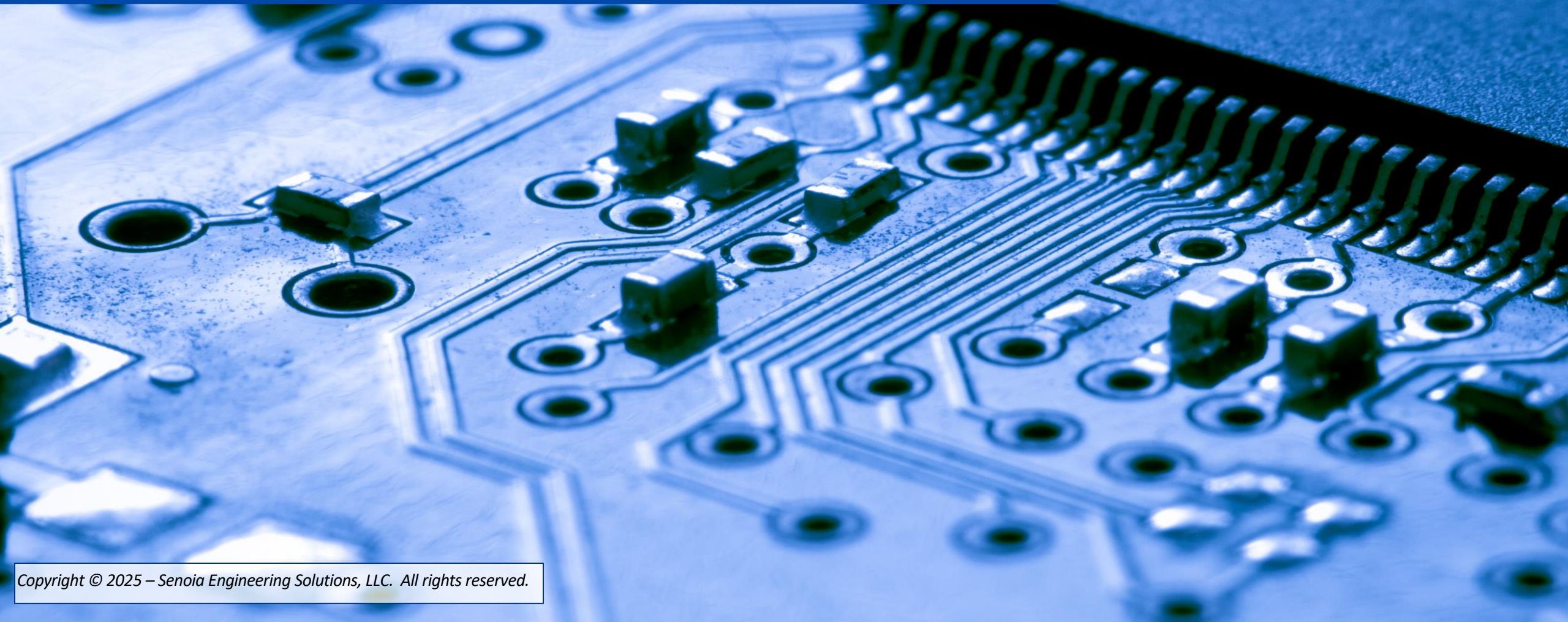




Reducing Cost and Achieving Resilience in the Automotive Electronics Supply Chain





The Society of Cost Engineering and Analytics, or SPCEA, is a non-profit professional society on a mission to expand awareness and education of cost engineering within manufacturing. We aim to promote the understanding and application of cost engineering principles, methods, and practices while supporting our members through training, certification, and networking opportunities.

<https://spcea.org/>

**Senoia Engineering
Solutions**



Senoia Engineering Solutions is a consulting company that specializes in cost engineering, supply chain resiliency, and value analysis of electronic and electromechanical subassemblies. We excel in helping clients find ways to reduce their costs by drawing from over 39 years of engineering, manufacturing, quality, and procurement experience within diverse industries such as automotive, home appliances, consumer electronics, and off-road equipment.

<https://senoiaengsolns.com/>

INTRODUCTION

Jeff Miller

President and Owner -

Senoia Engineering Solutions, LLC

President and Co-Founder -

Society of Product Cost Engineering & Analytics



Education

- B.S. Electrical Engineering – Kettering University (Flint, MI)
- M.S. Industrial Engineering – Purdue University (West Lafayette, IN)
- MBA – Rollins College (Winter Park, FL)
- Certificate in Executive Management – University of Notre Dame (South Bend, IN)

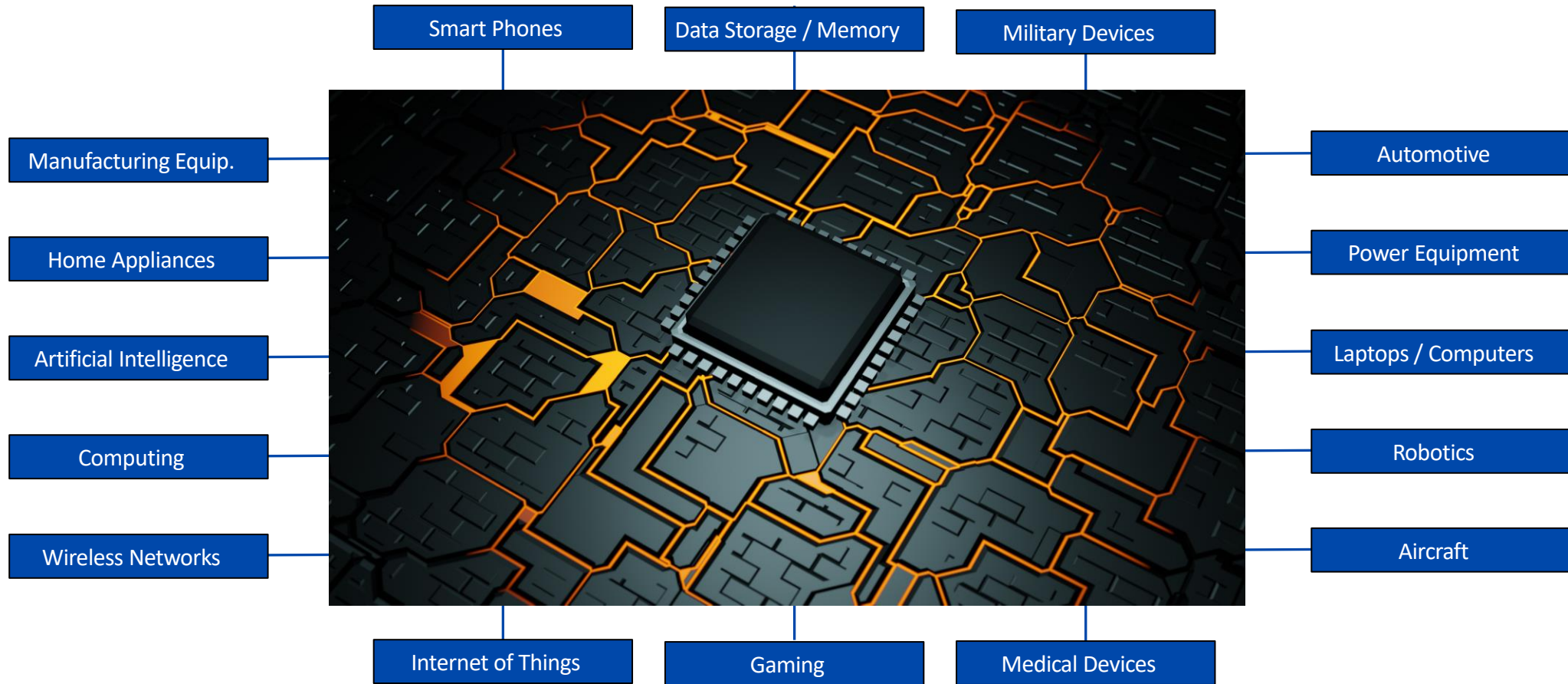
Experience

- 39 years of multifunctional experience within the electronics industry
 - *Automotive:* General Motors, Ford, Standard Motor Products, Panasonic
 - *Agriculture:* John Deere
 - *Major Appliance:* Whirlpool Corporation
- Over 15 years in cost engineering & VEVA of electronics & electrical assemblies.
- As a consultant: work with home appliance OEMs, automotive Tier 1s, cost engineering software companies, and management consulting firms.

Other

- Co-Founder, Board Member and President – Society of Product Cost Engineering & Analytics (SPCEA): <https://spcea.org/>
- Contributing author: “Realistic Cost Estimating for Manufacturing – 3rd Edition”. Published by the Society of Manufacturing Engineers.

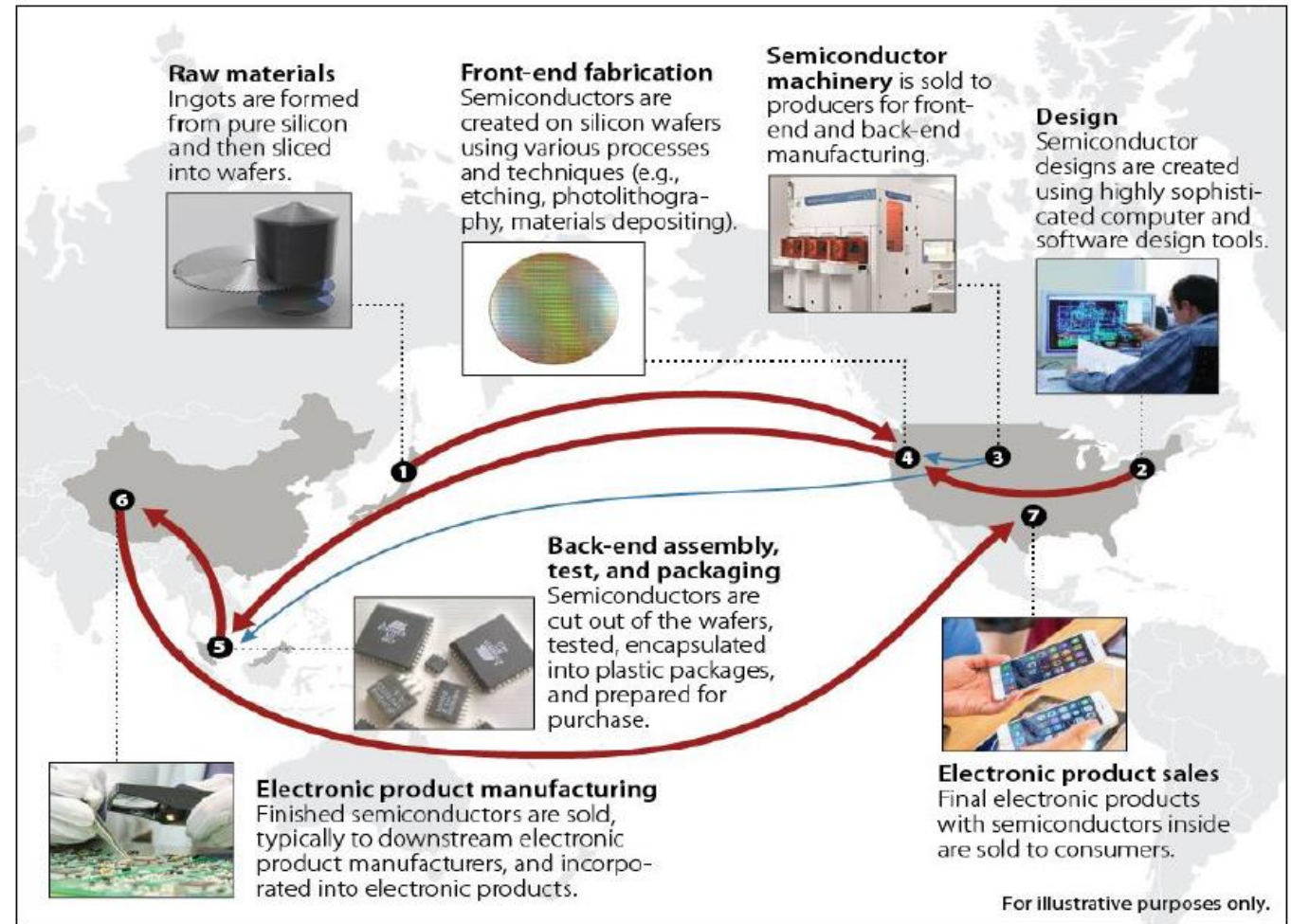
THE CURRENT MARKET FOR ELECTRONICS



Electronic components are in almost everything we buy today.

ELECTRONICS MANUFACTURING

- The electronics industry is the “poster child” for global supply chains.
- Semiconductor production is of particular concern, due to long lead times and global exposure.
- Production of semiconductors is concentrated in Asia and is typically distributed across multiple countries/regions.
 - Starting material: Japan, China
 - Wafer fabs: U.S., Europe, Asia
 - Back-End Processes / Test: SE Asia, Mexico
 - PCB Assembly: U.S., Europe, Asia



Source: “Semiconductors: U.S. Industry, Global Competition, and Federal Policy”, Congressional Research Service, October 26, 2020

Be Aware of Geopolitical Events

- Actively monitor geopolitical events and the corresponding impact on the electronics supply chain – Tier 1, Tier 2, Tier 3, and beyond.
- Consider nearshoring components to politically stable regions with strong infrastructure.

Diversification of Suppliers

- Avoid single sourcing of electronic components where possible. Source multiple suppliers in different geographical locations.
- Maintain a database of approved substitutes to quickly adapt to shortages.
- Use a scorecard during the product development toll-gates to rate designs on single-sourced components.

Supplier Risk & Visibility

- Regularly evaluate the financial health of key suppliers. Give sourcing priority to financially stable companies.
- Actively track the life-cycle stage of components. Have a strategy for dealing with components that are at end-of-life.



STRATEGIES FOR MANAGING COST OF ELECTRONIC ASSEMBLIES

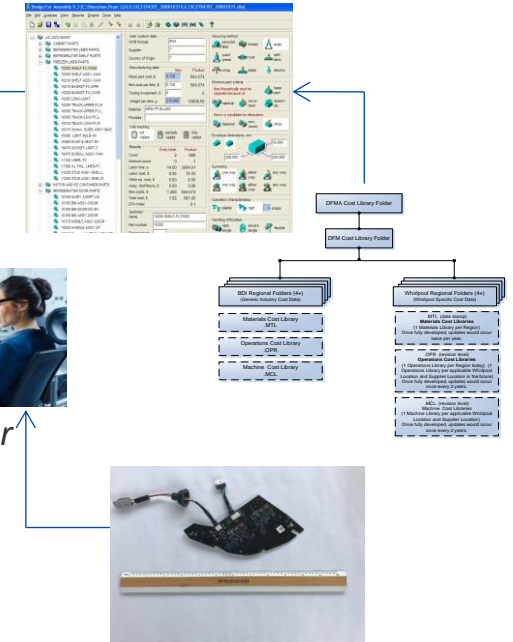
- Minimize PC board size and layer count.
- Optimize component placement.
- Design using industry standards
- Leverage widely available, standard components
- Optimize panelization.
- Design for high yield on automated assembly processes.
- Minimize the use of through-hole components.
- Design for Testability (DFT)
- Collaborate with suppliers to reduce their costs and increase yields.
- Monitor costs throughout the product development process.

Process Partners:

- Purchasing
- Engineering
- Sales
- Suppliers
- Other



Cost Engineer



- ***The Cost Engineer has expertise in all things that impact the cost of the PCBA***
- ***In electronics, the cost engineer is frequently seen as the SME in component cost due to our interaction with component characteristics and costs.***

Treat cost as a design parameter – just like the technical parameters (i.e. voltage, current, power, etc.)