

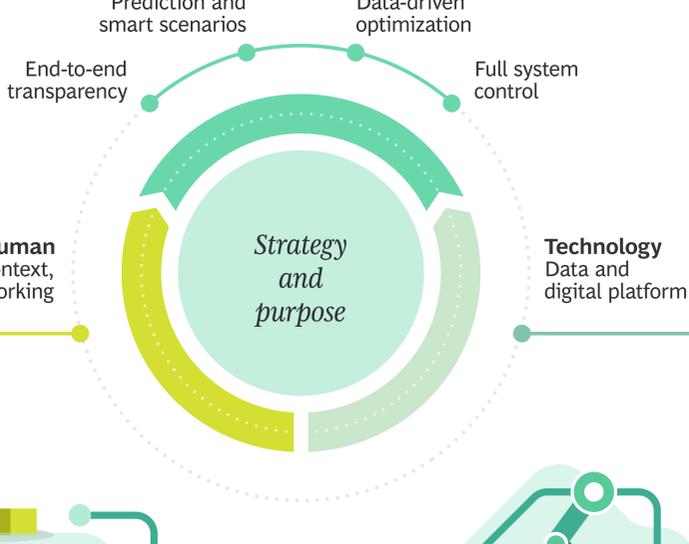
Bionic Supply Chains Power a New Operating Model

Bionic supply chains use technology to augment human decision making. By empowering people with technology, companies can change how they operate their supply chains—enabling faster, better integrated, and more precise decisions.



HOW BIONIC SUPPLY CHAINS GENERATE VALUE

Bionic supply chain outcomes



The typical operating model entails sequential decision making optimized for specific parts of the supply chain.



In a bionic supply chain, the operating model enables integrated decisions across silos, taking into account impact over the entire supply chain.



This improves the speed and quality of the decisions, as well as the supply chain's resilience and performance.



The new operating model is powered by an interconnected set of bionic solutions at scale.

BIONIC SOLUTIONS

Supply chain strategic design

- Portfolio analysis and complexity reduction
- Network optimization
- Flow system optimization

Dynamic integrated business planning

- AI-based demand forecasting
- Scenario-based planning
- Short-term demand sensing

End-to-end optimization

- Track and trace
- Optimizing logistics, production, quality, and scheduling

End-to-end visibility and orchestration

Control tower

Digital twin

Network simulation

Integrated decision making

Smart order management

Dynamic pricing and promotion

Customer capacity allocation

A BIONIC SUPPLY CHAIN DELIVERS TANGIBLE VALUE



Strategic planning
Raise capex-planning efficiency



Sales and ops planning
Balance demand and supply allocation
Optimize inventory and material flows
Improve maintenance planning



Weekly planning
Improve order prioritization
Reduce inventory while improving service
Minimize idle time on assets



Execution
React fast to flow issues
Enhance individual asset performance
Decrease logistics costs
Boost delivery performance

Revenue **4–6%**
increase in demand met

Service **5–30 percentage points**
boost in customer service level

EBITDA **2–4 percentage points**
rise in profitability

Working capital **15–30%**
reduction in inventory

Supply chain costs **10–20%**
decrease in manufacturing, warehousing, and distribution costs

Carbon footprint **>5%**
reduction (dependent on industry)

CREATING A BIONIC SUPPLY CHAIN

Start by understanding and prioritizing consumer and business needs. Then turn to building both human and technological capabilities, which are equally important in addressing these needs.



Dynamic platform organization



New ways of working



Bionic leadership models



New-world skills



Exponential learning



Integrated ecosystems

On the technology side, implement an architecture that lets you tap into the power of data, artificial intelligence (AI), and new technologies. Data and digital platforms enable the deployment of new solutions in a modular, scalable, and agile way.

On the human side, build people's capabilities to apply the new technologies, as well as actively adopt new ways of working.

Modular architecture

Layered and decoupled design

Data liberated from core systems

Data managed as an asset

World-class technology function

DELIVERING VALUE ACROSS INDUSTRIES

Leading companies are transforming their operating model and building bionic supply chain capabilities



A global biopharma company is building an advanced analytics capability for its supply chain. The benefits include run-rate cost savings of **\$50 million** and inventory reduction of **\$750 million**.



A leading steel player has transformed its entire supply chain for competitive advantage. The benefits include a **2 to 4 percentage-point** boost in EBITDA and a doubling of customer service levels.



A global consumer goods player is leveraging AI to boost productivity and unlock value. The benefits include a **10% to 20%** improvement in forecasting accuracy and a **50%** reduction in the duration of the planning cycle.

THREE GUIDING PRINCIPLES

Companies should follow these three principles in creating bionic supply chains:



Human-Led Prioritization

Focus on how you want to improve human decision making to capture value. Then look for the technology that can promote those improvements.



An Integrated Roadmap

Plan for a continually evolving integrated system. Adopt a systemic approach that identifies how each solution augments the power of the entire supply chain.



Dynamic Capability Building

Teach people how to make decisions in parallel and rapidly convert information into actionable insights. Establish centers of excellence that support continuous learning.

Companies that succeed in applying bionic principles to gain mastery over their supply chains will be well positioned to evolve in response to complexity and uncertainty

Source: BCG analysis and case examples.



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