



2023 Career Advancement in Manufacturing Report

Third Annual Joint Report



Key Insights

Xometry, in collaboration with the Women in Manufacturing Association, conducted our third annual joint survey on **career advancement and women in the manufacturing sector**, revealing the following key trends from 1,170 qualified responses:

1. In 2023, **82% of women** are more likely to recommend a career in manufacturing, significantly more so than in 2021 (75%).
2. There is improved optimism about women making significant progress in the manufacturing industry over time: in 2023, **30% of women** strongly agreed that women have made significant progress, up from **17% in 2020**.
3. **1 in 3** manufacturing professionals and **1 in 4** manufacturing leaders are women, with no significant change from 2021.
4. Despite the high likelihood of recommending a career in manufacturing, **73% of women fell into the industry** instead of intentionally seeking to join the sector, as opposed to 52% of men.
5. Meanwhile, **82%** of manufacturing companies are experiencing a labor shortage.
6. Most **in-demand job positions** are entry-level production positions, assemblers & fabricators, and engineers. We are seeing emerging tech positions such as robotics and automation specialists, computer programmers, and smart systems integration technicians in high demand.
7. The top three job functions with the **greatest female representation** are human resources, business functions, and quality control.

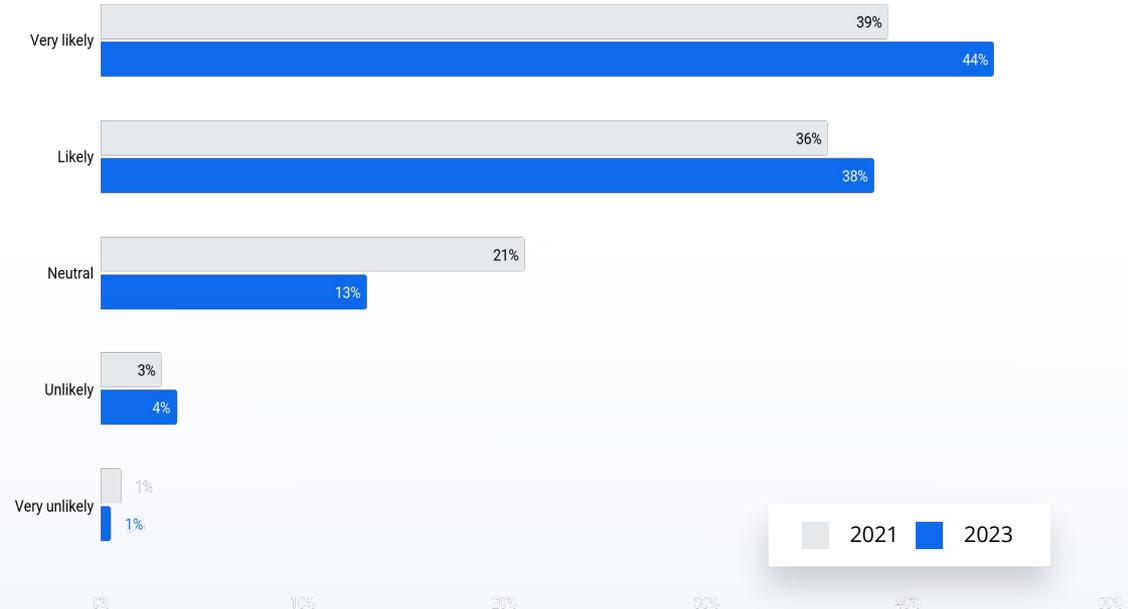
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Key Insights



How likely are you to recommend a career in manufacturing? (responses from women only)

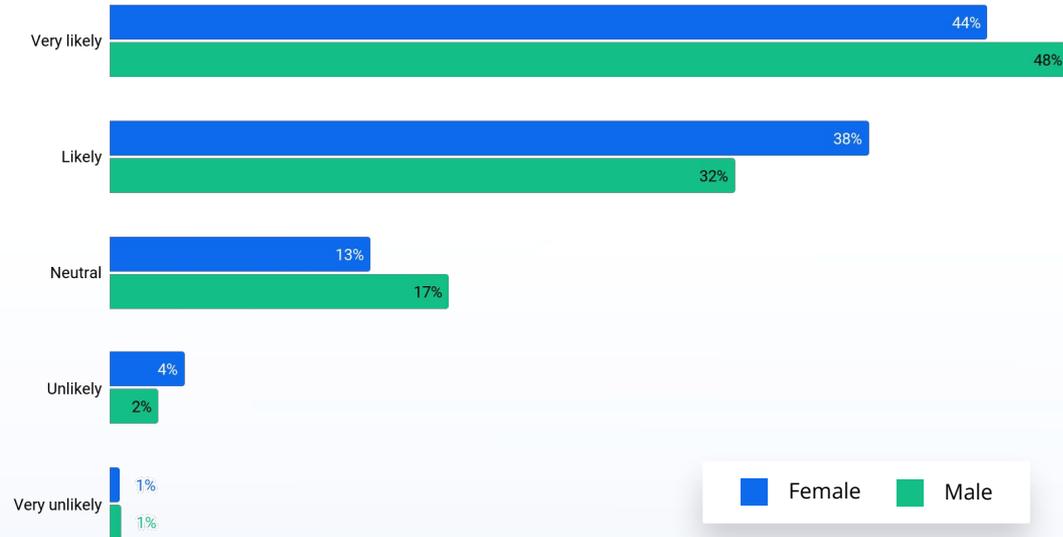
Women are significantly more likely to recommend a career in manufacturing in 2023 than they were in 2021: 82% compared to 75%*



*Tallied up percentage count of "Very likely" and "Likely." 2021 n=446; 2023 n=585; 95% confidence; p-value = 0.0170.

How likely are you to recommend a career in manufacturing?

82% of women would recommend a career in manufacturing, compared to 80% of men*



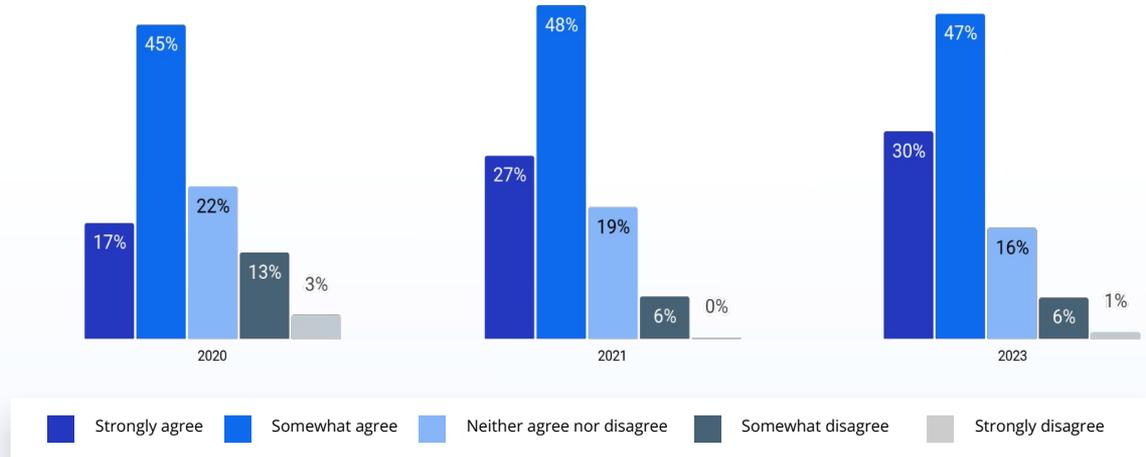
*Tallied up percentage count of "Very likely" and "Likely." Total Response Count: n=957; Female n=585; Male n=368; Non-Binary n=4; Sample size of <10 is omitted from report visualization.

Women have become more optimistic about progress made for them in manufacturing

When asked if they agreed with the statement “Women have made significant progress in the manufacturing industry over the last 5 years:

Women: In 2023, 30% of women strongly agreed that women have made significant progress. It’s a notable change from 2020 (17%) and 2021 (27%).

From Women in Manufacturing:



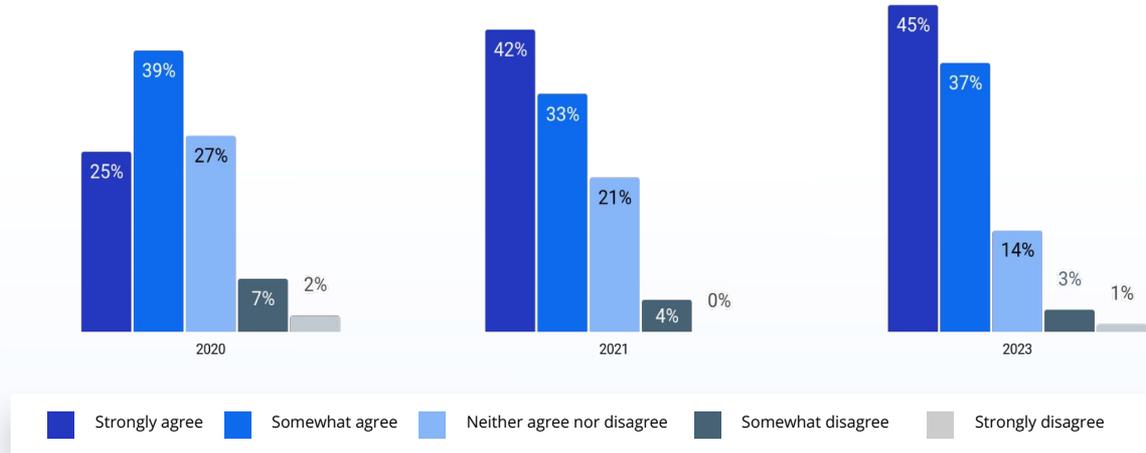
Response Count: Women: n=332 (2020); n=442 (2021); n=560 (2023); Non-binary and other responses are omitted due to n<10.

Men are even more optimistic about progress made for women in manufacturing

When asked if they agreed with the statement “Women have made significant progress in the manufacturing industry over the last 5 years:

Men: In 2023, 45% of men strongly agreed that women have made significant progress. It’s also a notable change from 2020 (25%) and 2021 (42%).

From Men in Manufacturing:



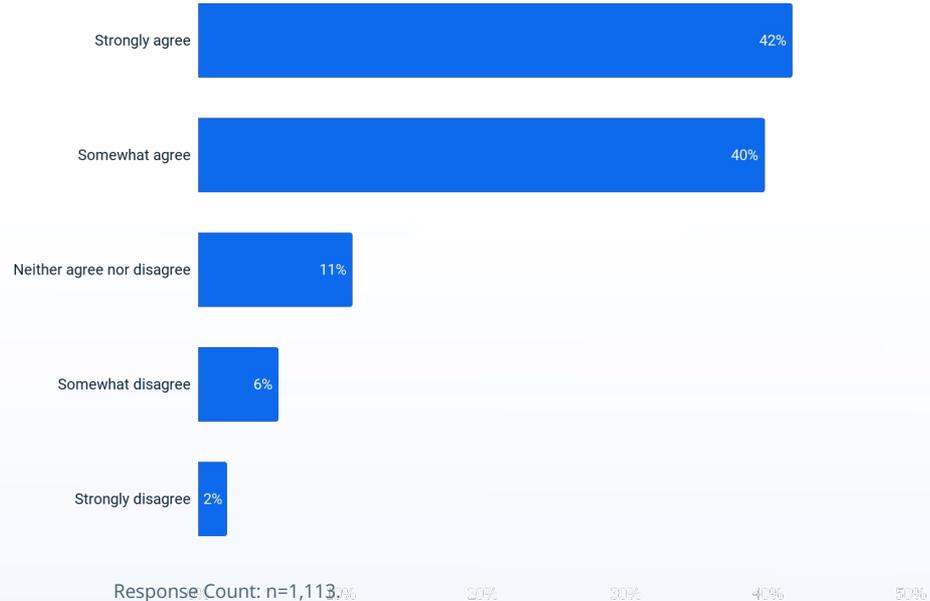
Response Count: Men: n=134 (2020); n=113 (2021); n=351 (2023). Non-binary and other responses are omitted due to n<10.

Do you agree or disagree with the following statement: We are experiencing labor shortages

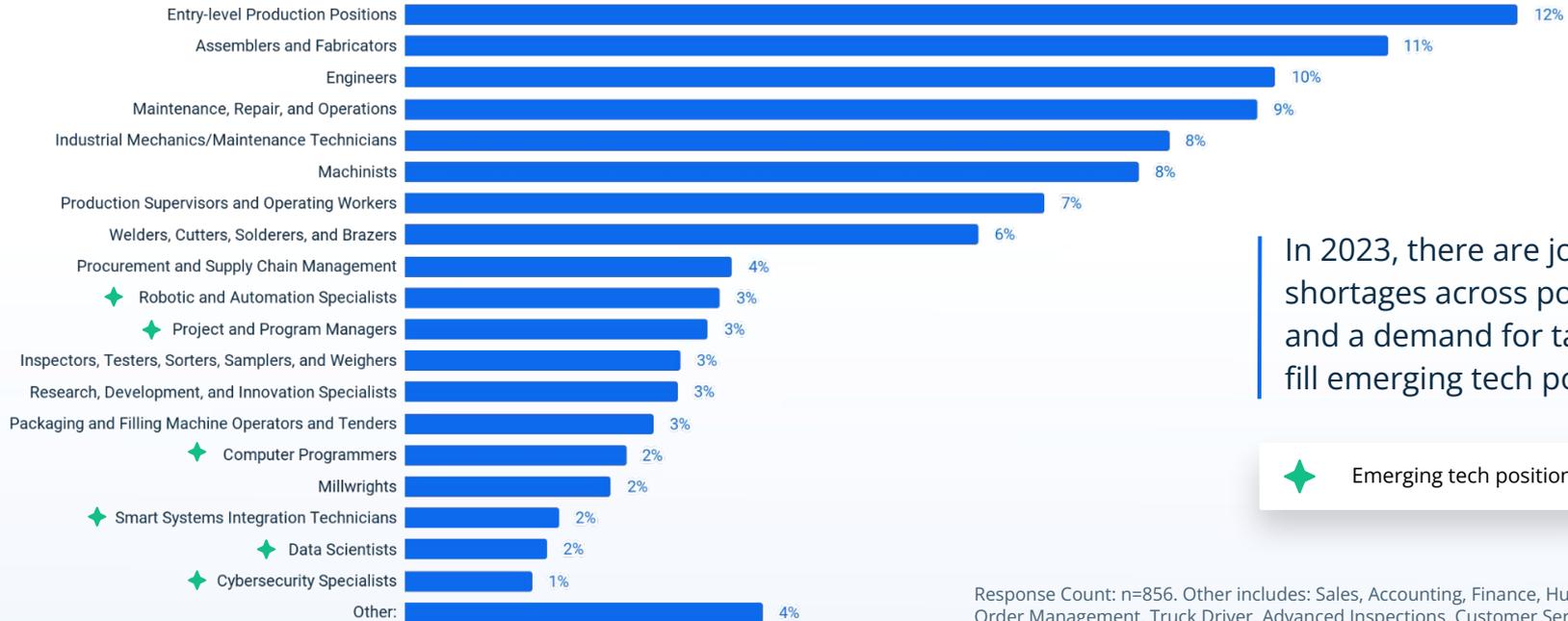
82% of manufacturing companies are experiencing labor shortages

From 1,113 industry professionals who are active in manufacturing, 42% strongly agreed that their organization is experiencing labor shortages. In the next page of this report, we break down the labor gap by:

- Job function
- State
- Industry



Which job positions are the hardest to fill in your field today? (select all that apply)

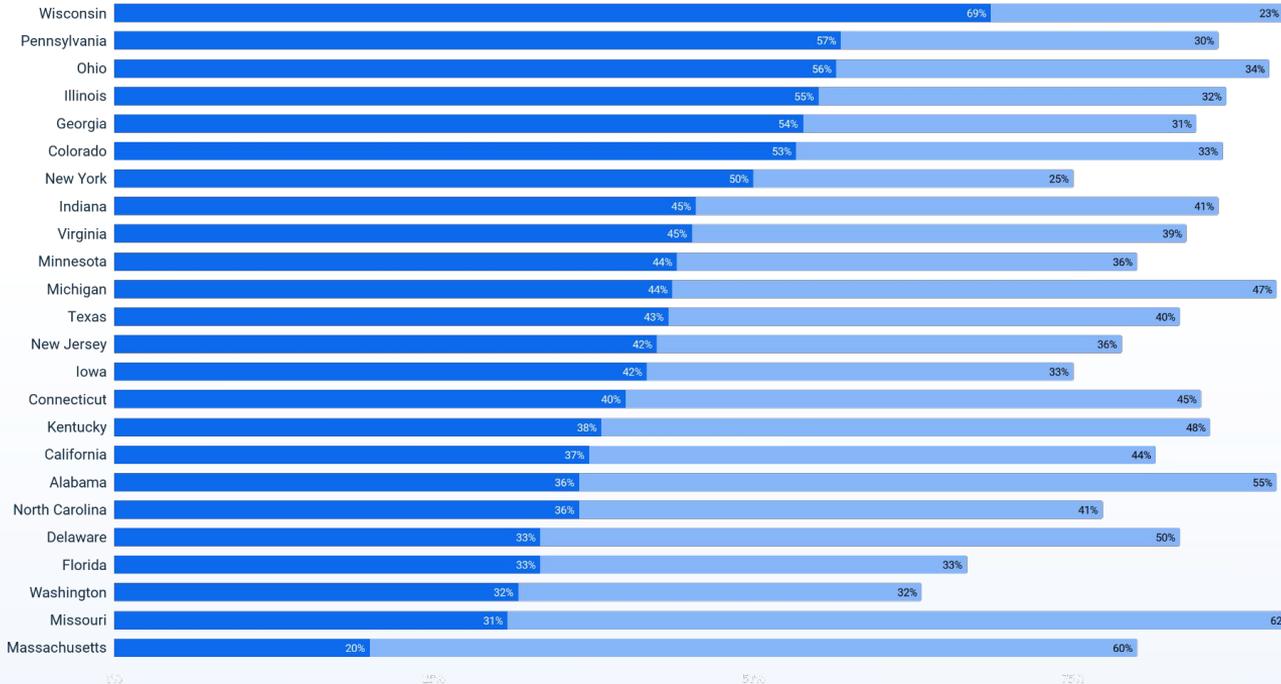


In 2023, there are job shortages across positions and a demand for talent to fill emerging tech positions

Emerging tech positions

Response Count: n=856. Other includes: Sales, Accounting, Finance, Human Resources, Order Management, Truck Driver, Advanced Inspections, Customer Service, and Controls.

Do you agree or disagree with the following statement: We are experiencing labor shortages

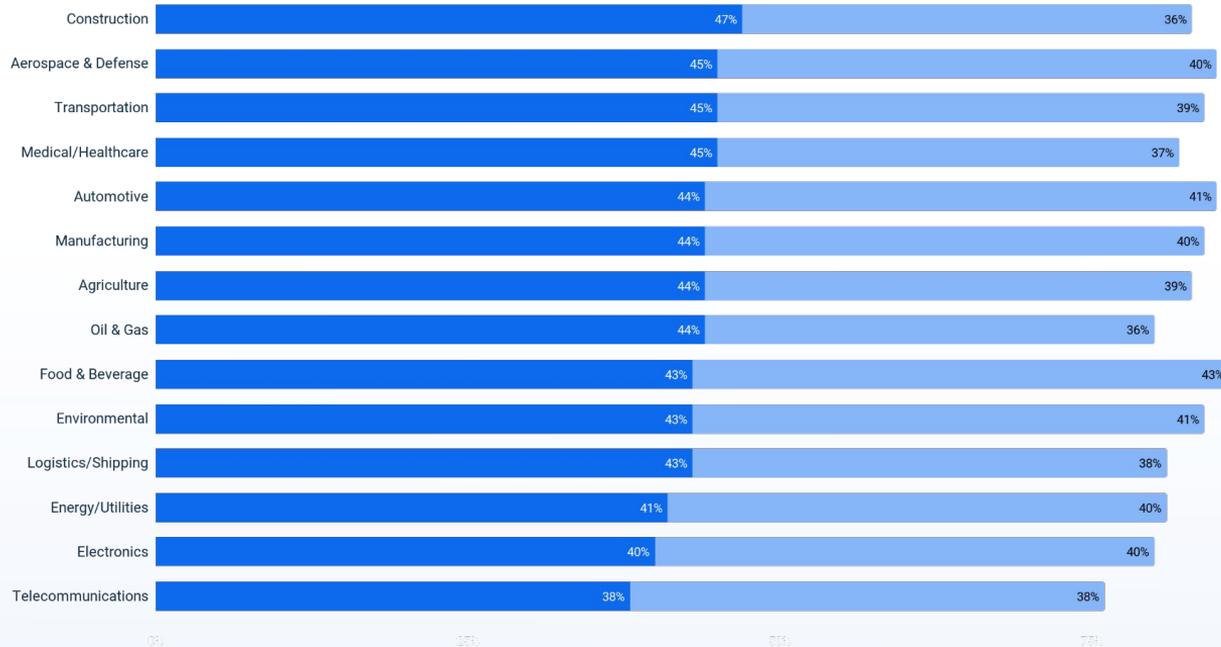


Wisconsin, Pennsylvania, and Ohio report the most acute labor shortages

Strongly agree
Somewhat agree

Response Count: n=823; Omitted states with <10 responses. Response Count by State: AL n=11; CA n=70; CO n=15; CT n=20; DE n=12; FL n=30; GA n=13; IL n=69; IN n=22; IA n=12; KY n=21; MA n=15; MI n=55; MN n=25; MS n=13; NJ n=33; NY n=40; NC n=44; OH n=62; PA n=44; TX n=30; VA n=31; WA n=19; WI n=35.

Do you agree or disagree with the following statement: We are experiencing labor shortages



Construction, aerospace & defense, and transportation are experiencing the most acute labor shortages

Strongly agree
Somewhat agree

Response Count: n=1,113; Industry Specific Responses Count: Aerospace & Defense n=337; Agriculture n=227; Automotive n=341; Construction n=268; Electronics n=220; Energy/Utilities n=256; Environmental n=148; Food & Beverage n=229; Oil & Gas n=187; Logistics/Shipping n=117; Manufacturing n=720; Medical/Healthcare n=262; Telecommunications n=97; Transportation n=212.

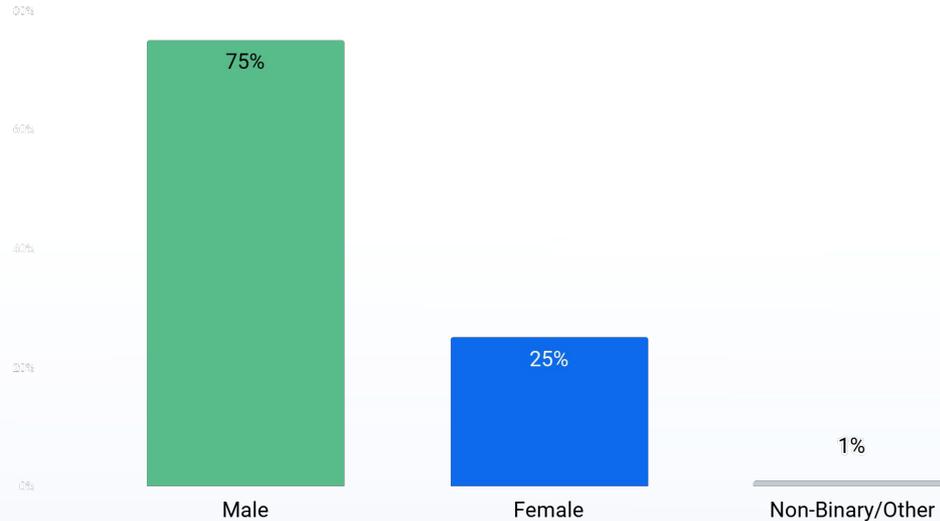
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Women's Participation in Manufacturing



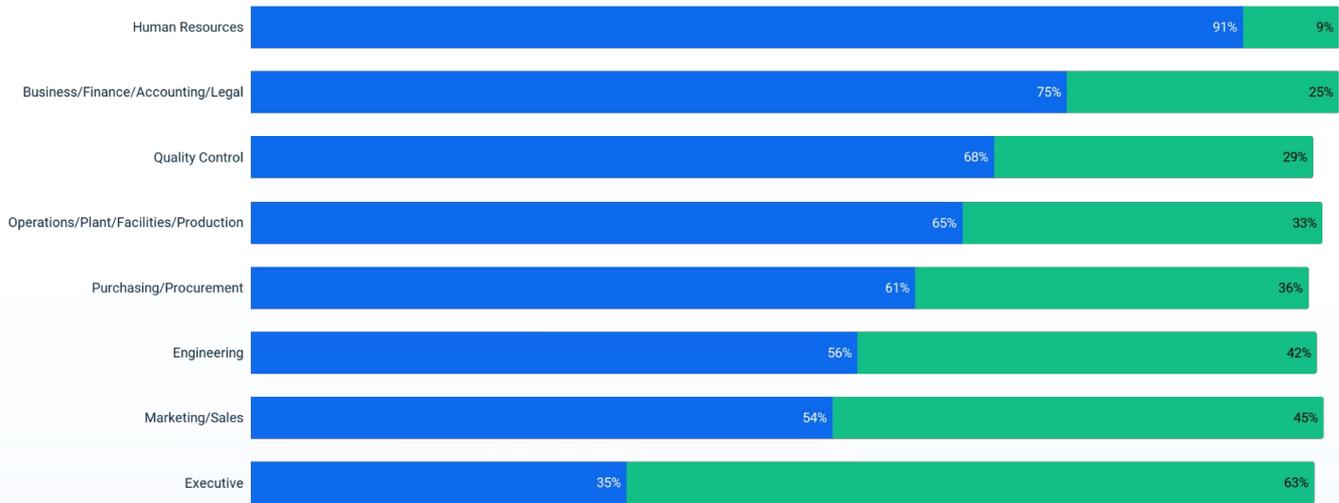
Please estimate the percentage of employees on your company's leadership team by gender:

25% of manufacturing business leaders are female, with no significant change from 2021



Response Count: n=937

Which option best describes the department you work in?

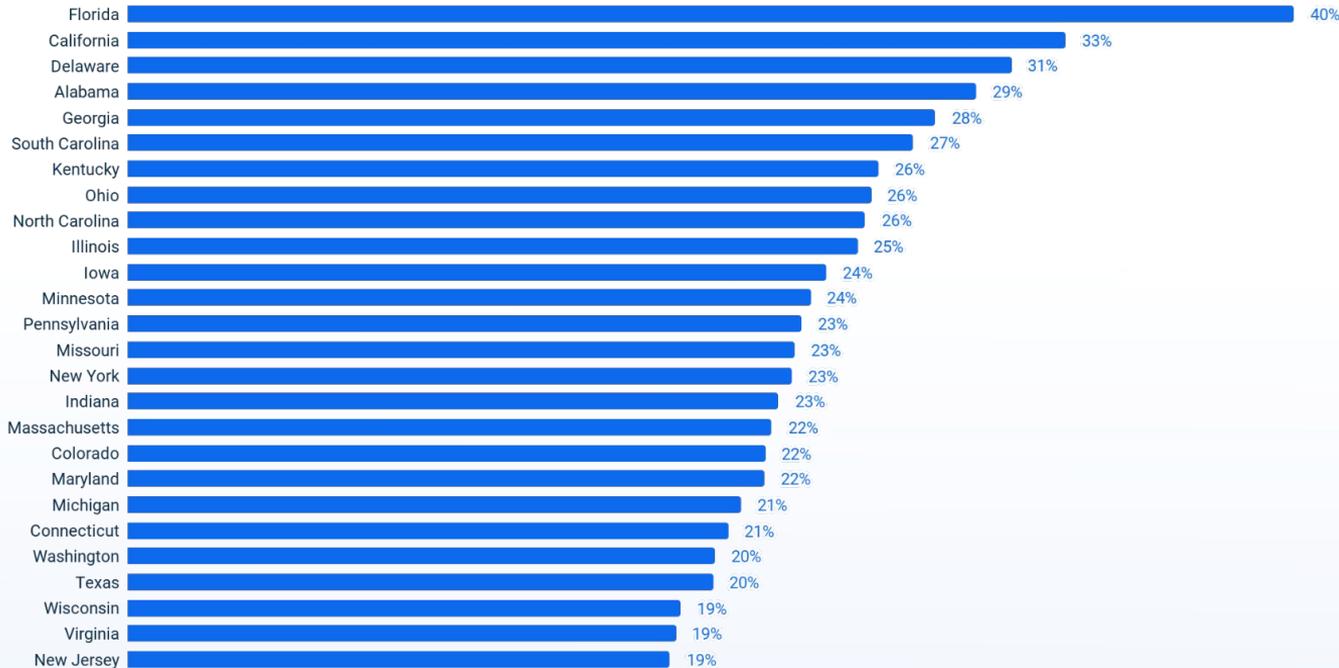


Human resources, business functions, and quality control are the top three job functions in manufacturing with the highest percentage of female representation



Response Count: n=537; Human Resources n=52; Business/Finance/Accounting/Legal n=42; Quality Control n=28; Operations/Plant/Facilities/Production n=83; Purchasing/Procurement n=44; Engineering n=82; Marketing/Sales n=76; Executive n=130. Omitted job functions with n<25.

Please estimate the percentage of employees on your company's leadership team by gender:

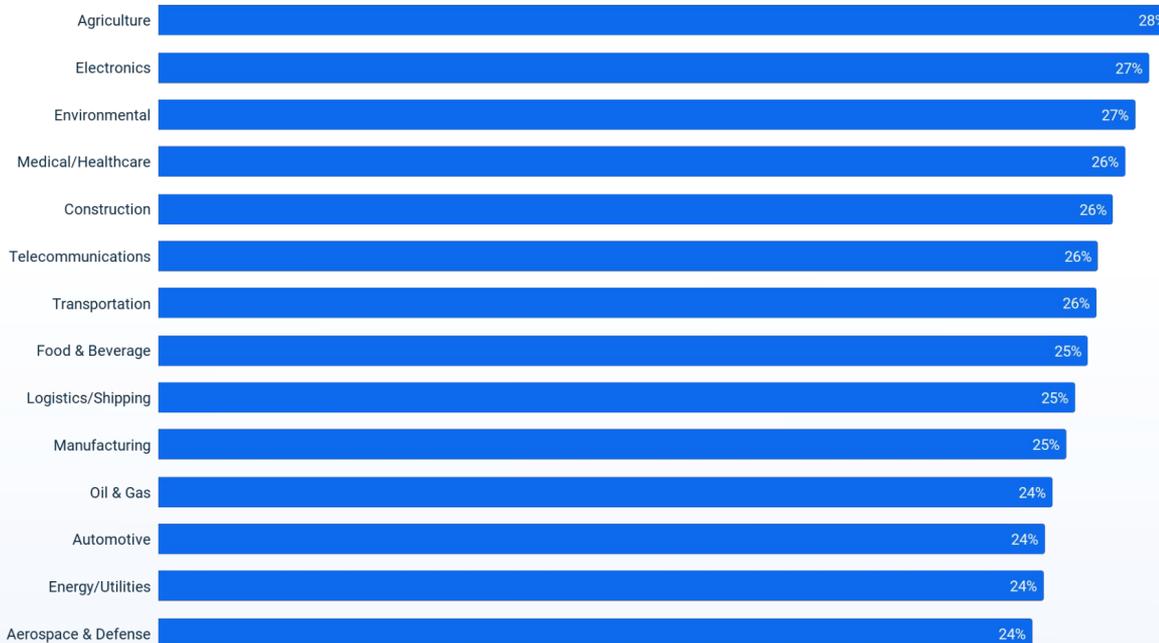


Female Leadership:
Florida, California, and Delaware have the highest percentage of female leadership in manufacturing

% of female leadership

Response Count: n=936; Omitted states with <10 responses. Response Count by State: FL n=23; CA n=66; DE n=12; AL n=11; GA n=14; SC n=11; KY n=21; OH n=63; NC n=46; IL n=68; IA n=12; MN n=26; PA n=46; MO n=14; NY n=40; IN n=22; MA n=14; CO n=15; MD n=10; MI n=55; CT n=19; WA n=18; TX n=28; WI n=36; VA n=30; NJ n=33.

Please estimate the percentage of employees on your company's leadership team by gender:



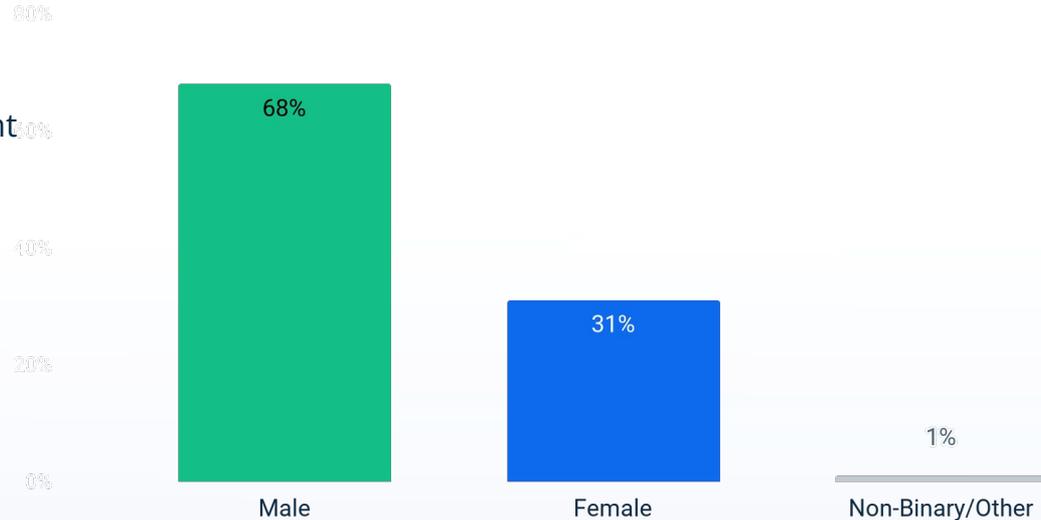
Female Leadership:
Agriculture, electronics, and environmental have the highest percentage of female leadership in manufacturing

% of female leadership

Response Count: n=936; Omitted states with <10 responses. Response Count by State: FL n=23; CA n=66; DE n=12; AL n=11; GA n=14; SC n=11; KY n=21; OH n=63; NC n=46; IL n=68; IA n=12; MN n=26; PA n=46; MO n=14; NY n=40; IN n=22; MA n=14; CO n=15; MD n=10; MI n=55; CT n=19; WA n=18; TX n=28; WI n=36; VA n=30; NJ n=33.

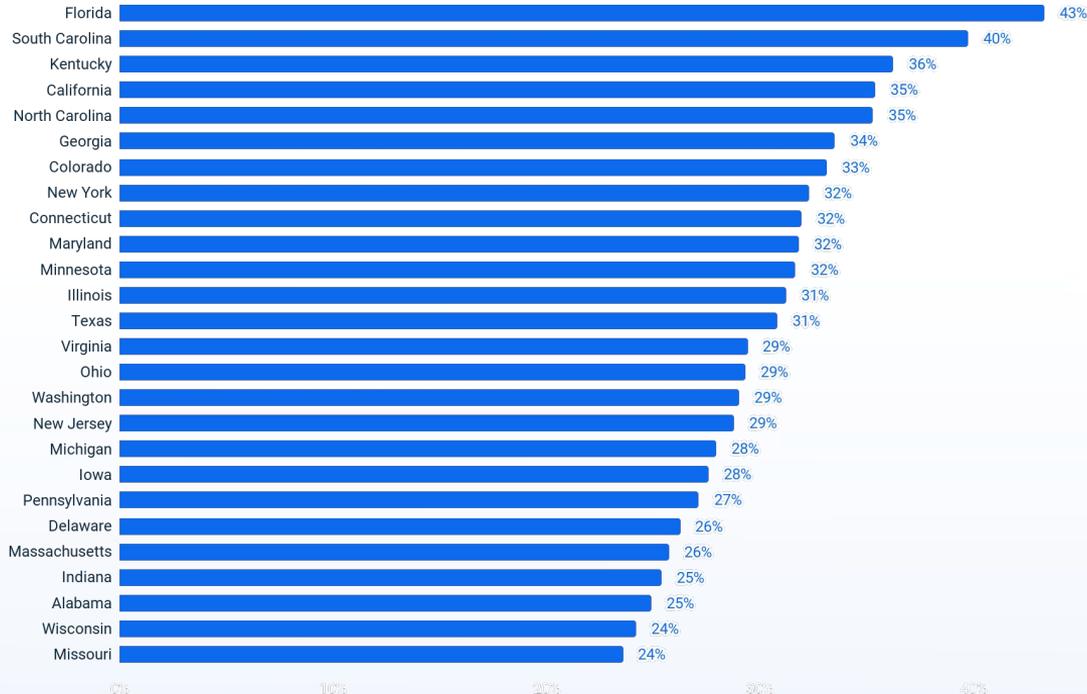
Please estimate the percentage of employees on your company's leadership team by gender:

An estimated 33% of employees in manufacturing are female, with no significant change from 2021



Response Count: n=957.

Please estimate the percentage of employees in your entire company by gender:

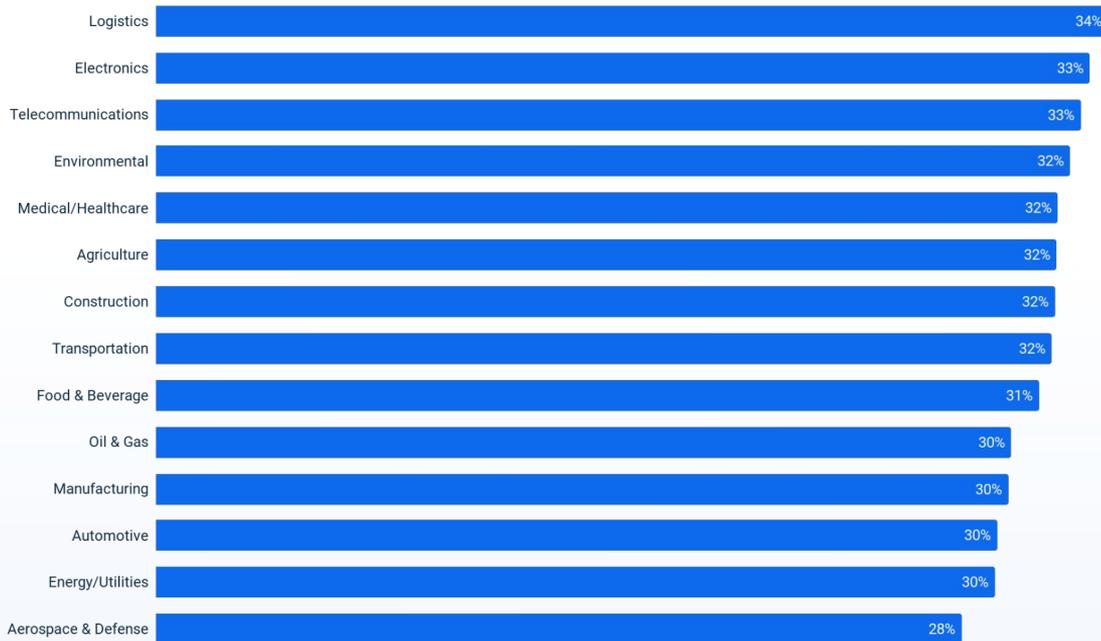


Female Representation:
Florida, South Carolina, and Kentucky have the highest percentage of women in manufacturing

% of women in organization
(estimated by respondents)

Response Count: n=936; Omitted states with <10 responses. Response Count by State: FL n=23; CA n=66; DE n=12; AL n=11; GA n=14; SC n=11; KY n=21; OH n=63; NC n=46; IL n=68; IA n=12; MN n=26; PA n=46; MO n=14; NY n=40; IN n=22; MA n=14; CO n=15; MD n=10; MI n=55; CT n=19; WA n=18; TX n=28; WI n=36; VA n=30; NJ n=33.

Please estimate the percentage of employees in your entire company by gender:



Female Representation: Logistics, electronics, and telecommunications have the highest percentage of female employees

% of women in organization
(estimated by respondents)

Response Count: n=956; By Industry: Logistics n=103; Electronics n=182; Telecommunications n=83; Environmental n=129; Medical/Healthcare n=230; Agriculture n=198; Construction n=227; Transportation n=184; Food & Beverage n=193; Oil & Gas n=159; Manufacturing n=620; Automotive n=297; Energy/Utilities n=217; Aerospace & Defense n=295.

Quoted responses from industry professionals on how to bring more women into manufacturing — education and career development



“ Recruiting more women into entry-level roles out of college, and building them up through the company. ”



“

Make young women [aged] 15 to 25 aware of options and pay in manufacturing; K-12 educators know nothing of manufacturing, never talk about it, don't recommend it, and think it is dirty and dangerous.

”

“

Education starting at the high school level — explaining how manufacturing has changed over the years and the great opportunities there are especially in skilled trades. I believe we have to start early and educate. Get involved in community partnerships and reach out to the public and educate them on how to get the schooling they need and the opportunities that are there for women and men for that matter.

”

Quoted responses from industry professionals on how to bring more women into manufacturing — retention and culture advice



“

If women are leading a team, all employees should treat them the same way they would treat a male in that position.

”



Sometimes women have a difficult time accepting roles that position them for senior leadership opportunities. Employers who develop women leaders, provide networking and mentorship opportunities, and showcase their work flexibility for women who also have responsibilities at home/life will be in the best position to recruit and retain female talent. Additionally, paying women for their worth that is equal to their male peers is essential to making women feel valued.



Recruiting isn't the hard part in my opinion; it's retention. The women I know who are engineers take on additional workload because it's second nature (emotional labor) and burn out faster than the men do who don't feel the constant need to prove themselves. Addressing systemic piling of work on top performers while allowing the lesser performers to slide by is a gross issue that I've witnessed over my nearly 16-year career so far.



“

Have diverse senior leadership! I work in a company that has diverse leadership, and it is night and day from companies I've worked with where the 'old boys' club' runs the show. These companies need to be open to new ideas and changing the way things have 'always been done.'

”

“

We need to embrace and let women know they are welcome and are on the same level as male counterparts. Too often women tend to get brushed over as a secretary or a calendar keeper. We are not just admins; we are so much more! It's getting better, but we aren't there yet!

”

Quoted responses from industry professionals on how to bring more women into manufacturing — inclusivity best practices

“

You could recruit and retain more women by promoting women in leadership positions. Female recruits/hires need to see someone like them in a leadership position, someone they can relate to, in order to see a future with the company.

”

“

Have a strong percentage of women at each level of ranking in the hierarchy. You see a strong showing in lower levels, but less and less as you rise, and even lower for minority women.

”

“

More strong women in leading roles, and these strong women need to have male colleagues that do not undermine their authority as well. In industry you see it frequently. It's important to see that we are all valued at all levels.

”

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“

Better benefits for mothers such as onsite child care, paid parental leave, part-time or flexible hours.

”

“

Upgrade the facilities at the manufacturing sites, including areas for new mothers to pump and store breastmilk.

”

“

By closing the pay gap, giving flexible work options, and allowing room for new and innovative ideas and technologies.

”

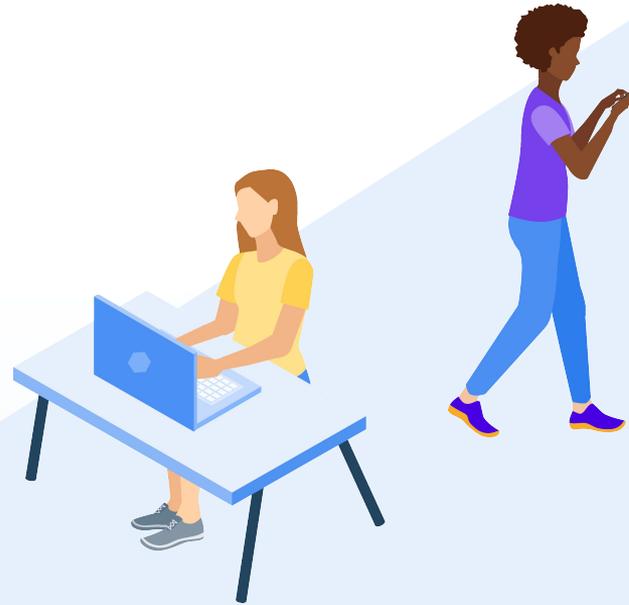
“

By adapting to different leadership strategies and measurement standards. Sometimes the standards don't work for certain people, and I believe a higher percentage of those are women. Whether it's getting recognition or the way we talk about future goals, etc. — doing things "the way we have always done them" prevents people with new perspectives and ideas from entering a male-dominant environment.

”

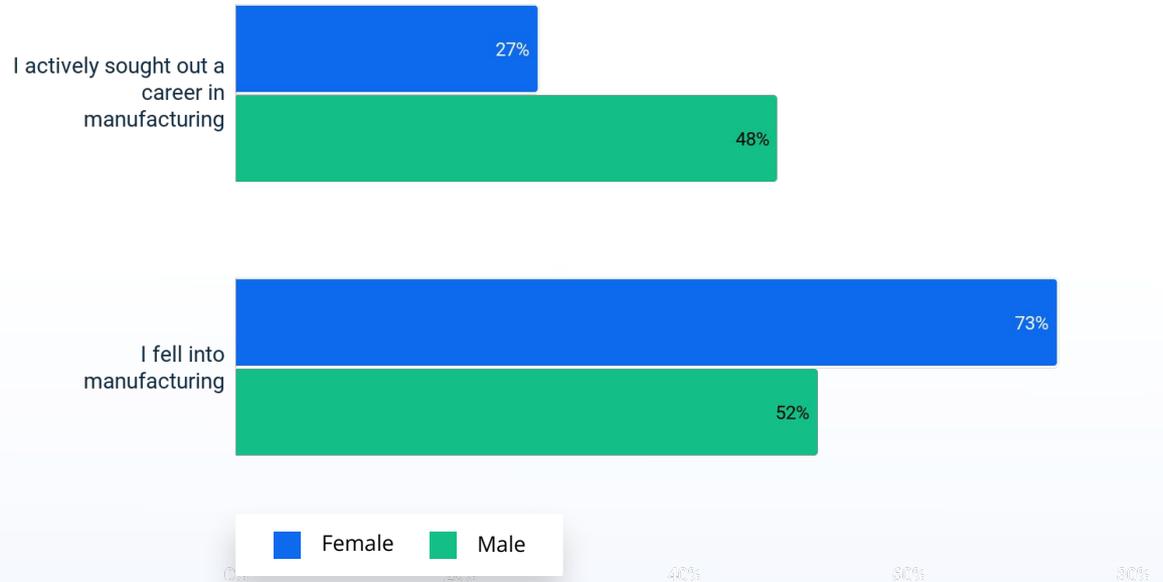
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How to Retain and Engage Talent



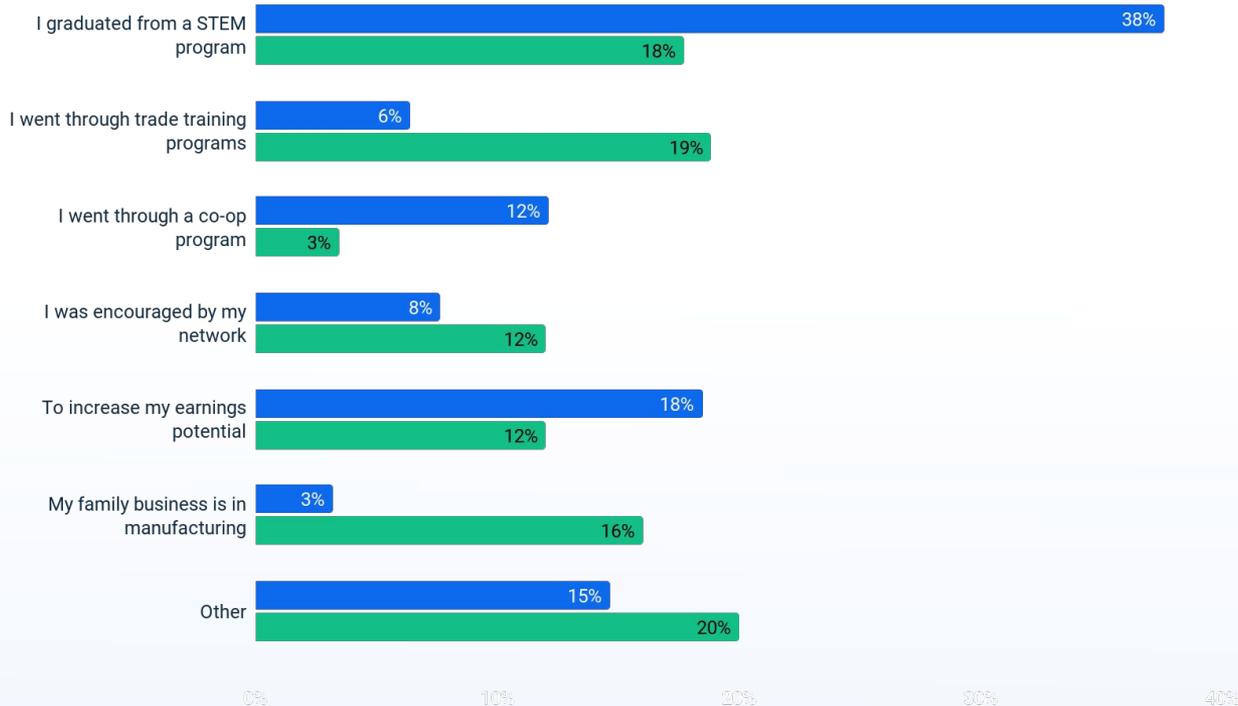
How did you enter the manufacturing industry?

73% of women enter the manufacturing industry unintentionally, with no significant change from 2021 (70%)



Response Count: n=973; By Gender: Female n=584; Male n=365; Non-binary, Other, or Prefer Not to Answer n=24. Survey respondents identifying as Non-binary or Other constituted less than 10 responses and were not included due to sample size.

How did you seek out this industry?

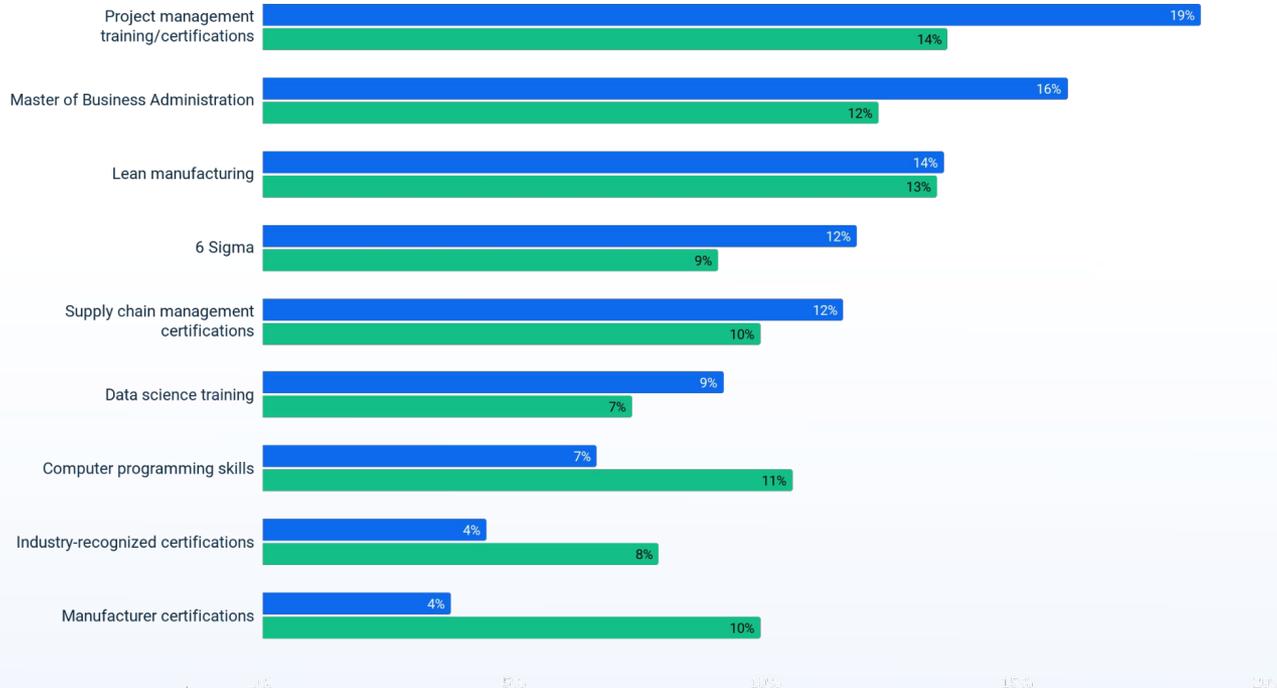


Women and men seek out the manufacturing industry for different reasons

Female Male

Response Count: n=345; By Gender: Female n=157; Male n=175; Non-binary, Other, or Prefer Not to Answer n=13. Survey respondents identifying as Non-binary or Other constituted n<10 and were not included due to sample size. Other includes salary, family influence, circumstance, and looking for new opportunities.

Which certifications or skill sets would best boost your future earning potential?

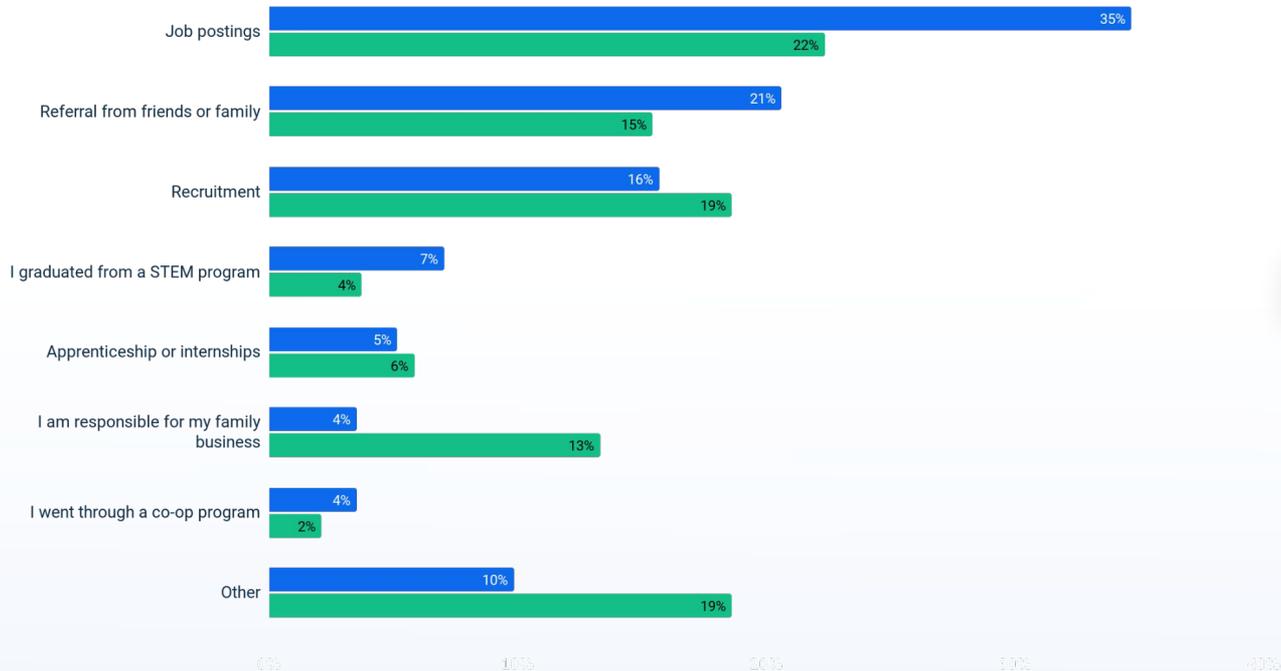


Women are significantly more likely than men to consider project management and MBAs as key ways to boost their future earning potential

Female Male

Response Count: n=979; By Gender: Female n=586; Male n=369; Non-Binary or Other n=4; Prefer Not to Answer n=20.0. Statistical significance ascertained by Qualtrics Stats iQ analytics.

How did you end up in this industry?



A majority of employees end up in manufacturing through job postings or referrals

Female Male

Other includes temporary placement, moved between departments, and networking.

Response Count: n=626; By Gender: Female n=427; Male n=188; Non-binary, Other, or Prefer Not to Answer n=11. Survey respondents identifying as Non-binary or Other constituted n<10 responses and were not included due to sample size.

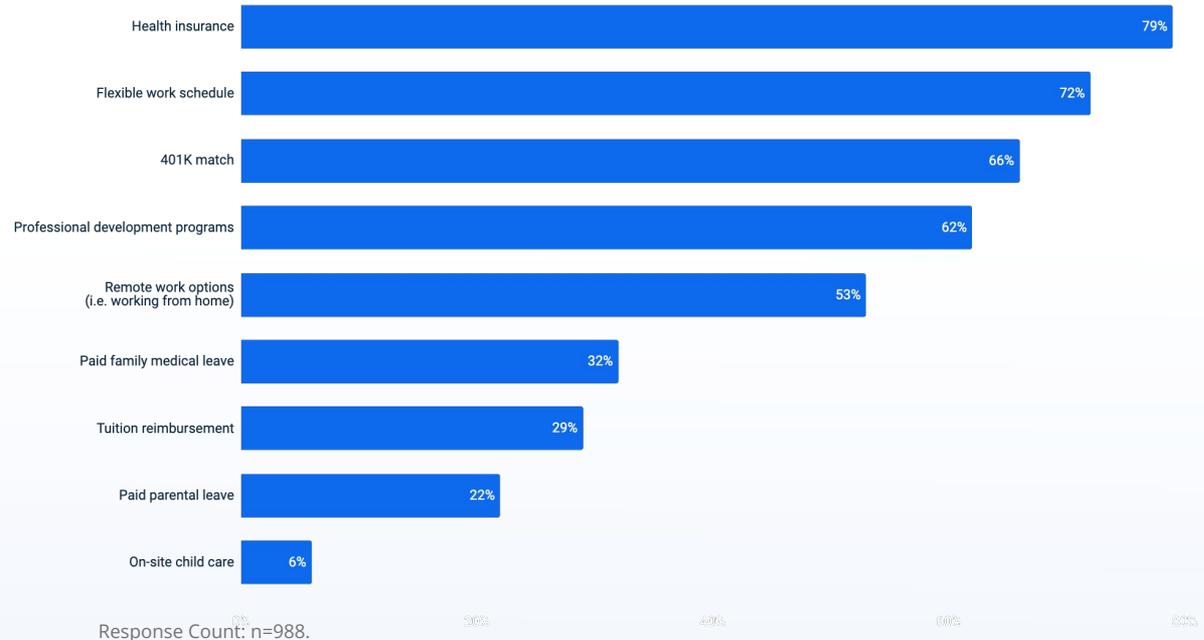
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Talent Retention: Benefits and Attitudes



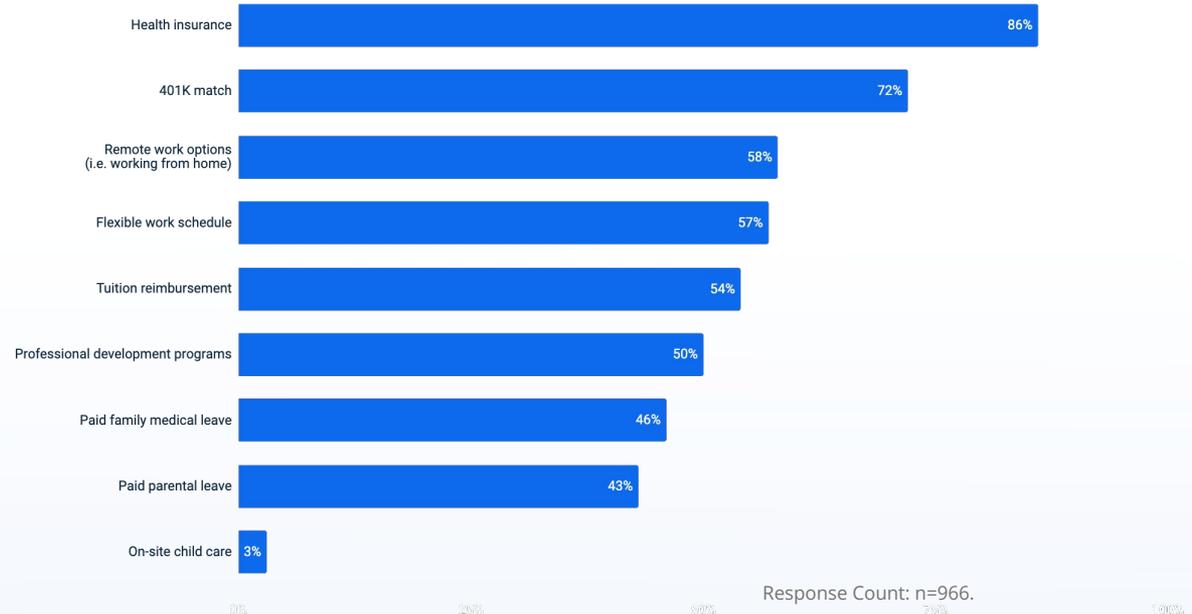
Please select the employee benefits that are the most important to you:

Health insurance, flexible work schedule, and 401(k) match are the most desired employee benefits



Please select the employee benefits your company offers today: (select all that apply)

Top benefits offered today include health insurance and 401(k) match



Quoted responses from industry professionals showcasing the breadth of training programs available for career advancement

“Leadership development programs for DEI [Diversity, Equity, and Inclusion] groups. Manufacturing leaders training. Partnership with grad schools for training seminars.”

“Reimbursed education for all levels techs to PhD as long as related to your work or job progression.”

“MBAs for high performers [and] on-site leadership and team-building courses.”

“We are planning [to] start the automation business in [the] USA and related to that [...] the sales and marketing, journalism, business management, production related technical courses.”

“Specialized OSHA Training (OSHA 10 and OSHA 30) and custom designed follow-up safety training to implement what we learn in the OSHA classes to real-world situations at work.”

“NIMS, machinist and tool & die apprenticeship, tuition toward professional development.”

Quoted responses from industry professionals showcasing the breadth of training programs available for career advancement

“Certifications (advanced management, bioprocess technology), supervisor development program, and rotational development programs.”

“Supply chain, finance, technology (mechanical, electrical, software), commercial sales, digital technology development programs. All entry level.”

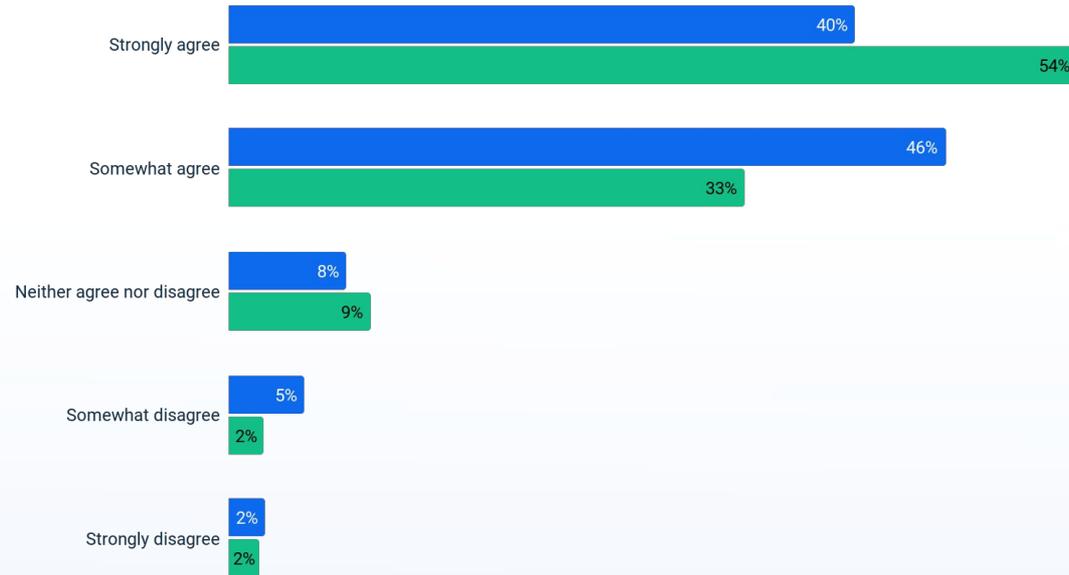
“Training courses, participation in MAPI councils and organizations such as WiM.”

“Women in Action (professional development program [for] women in different stages of their career). Accelerated development program (rotation program to fast-track new grads). Tuition reimbursement.”

“We have employee resource groups that include memberships into professional organizations. We also have Six Sigma training/programs, lean manufacturing, and access to Coursera and LinkedIn Learning programs.”

“Compliance training to maintain their quality certifications.”

Do you agree or disagree with the following statement: I believe that my company values my contributions



Men are more likely to strongly feel valued by the companies they work for than women

Female Male

Response Count: n=934; By Gender: Female n=560; Male n=354; Non-binary or Other n=4; Prefer Not to Answer n=16. Survey respondents with n<10 were not included due to insignificant sample size.

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Methodology



Methodology

This survey was conducted over a 13-day period from March 1 to March 13, 2023.

A total of 1,403 respondents participated, and 1,170 were qualified for the survey. Due to the conditional and multiple choice nature of the survey, some datasets may contain a different respondent number, which is annotated in the footnotes for clarity.

Invited Participants:

- **Qualifiers:**
 - ◆ Complete, non-duplicate entry
 - ◆ Required to work in the manufacturing or industrial sector
- **Recruitment:**
 - ◆ Respondents were invited to participate via Thomasnet.com®, The Women in Manufacturing Association, and The Association of Manufacturing Technology emails. The invitation pool was incentivized with an executive summary report of the survey findings.

Respondents' Firmographics:

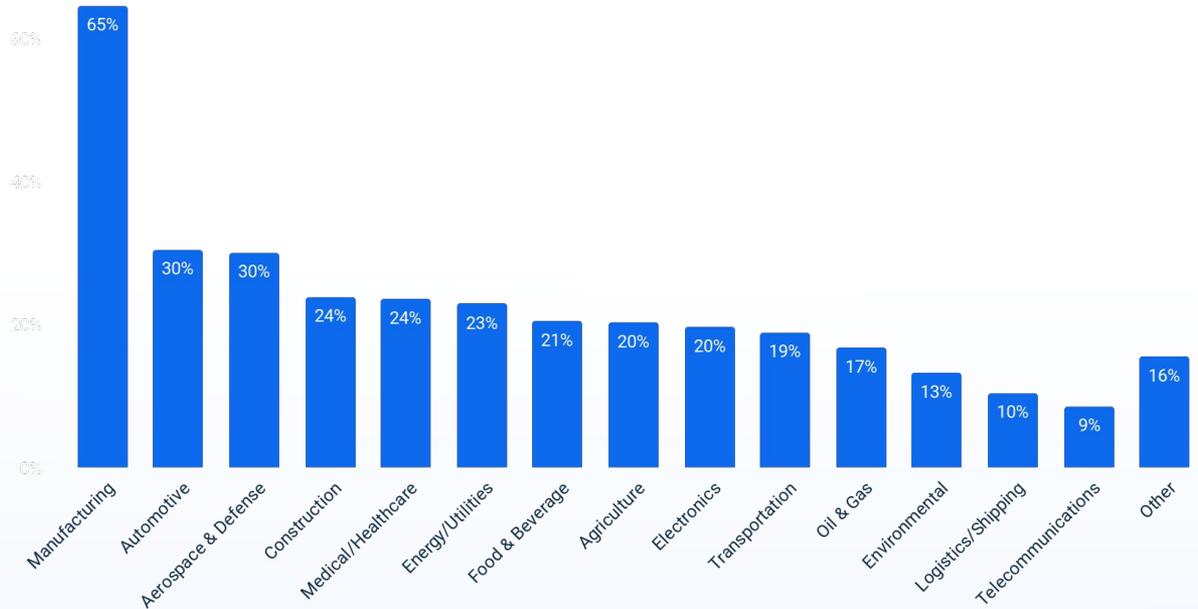
- **Revenue:** Business revenues span from less than \$1 million to more than \$1 billion.
- **Employees:** Company size spans from 1 to more than 15,000 employees.
- **Company Location:** Identified by country and state/province.

Survey Information:

- **Survey Administration:** Qualtrics, online survey
- **Survey Language:** English
- **Questions:** 34 questions were included

Which industrial sectors does your business serve?

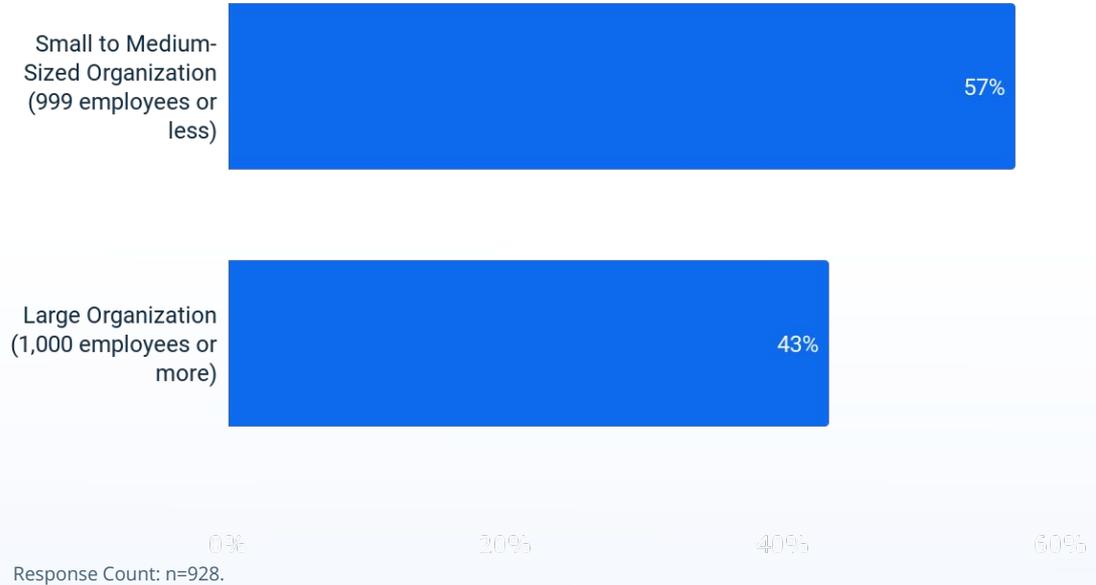
Respondents are from a variety of industries



Response Count: n= 1,125; Other includes Education, Government, Retail, Chemicals, and Consumer Goods.

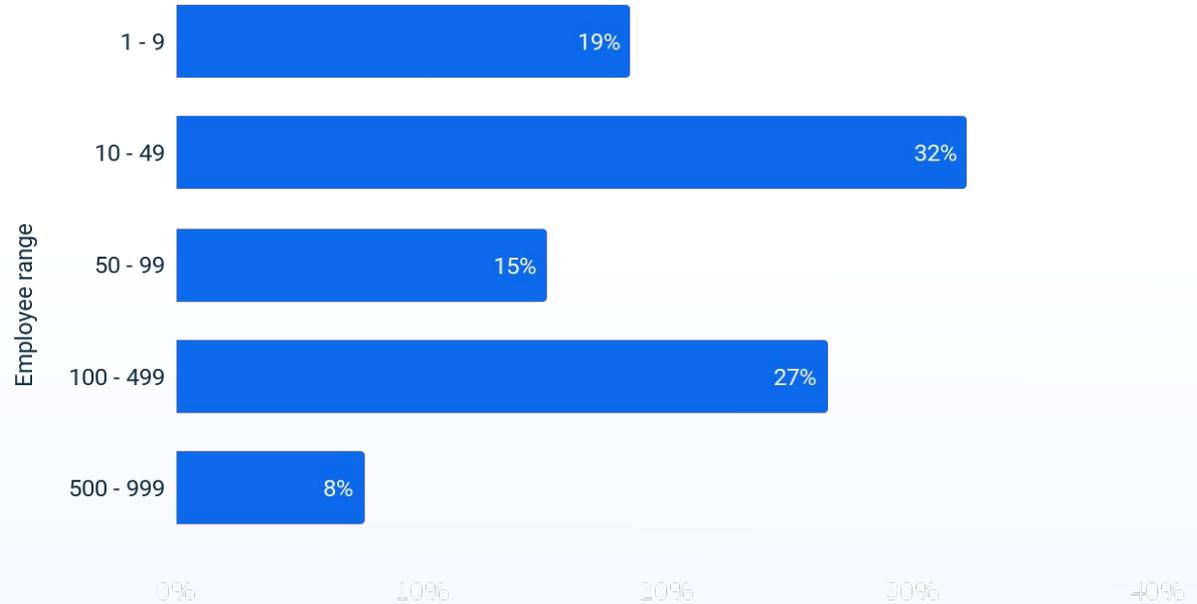
My organization is a:

Companies are both large organizations and SMBs



How many employees does your organization have?

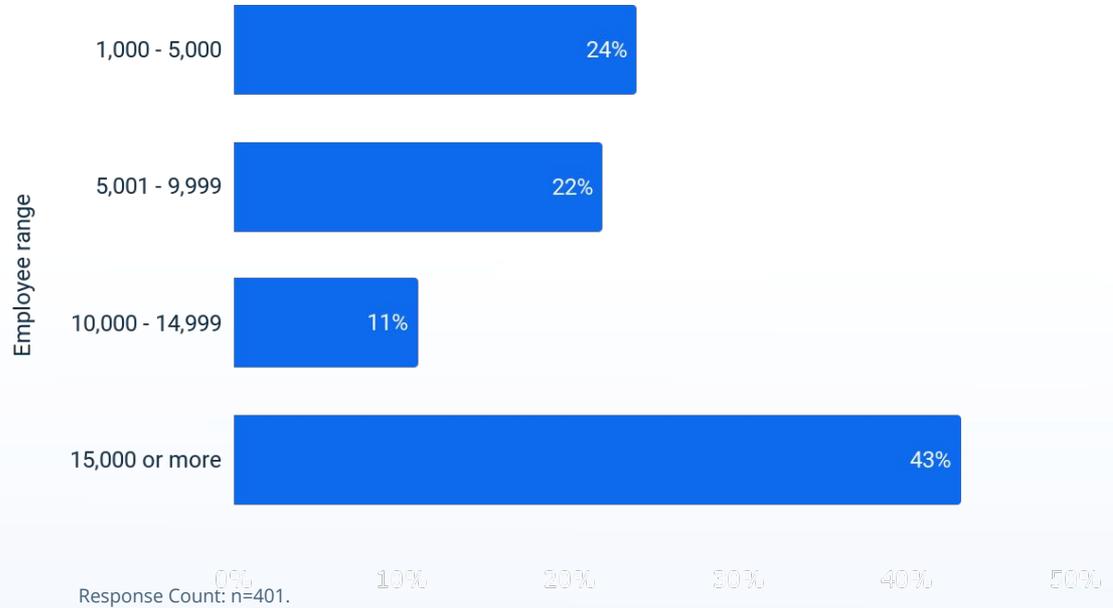
Small to medium-sized business: Participating organizations by company size



Response Count: n=527.

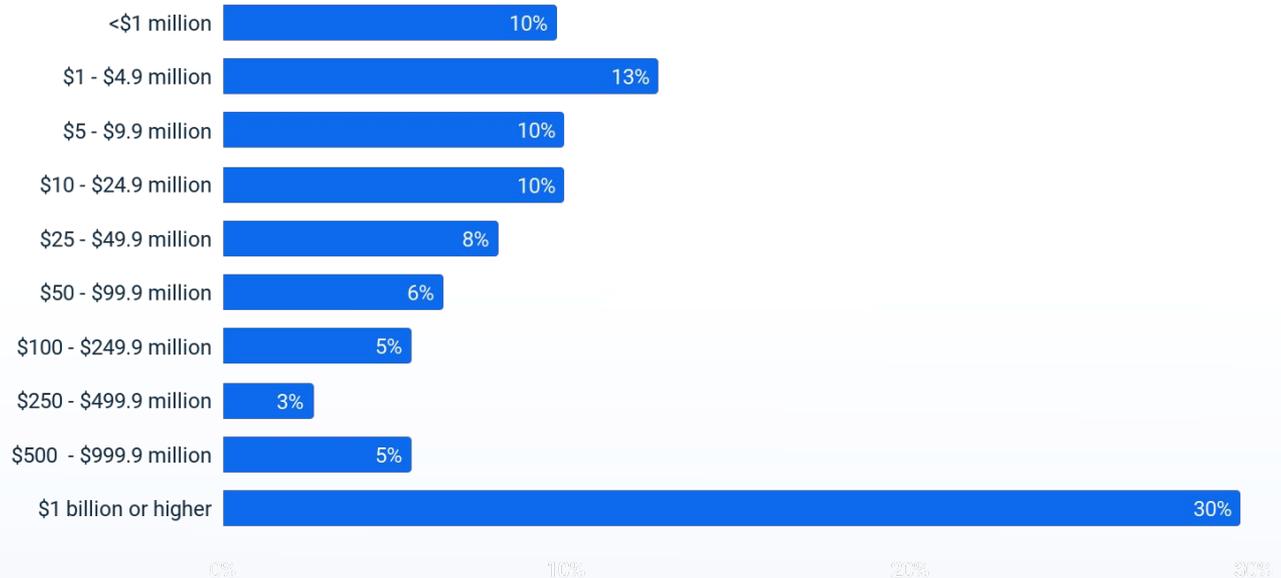
How many employees does your organization have?

Enterprise: Most respondents from large enterprises work at organizations with more than 15,000 employees



What is the annual gross revenue of your business?

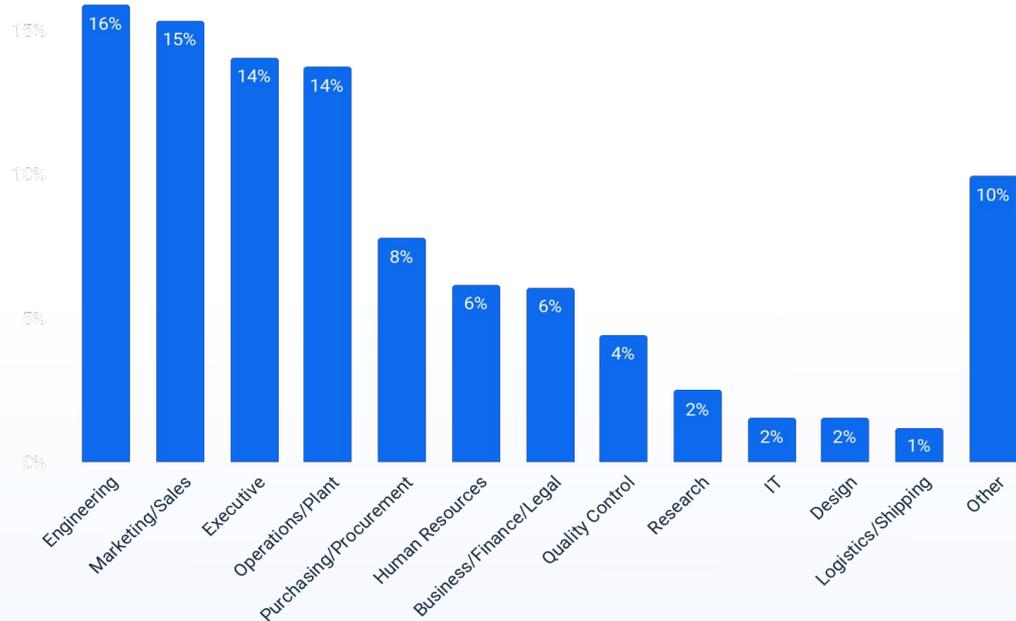
Respondents work at diversely sized companies based on annual gross revenue



Response Count: n=827.

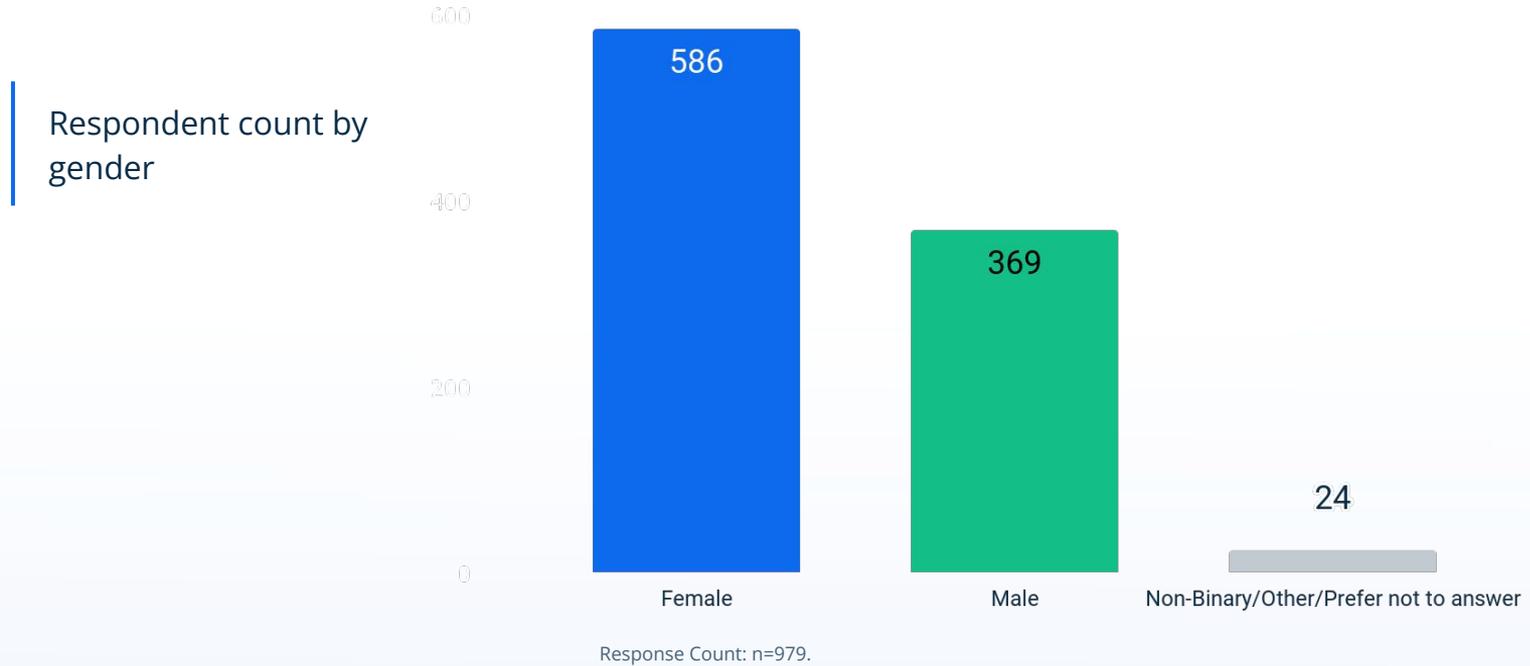
Which option best describes the department you work in?

Respondents represent a variety of business departments



Response Count: n=926; Other includes Sales, Health & Safety, Management, and Customer Service.

What is your gender?



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About Xometry and the Women in Manufacturing Association



wim | women in
manufacturing®



Women in Manufacturing (WiM) is the only national trade association dedicated to providing year-round support to women who have chosen a career in the manufacturing industry.

WiM members benefit from exclusive access to educational programming, networking opportunities, bimonthly webinars, a customized job board, a robust searchable directory, and much more.

womeninmanufacturing.org



Company Overview

Nasdaq: **XMTR**

Founded in 2013 and headquartered in Maryland, with offices based in North America, Europe, and Asia

40K+ Active Buyers

Throughout North America, Europe, and Asia

10K+ Suppliers

The world's largest network, with suppliers based in North America, Europe, and Asia

Dozens of Processes

And hundreds of materials, available via our Instant Quoting Engine®

Fully Managed Manufacturing Services

With Xometry
Regional
Headquarters



North America
Derwood, MD, USA



Europe
Munich, Germany



Asia
Shanghai, China

Xometry's Instant Quoting Engine



The Xometry Instant Quoting Engine leverages AI-driven algorithms plus its massive network of top global suppliers to **deliver a simple, elegant, and efficient digital quoting experience.**

- ✓ Expedite, standard, and economy lead times
- ✓ Secure file uploads
- ✓ ISO 9001:2015, ISO 13485:2016, and AS9100D Certified

Immense Manufacturing Capacity and Services

Additive Manufacturing

- Binder Jetting
- Carbon DLS
- Direct Metal Laser Sintering (DMLS)
- Fused Deposition Modeling (FDM)
- HP Multi Jet Fusion
- PolyJet
- Selective Laser Sintering (SLS)
- Stereolithography
- Vapor Smoothing 3D Prints

Plastic Part Production

- Bridge Tooling
- Compression Molding
- Injection Molding
- Insert Molding
- Liquid Silicone Rubber (LSR)
- Plastic Extrusion
- Production Tooling
- Prototype Modeling
- Urethane and Silicone Casting

Sheet and Tube Fabrication

- Laser Cutting
- Laser Tube Cutting
- Plasma Cutting
- Sheet Cutting
- Sheet Metal Fabrication
- Tube Bending
- Waterjet Cutting

Metal and Sheet Part Production

- Die Casting
- Metal Stamping
- Metal Extrusion
- Metal Injection Molding (MIM)

CNC Machining

- CNC Milling
- CNC Turning
- Wire and Sinker EDM

Value-Added Services

- Assembly Services
- Finishing Services
- High-Volume Production
- Rapid Prototyping



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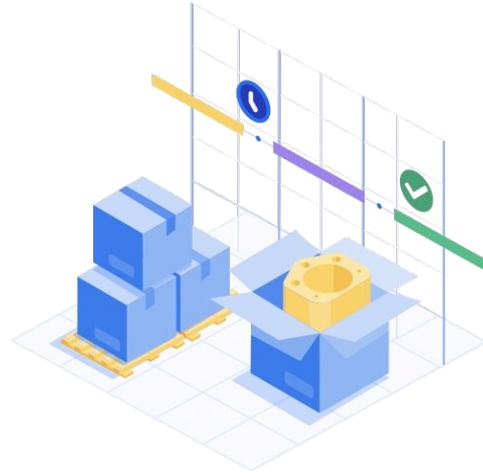
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Thank You



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