

Introduction

2018 MPI Manufacturing Study

Please answer all questions to the best of your ability and based on your manufacturing facility. The survey will take 15-20 minutes to complete. If answering at a corporate level, please complete a survey for each plant or provide answers typical to all of your plants. The survey deadline is Dec. 18, 2017.

To receive an Executive Summary of this year's study findings and free online access to customizable benchmarks from four years of the study data, please provide contact information at the end of the questionnaire.

Screener

A. In what industry does your company participate?

Manufacturing

Wholesale

Retail

Services

Government or non-profit

Other

B. How familiar are you with your company's manufacturing practices and production measurements?

Extremely familiar

Very familiar

Fairly familiar

Somewhat familiar

Not familiar at all

C. Which of the following best describes your title?

Chairman, President, or CEO

COO or comparable

Other C-level title

Manufacturing VP, Director, or comparable

VP, Director, or comparable other than manufacturing

Plant/facility/production manager, supervisor, or comparable

Other titles

Block 1

Plant Profile

1. Please indicate if this plant is part of a public or private company:

Public

Private

2. In which country or region is this plant located?

United States

Mexico

Canada

Europe

Asia (not China)

China

Other

3. What is the nature of manufacturing operations for primary products at this plant?

Discrete (measured by numeric quantities)

Process (measured by weight or volume)

Both or hybrid

4. What is the primary product that this plant manufacturers (e.g., axles, software, toys)?

5. What is the primary industry in which this plant participates?

Food manufacturing

Beverage and tobacco product manufacturing

Textile mills

Textile product mills

Apparel manufacturing

Leather and allied product manufacturing

Wood product manufacturing

Paper manufacturing

Printing and related support activities

Petroleum and coal products manufacturing

Chemical manufacturing

Plastics and rubber products manufacturing

Nonmetallic mineral product manufacturing

Primary metal manufacturing

Fabricated metal product manufacturing

Machinery manufacturing

Computer and electronic product manufacturing

Electrical equipment, appliance, and component manufacturing

Transportation equipment manufacturing

Furniture and related product manufacturing

Miscellaneous manufacturing/Other

6. How many years has it been since plant start-up?

Less than 5 years

5 - 10 years

11 - 20 years

More than 20 years

7. Which criterion below best describes the volume and product mix of your plant's operations?

High volume/High mix

High volume/Low mix

Low volume/High mix

Low volume/Low mix

8. What is the approximate annual revenue of the plant's corporate parent for 2017?

— report in U.S. dollars

— do not use \$ or punctuation

9. What is the approximate annual revenue of this plant for 2017?

— report in U.S. dollars

— do not use \$ or punctuation

— if plant is a cost center, please report as the value of shipments

10. How much progress has the plant made toward achieving world-class manufacturing status?

No progress

Some progress

Significant progress

Fully achieved

Block 2

Human Resources and Leadership

11. How important is human-resource management to your plant’s success over the next five years?

- Not important
- Minor importance
- Somewhat important
- Important
- Highly important

12. Approximately how many employees (all staff) are at this plant in 2017?

13. What percentage of plant employees are the following?

Frontline production associates	0
Material handling personnel	0
Quality control personnel	0
Supervisors and managers	0
Maintenance personnel	0
Other personnel	0
Total	0

14. What percentage of plant production workers are represented by a union(s)?

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100%

15. What is the plant's annual labor turnover rate for the most recent year? (number of voluntary and involuntary separations ÷ typical staffing level)

16. What percentage of production employees participate in empowered or self-directed work teams?

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100%

17. What are the average annual hours of formal training received by each plant employee?

- Less than 8 hours
- 8-20 hours
- 21-40 hours
- More than 40 hours

18. What percentage of positions have documented skill standards supported by training aligned with those standards?

- 0%
- 1-25%
- 26-50%

51-75%

76-99%

100%

19. How difficult is it for this plant to find the skilled workers it needs?

Not at all difficult

Somewhat difficult

Very difficult

Impossible

20. What are the approximate wages for production employees?

— report U.S. dollar hourly rate without overtime

Average wage \$

Starting wage \$

21. Which of the following human-resource practices/programs are used at this plant? (check all that apply)

Formal employee training program

Apprenticeship program

Teaming/team-building practices

Leader/supervisor development

Recruiting and hiring program

Paid medical benefits

Paid sick and/or personal days

Formal safety/health program

Paid vacation days

Annual review and raise program

- Employee-ownership options
- Profit or revenue-sharing plan
- Bonus plan
- Education reimbursements
- None of these

**22. For the past year, how many:
— report total for plant**

Job-related injuries and illnesses

Job-related injuries and illnesses resulting in lost work days

23. Please rate the overall quality of leadership at your plant:

- Poor
- Fair
- Good
- Very good
- Excellent

24. How would you rate your plant's bench strength (supply of capable leaders) to fill critical leadership roles over the next three years?

- Very weak
- Weak
- Adequate
- Strong
- Very strong

Operations

25. Please indicate which of the following improvement methodologies are followed at the plant: (check all that apply)

- Agile Manufacturing
- Lean Manufacturing
- Theory of Constraints
- Six Sigma
- Total Quality Management
- Toyota Production System
- Other methodology(ies)
- No methodology

26. Please describe the depth and breadth of adoption of your chosen methodology(ies)?

- None
- Minimal
- Moderate
- Extensive
- Complete

27. How important is process improvement to your plant's success over the next five years?

- Not important
- Minor importance
- Somewhat important
- Important
- Highly important

28. What percentage of your workforce is fully engaged in your improvement methodology(ies)?

29. Which of these programs and/or practices occur at this plant? (check all that apply)

- Benchmarking
- Total productive maintenance
- Quality certifications (e.g. ISO)
- Continuous-improvement program
- Performance management system
- Open-book management
- Strategy/policy deployment
- Waste elimination (i.e., seven wastes)
- Zero-loss thinking
- Value-stream mapping
- Kaizen events/blitzes
- PDCA problem-solving
- None of these

30. To what extent does production collaborate with the following groups? (check one for each row)

	No or poor collaboration	Fair collaboration	Good collaboration	Excellent collaboration
R&D/product development	☐	☐	☐	☐
Purchasing/procurement	☐	☐	☐	☐
Sales and marketing	☐	☐	☐	☐
Customer service/support	☐	☐	☐	☐
Finance/accounting	☐	☐	☐	☐
Directly with suppliers	☐	☐	☐	☐
Directly with customers	☐	☐	☐	☐

31. Please estimate the following operation/production measures for your plant:

Manufacturing cycle time (hours from start of plant production to completion of primary product)

Current year

3 years ago

On-time delivery rate (% of goods delivered on time)

Current year

3 years ago

Perfect delivery rate (% of goods on time to customer-requested date, perfect quality, and to all customer specifications)

Current year

3 years ago

Finished-product first-pass quality yield (% of product that passes final inspection)

Current year

3 years ago

Scrap and rework (as % of plant sales)

Current year

3 years ago

Warranty costs (as % of plant sales)

Current year

3 years ago

32. How has total production output (unit volume) changed in the past 12 months?

- Decreased more than 20%
- Decreased 10-20%
- Decreased 1-10%
- Stayed the same
- Increased 1-10%
- Increased 10-20%
- Increased more than 20%

33. What are the plant's costs as a percentage of cost of goods sold (COGS)?

Labor %	0
Overhead %	0
Material %	0
Total	0

34. What is the plant's cost of goods sold as a percent of plant revenue? (annual COGS ÷ annual revenue)

35. What are the approximate sales per employee for the most recent fiscal year?
- include all employees, not just direct labor
 - report in U.S. dollars
 - do not use \$ or punctuation

36. How have per-unit manufacturing costs, excluding purchased materials, changed in the last 3 years?

Decreased more than 20%

Decreased 10-20%

Decreased 1-10%

Stayed the same

Increased 1-10%

Increased 10-20%

Increased more than 20%

37. Which of the following practices are used to manage inventory? (check all that apply)

One-piece flow techniques

Pull systems with kanban signals

Parts/goods supermarkets

Quick equipment changeovers

RFID or real-time inventory tracking

Just-in-time supplier deliveries

Vendor-managed or -owned inventories

None of these

38. What are the plant's inventory turn rates for the following categories of material?

— report turns per year

Raw material (annual COGS ÷ average value of raw material on hand)

Work-in-process material (annual COGS ÷ average value of WIP on hand)

Finished goods (annual COGS ÷ average value of finished goods on hand)

Total inventory (annual COGS ÷ average value of total inventory on hand)

39. Approximately what percentage of the plant's inventory is obsolete?

40. How has the total inventory turn rate changed in the last 3 years?

Decreased more than 20%

Decreased 10-20%

Decreased 1-10%

Stayed the same

Increased 1-10%

Increased 10-20%

Increased more than 20%

41. How have government regulations affected the profitability/cost performance of this plant? (check one in each row)

	Negative effect	No effect	Positive effect
International regulations	☐	☐	☐
Federal regulations	☐	☐	☐
State regulations	☐	☐	☐
Local regulations	☐	☐	☐

Supply Chain

42. How important is supply-chain management to your plant’s success over the next five years?

- Not important
- Minor importance
- Somewhat important
- Important
- Highly important

43. Which of the following best describes your relationship with suppliers and customers? (check one in each row)

	Buy and sell (e.g., cost and quality focus)	Certification (e.g., broad qualifications established)	Cooperation (e.g., sharing product ideas, best practices)	Partnership (e.g., sharing resources, intellectual property, cost savings)
Suppliers	☐	☐	☐	☐
Customers	☐	☐	☐	☐

44. Which of the following criteria are assessed and documented for material/component suppliers? (check all that apply)

- Quality/reliability
- Delivery (to schedule)
- Productivity
- Total cost
- Adherence to specifications
- Service/responsiveness
- Labor practices

- Financial stability
- Ethics
- Environmental performance
- Criteria of supplier's suppliers
- Other
- No criteria

45. How have the following (on a per unit basis) changed in the past 12 months? (check one in each row)

	Decreased more than 10%	Decreased 6-10%	Decreased 1-5%	No change	Increased 1-5%	Increased 6-10%	Increased more than 10%
Price for your products	☐	☐	☐	☐	☐	☐	☐
Component/material costs	☐	☐	☐	☐	☐	☐	☐
Employee wages	☐	☐	☐	☐	☐	☐	☐
Employee benefits	☐	☐	☐	☐	☐	☐	☐
Logistics/transport costs	☐	☐	☐	☐	☐	☐	☐
Utilities/fuel	☐	☐	☐	☐	☐	☐	☐

46. Please estimate the following customer and supplier measures for your plant:

Customer reject rates (parts per million)

Current year

3 years ago

Customer retention rate (% of customers retained from previous year)

Current year

3 years ago

International sales (% of goods sold outside of home country)

Current year

3 years ago

Imported material/components (% of dollar volume purchased from outside home country)

Current year

3 years ago

47. Which of the following supply-chain programs and/or practices are in place? (check all that apply)

Certification of major suppliers

Supplier-management program

Sharing forecasts with suppliers

Collaborative design with suppliers

Customer-satisfaction surveys

Kitting/preassembly for customers

Collaborative design with customers

Access to customer forecasts

None of these

48. What percentage of your company's total output (dollar volume) comes from this plant?

49. What percentage of your company's total output (dollar volume) comes from plants outside of home country?

Block 5

Capacity/Equipment/IT

50. Please estimate the following capacity/equipment measures for your plant:

Production volume (as % of designed plant capacity)

Current year

3 years ago

Machine availability (% of scheduled uptime)

Current year

3 years ago

Overall equipment effectiveness (% machine availability X % quality yield X % of optimal rate that equipment operates)

Current year

3 years ago

Unplanned maintenance (% of total annual maintenance expenses)

Current year

3 years ago

Return on invested capital (net operating profit after taxes ÷ capital invested)

Current year

3 years ago

51. Has your plant adopted an Internet of Things (IoT) strategy?

Yes

Planning an IoT strategy

No

Never heard of the IoT

52. Has an IoT strategy improved plant performance in any of the following areas? (check all that apply)

Safety

Quality

Production costs

Energy usage

Machine uptime

Machine longevity

Other

No improvements recorded by IoT strategy

No IoT strategy

53. Approximately what percentage of your plant's equipment is intelligent (i.e., incorporates technologies that enable machine-to-machine or machine-to-IT-system communications)?

54. Please rate your plant's capability to monitor and measure the following: (check one in each row)

	1= No capability	2	3	4	5= Real-time capability
Process-specific quality	☐	☐	☐	☐	☐
Process-specific productivity (i.e., value vs. waste)	☐	☐	☐	☐	☐
Process-specific pace or speed	☐	☐	☐	☐	☐
Process-specific safety	☐	☐	☐	☐	☐
Process-specific sustainability performance	☐	☐	☐	☐	☐
Location-specific inventory levels	☐	☐	☐	☐	☐
Individual equipment or machine performance	☐	☐	☐	☐	☐
In-plant material-handling performance	☐	☐	☐	☐	☐
External logistics/distribution performance	☐	☐	☐	☐	☐
Supplier performance	☐	☐	☐	☐	☐

55. To what extent is your plant able to track supplies and products in real time at the following? (check one in each row)

	No real-time tracking	Limited real-time tracking	Adequate real-time tracking	Extensive real-time tracking
Original source of materials or ingredients or furthest tier of suppliers	☐	☐	☐	☐
At mid-tier suppliers	☐	☐	☐	☐
At immediate suppliers	☐	☐	☐	☐
Within the plant	☐	☐	☐	☐
En route to customers	☐	☐	☐	☐
At customers	☐	☐	☐	☐

56. To what extent is your plant using 3D printing/additive manufacturing to create the following? (check one in each row)

	No use of 3D printing	Limited use of 3D printing	Moderate use of 3D printing	Extensive use of 3D printing
Equipment replacement parts	☐	☐	☐	☐
Tooling	☐	☐	☐	☐
Product components	☐	☐	☐	☐
Prototypes	☐	☐	☐	☐
Finished products	☐	☐	☐	☐

57. What percentage of your plant's processes incorporate the following technologies?

% that incorporate automation

% that incorporate robotics

% that incorporate automated guided vehicles

58. How are Work Instructions most likely delivered?

Books at the line

Travelers for each order

Electronic

Other

59. Are you using a Digital Twin virtual representation of the product in production or service operations?

Yes

No

60. For which functions are technology (IT) applications and/or systems likely to be purchased or upgraded in the next 12 months? (check all that apply)

Enterprise management

Planning/scheduling

Design/development

Procurement/purchasing

Production/operations

Logistics/distribution

Human resources

Accounting/finance

Supply-chain management

Asset management

Customer service/support

None of these

61. Approximately what percentage of IT systems and applications use cloud computing?

62. What are the following investments/expenses as a percentage of plant sales for the current year, and how is that percentage likely to change next year?

- Capital equipment spending
- Information technology spending
- Process-improvement initiatives
- Employee costs (all wages, benefits, etc.)
- Utilities/energy
- Material and components
- Transportation/logistics costs
- MRO (maintenance, repair, and overhaul) expenses
- SG&A (selling, general, and administrative) expenses
- Research and development
- Other costs

63. How are the following investments/expenses likely to change next year?

	Increase	Same	Decrease
Capital equipment spending	☐	☐	☐
Information technology spending	☐	☐	☐
Process-improvement initiatives	☐	☐	☐
Employee costs (all wages, benefits, etc.)	☐	☐	☐
Utilities/energy	☐	☐	☐
Material and components	☐	☐	☐
Transportation/logistics costs	☐	☐	☐
MRO (maintenance, repair, and overhaul) expenses	☐	☐	☐
SG&A (selling, general, and administrative) expenses	☐	☐	☐
Research and development	☐	☐	☐

Block 6

Green/Sustainability

64. How important is green/sustainability to your plant's success over the next five years?

Not important

Minor importance

Somewhat important

Important

Highly important

65. Which of these Green programs and/or practices occur at this plant? (check all that apply)

Energy management

Recycling/reuse programs

Use of renewable energies

Formal Green corporate program

Carbon footprinting

None of these

66. Please estimate the following customer and supplier measures for your plant:

Green products (% of plant products that are recyclable/reusable)

Current year

3 years ago

Carbon footprints (% of plant products with a documented carbon footprint)

Current year

3 years ago

Green components and materials (% of purchased components and materials that are recycled/regrind/etc.)

Current year

3 years ago

Renewable energy (% of plant energy from a renewable source)

Current year

3 years ago

**67. By approximately what percentage has energy-per-unit-of-product-output changed in the past year?
— report a decrease with a minus (-) symbol**

Block 7

Thank you for completing the MPI Manufacturing Study

To receive your free Executive Summary of this year’s study findings and free online access to customizable benchmarks from study data, please provide the following contact information. You must provide all fields of information. (Your responses to the study will remain confidential; only MPI has access to contact information.)

Name	
Title	
Company	
Email address	