Raising the Bar
Benchmarking Best Practices in Modern Manufacturing

July 2025

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Benchmarking Best Practices in Modern Manufacturing
Your Presenters

Forvis Mazars Benchmark Team

Jonathan S. Stomberger | Benchmarking & Process Optimization – Partner

jonathan.stomberger@us.forvismazars.com

Shree Mukhopadhyaya| Benchmarking & Process Optimization – Senior Manager

Shree.mukhopadhyaya@us.forvismazars.com

Brett Johnson | Benchmarking & Process Optimization – Manager

brett.johnson@us.forvismazars.com

Learning Objectives

1. Understand how manufacturing organizations can leverage benchmarking to enhance operational performance and competitiveness.

2. Identify pre-requisites and challenges in benchmarking efforts and discuss how to overcome them.

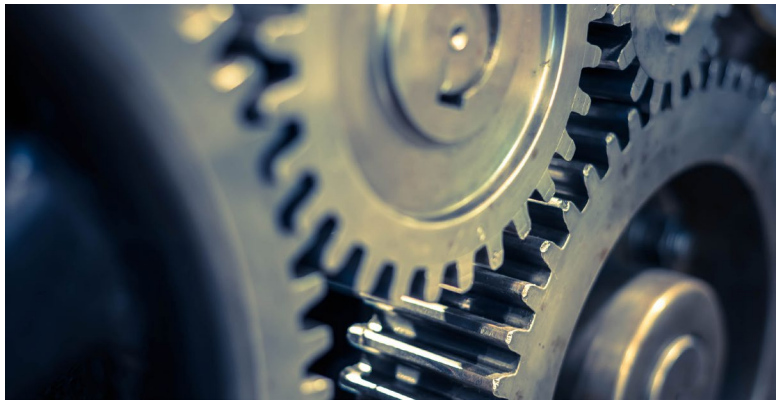
3. Gain insight into the various benchmarking services you can use to optimize your manufacturing/ finance/ supply chain operations.

Benchmarking Best Practices in Modern Manufacturing
Data Trends in Modern Manufacturing

AI & Machine Learning in Modern Manufacturing

AI and Machine Learning are now central to manufacturing operations. They are used to:

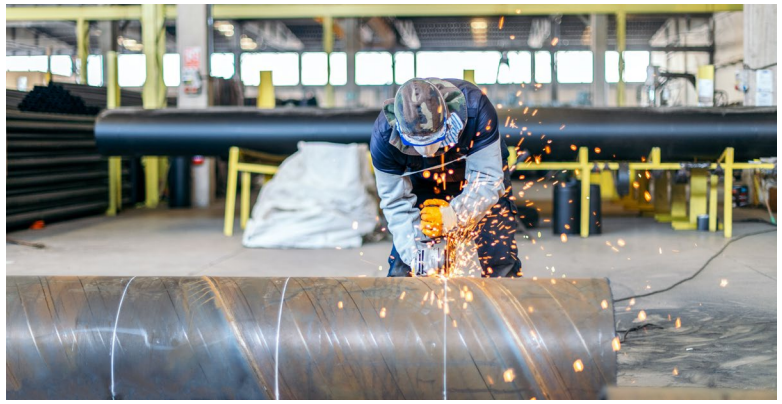
- Predict equipment failures.
- Optimize production schedules.
- Improve product quality through real-time defect detection.



Real-Time Monitoring & Analytics

Manufacturers are increasingly relying on real-time data streams to:

- Monitor production process continuously.
- Detect anomalies instantly.
- Implement predictive maintenance strategies.



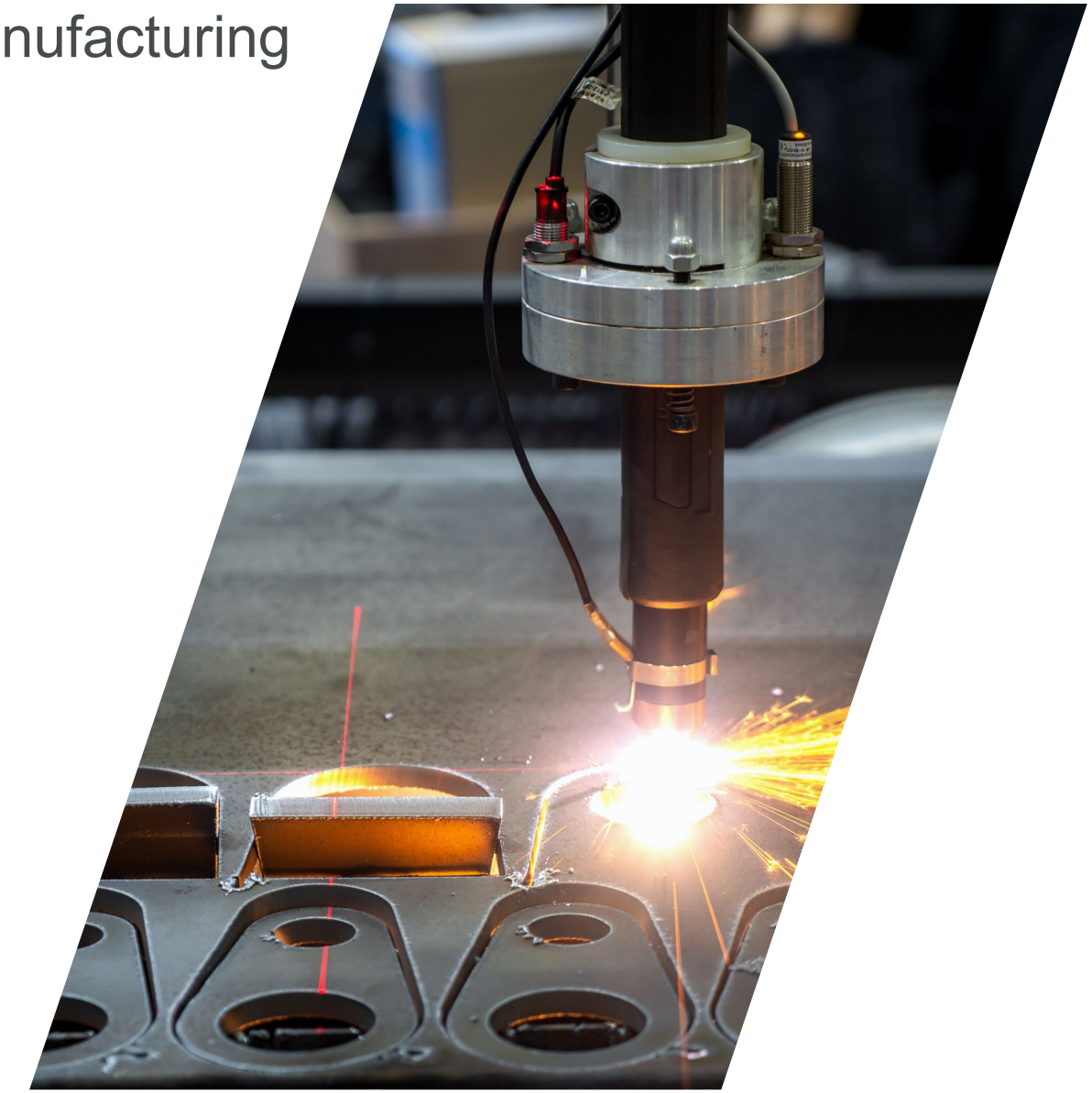
Integration of IoT Sensors

Internet of Things (IOT) is transforming manufacturing operations by:

- Providing deep insights into machine performance.
- Enabling scenario simulations without physical trials.
- Accelerating innovation and reducing costs.

Data Trends in Modern Manufacturing

In the fast-evolving manufacturing sector, setting clear and measurable performance goals is essential for driving operational excellence, maintaining competitiveness, and achieving long-term strategic objectives. These goals serve as a road map for aligning workforce efforts, optimizing production processes, and ensuring consistent quality and efficiency across the value chain. Whether focused on reducing downtime, improving yield, or enhancing sustainability, performance goals provide the structure and motivation needed to continuously improve and adapt in a dynamic industrial landscape.



Performance on Business Goals – Manufacturing Sector

41%

on target/achieved/exceeded business goals for 2024

25%

On target/ exceed competitors'/ peers' performance

**APQC's 2025 Supply Chain Priorities and Challenges: Manufacturing Sector Report; N= 212*

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Data Trends in Modern Manufacturing

Supply Chain in 2025 – Top Priority Areas

89%
Logistics and Inventory Management

86%
Sourcing and Procurement

85%
Supply Chain Planning

81%
Innovation

80%
Order Management

74%
Product Development

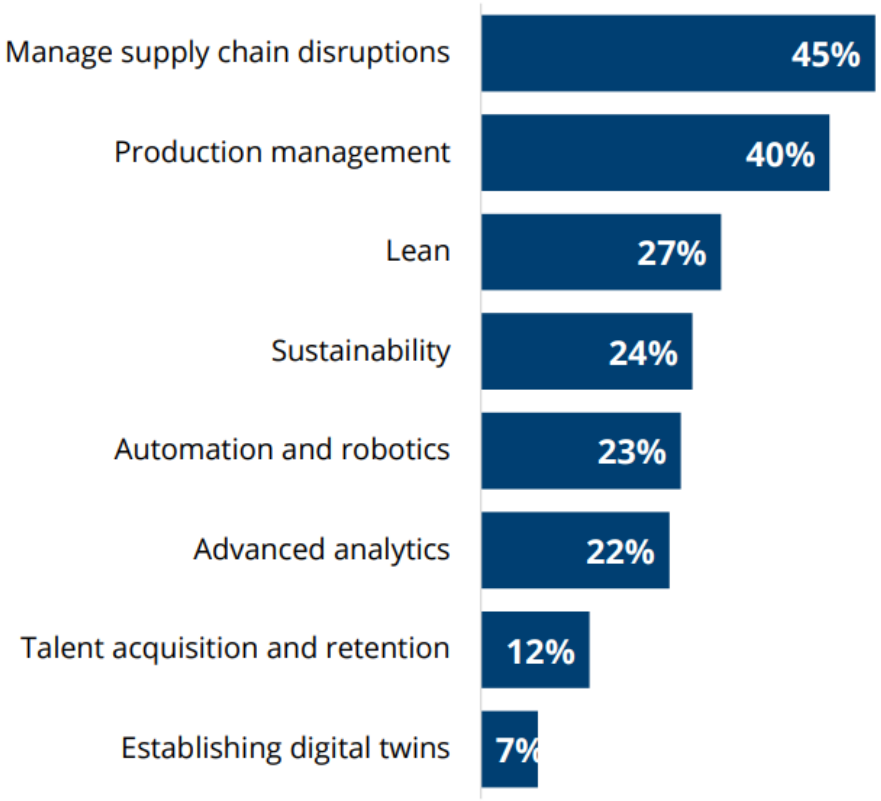
73%
Manufacturing

**APQC's 2025 Supply Chain Priorities and Challenges: Manufacturing Sector Report; N=210*

Benchmarking Best Practices in Modern Manufacturing

Data Trends in Modern Manufacturing

Supply Chain in 2025 – Top Priority Areas (Manufacturing Specifically)



Demographics

Top Industries	
Consumer Products/Packaged Goods	20%
Industrial Products	17%
Pharmaceutical	11%
Automotive	11%
Petroleum/Chemical	11%
Aerospace	10%
Mining	10%
Electronics	9%

Annual Revenue (in USD)	
Less than $500 million	2%
$500 million to less than $1 billion	28%
$1 billion to less than $5 billion	33%
$5 billion to less than $10 billion	17%
$10 billion to less than $20 billion	8%
$20 billion or higher	12%

**APQC's 2025 Supply Chain Priorities and Challenges: Manufacturing Sector Report; N=153*

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Benchmarking Best Practices in Modern Manufacturing
Benchmarking 101

What is data benchmarking and how do I get started?

Key Components of Data Benchmarking:

- **Data Collection** – Gather relevant data from internal systems, *e.g.*, ERP, or other external sources.
- **Selection of Benchmarks** – Chose the benchmarks or KPIs to compare against, *e.g.*, industry standards, competitor performance, internal best practices.
- **Analysis and Comparison** – Analyze gaps between your current performance and the benchmark to identify strengths and weaknesses.
- **Action Planning** – Use insights to set improvement goals, optimize processes, and track progress over time.

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Benchmarking Best Practices in Modern Manufacturing
Benchmarking 101

Why Should I Benchmark?

Benchmarking is an essential strategy for manufacturing companies, enabling them to remain competitive, boost efficiency, and foster innovation. At its core, benchmarking helps identify performance gaps by comparing a company's processes, products, and metrics against peers, industry leaders, or best practices. Even industry leaders who have implemented best practices can compare against their own historical performance and instill a culture of continuous improvement. Such comparison highlights areas of underperformance and opportunities for improvement. It can also uncover inefficiencies in production lines, supply chains, or resource usage—insights that, when acted upon, can lead to cost reductions, faster production cycles, and more effective resource management.

Benchmarking Best Practices in Modern Manufacturing
Benchmarking 101

Top 4 Challenges with implementing good benchmarking practices

1 Data Inconsistency and Quality Issues

- **Challenge:** Absence of data, data with multiple and inconsistent definitions across plants or systems, and/or data in varying formats or with different levels of accuracy.
- **Impact:** Makes it difficult to compare apples to apples or have the ability leading to misleading benchmarks or incorrect conclusions.

2 Limited Access to Industry Benchmarks

- **Challenge:** Reliable external benchmarks, *e.g.*, from competitors or industry leaders, are often proprietary or hard to obtain.
- **Impact:** Manufacturers may rely to heavily on internal comparisons, missing broader performance insights.

3 Resistance to Change

- **Challenge:** Teams may resist benchmarking results if they feel judged or if the data is misunderstood.
- **Impact:** Can lead to poor adoption of improvement initiatives or misaligned priorities.

4 Misinterpretation of Results Leading to Inaction

- **Challenge:** Teams may misinterpret the root cause of under or outperformance against benchmarks due to inaccurate or inadequate definition of KPIs.
- **Impact:** Jumping to conclusions by interpreting data without proper strategic and analytical guidance can lead to inaction or, worse, allocation of resources to the wrong problem..

Benchmarking Best Practices in Modern Manufacturing
Benchmarking 101

Benefits of Data Benchmarking

Monitor Business Performance

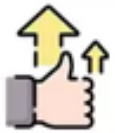
Increases Productivity

Increases Efficiency in Business Processes

Supports Scalability

Improved Multi-Process Coordination

Power to Make Fact-Based Decisions



Critical Competitive Advantage

Improves Customer Relationships

Lowers Maintenance Costs

Business Transformation

Benchmarking Best Practices in Modern Manufacturing
High-Performing KPIs

High-performing manufacturing organizations tend to focus on KPIs that go beyond basic efficiency—they zero in on metrics that drive strategic growth, operational agility, and customer satisfaction. Here are some of the most critical ones they track:

Strategic & Operational KPIs

Strategic KPIs are metrics used to track progress towards long-term goals and business objectives. Operational KPIs focus on short-term performance and day-to-day activities.

Agility & Innovation

Agility KPIs measure a manufacturing organizations ability to respond quickly and effectively to change. Innovation KPIs assess how effectively a manufacturing organization is investing in and executing new ideas, technologies, or processes.

Cost & Profitability

Cost metrics measure the efficiency and financial impact of manufacturing operations. Profitability metrics assess how effectively a manufacturing operation converts inputs into financial gain.

Sustainability & Safety

Sustainability KPIs measure a manufacturer’s environmental and social impact. Safety KPIs track the effectiveness of health and safety programs, aiming to reduce workplace incidents and protect employees.

Quality & Continuous Improvement

Quality KPIs measure how well manufacturing processes meet product specifications and regulatory standards. Continuous Improvement KPIs track the effectiveness of initiatives aimed at enhancing processes and increasing efficiency over time.

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Benchmarking Best Practices in Modern Manufacturing
Standard Manufacturing KPIs

The following is a list of standard KPIs often benchmarked against in Modern Manufacturing.

Cycle Time

The total time to produce a product from start to finish.

- Engineering to Order Cycle Time
- Engineering Change Order (ECO) Cycle Time

Yield

The percentage of products produced correctly without rework.

- Finished-product first-pass quality yield for primary products

On-Time Delivery

Tracks the percentage of orders delivered on or before the promised date.

Downtime

Measures the amount of time production is halted due to equipment or process issues.

- Unplanned machine/equipment downtime as a percentage of scheduled run time

Inventory Turnover

Indicates how often inventory is sold and replaced over a period.

- Raw material inventory turns
- Work-in-process (WIP) inventory turns

Scrap Rate

The percentage of materials and labor hours wasted during production.

- Scrap and rework costs as a percentage of sales
- Scrap and rework costs as a percentage of cost of goods sold

Benchmarking Best Practices in Modern Manufacturing

The Benchmark Process

End-to-End Benchmarking Process

Determine Benchmark Needs

- Identify what you want to benchmark
- Determine which factors are influencing your organizations desire to benchmark
- Conduct interviews with key stakeholders to identify underperforming focus areas

Select Benchmark Approach

- Assess whether internal or external benchmarking is more suitable for the organization's goals
- Select relevant KPIs and performance indicators

Gather Organization Data

- Gather data from internal systems (ERP, MES) or external sources
- Ensure data is consistent, complete, and timely

Perform Analysis of Data

- Stratify and normalize data to ensure equivalency
- Use statistical summaries (mean, median, standard deviation)
- Visualize data using charts (bar, line, box plots) to identify trends and outliers

Review Findings and Critical Points

- Identify performance gaps and actionable next steps
- Inform and align teams within the organization
- Implement change
- Continuous improvement

Benchmarking Best Practices in Modern Manufacturing
Determine Benchmark Needs

Factors That Cause Manufacturing Organizations to Benchmark

Performance Visibility

Manufacturing leaders want clear, data-backed insights into:

- How operations compare to competitors
- Which plants or teams are underperforming
- Where to focus improvement efforts

Benchmarking pinpoints gaps using data rather than gut instinct

Investment Decisions

Leaders in manufacturing organizations are using benchmarking to:

- Justify capital investments, *e.g.*, automation & new tech
- Prioritize high-impact initiatives
- Align operations with long-term business goals

Benchmarking enables leaders to prioritize and allocate resources based on ROI

Competitive Advantage

Leaders are using benchmarking to:

- Stay ahead of industry trends
- Adopt best practices from top performers
- Strengthen market position

Benchmarking reveals where your organization stands and how to lead

Cost Pressure

With rising costs and global competition, leaders are motivated to:

- Identify inefficiencies
- Reduce waste and down-time
- Optimize resource utilization

Benchmarking helps uncover hidden cost-savings opportunities

Benchmarking Best Practices in Modern Manufacturing
Select Benchmark Approach

Internal Benchmarking

Internal benchmarking is the process of comparing performance, processes, or practices within the **same organization – across different departments, plants, or teams**.

- Helps uncover what's working well in one department, plant, or production line and enables **replication of successful methods** across the organization.
  - Example: If one plant has significantly lower defect rates, internal benchmarking can reveal the quality control methods they use.
- Highlights inefficiencies or bottlenecks in **underperforming areas** and encourages lean manufacturing by comparing usage, cycle times, and down time.
  - Example: Comparing OEE (Overall Equipment Effectiveness) across lines can pinpoint where equipment is underutilized.

External Benchmarking

External benchmarking is the process of comparing your organization's performance, processes, or practices against **other companies or industry standards** to identify gaps and opportunities for improvement.

- Understand how your performance stacks up **against competitors** or industry standards, identify emerging trends, technologies, and best practices.
  - Example: Learning how top automotive manufacturers reduce energy consumption per unit produced.
- Use external data to set **performance targets** that are ambitious yet achievable.
  - Example: If your competitor achieves 95% OEE and you're at 85%, that sets a clear improvement target.
- External comparisons often **reveal blind spots** that internal benchmarking might miss.
  - Example: Realizing your cost per unit is significantly higher than the industry average, prompting a review of procurement or production processes.

Benchmarking Best Practices in Modern Manufacturing

Gather Organizational Data

Best Practices

Gathering accurate and consistent data is the foundation of any successful benchmarking initiative. Without reliable data, even the most well-intentioned and executed comparisons can lead to flawed conclusions and missed opportunities.

Define Clear Objectives

Standardize Data Collection Methods

Use Reliable and Integrated Data Sources

Ensure Data Quality and Accuracy

Maintain Data Security and Confidentiality

Collect Data Over a Meaningful Time Period

Involve Cross-Functional Teams

Benchmarking Best Practices in Modern Manufacturing
Analysis of Organizational Data

Stratification Is Critical When Performing an Analysis of Your Organizational KPIs

Stratifying your benchmarks—organizing benchmarking data into meaningful categories like industry, size, geography, or operational scale—is essential for making your comparisons accurate, relevant, and actionable

- NAIC Code or Equivalent – North American Industry Classification (NAIC) code is a standard code used by business and governments in the United States, Canada, and Mexico to classify and analyze economic activities across industries. Stratifying by NAIC code ensures you are comparing your organization to **others in the same industry**, making benchmarks more meaningful and actionable.

- Revenue – Stratifying by revenue allows you to compare performance metrics (like cost per unit, OEE, or headcount efficiency) among **similarly sized peers**, making the insights more relevant.

- FTE (*Full-Time Equivalent*) Counts – Stratifying by headcount ensures you are comparing organizations with **similar operational scale**, which affects productivity, communication, and resource allocation.

- Geographic Location – Stratifying by geography ensures you are comparing performance against peers facing **similar economic conditions**. Comparing facilities or companies in **similar labor markets** provides more realistic benchmarks for productivity and staffing.

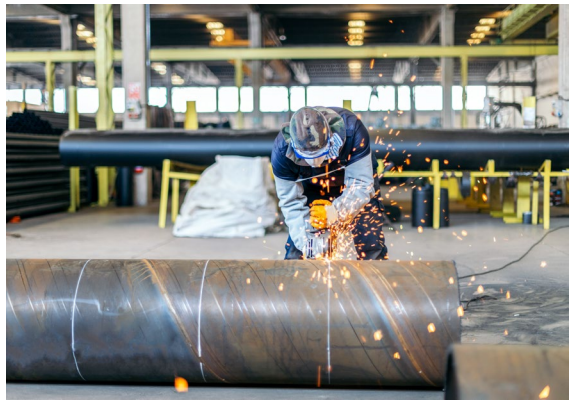
Benchmarking Best Practices in Modern Manufacturing
Review Findings & Critical Points

Identify Actionable Items

- Analyze the benchmarking data to identify performance gaps
- Highlight areas where performance is below internal or external benchmarks
- Interpret performance gaps incorporating context and company specific situations
- Translate findings into specific, measurable actions

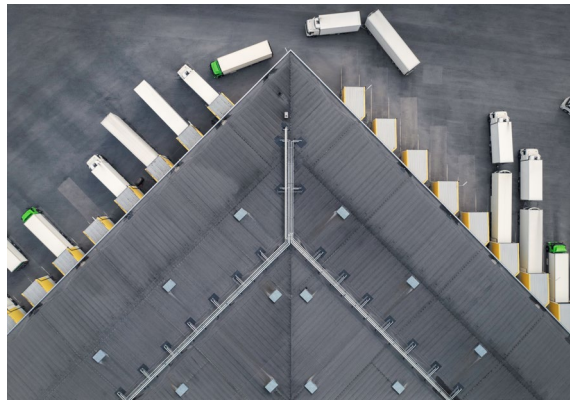
Inform & Align Teams

- Involve process owners, team leads, and operators to validate findings
- Gather input on practical challenges and potential solutions.
- Create an improvement road map with timelines, resources, and KPIs
- Include short-term wins and long-term improvements



Implement Change

- Develop a list of specific workstreams with action items under each work stream
- Designate responsible individuals or teams for each action item
- Develop SOPs, updated policies, and other documentation to ensure people are trained and empowered to implement changes in the road map



Continuous Improvement

- Regularly update external benchmarks to ensure relevance
- Track progress against internal benchmarks over time
- Adapt benchmarking goals and strategies based on new data and evolving standards

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Benchmarking Best Practices in Modern Manufacturing

Case Studies

Benchmarking for Efficiency

Background:

The company provides electronic manufacturing services to highly regulated Industries including military, aerospace, medical, and industrial sectors. To improve product quality, profitability, and on-time delivery, the company performed a detailed benchmarking assessment by undertaking the following steps:

- Utilized APQC's Open Standards Benchmarking (OSB) in Manufacturing to compare their performance against industry peers
- Completed APQC's comprehensive Manufacturing Open Standards Benchmarking Assessment using standardized data collection instruments
- Changed the design of their work cells minimizing flat surfaces, adding shadow boards for tools and Kanban system for work cells
- Implemented Class 3 certification for shop floor employees and peer training

Benefits:

- Enhanced efficiency through elimination of non-value-added activities
- Improved quality metrics aligned with industry best practices
- Streamlined manufacturing processes based on peer comparisons
- Received prestigious Association for Manufacturing Excellence award in 2013 for commitment to continuous improvement

Benchmarking for Scale

Background:

The company supplies healthcare-related PPE products industries including military, aerospace, medical, and industrial sectors. This fifth-generation family-owned company needed to rapidly scale production to meet critical healthcare worker needs when Covid hit in 2020. Toyota reached out offering help to the organization free of charge, leading to Toyota Production System Support Center (TSSC) working with the company to reduce cycle time.

By benchmarking against Toyota Production System (TPS) principles and practices and with training from TSSC, the company identified their bottlenecks and areas where best practices needed to be implemented.

Benefits:

- Face Shields: 700% increase in production between in one month
- Respirators: 200% increase in production capacity for respirators and significantly reduced the time from customer order to shipment
- Hoods: 200% increase in production capacity for hoods by mobilizing workers to create a new sewing line, with new employees not needing prior sewing experience

Benchmarking Best Practices in Modern Manufacturing
Forvis Mazars Benchmarking Services With APQC

APQC (American Productivity & Quality Center) is a globally recognized nonprofit organization that helps organizations improve productivity and performance through benchmarking, best practices, process improvement, and knowledge management.

Forvis Mazars and APQC together offer powerful benchmarking capabilities. APQC provides a rich database of industry benchmarks and best practices, while Forvis Mazars applies these insights through tailored consulting to help organizations improve performance and efficiency. Their collaboration enables data-driven decision making and continuous improvement across key business functions.

Benchmarking Strategy

Benchmarking strategy services serve as a critical first step in an organization's performance improvement journey. These **services help define clear objectives**, select relevant metrics, and establish the right context for meaningful comparisons. As a precursor to both on-demand benchmarks and comprehensive benchmark assessments, strategy services ensure that organizations are well-prepared to interpret results and act on insights.

On-Demand Benchmark

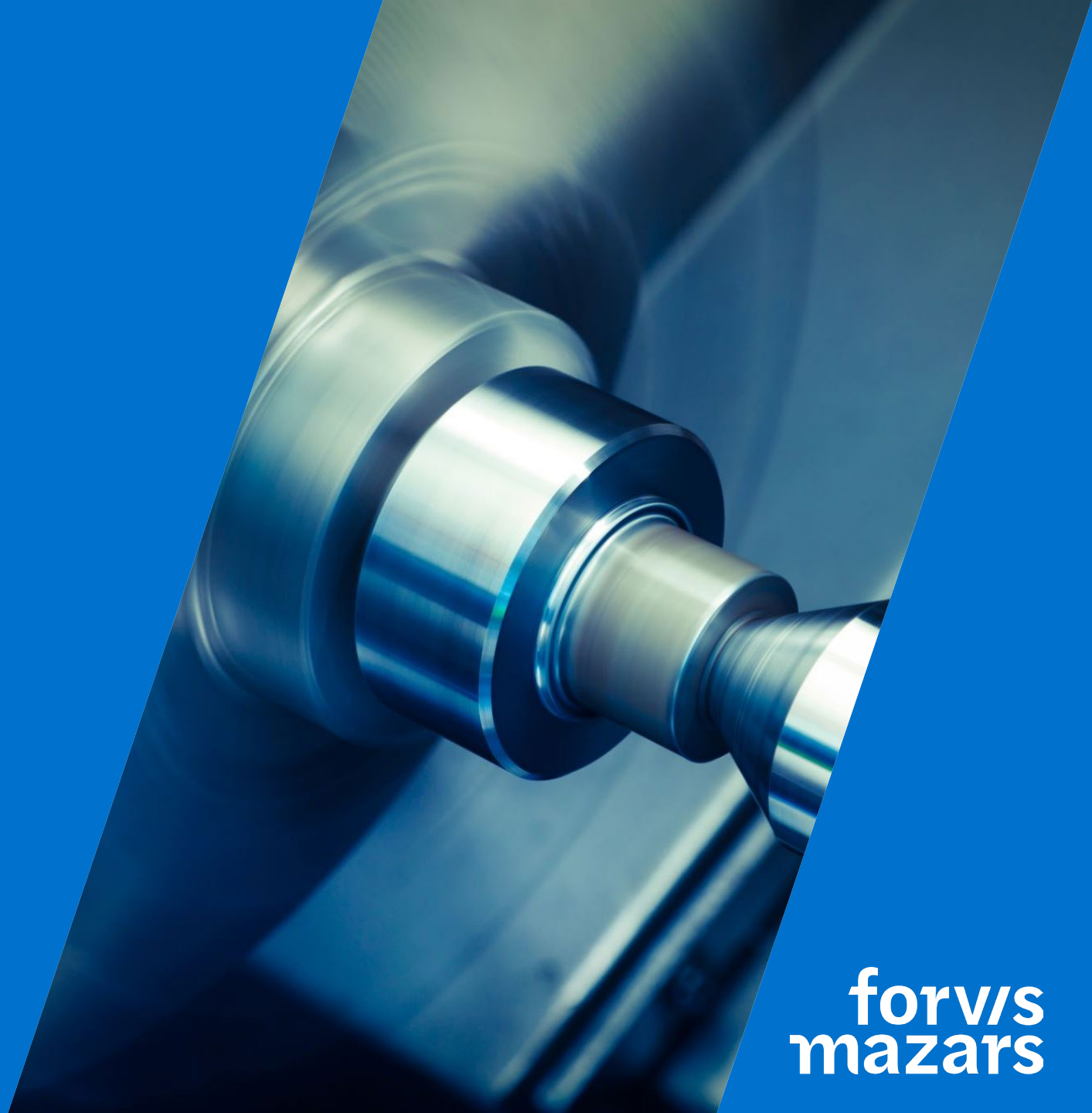
On-demand benchmark services offer organizations a **fast, flexible way to access performance data** without the need for a full-scale assessment. Through partnerships like the one between Forvis Mazars and APQC, clients can request targeted benchmarks—such as KPIs for financial consolidation or supply chain efficiency—tailored to their industry, size, and geography. These services are ideal for companies seeking quick insights to support business cases, validate internal performance, or guide strategic decisions.

Benchmark Assessments

Benchmark assessment services provide a deeper, **more comprehensive evaluation of organizational performance** compared to on-demand benchmarking tools. While on-demand benchmarks offer quick comparisons against high-level metrics, benchmark assessment services go further by using standardized measures, validated data sets, and expert analysis to uncover root causes of performance gaps.

Questions?

Thank You



Contact

Forvis Mazars

Jonathan Stomberger
Partner
P: 717.487.8544
jonathan.stomberger@us.forvismazars.com

Shree Mukhopadhyaya
Senior Manager
P: 224.460.8634
shree.mukhopadhyaya@us.forvismazars.com

Brett Johnson
Manager
P: 215.570.9958
brett.johnson@us.forvismazars.com

Appendix

Forvis Mazars

Overview

With a legacy spanning more than 100 years, Forvis Mazars is committed to providing a different perspective and an unmatched client experience that feels right, personal and natural. We respect and reflect the range of perspectives, knowledge and local understanding of our people and clients. We take the time to listen to deliver consistent audit and assurance, tax, advisory and consulting services worldwide.

We nurture a deep understanding of our clients' industries, delivering greater insight, deeper specialization and tailored solutions through people who listen to understand, are responsive and consult with purpose to deliver value.

Deep industry understanding

Forvis Mazars' deep understanding of industry-specific environments, issues and trends helps us anticipate and address evolving needs to prepare you for strategic opportunities ahead.

Every industry is different, and we put a strong focus on specific industry experience and knowledge of your complex and evolving environment. We provide a range of audit and assurance, tax, advisory and consulting services to help your business by bringing together experienced professionals from all over the globe who understand local contexts and cultures.

We serve global industries including:

- Financial Services
- Manufacturing & Distribution
- Technology, Media & Telecommunications
- Life Sciences
- Private Equity

$5B
combined revenue (2023)

100+
combined countries, territories & markets

400+
combined offices & locations

1,800+
combined partners

40,000+
combined team members

forvismazars.com/global

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U.S. Presence

Top 10
U.S. Public Accounting Firm*

$2bn
Revenue (2023)

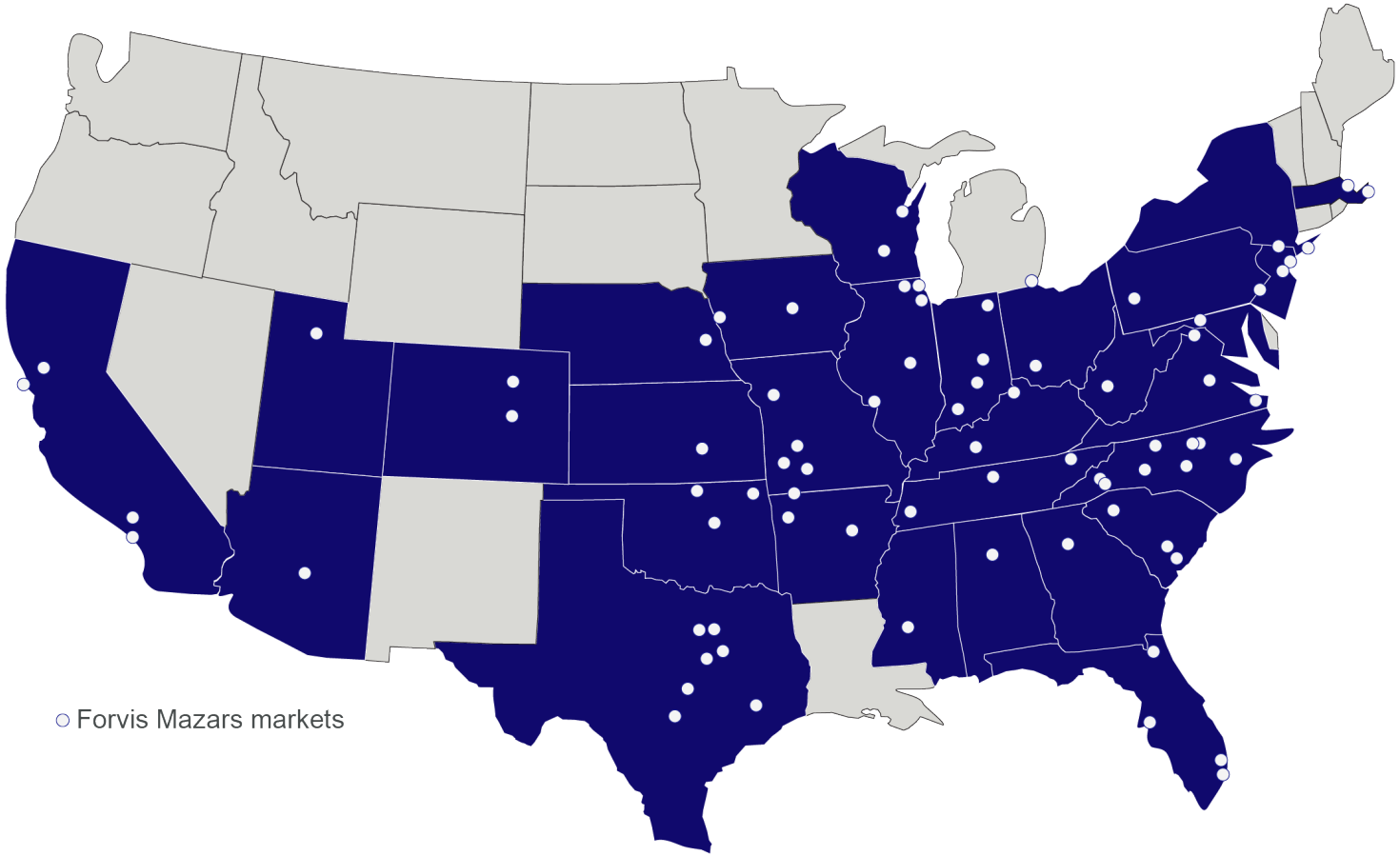
79
Markets

28
States

600+
Partners & Principals

7,000+
Employees

*Source: Inside Public Accounting, based on most recent rankings
2023 combined revenues: FORVIS $1.7bn, Mazars USA (expected) $305M



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Global Presence

Top 10
Global Network*

$5bn
Combined Revenue (2023)

100+
Combined Countries & Territories

400+
Combined Offices & Locations

1,800+
Combined Partners

40,000+
Combined Employees

* Source: IAB World Network rankings, based on most recent rankings

2023 revenues: FORVIS $1.7bn (€1.6bn), Mazars (expected) $3bn (€2.8bn)

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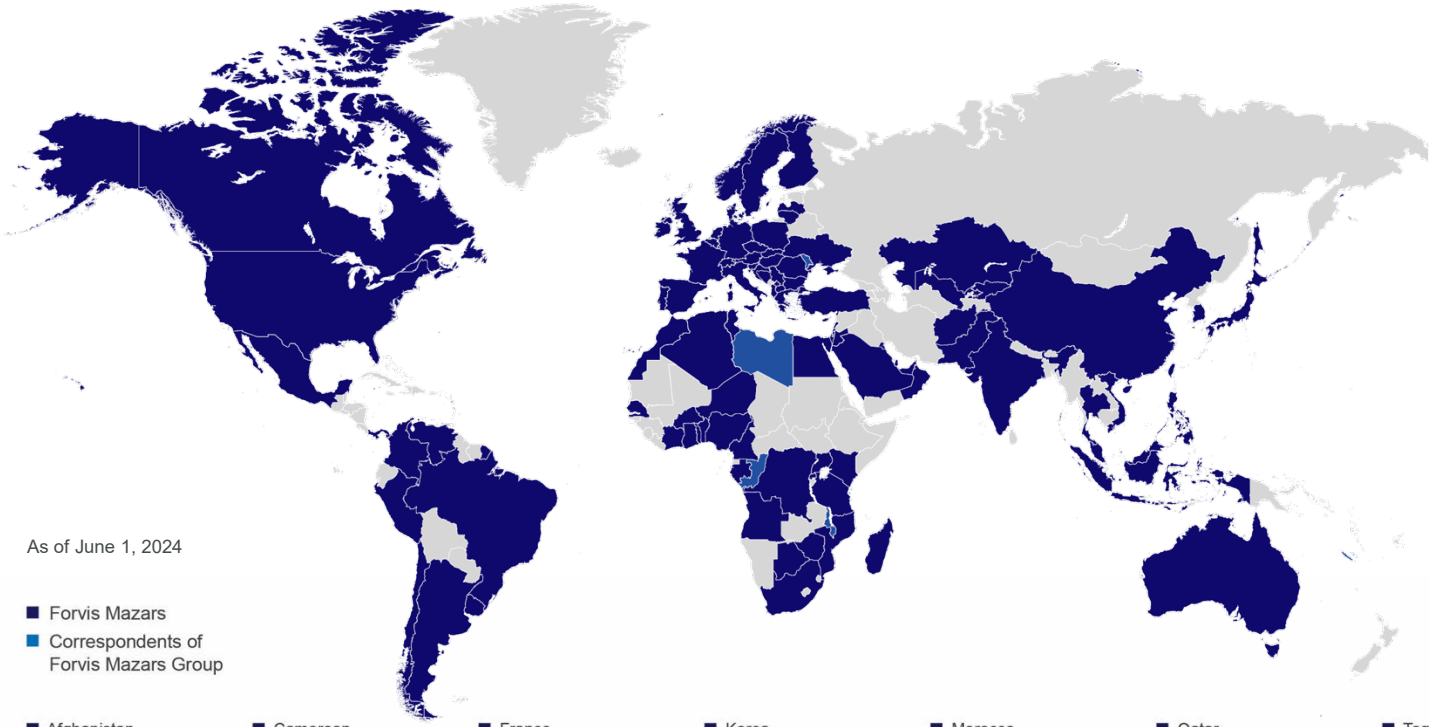

- Afghanistan
- Albania
- Algeria
- Angola
- Argentina
- Australia
- Austria
- Bahrain
- Belgium
- Benin
- Bermuda
- Bosnia and Herzegovina
- Botswana
- Brazil
- Bulgaria
- Burkina Faso
- Cameroon
- Canada
- Cayman Islands
- Chile
- China
- Colombia
- Congo
- Côte d'Ivoire
- Croatia
- Cyprus
- Czech Republic
- Democratic Republic of the Congo (DRC)
- Denmark
- Egypt
- Finland
- France
- Gabon
- Germany
- Ghana
- Greece
- Hong Kong
- Hungary
- India
- Indonesia
- Ireland
- Israel
- Italy
- Japan
- Jordan
- Kazakhstan
- Kenya
- Korea
- Kosovo
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- Sweden
- Switzerland
- Taiwan
- Tanzania
- Thailand
- Togo
- Tunisia
- Türkiye
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- United States
- Uruguay
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- Venezuela
- Vietnam
- Zimbabwe

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