PMA Metalforming Insights Operations Report

July 2022

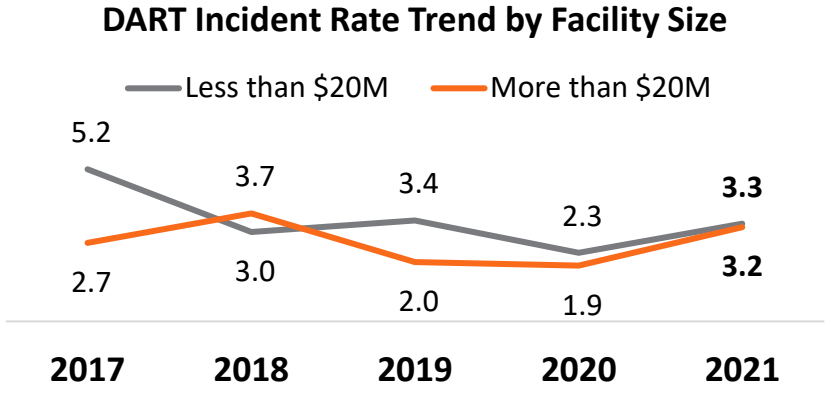
Executive Summary: Setting the Stage

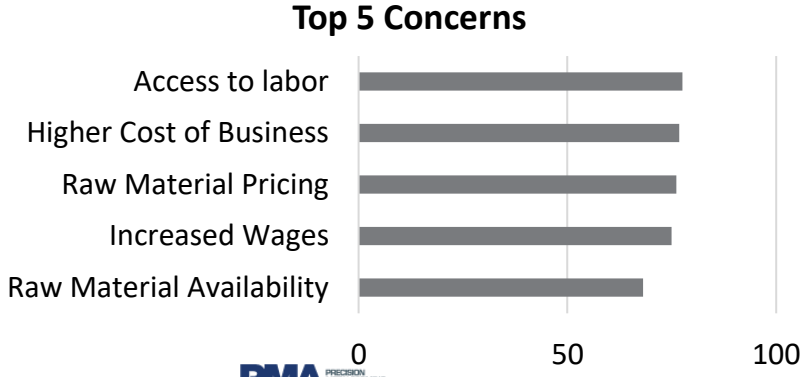
- The first quarter PMA Metalforming Insights survey explored the financial performance of metalformers through 2021 to find overall improved financial performance over 2020 with the return of demand. This second quarter PMA Metalforming Insights survey explores the operational performance of metalforming companies, including differences in those producing at different volume levels and complexity.
- Current market conditions are volatile. Rapidly increasing inflation paired with the Fed's interest rate hikes and fuel prices at record levels are making an impact. Additionally, supply chain and labor issues have not relented. These factors are putting constant pressure on the manufacturing industry. Despite these challenges, consumers are buying vehicles and other durable goods. Demand is softening but the backlogs of vehicles, appliances, and other durable goods are still strong.
- These market conditions are apparent when looking at the lead times experienced by metalformers, which have increased by an average of 83% over pre-pandemic levels. The worst experience has been by suppliers to the medical industry who tend to use more stainless steel, which experienced more severe production issues, and often order in smaller quantities.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Executive Summary: Safety Trend Reverses

- "Safety First" has become an operations mantra, which is why the 2021 reversal in the declining DART incident rate trend up to 3.3 is concerning.
- "Access to labor" being the number one concern for most may be a clue: increased overtime to a point of fatigue, abbreviated on-board training in haste to bring people on, and lax discipline for housekeeping could all be side effects of people shortages leading to poorer safety records. Keeping people safe is necessary to retain and attract labor, so disciplines for safety must be maintained.
- While access to labor is the number one concern, the next three of the Top 5 Concerns in the survey involve higher costs in materials, in wages for scarce labor, and in overall higher costs of doing business likely including energy, freight, shop supplies, and outside services. These higher costs and challenges to get inputs of labor and material are expected to stay a part of doing business, which necessitates pricing adjustments and operations improvements.





PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Executive Summary: Responses to New Conditions

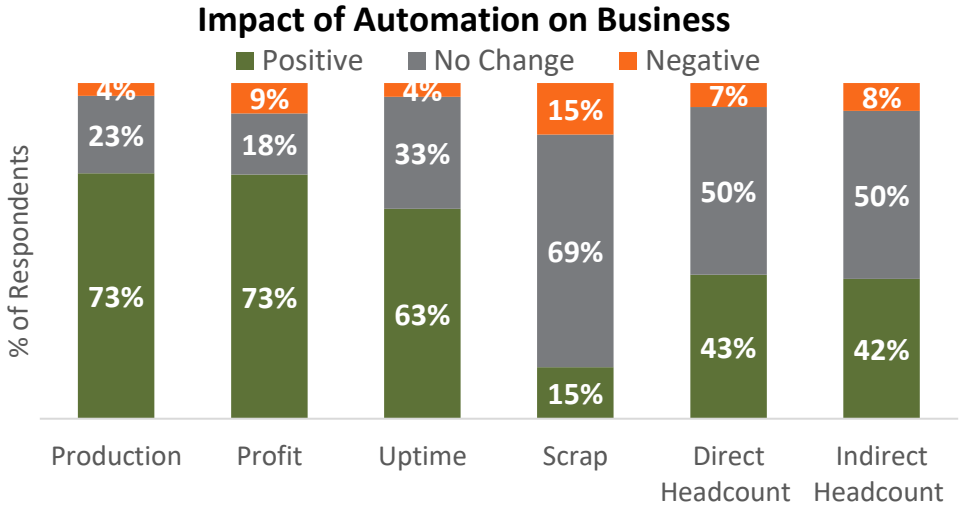
- The greatest surprise in the entire survey was that not 100% of companies across all industries responded they were working with customers on supply chain issues. Even if the impact of supply chain issues, access to labor, and rising costs were internally manageable and affordable, why miss the opportunity to raise the issues with the customer to collaborate on improved scheduling, lead time expectations, and even pricing? If you're one of the few 6-15% of suppliers who haven't, the risk is the customer beginning to think they paid too much.
- With access to labor a known factor, the survey opened up a write-in response from participants as to what are they doing to cope. Cross-training employees to deal with shortages was the most common response. Others included an increased interest in automation, investment in apprenticeships and other employee development, as well as upgrading equipment for better productivity and more marketing to attract new talent.

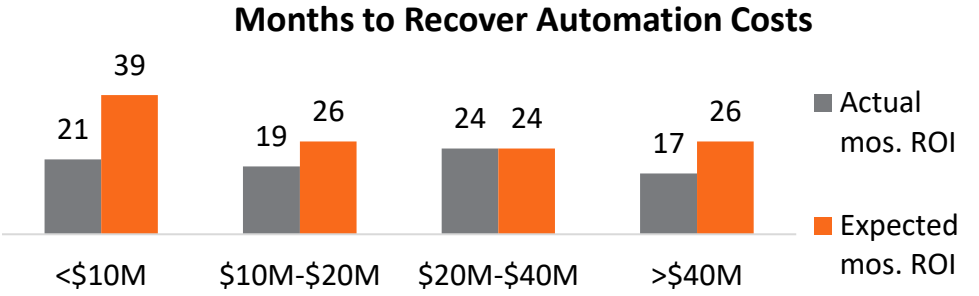
% Working with Customers on Supply Chain Issues

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Executive Summary: Automation Benefits

- An increased interest in automation was one method mentioned to address scarcity of labor. Larger companies have the advantage as 82% of >$20M companies have purchased automation, while only 50% of <$20M companies have.
- Scarce labor is likely why only 43% of respondents who did implement automation saw a reduction in direct headcount as a result. Those direct heads were likely redeployed. Over half of the respondents did realize an increase in production, profit and uptime.
- Integration of automation typically took 3-6 months, and some integration was faster than expected.
- The time to reach a breakeven or the return on investment for automation varied from 1.5 to 2 years, but generally was much faster than expected by the survey respondents who did implement automation.

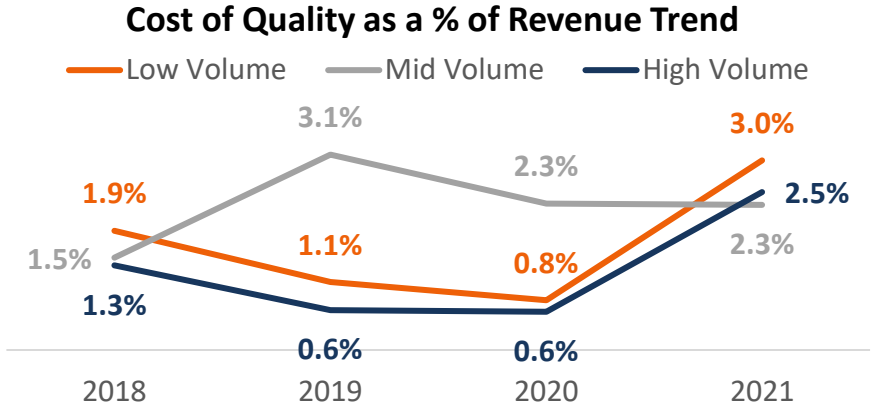


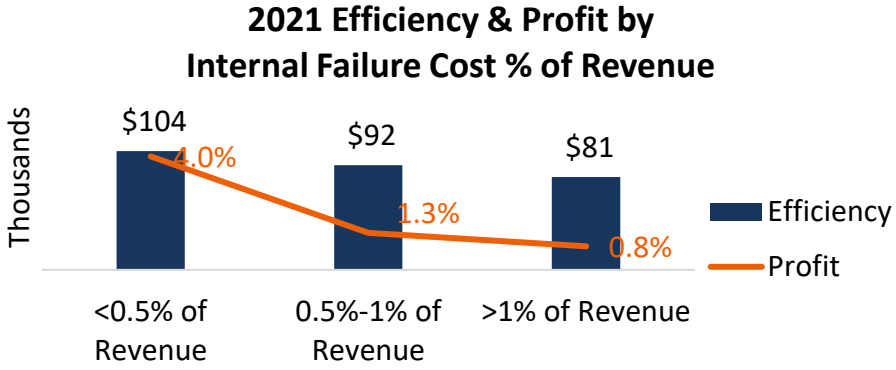


PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Executive Summary: Bad Quality Gets More Costly

- Another trend reversed in the wrong direction in 2021 was in the Total Cost of Quality. Regardless of volume levels, metalformers experienced increases in cost of quality. Constraints on access to labor again may have been a contributor, thanks to abbreviated training of direct labor or a loss of skilled indirect labor to maintain the processes.
- Regardless of reason, the data correlates that those who have greater control of their processes, and therefore have lower internal failure costs such as scrap, experience higher efficiency and higher profits.
- Shops today are dealing with externally-imposed cost increases are rampant and out of the control of an operations manager, so it is even more important to maintain and control the manufacturing processes to avoid additional costs. Producing parts that cannot be sold only exacerbates the "access to labor" problem.

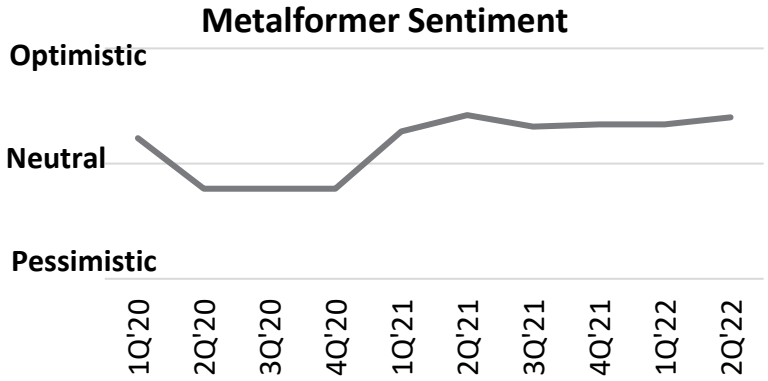


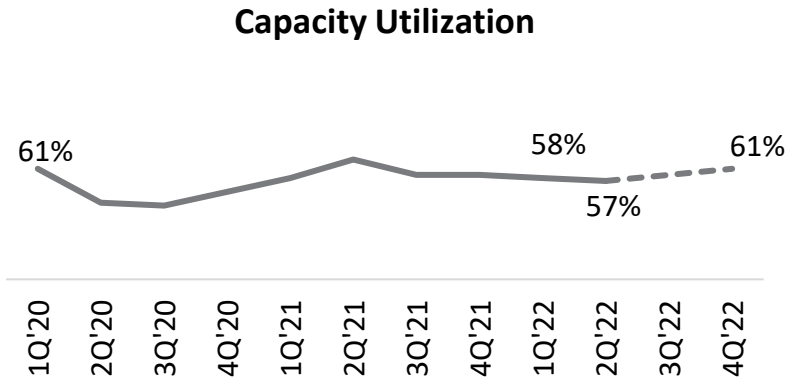


PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Executive Summary: Outlook of Cautious Optimism

- The overall average metalformer sentiment on the production outlook remains optimistic among 62% of respondents, very optimistic among 11%, and only 4% are pessimistic.
- This optimism may be because 2022 is progressing better than expected for companies under $20 million in revenues, and among participants across many industries including automotive, agriculture, aerospace, medical and consumer products.
- The metalforming industry is expecting the capacity utilization to return to pre-pandemic levels by the end of 2022, despite having a softer second quarter after slightly higher in the second quarter of 2021 and start of 2022.
- The cautious optimism of the respondents was captured in surveys through mid-June 2022.





PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

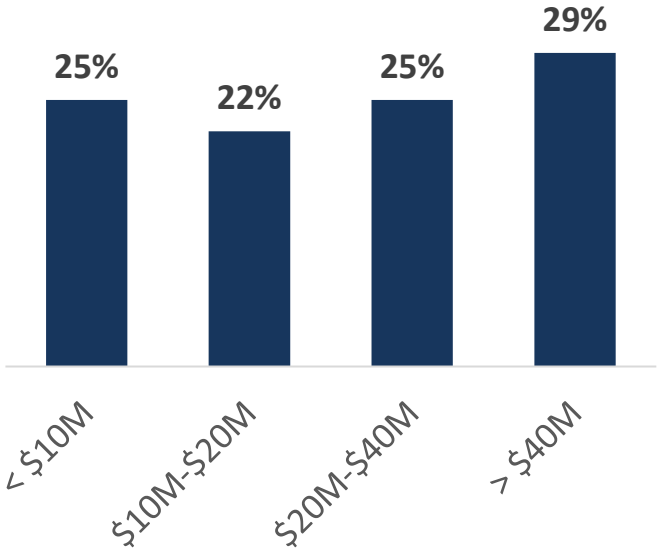
Profile of Respondents

Harbour IQ 2022 Q2 Operations Report

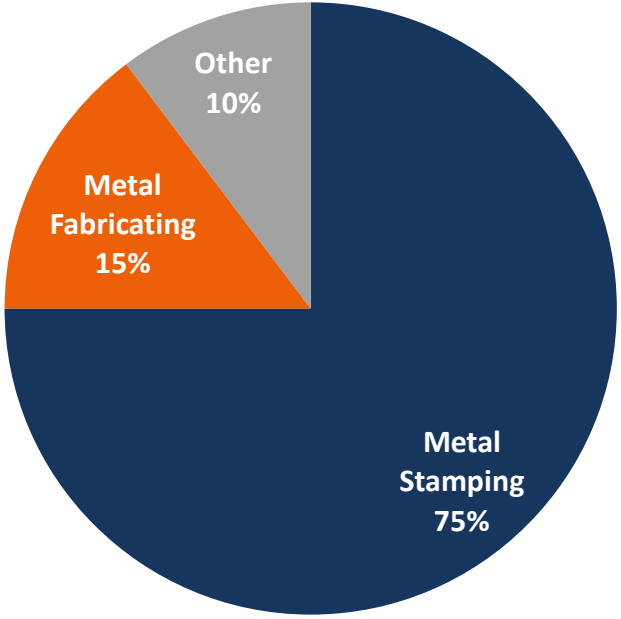
PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Respondent Demographics: 71 Facilities

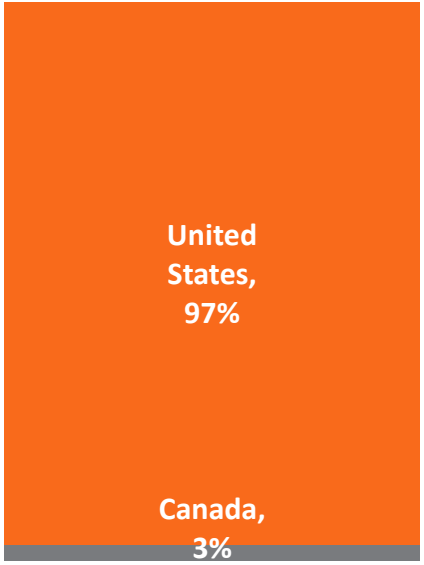
Revenue Range



Process Type

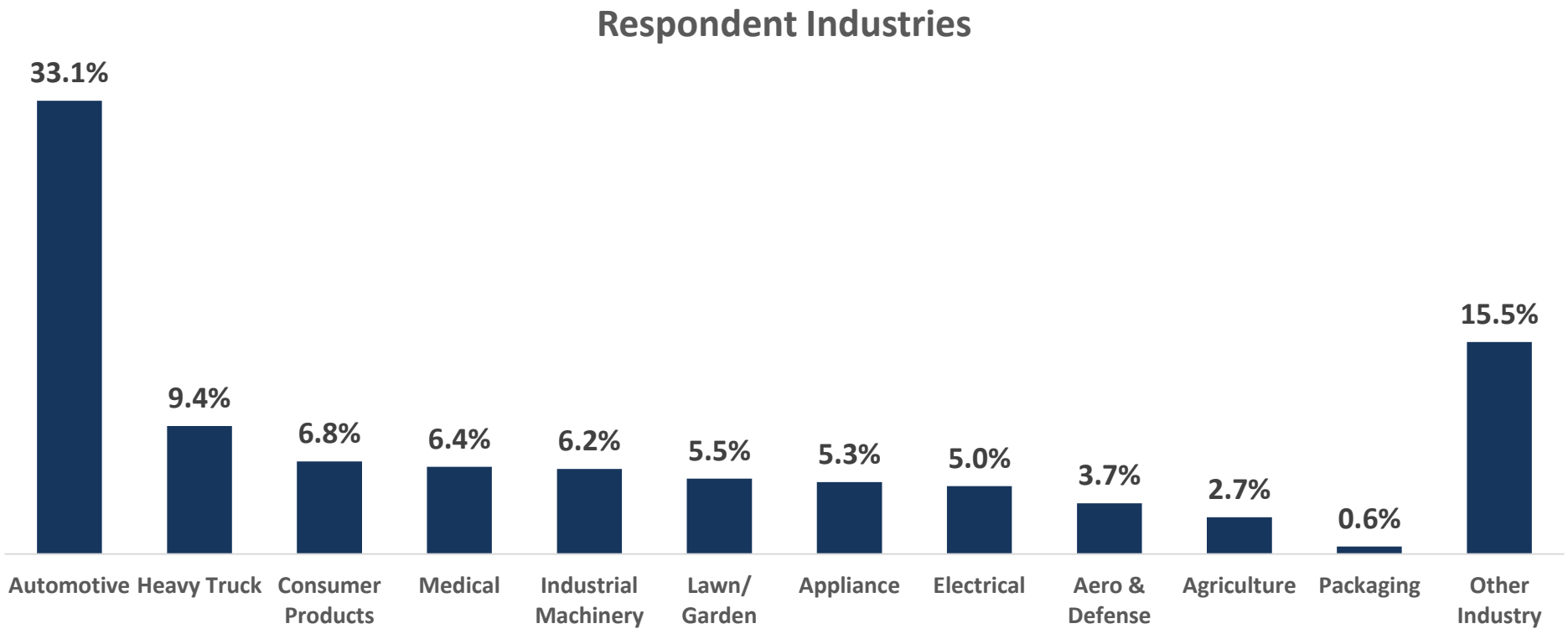


Region



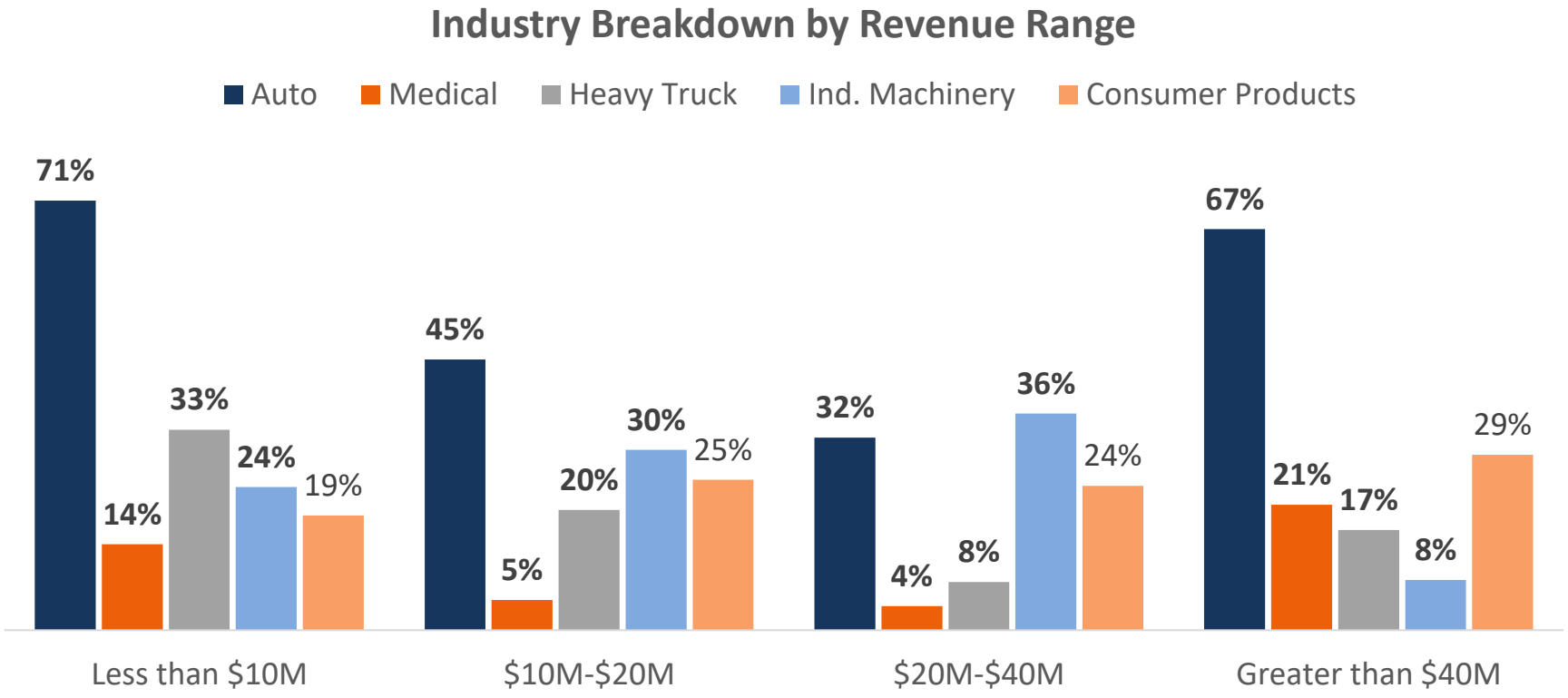
Questions: What was your annual revenue? What is your facility's primary focus? Please identify your company's geographic location. Source: Harbour Results.

Automotive Remains the Largest Respondent Base



Question: What industries does your facility serve?
Note: Other includes Telecom, Furniture, Marine, Material Handling, and Sports & Recreation.
Source: Harbour Results.

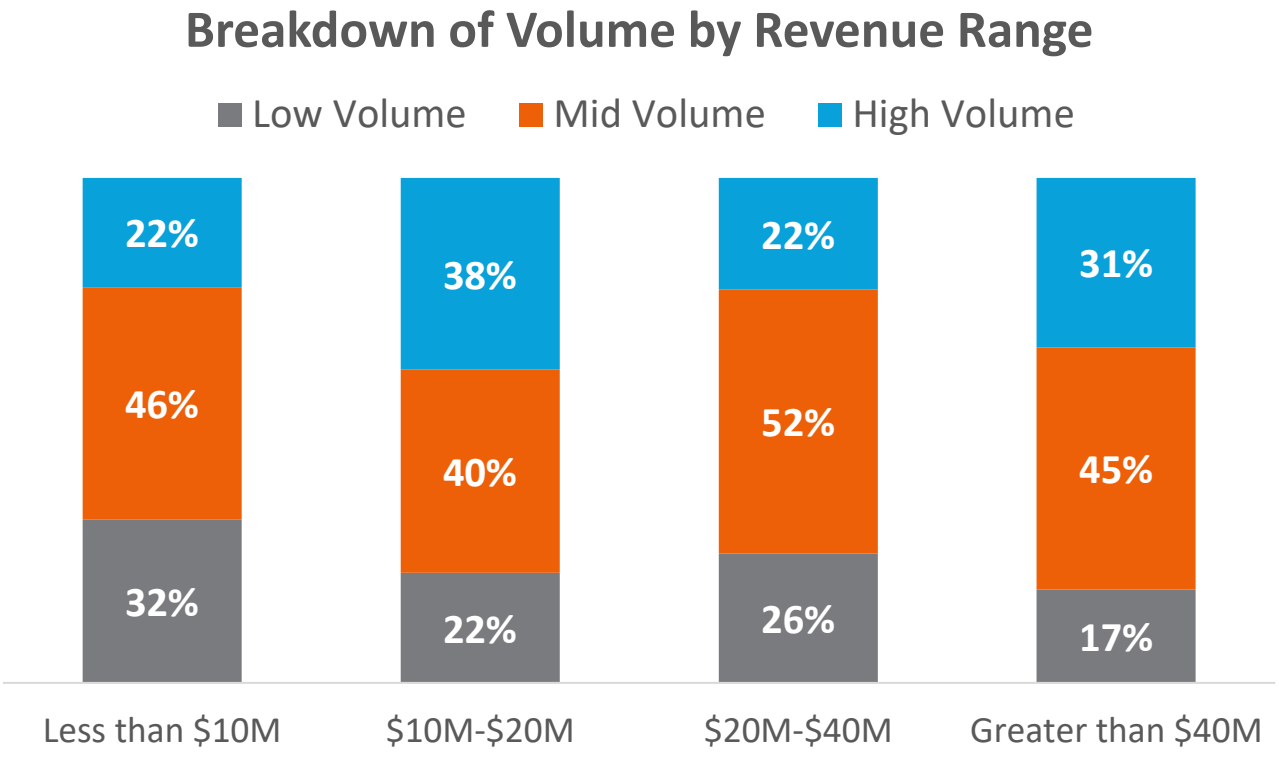
Industries by Revenue Range



Question: What industries does your facility serve? Select all that apply. Process: Metal Forming.
Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

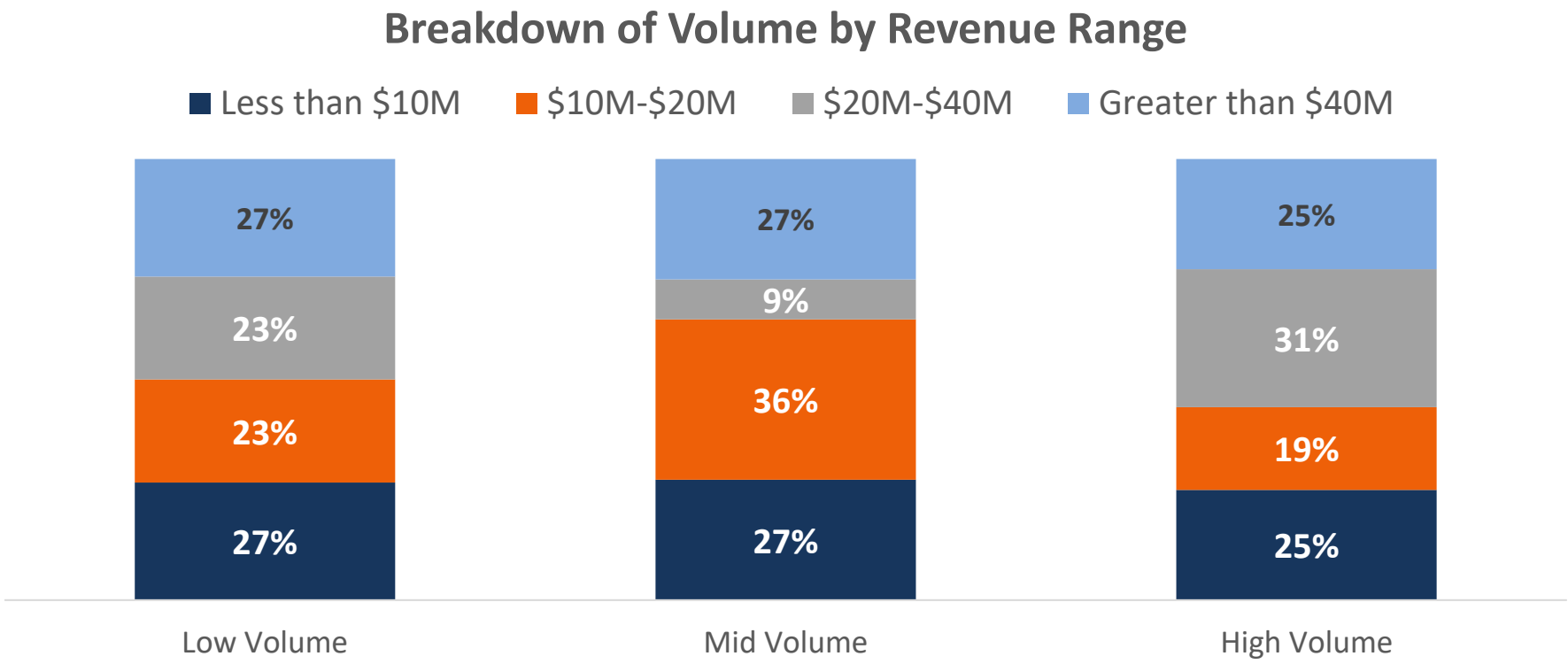
Split of High/Mid/Low Volumes Fairly Consistent



While low-volume shops are more often smaller revenue shops, the high-volume shops are not necessarily higher revenue shops, as we see some mid-sized shops have a greater mix of high volume. With this mix of business volumes across size ranges of metalformers, we cannot assume big equals high and small equals low-volume.

Definition: Low Volume equals less than 24 annual production hours. Mid Volume equals 24 to 300 annual production hours. High Volume equals more than 300 annual production hours. Question: How much of your facility's work is split between low, mid, and high volume? Source: Harbour Results.

Low Volume Shops Are Evenly Split By Size



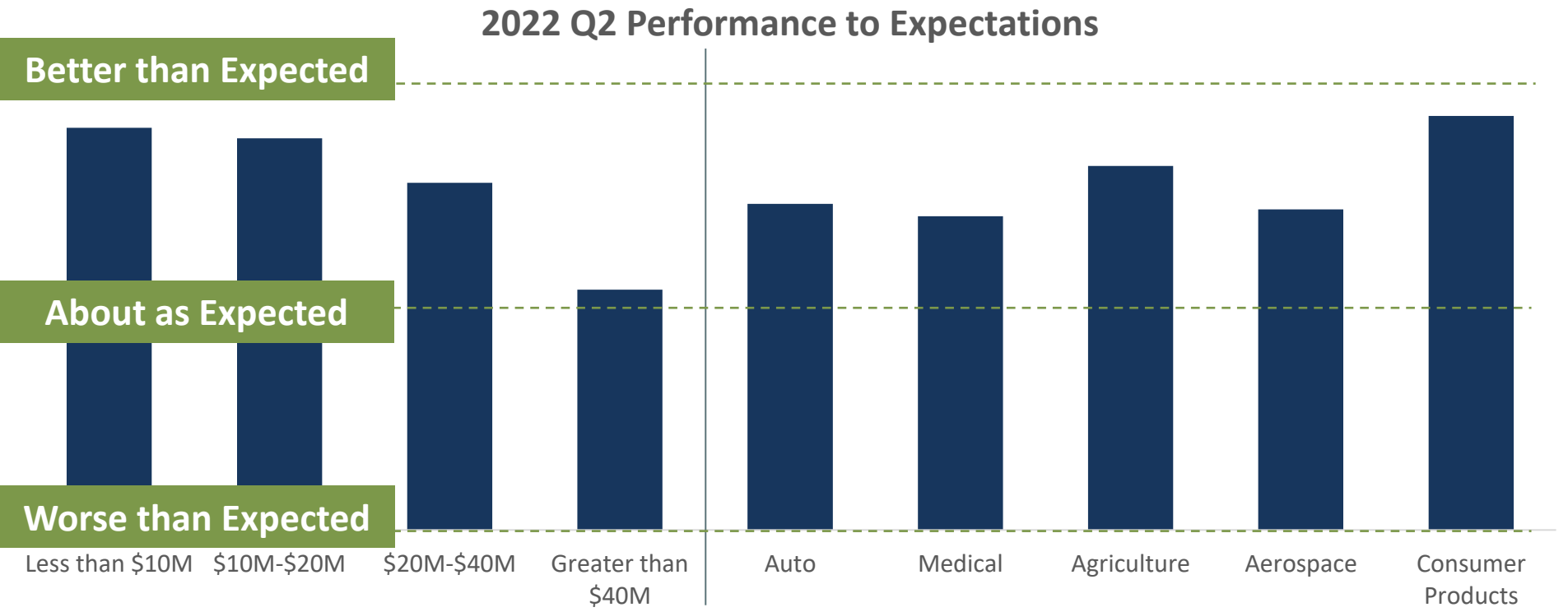
Definition: Low Volume equals less than 24 annual production hours. Mid Volume equals 24 to 300 annual production hours. High Volume equals more than 300 annual production hours. Question: How much of your facility's work is split between low, mid, and high volume? Source: Harbour Results.

Pulse

Harbour IQ 2022 Q2 Operations Report

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

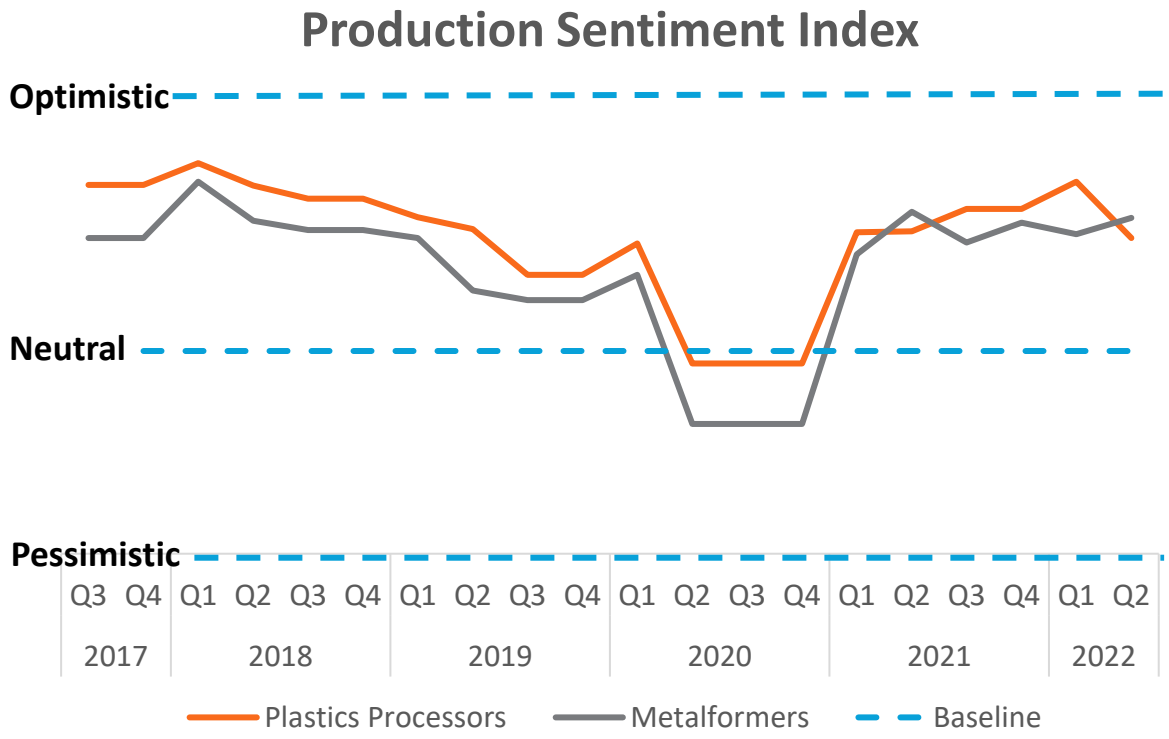
Key Industries Outperformed Expectations



Question: From Jan through Mar of 2022, how did your facility perform compared to expectations for the quarter?
Process: Metal Forming. Region: North America. Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Sentiment Rebounds in 2021



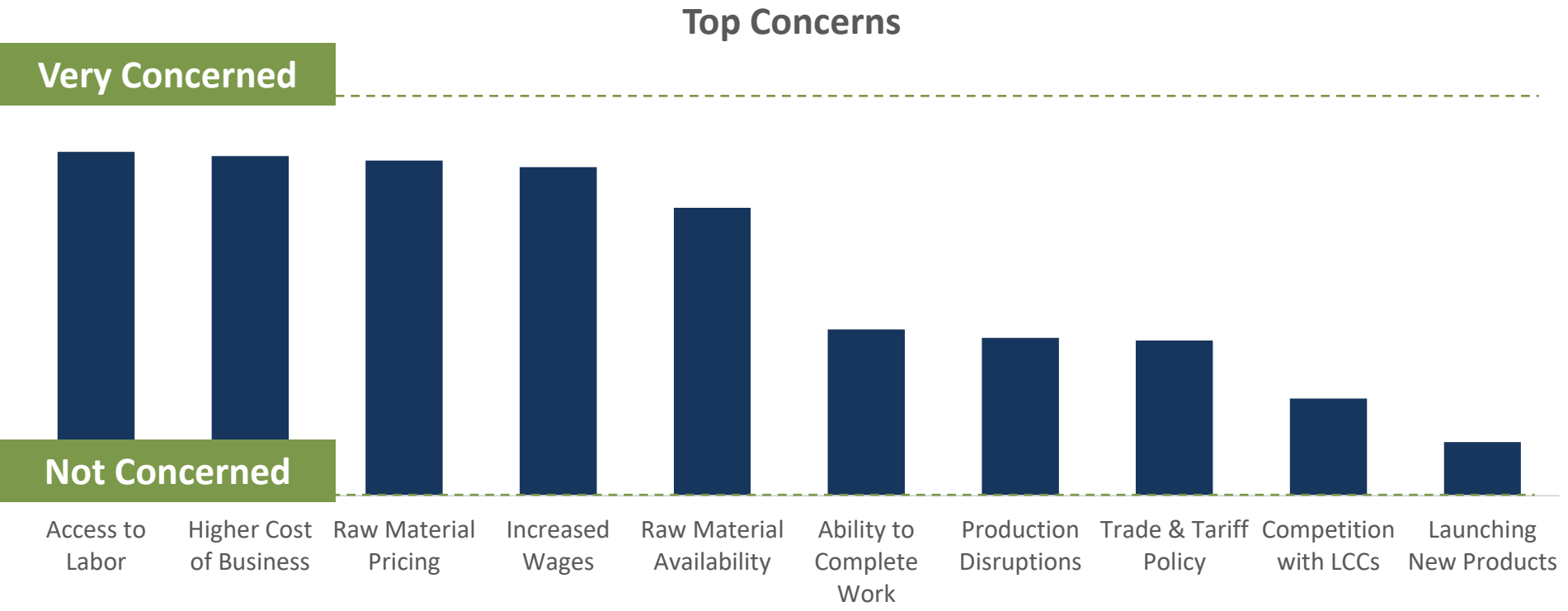
Sentiment held steady for metalformers while declining two consecutive quarters for plastics processors. Overall, the industry remains optimistic for 2022.

Facility % Breakdown		
	Stampers	Molders
Very Optimistic	11%	5%
Optimistic	62%	56%
Neutral	23%	33%
Pessimistic	4%	7%
Very Pessimistic	0%	0%

Question: What is the general outlook for your facility for 2022? Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

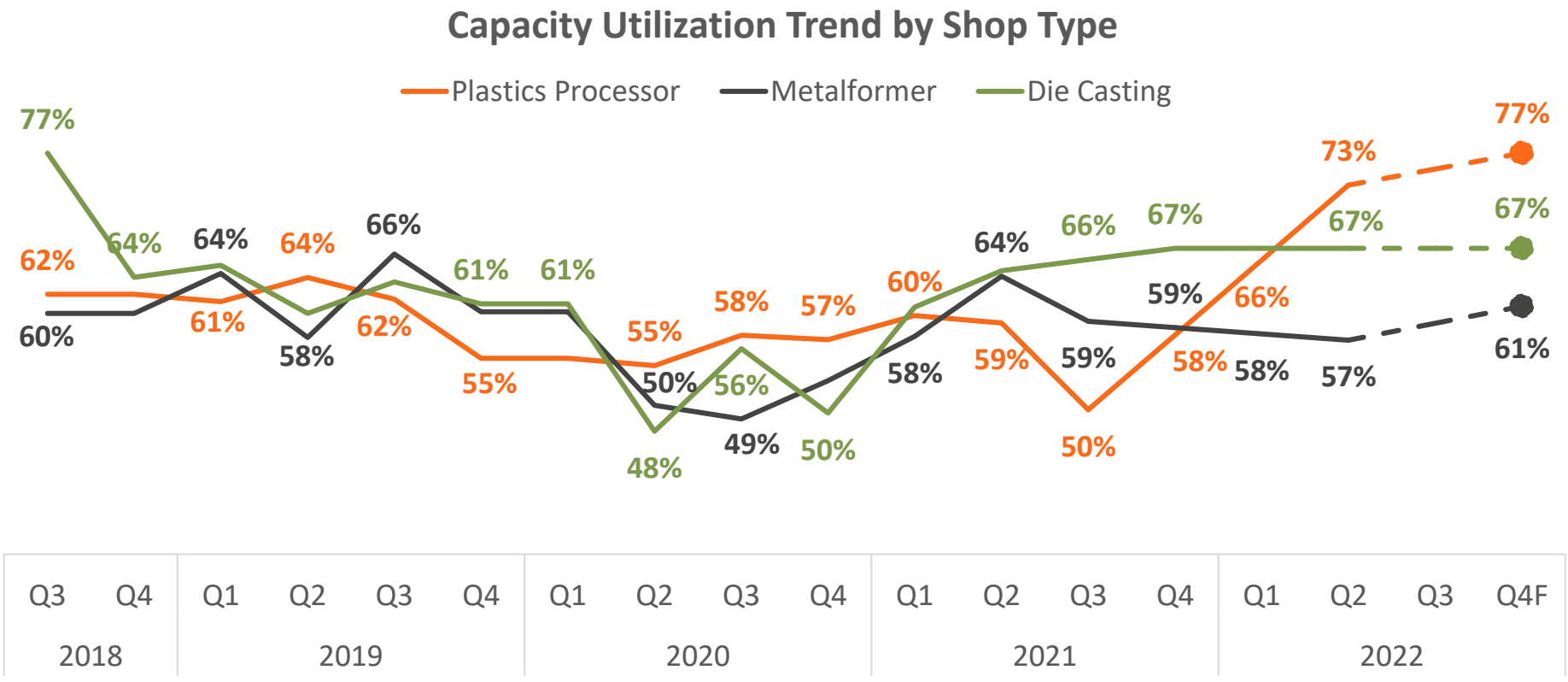
Access to Labor and Higher Costs Are Top Concerns



Question: Thinking about the future of your business, please rate your level of concern in the following areas…
Process: Metal Forming. Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

2022 Q4 Utilization Forecasted Up Over Softer Q2

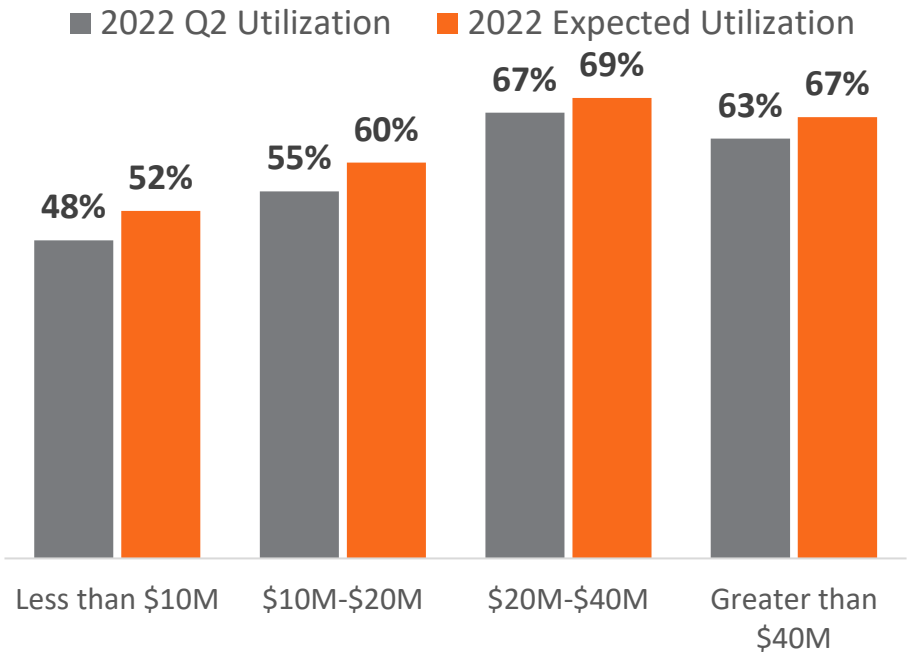


Question: Based on your shift structure and hours, what is your facility's current/expected 2022 capacity utilization? Region: North America. Source: Harbour Results.

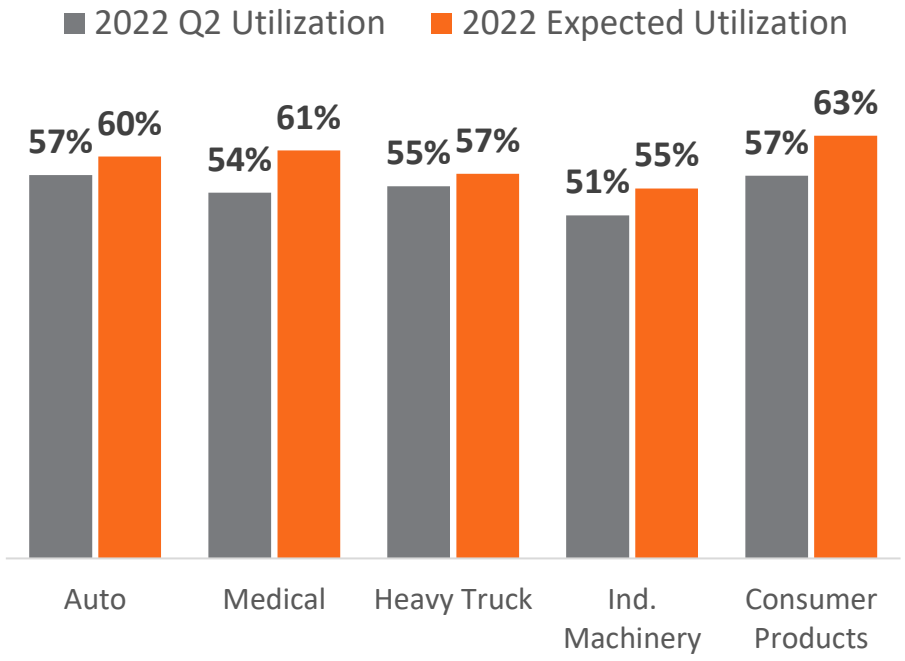
PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Increased Utilization Expected in All Industries

Metalforming Utilization by Revenue



Metalforming Utilization by Industry



Question: Based on your shift structure and hours, what is your facility's current and expected 2022 capacity utilization? Process: Metal Forming. Region: North America. Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Your Strategies to Match Changing Demand

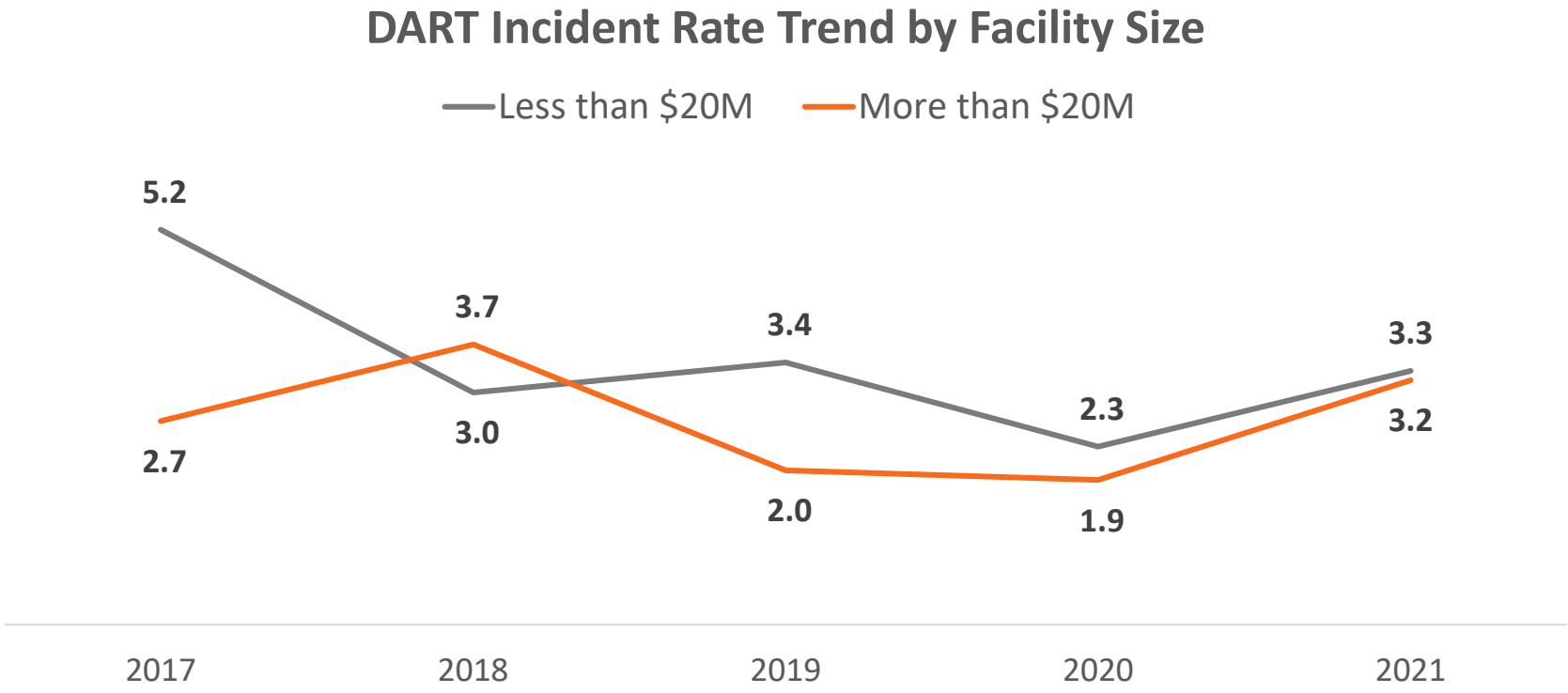
Question: What strategies is your organization implementing to match changing demand?
Process: Metal Forming. Region: North America. Source: Harbour Results.

Operations

Harbour IQ 2022 Q2 Operations Report

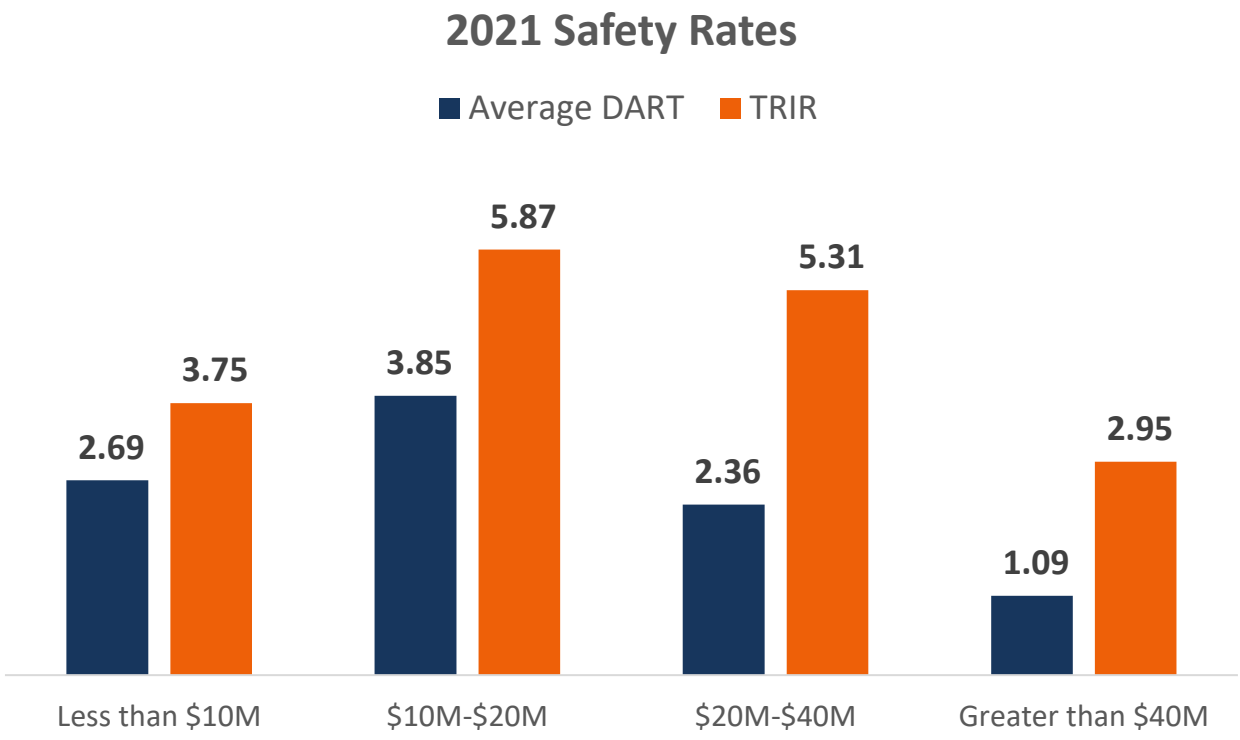
PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

DART Incident Rate Increased in 2021



Questions: Using your facility's 2021 OSHA 300 log, please report the 2021 totals for: total hours worked, total incidents reported, number of injuries with days away, transfer or restriction, and total days away, transferred or restricted. Source: Harbour Results.

Concerned Over Safety at Mid-Sized Shops

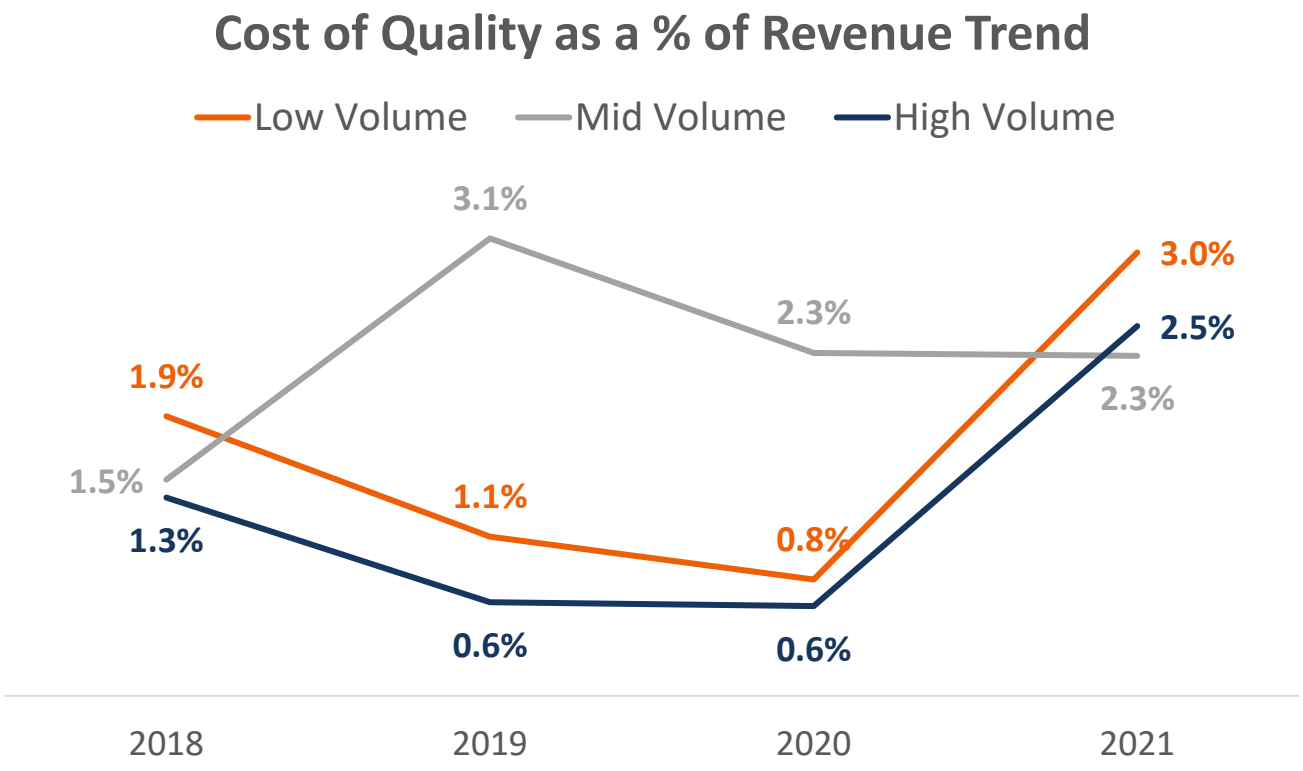


TRIR shows the number of recordable incidents per 100 full-time employees in a year. A TRIR above 3 can lead to an increase in insurance premiums, as well as increased OSHA inspections and penalties. DART is similar, but shows the number of incidents with days away, transferred, or restricted.

The higher rate of safety-related incidents appears to be particularly among the mid-sized shops. Could the mid-sized shops be lacking formal programs to identify hazards and implement corrections, or lacking formal training programs designed to keep new hires safe?

Questions: Using your facility's 2021 OSHA 300 log, please report the 2021 totals for: total hours worked, total incidents reported, number of injuries with days away, transfer or restriction, and total days away, transferred or restricted. Source: Harbour Results.

Total COQ Trend Reverses, Likely Raising Costs

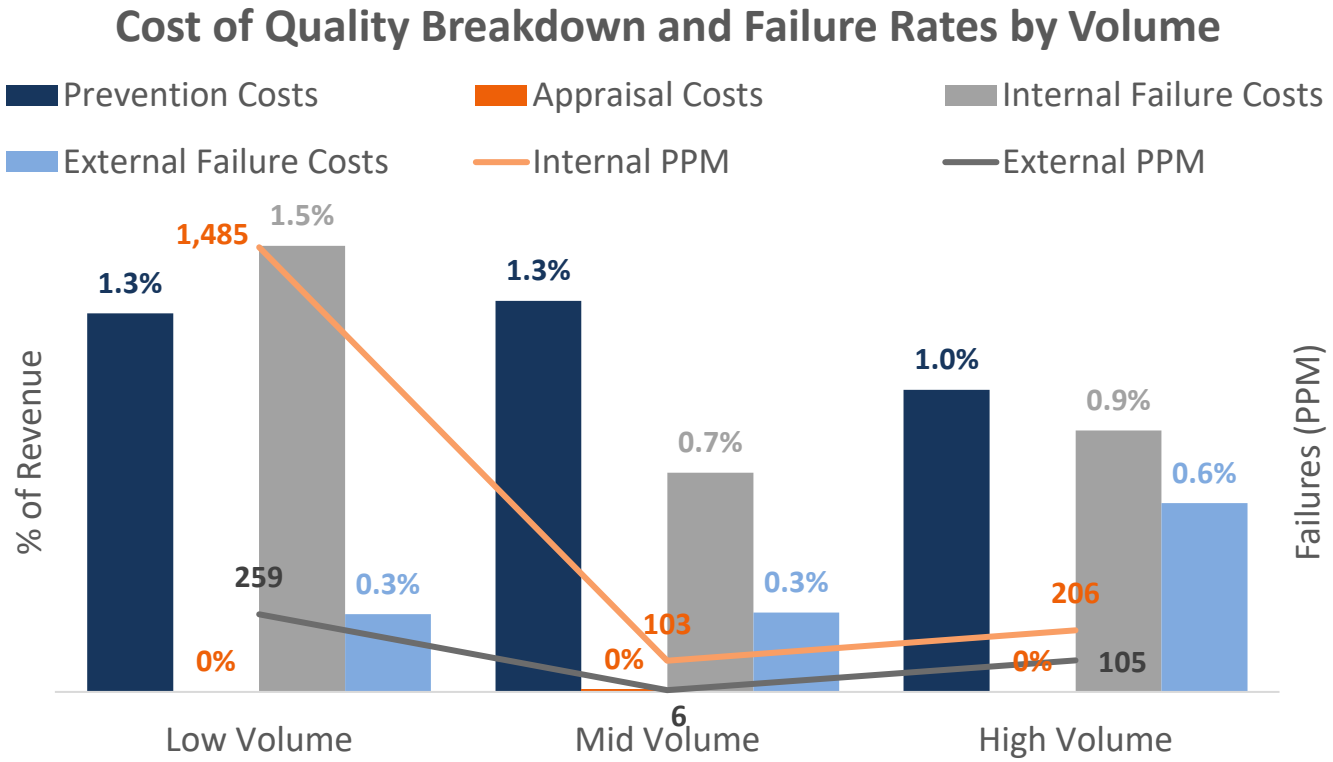


The Total Cost of Quality (COQ) sums manufacturers' incurred costs for prevention, appraisal, internal failures, and external failures.

The trend in declining year-over-year COQ reversed. The greatest reversal was among the low-volume producers who may not have had the process control disciplines in place as demand suddenly increased in 2021. But even the high-volume producers appear to have experienced a challenge in process control for higher quality-related costs.

Questions: What was your facility's cost of quality in 2021? Source: Harbour Results.

Low Volume Spend More on Controlling Quality



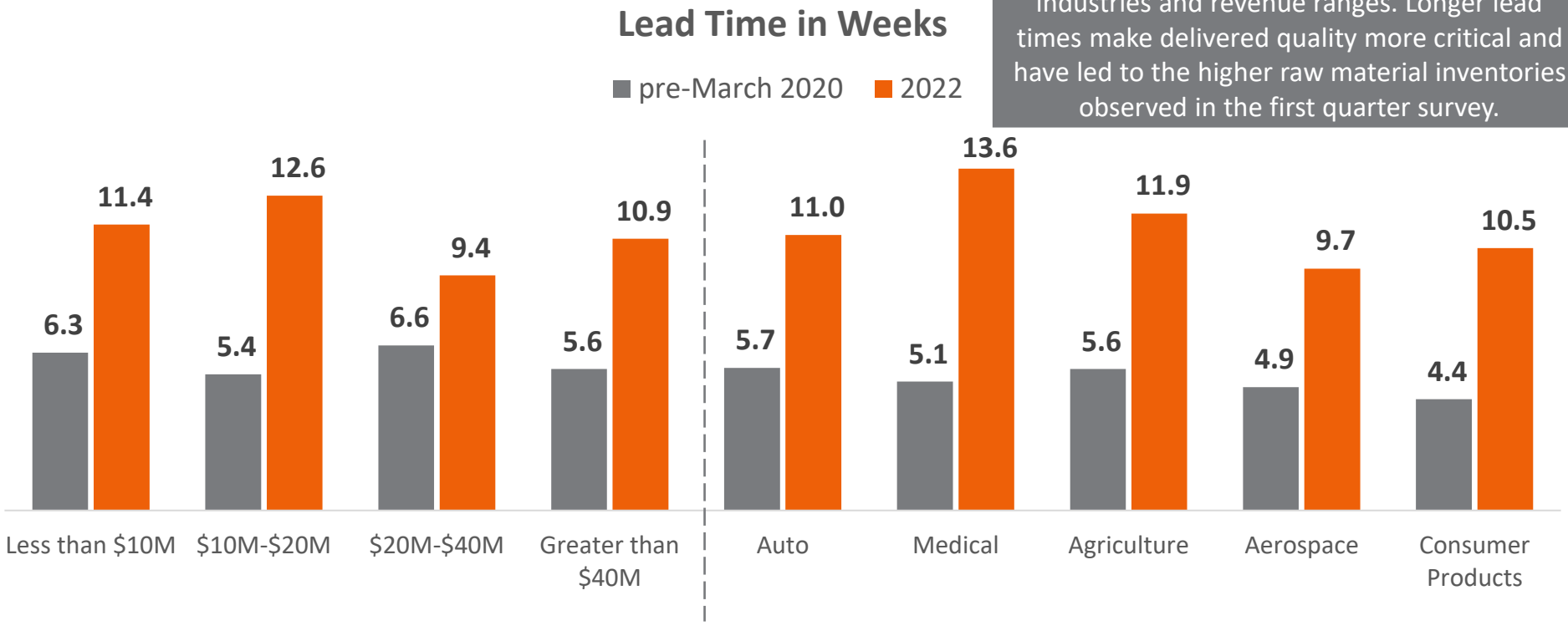
The breakdown in the components of Total Cost of Quality suggests that few metalformers are tracking Appraisal Costs or lump those costs in with Prevention Costs. Appraisal Costs can include receiving inspection, in-process inspections and sorting, and outside testing or layouts.

Mid-volume companies are spending more on prevention and seeing the results in lower internal and external PPM.

Questions: What was your facility's cost of quality in 2021? In 2021, what was the total number of parts made/ shipped? Of each, what was the PPM rejected? Source: Harbour Results.

Raw Material Lead Times Still High v. Pre-pandemic Times

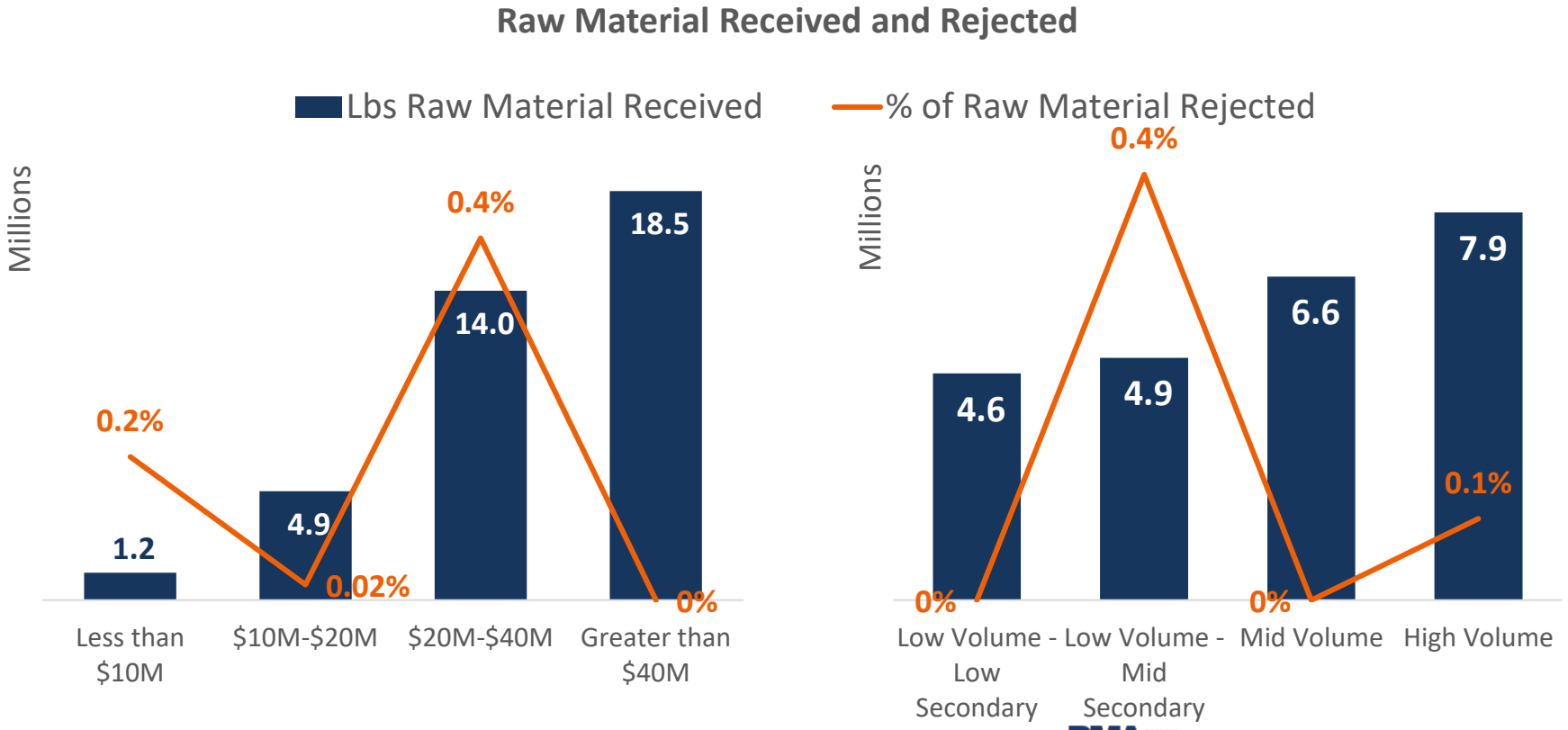
Raw material lead times are up across industries and revenue ranges. Longer lead times make delivered quality more critical and have led to the higher raw material inventories observed in the first quarter survey.



Question: What was your organization's average raw material lead time in weeks prior to March 2020 and what is the current average? Process: Metal Forming. Region: North America. Source: Harbour Results.

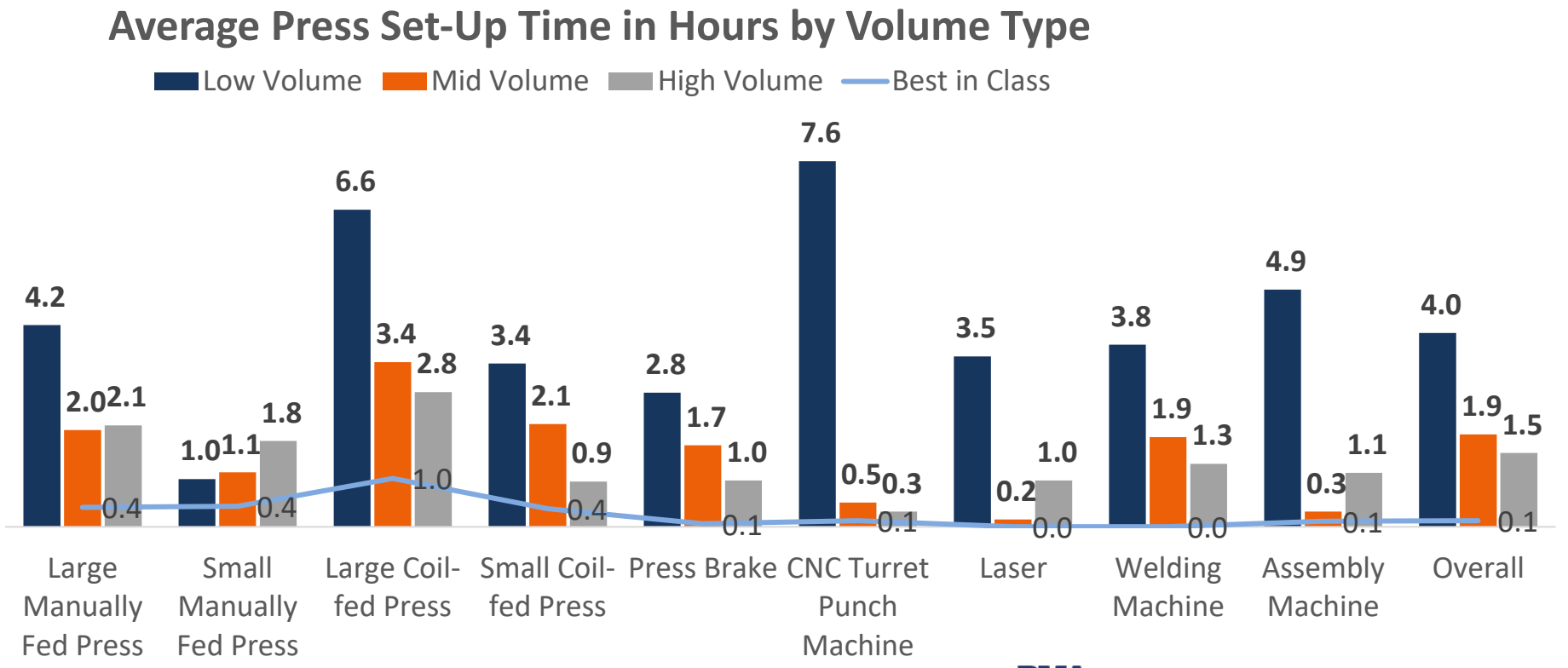
PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

More Alloy Variations Meant More Rejected



Questions: In 2021, what was the total pounds of raw material received? What percent was rejected?
Source: Harbour Results.

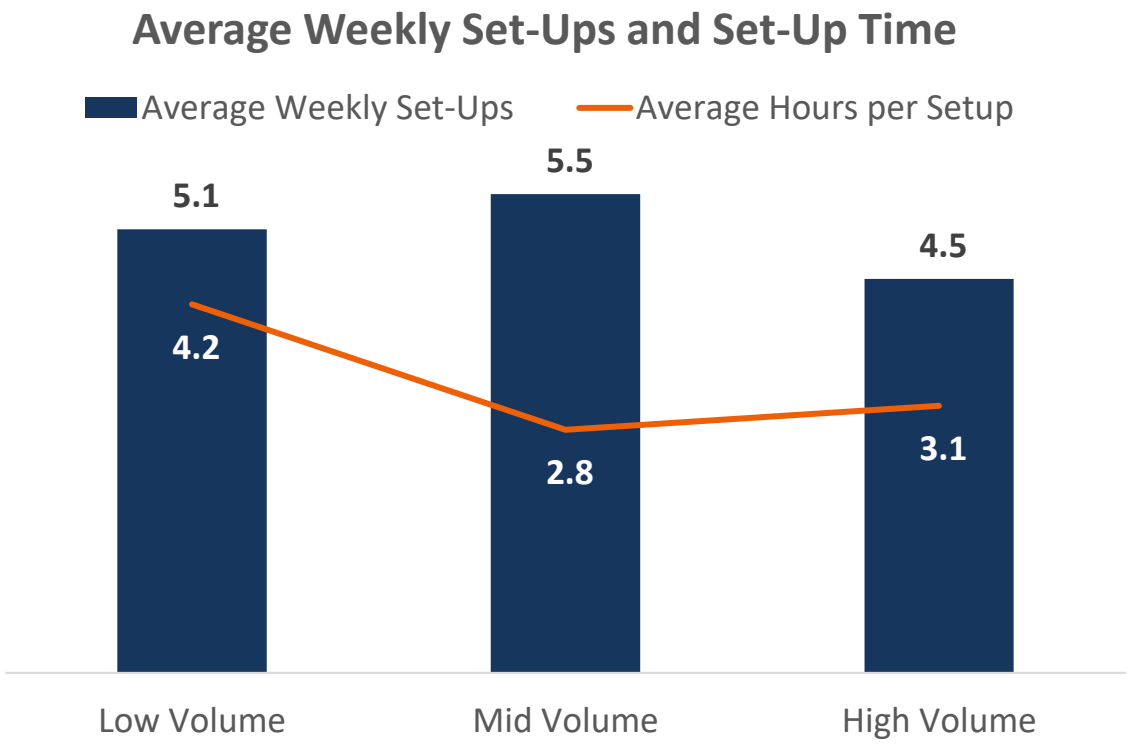
Low Volume Shops Experience Longer Set-Up Times



Questions: In hours, what was the average set-up time per press type? Source: Harbour Results
Note: Best in class represents the top 10% of shops with the lowest setup times for each machine type.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Mid-volume Shops do More Set-ups in a Week

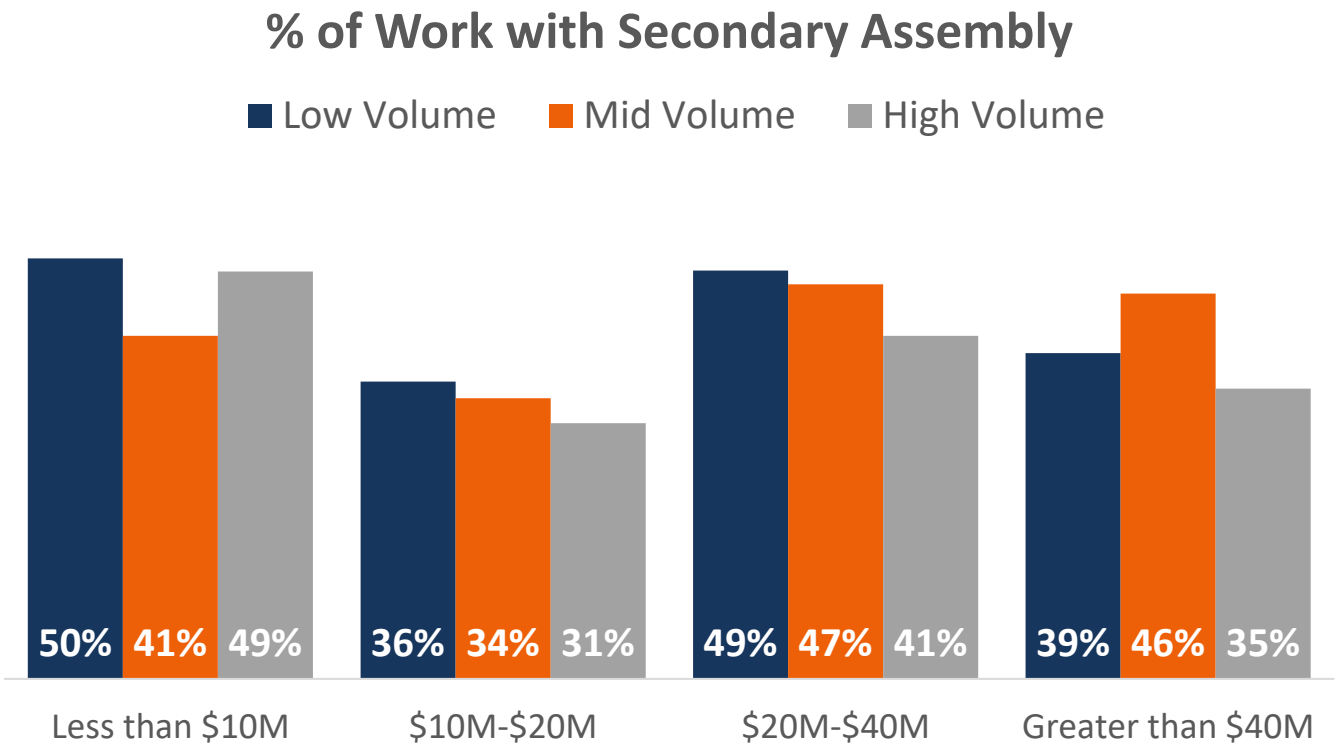


While the low-volume shops might be expected to have more set-ups, they have longer set-up times and therefore more likely to leave dies in the press between runs. In contrast, the mid-volume companies have higher average weekly set-ups to manage and must keep turning over the presses, so have worked to reduce average set-up time.

Creating more efficient set-up procedures for all machines is an operational best practice. With 20 minutes less per set-up at 5.5 set-ups per week can add up to an extra 2-shifts of uptime per year.

Question: In an average week, how many set-ups does your facility do per machine? And on average, how long does each set-up take? Process: Metal Forming. Region: North America. Source: Harbour Results.

$10-$20M Have Less Secondary Work

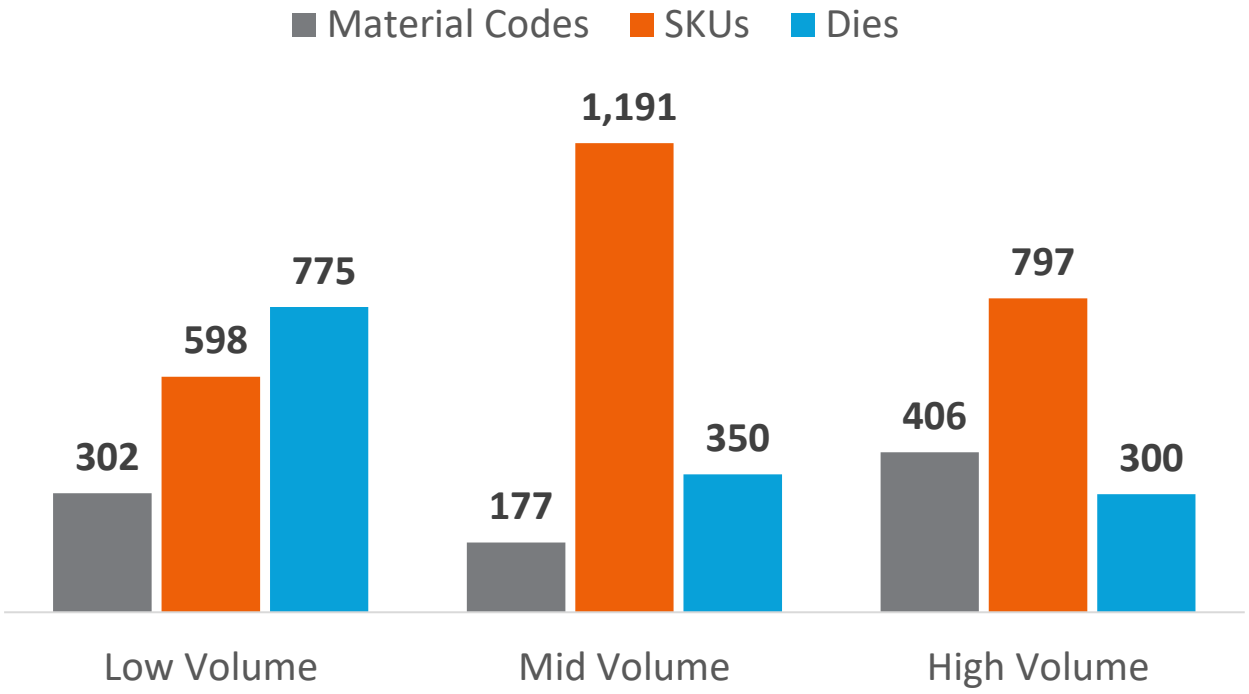


The mid-sized $10-20 million stampers at all levels of volume are more likely to be stamp-and-ship suppliers, with about a third or less involving secondary operations. This is followed by the large companies involved in high-volume production, who are likely stamp-and-ship of large parts from large presses.

Questions: What percent of low, mid, and high-volume work has secondary activity? Source: Harbour Results.

Mid-volume Shops Have More to Manage

Product Breakdown by Company Volume Type



The shops that are predominantly mid-volume have a greater number of part SKUs in order to utilize their equipment. The high-volume shops tend to have longer runs, and therefore less open machine capacity to sell into and therefore a lower number of dies.

The predominantly low-volume shops are not managing a greater number of items, but they are managing a large number of dies, many of which are likely service parts.

Questions: How many material codes, SKUs, and dies did your facility have in 2021? Source: Harbour Results.

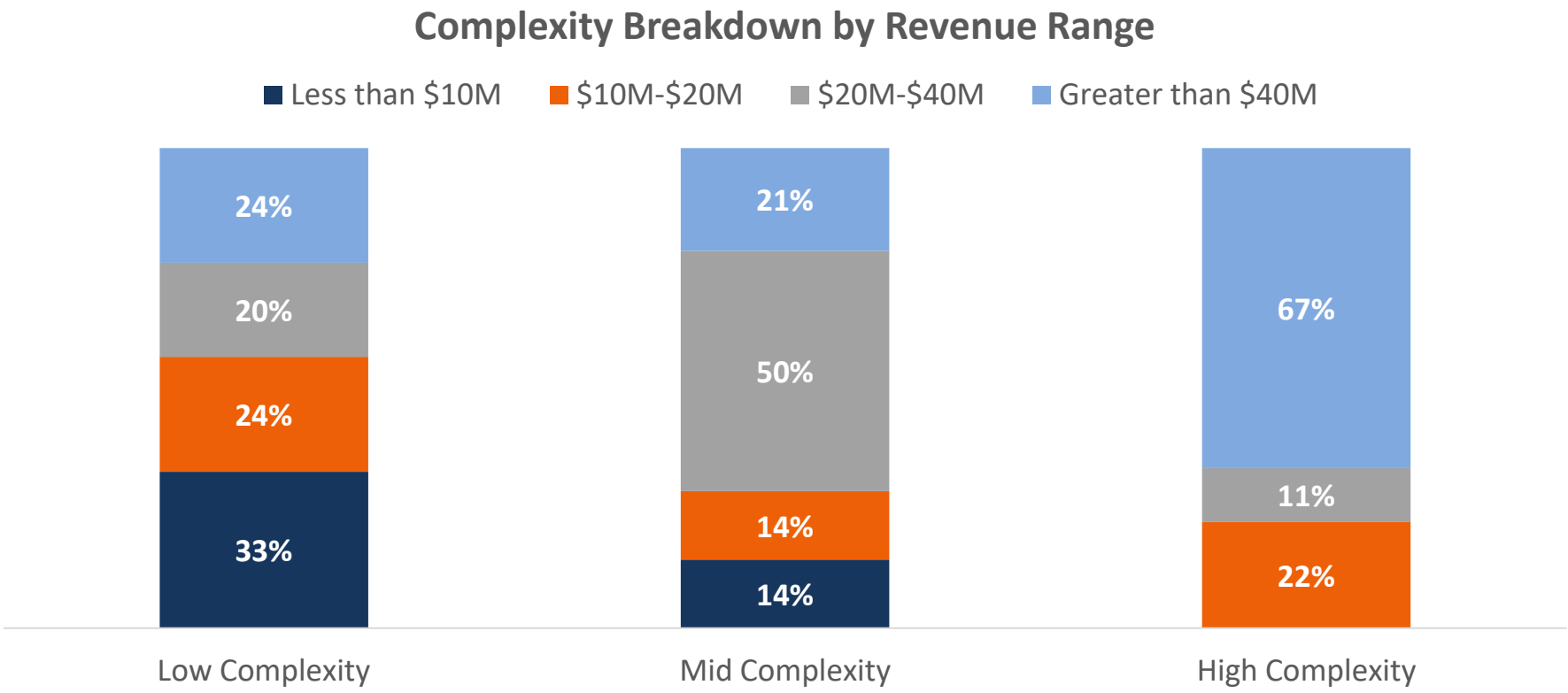
Complexity

Each survey respondent was assigned an overall low, mid, or high-complexity score based on the following criteria.

Operational Characteristic	Low	Medium	High
Number of Facilities	1	2	>2
Number of Markets	>80% in one	50%-80% in one	<50% in one
Majority of Volume (hours/yr in machine)	>300 hrs	24-300 hrs	<24 hrs
Parts with Secondary Operations	<30%	30-60%	>60%
Number of Active Dies	<35	35-500	>500
Number of Active SKUs	<275	275-1000	>1000
Number of Active Material Codes	<50	50-250	>250
Number of Processes or Machine Types	1	2-4	>4
Pieces per Stroke	1	2	>2
Overall Complexity	**Average of Component Scores**		

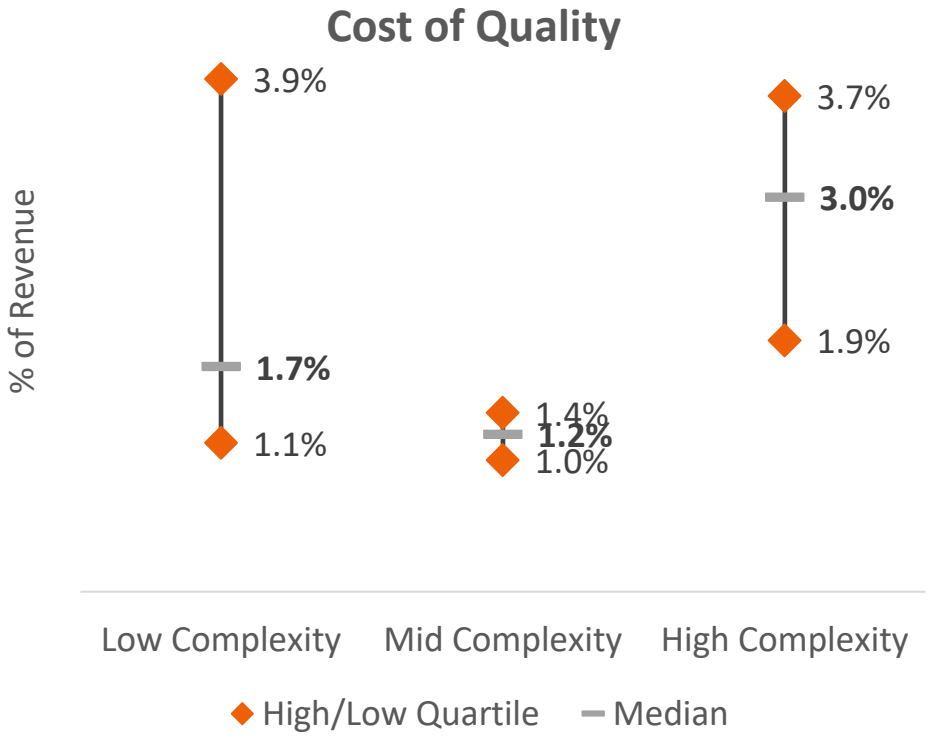
Source: Harbour Results.

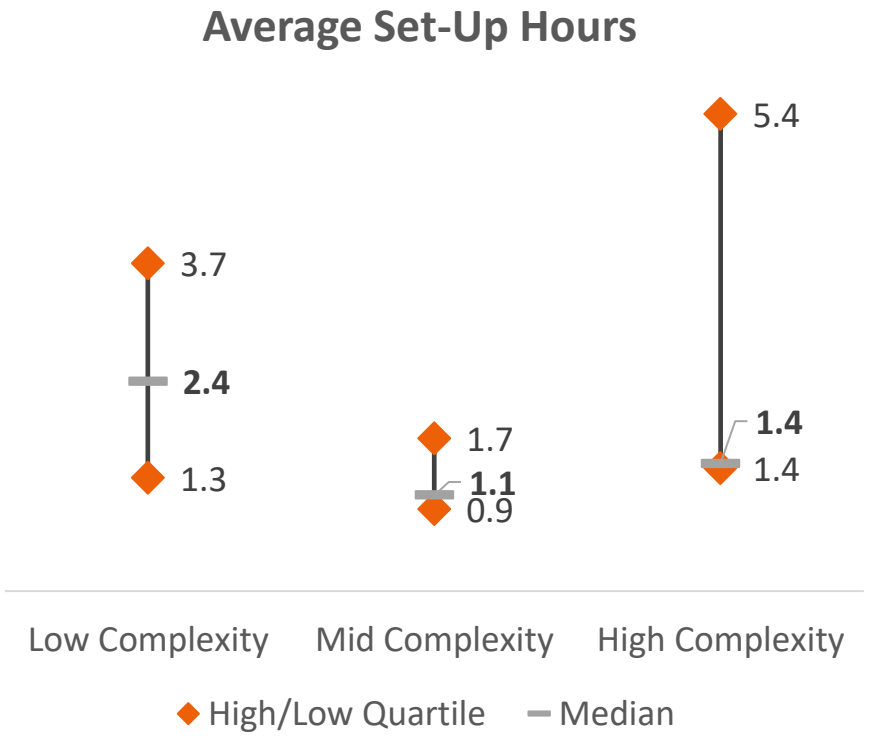
Complexity Breakdown Spread Across Sizes



What was your annual revenue? Source: Harbour Results.

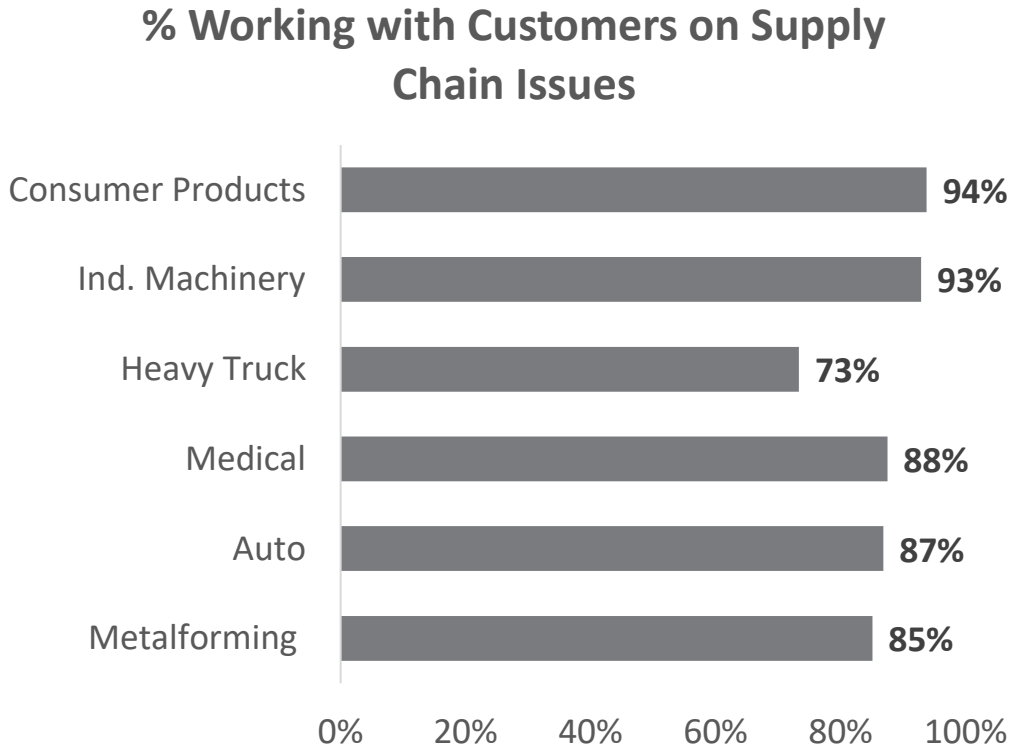
Cost of Quality and Set-up Time by Complexity





Questions: What was your facility's cost of quality in 2021? In hours, what was the average set-up time per press type? Source: Harbour Results.

Some Still Not Working with Customers for Solutions

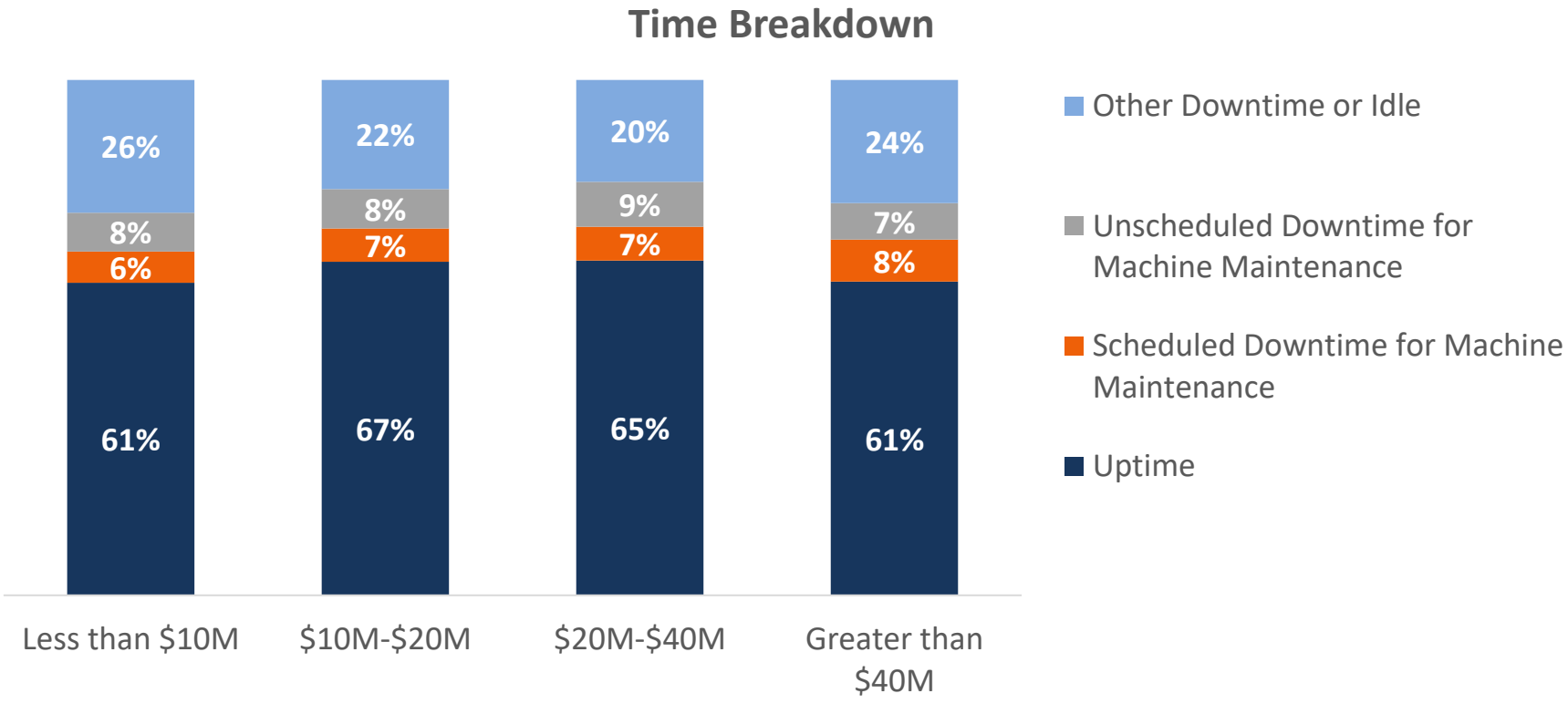


Actions Reported by Respondents

- Early ordering
- Alternate/increasing suppliers
- Increased communication
- Larger buys
- Holding inventory
- Alternate material
- Increasing payment terms
- Longer term contracts
- Domestic sourcing
- Improved forecasting

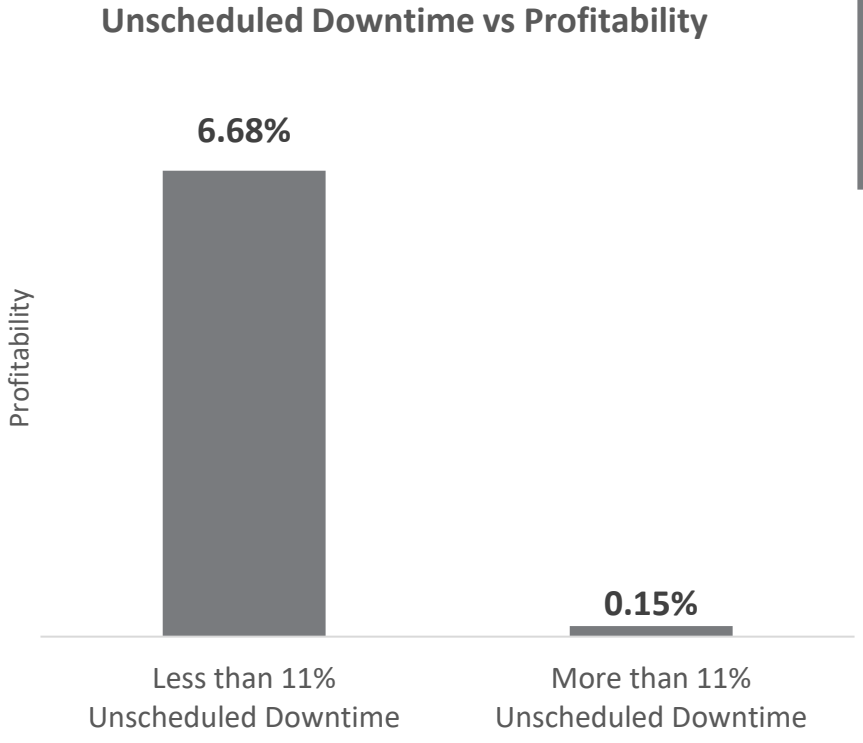
Question: Are you working with your customers to figure out how to handle supply chain disruptions?
Process: Metal Forming. Region: North America. Source: Harbour Results.

Uptime Highest with Mid-sized Shops

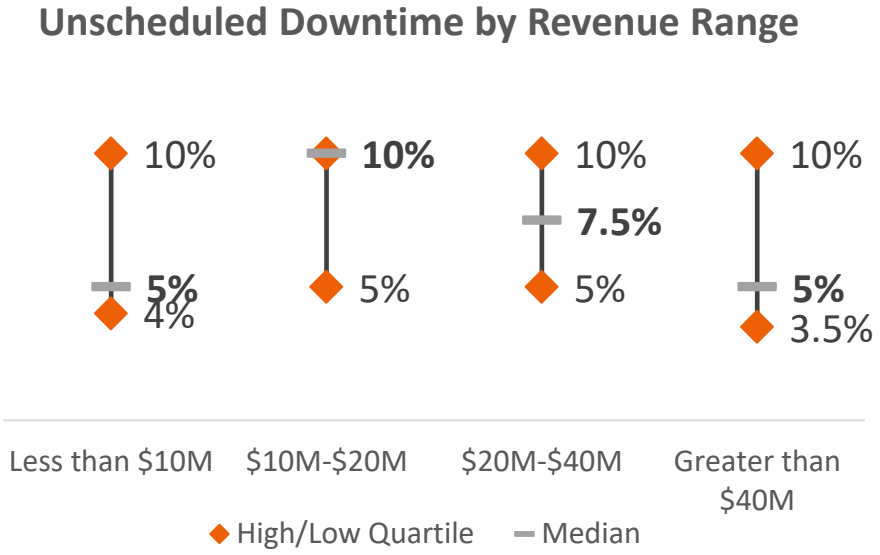


Question: For the past 12 months, how was time split between uptime and downtime across all machines at your facility? Process: Metal Forming. Region: North America. Source: Harbour Results.

Unscheduled Downtime Highest for Mid-sized

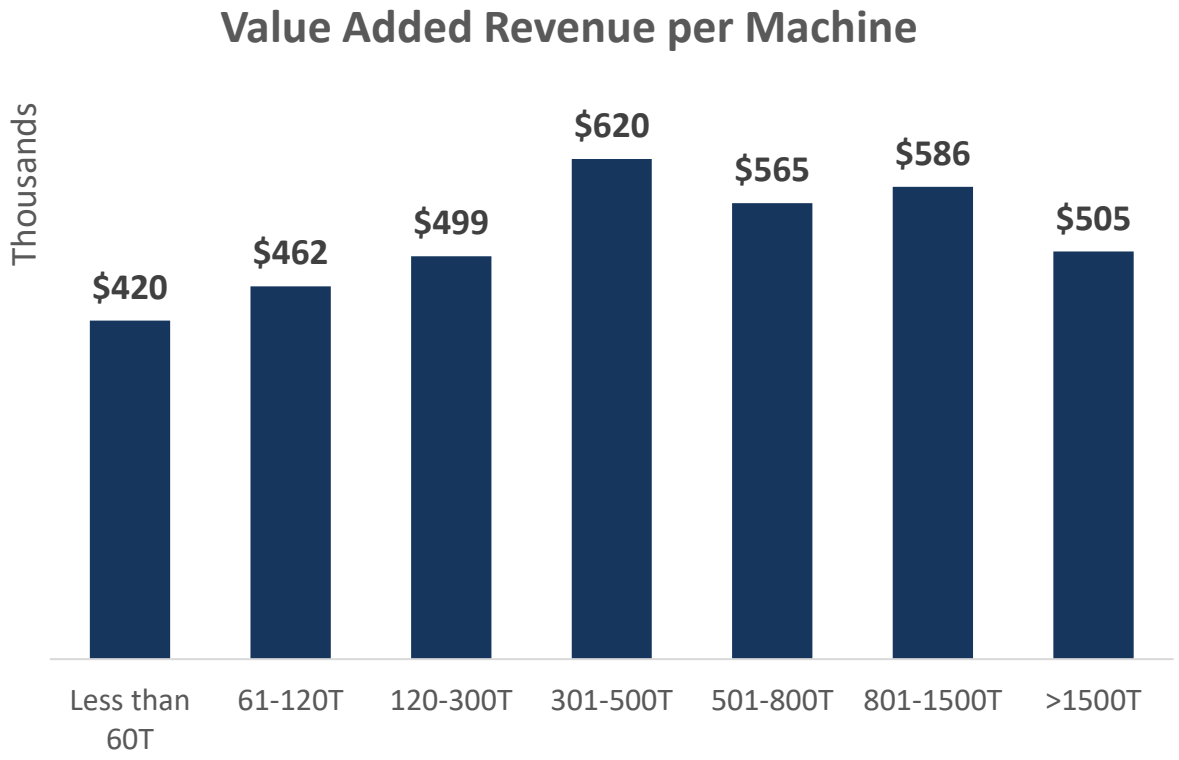


Exploring just unscheduled downtime by size revealed an upper quartile level at 10%, while medians for large and small companies was half that. The data does show that those with excessively high downtime correlates with those who have lower profitability.



Question: For the past 12 months, how was time split between uptime and downtime across all machines at your facility? Process: Metal Forming. Region: North America. Source: Harbour Results.

VAR/Machine Not Exactly Correlated to Tonnage

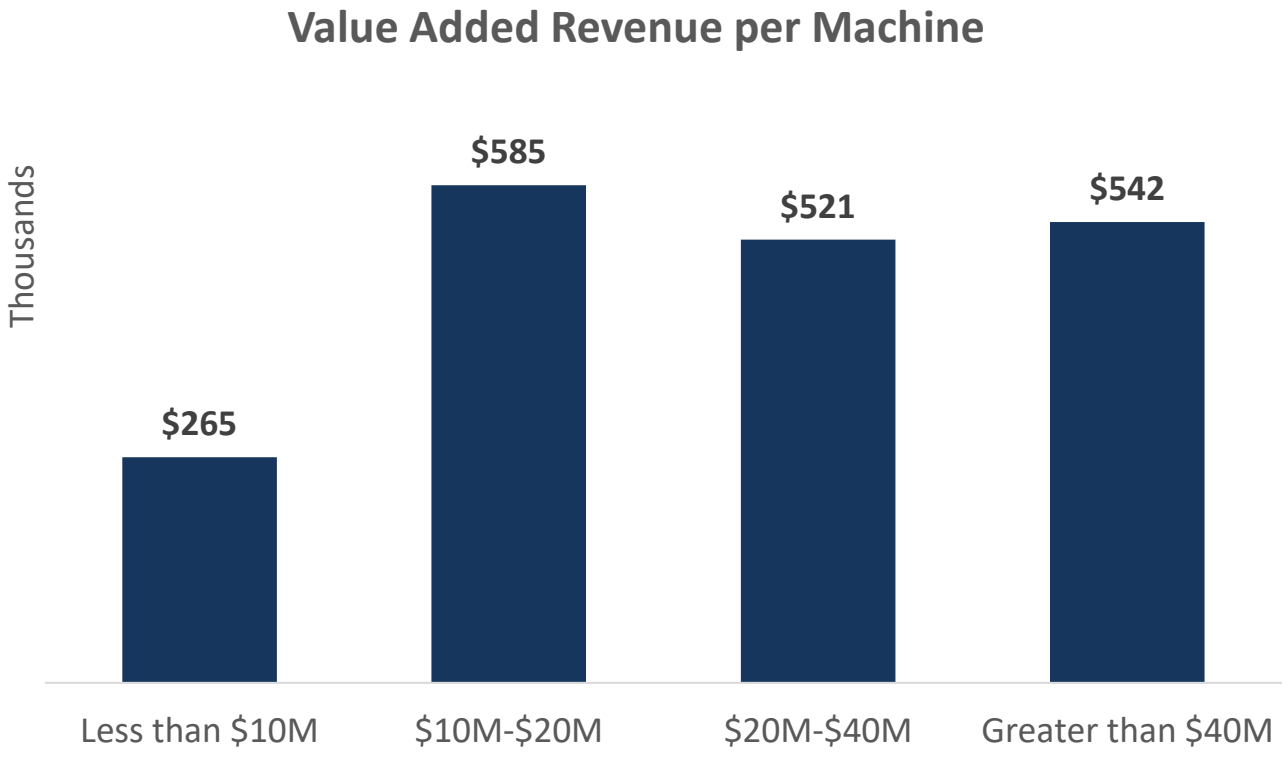


The conventional wisdom of the industry would suggest that value-added revenue per machine would correlate with increasing tonnage. However, the data would not support that assumption.

While larger presses can produce a heavier part and likely more value-add per hit, as presses get larger, they typically have to run slower. The slower rate of the larger machines would then produce less total value-add during the year than a slightly smaller machine running higher strokes per minute.

Question: By machine type, how many machines are at your facility?
Process: Metal Forming. Region: North America. Source: Harbour Results.

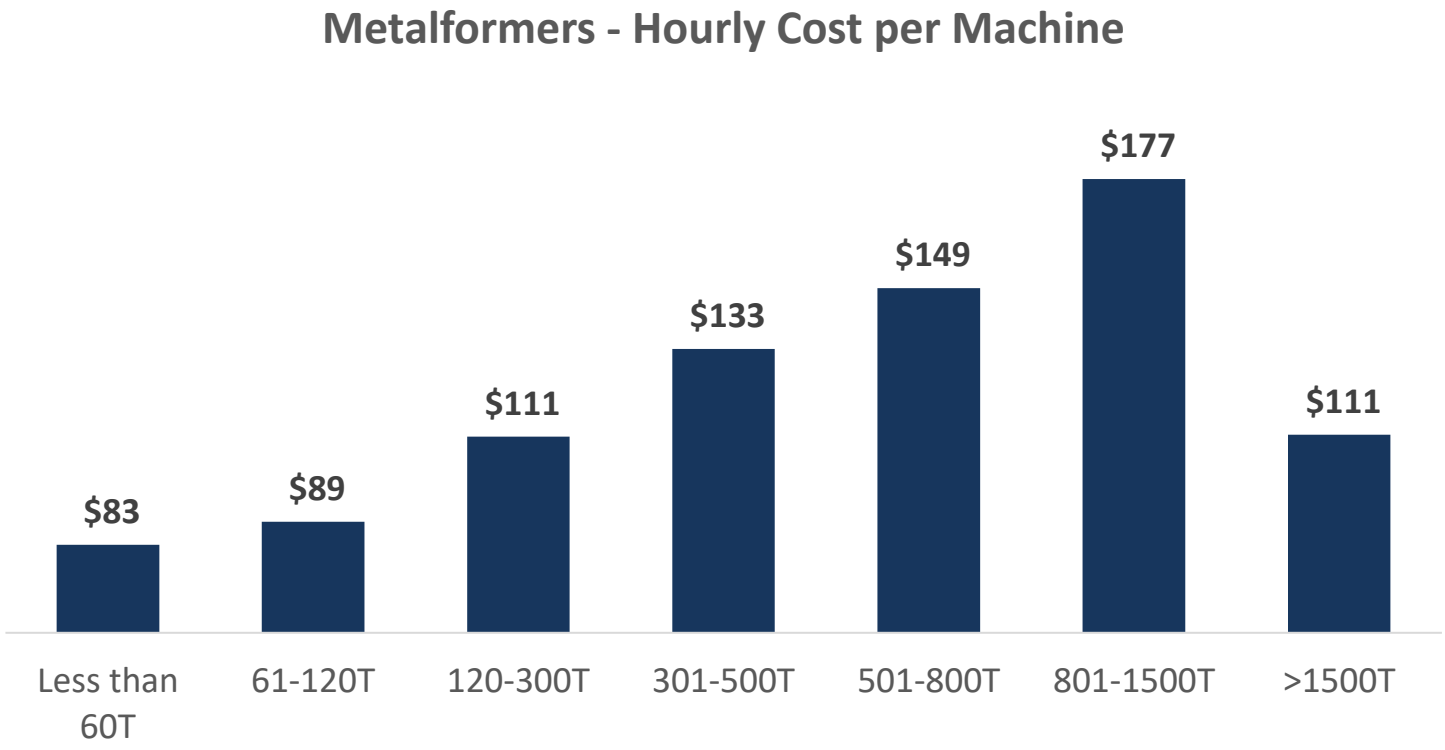
VAR/Machine Low for Smallest Companies



Metalformers under $10 million in revenues tend to have a higher quantity of presses under 60 tons, which generate less value-add per machine. The even lower performance for under $10 million in value-add per machine also suggests a higher number of idle or under utilized machines bringing town the total.

Question: By machine type, how many machines are at your facility?
Process: Metal Forming. Region: North America. Source: Harbour Results.

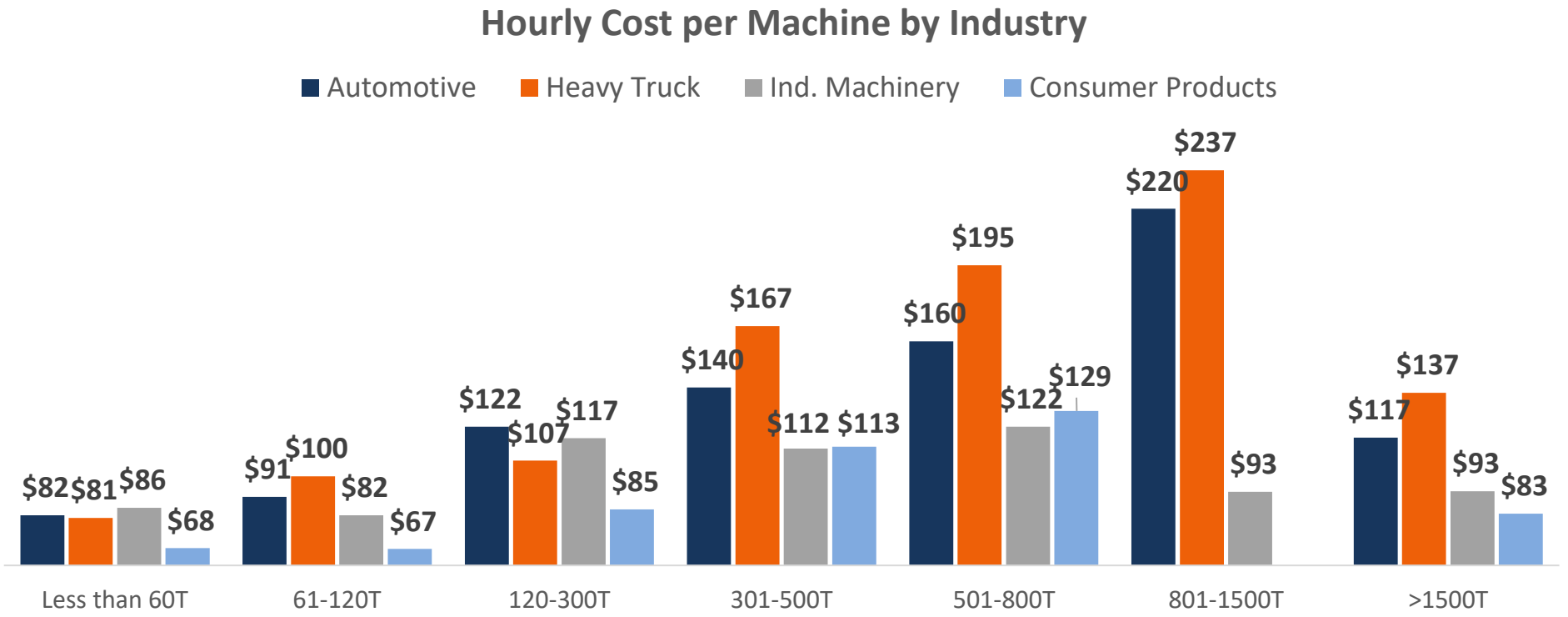
Machine Rates Higher for 300T-1500T



Historically, metalformers sought to obtain larger tonnage presses to escape crowded markets of low- and mid-tonnage stampings. So, the expectation was to observe increasing hourly rates with tonnage, but the data provided shows lower average cost/hour for >1500T. This could be due to a confounding factor among the sample, or an increase in high tonnage competition.

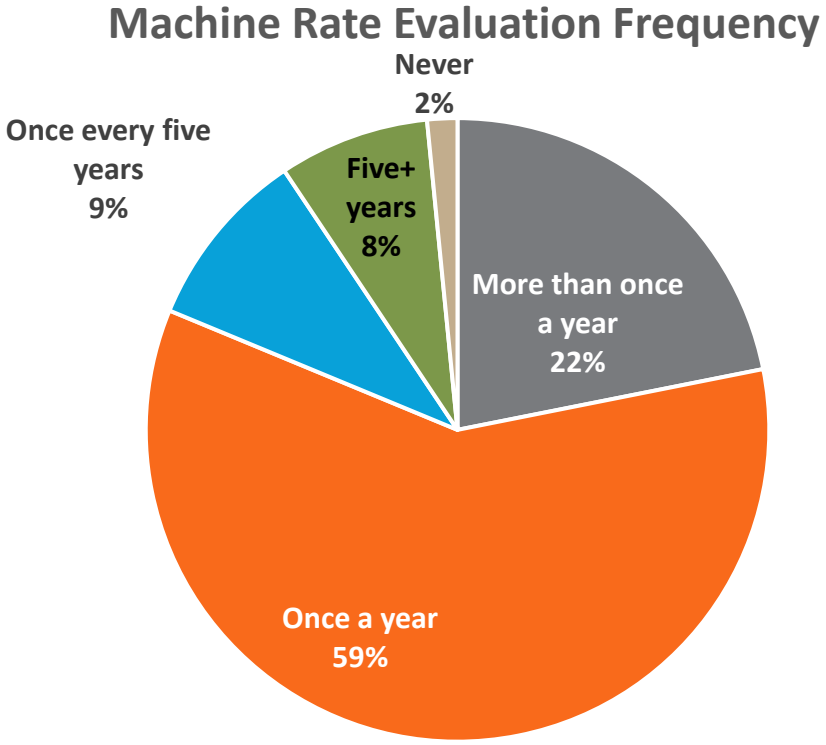
Question: By machine type, what is the average machine rate (standard cost per hour including overhead)?
Process: Metal Forming. Region: North America. Source: Harbour Results.

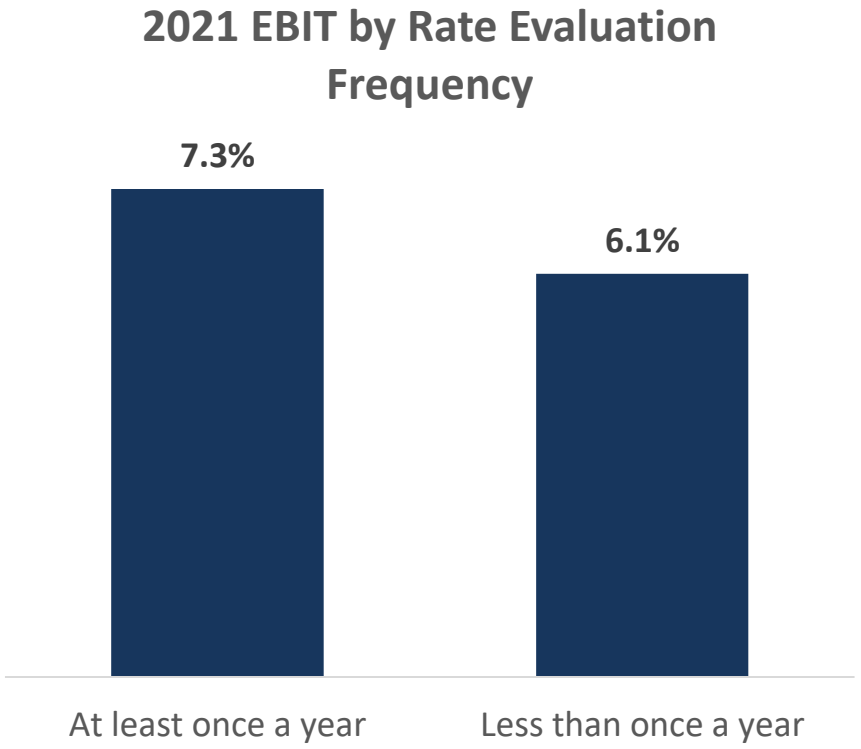
Machine Rates Highest in Heavy Truck



Question: By machine type, what is the average machine rate (standard cost per hour including overhead)?
Process: Metal Forming. Region: North America. Source: Harbour Results.

Evaluating Machine Rates Correlates to Profits





Question: How often do you re-evaluate standards or machine rates?
Process: Metal Forming. Region: North America. Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

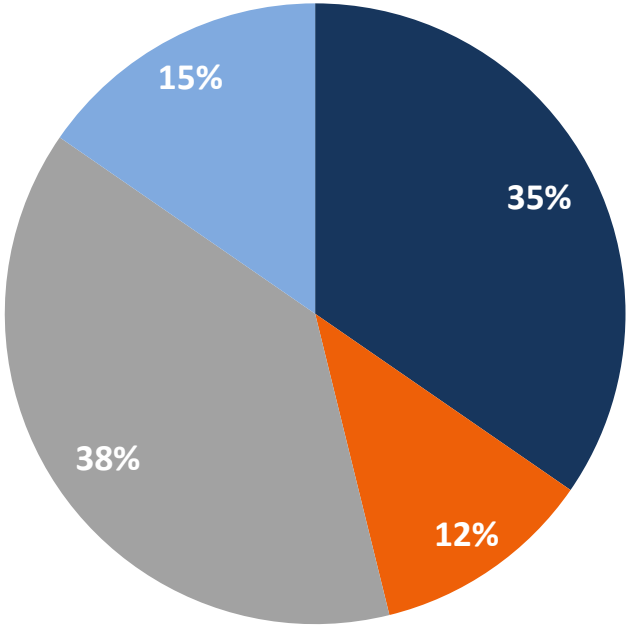
Automation & Technology

Harbour IQ 2022 Q2 Operations Report

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Larger Metalformers Already Using Automation

Less than $20M



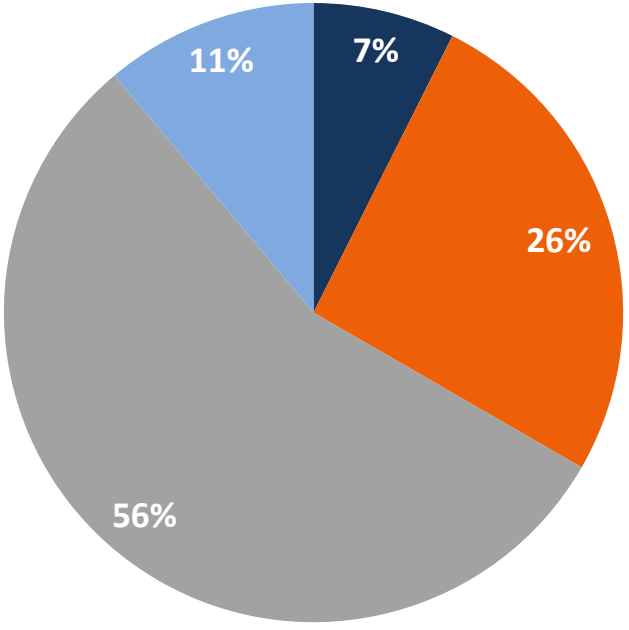
Planning to Purchase Automation

Already Purchased Automation

Already Purchased and Planning More

No Plans to Purchase Automation

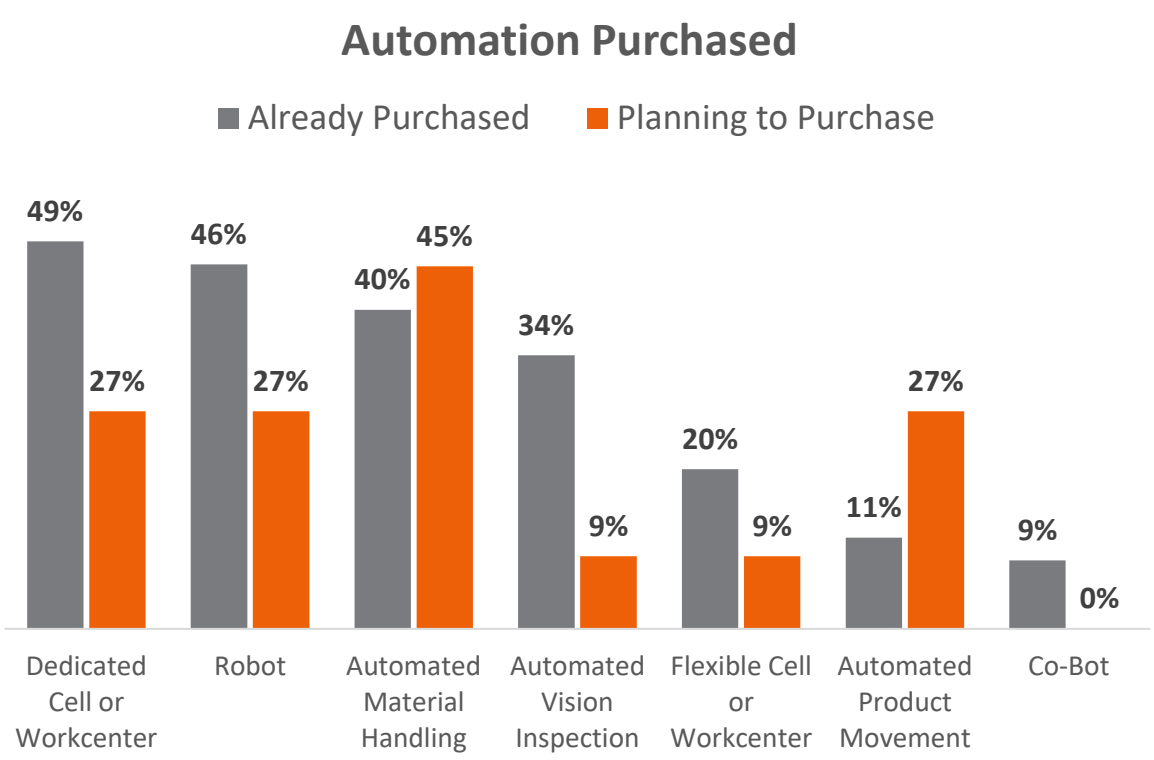
More than $20M

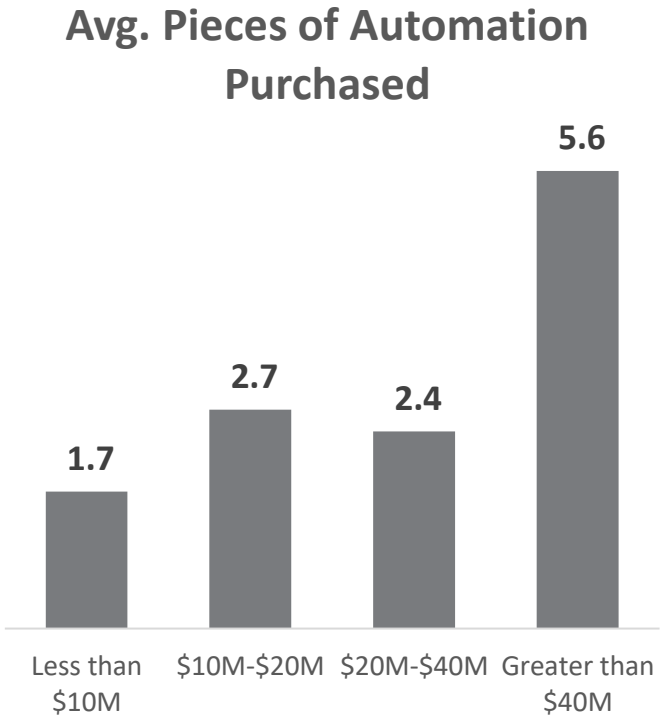


Question: Has your facility purchased automation equipment in the last 2 years or is your facility planning to purchase automation equipment in the next 2 years?
Process: Metal Forming. Region: North America. Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Dedicated Cells, Robots, and Material Handling

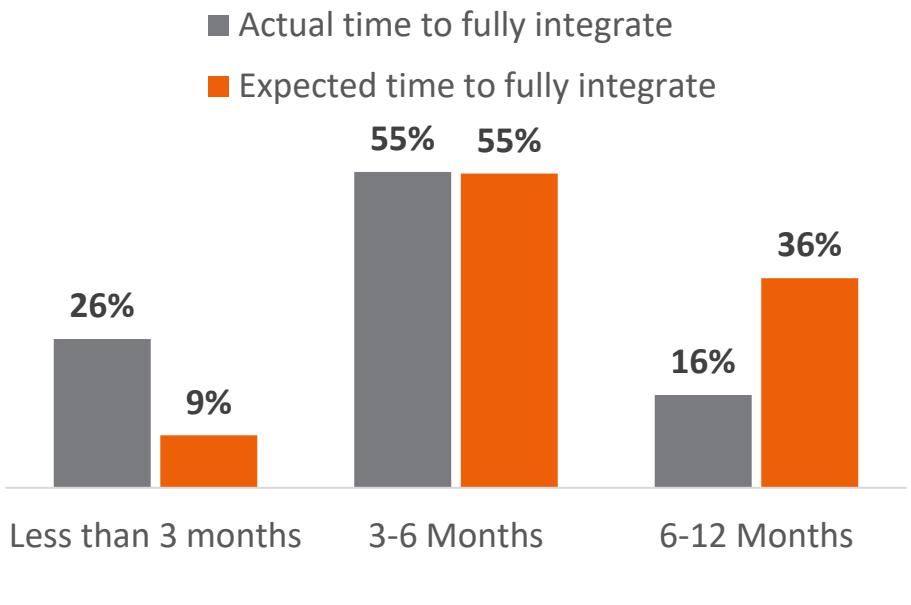




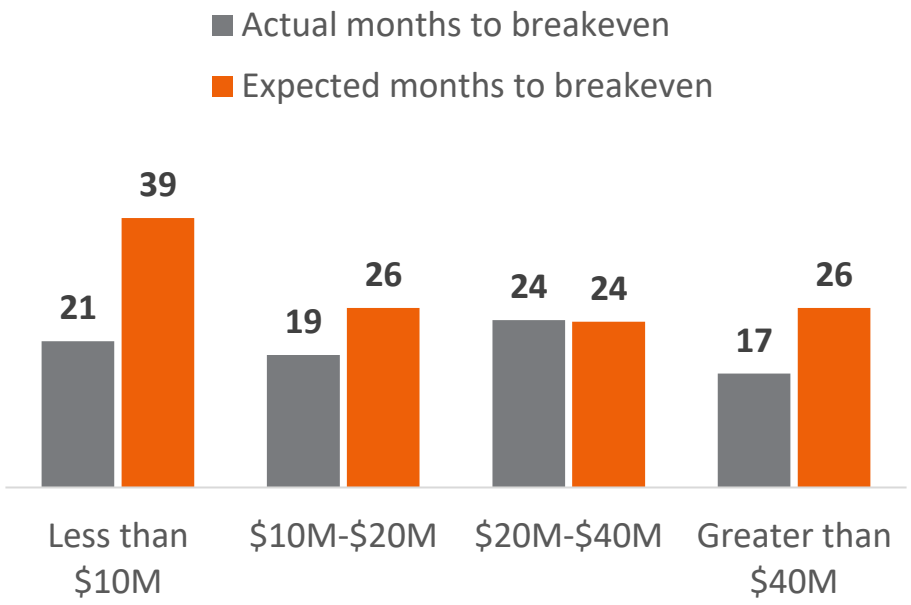
Question: What did your facility purchase? How much automation equipment did your facility purchase over the last 2 years?
Process: Metal Forming. Region: North America. Source: Harbour Results.

Integration and Payback Beat Expectations

Time to Fully Integrate Automation

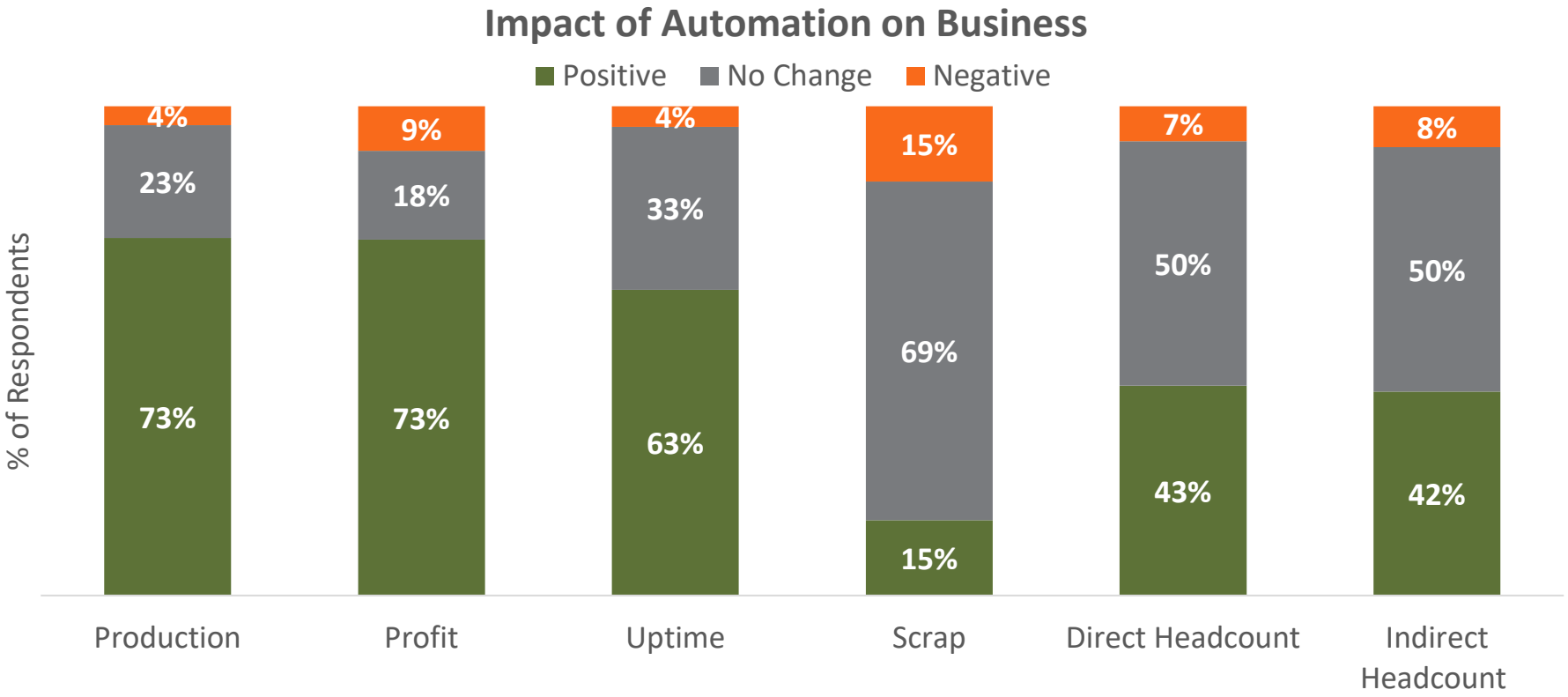


Months to Recover Automation Costs



Question: On average, how long do you expect it will take for the average automation equipment to be fully integrated into your operations? When planning to purchase a piece of automation equipment, what is the expected average return on investment in months?
Process: Metal Forming. Region: North America. Source: Harbour Results.

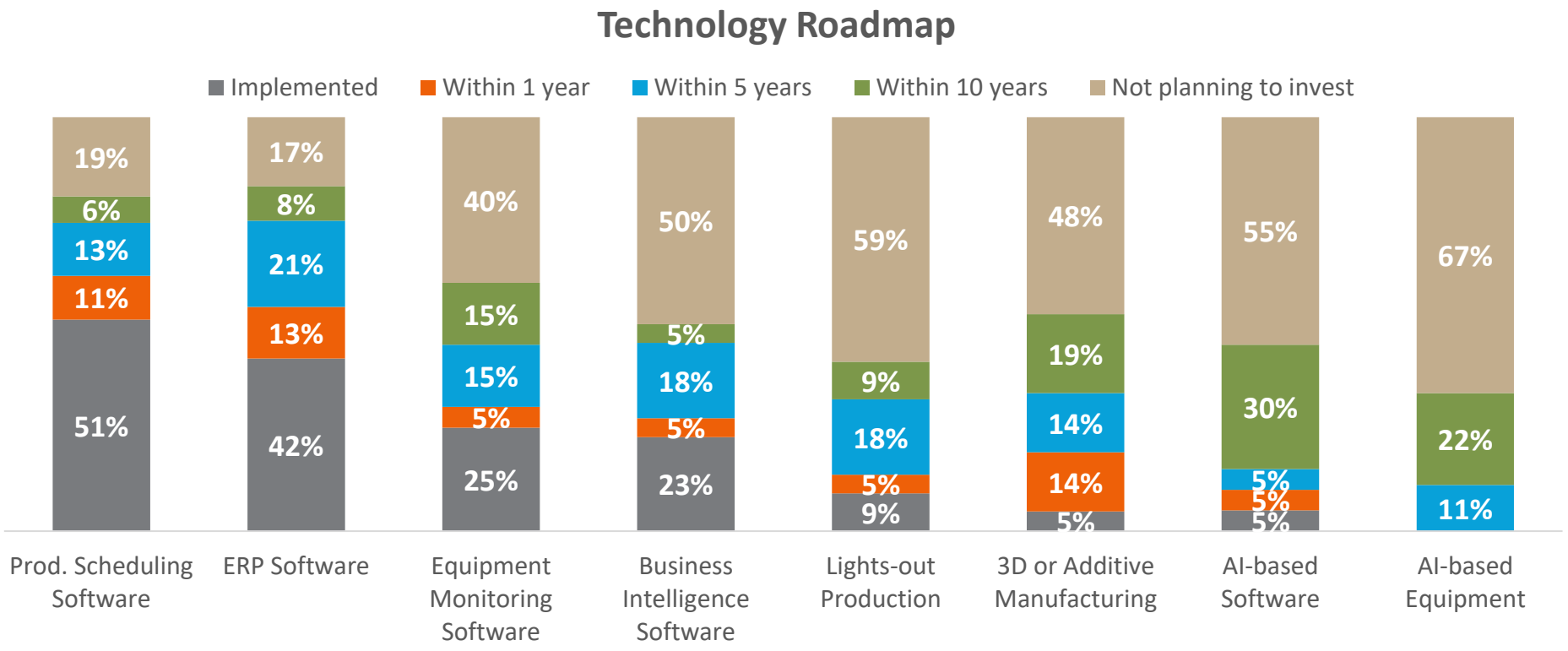
Automation Impact Clear



Question: For each of the following areas, what has been the impact of automation on your business.
Process: Metal Forming. Region: North America. Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

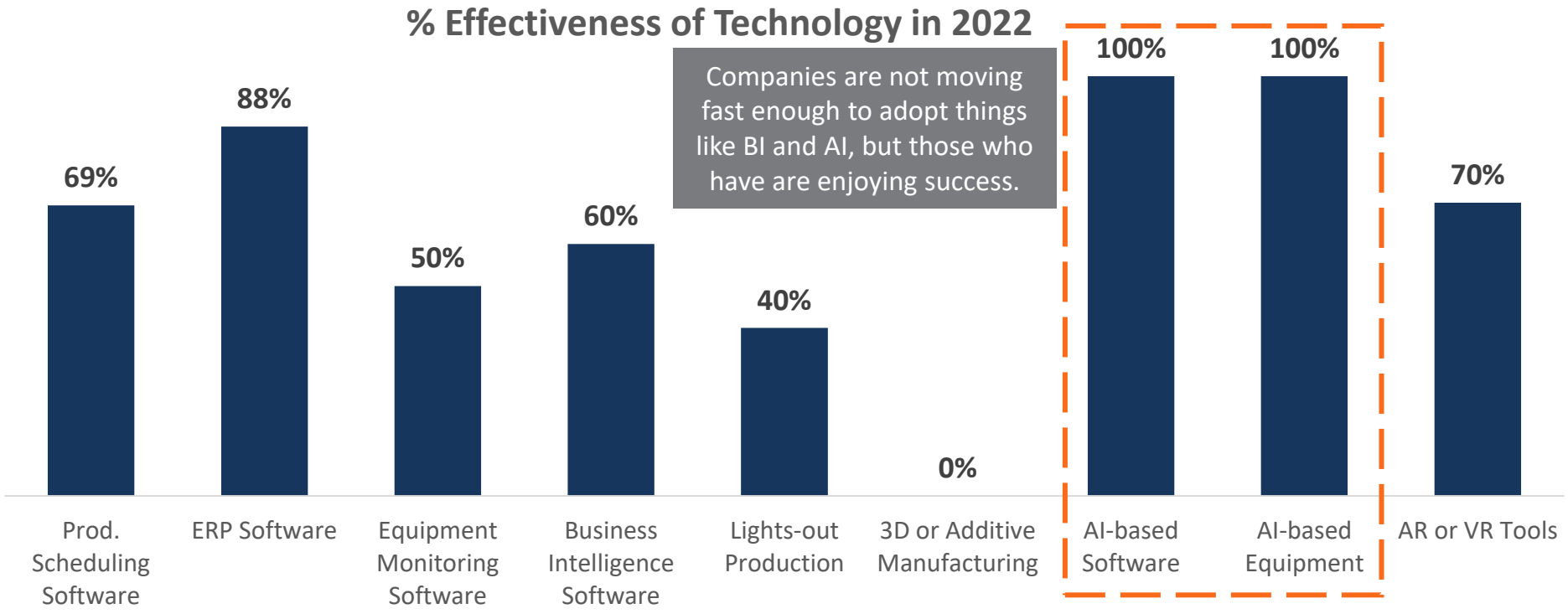
Industry 3.0 & 4.0 Technologies Are Distant Future



Question: Please indicate which of the technologies and improvements you intend to invest in and which time frame you intend to invest in.
Process: Metal Forming. Region: North America. Source: Harbour Results.

PMA PRECISION METALFORMING ASSOCIATION
METALFORMING INSIGHTS
POWERED BY HR HARBOUR RESULTS INC.

Those Who Implemented Still Have Improvement



Question: For each of the following technologies/improvements that you have already purchased, please rate your effectiveness of use.
Process: Metal Forming. Region: North America. Source: Harbour Results.

Trusted Advisor to the Manufacturing Industry

Established to help small- to medium-sized businesses transform operations and develop a roadmap to maintain financial and operational success.

Business Assessments

Operations Improvement

Strategic Development

Sales Planning

Custom Analysis Benchmarking

Due Diligence

powered by HARBOUR IQ™

Next Metalforming Insights Study

August 2022 – Workforce and Sales survey opens

Please contact Cindy Minn with any questions – 216.901.8800 ext. 146

For more than 40 years, PMA's business reports have provided members with key industry data to optimize company operational and strategic performance. PMA has partnered with Harbour Results, Inc. to enhance and update our industry surveys and reports. By partnering with manufacturing and metalforming experts, we are combining manufacturing, metalforming and market expertise to provide an unmatched resource of business-critical data and insights for PMA members.