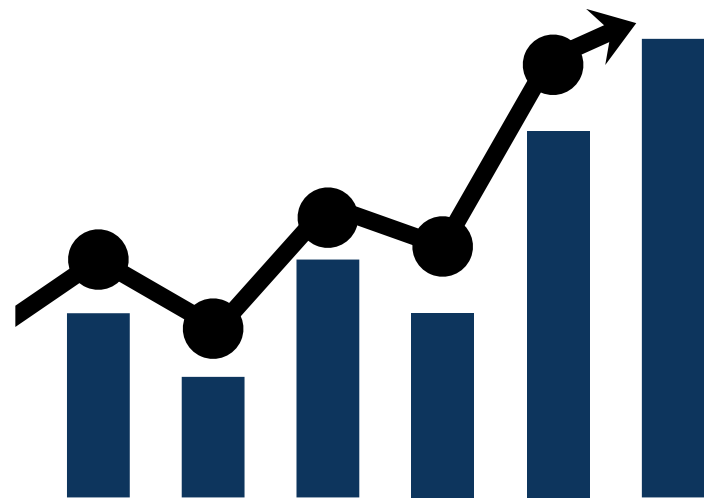


- Automotive lower priority as chip demand spiked for PCs, cellphones during pandemic
- Mature node capacity constrained, fiercer competition for auto-grade chips
- Cost-sensitive automotive semiconductors deprioritized by suppliers

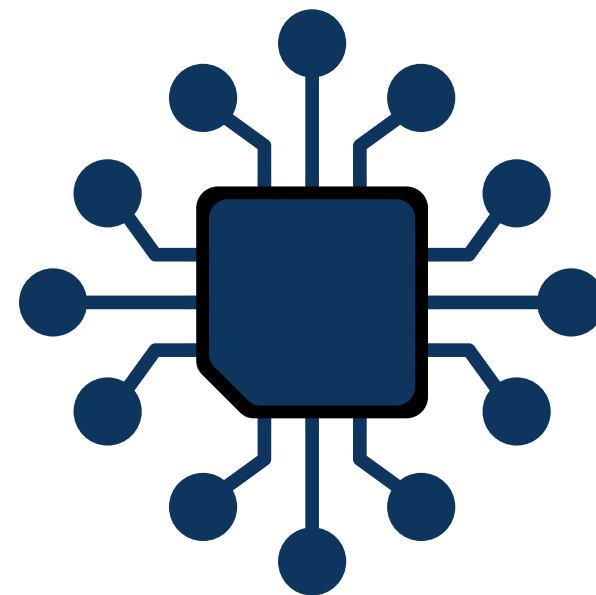
Technology and their Applications



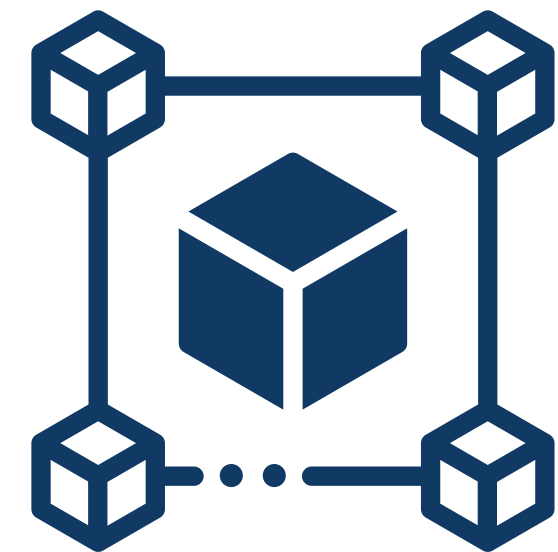
AI to detect changes in
demand and supply



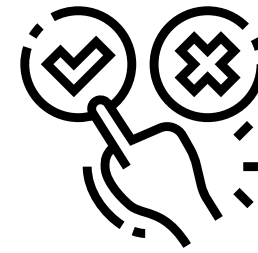
IoT solving Chip
Shortage



Blockchain integration
with IoT



Qualitative Benefits of Digital Transformation



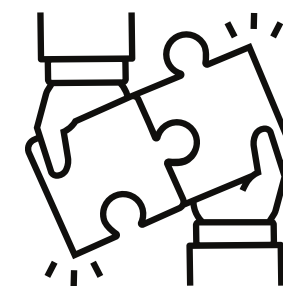
1. ENHANCED DECISION MAKING



2. PROACTIVE RISK MANAGEMENT



3. BUILD RESILIENCY IN THE SUPPLY CHAIN



4. ENHANCED COLLABORATION AND COMMUNICATION

Measuring Digital Technology Effectiveness in Supply Chains



- 01 PERFECT ORDER RATE**
The percentage of orders delivered without any issues, such as delays, damages, or inaccuracies.
- 02 CYCLE TIME REDUCTION**
The reduction in time taken to move a product from order to delivery, measured pre- and post-digital transformation.
- 03 DIGITAL TRACEABILITY INDEX**
The extent to which a company can track and trace products throughout the supply chain using digital tools.
- 04 INVENTORY ACCURACY**
The accuracy of inventory records compared to physical stock.
- 05 SUSTAINABILITY METRICS**
Metrics such as carbon footprint reduction, waste minimization, and resource optimization, enabled by digital technologies.

Challenges & Solutions



01 **HIGH INITIAL COSTS**

- Seek government grants and incentives for digital transformation initiatives to make the automotive industry more resilient and sustainable

02 **INTEGRATION ISSUE**

- Define standards for integrating semiconductor data across supply chain
- Alignment across procurement, supply chain, IT, product development
- Establish governance for sharing semiconductor data across OEM

03 **DATA SECURITY CONCERNS**

- Implement cybersecurity controls to protect sensitive chip information
- Use a Multi-Layered Security Approach such as firewalls or intrusion detection systems

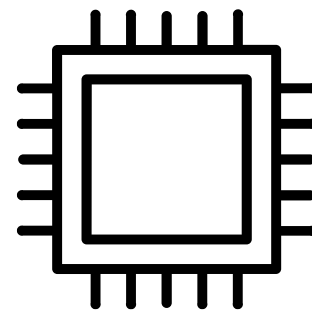
04 **CHANGE MANAGEMENT**

- Create a technology roadmap that connects supply chain functions to better develop next-gen semiconductor innovations
- Communicate the benefits of digital transformation clearly to all stakeholders

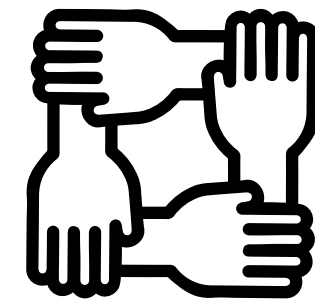
Recommendations



**STRENGTHENING GLOBAL
TRADE AGREEMENTS AND
POLICIES TO FACILITATE
THE FREE FLOW OF
SEMICONDUCTOR
PRODUCTS.**



**INVESTING IN
DOMESTIC
SEMICONDUCTOR
MANUFACTURING
CAPABILITIES**



**ESTABLISHING
COLLABORATIVE
SEMICONDUCTOR
ECOSYSTEMS WITH
REGIONAL HUBS**

Roadmap to 2030

2024-2025

- Initial research and global outreach
 - Begin foundational studies for blockchain integration in trade processes

2026-2027

- Negotiations for new trade agreements
- invest in infrastructure for domestic manufacturing
 - Pilot projects for blockchain to secure supply chain data

2028

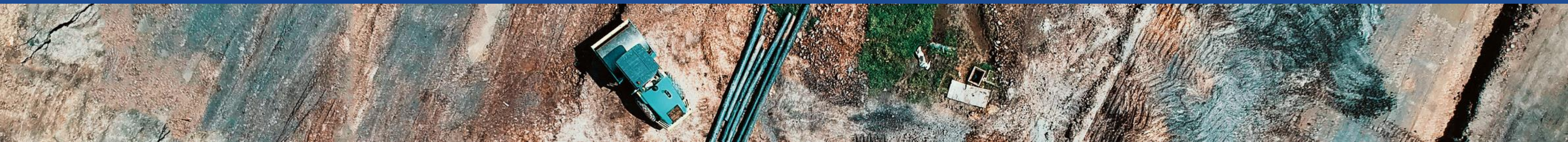
- Implementation of trade agreements
- Start pilot projects for IoT applications in semiconductor manufacturing.

2029

- Evaluate the effectiveness of trade policies and blockchain implementations
 - Scale up domestic production with IoT integration for efficiency

2030

- Establish and formalize regional hubs
 - Full-scale deployment of blockchain and IoT within these ecosystems



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OUR TEAM



MARIA
TOBAR



SEBASTIAN
ROZAS



M. CAMILA
AGUIRRE



ILORA
BANDYOPADHYAY



TIMOTHY F.
LIKAKU

