

Engineering and operations teams in electronics manufacturing reveal their supply chain struggles and their most time-consuming tasks

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Introduction

No one could have guessed just how the COVID-19 pandemic would affect the manufacturing industry. Just two years ago consumer needs changed overnight, which forced companies to immediately ramp up or scale down their manufacturing, attempt to remain agile and predict an uncertain future.

Today, reports show that mentions of "supply chain" in earnings calls by Fortune 500 companies rose 412% in just two years. Tens of millions have also joined The Great Resignation, which is particularly affecting manufacturing. In the middle of these seismic changes, it was impossible to see the long-term industry impact. Now, two years later, we can finally begin to assess the influence of these sudden shifts on mass production. That's why we're launching a new report: The 2022 State of Mass Production.



We wanted to know how engineering and operations teams in mass production are coping with supply chain and data collection disruptions when they can't visit the factory floor, so we surveyed over 300 professionals across manufacturing — in verticals including consumer, industrial, medical, automotive, aerospace and mission-critical electronics. The consultants, managers, directors, VPs and C-suite leaders who participated told us that the supply chain is far from the only thing on their minds. They're also fed up with their lack of access to critical manufacturing data, and they're spending more time on management tasks than solving problems on the line.

In short, everything has changed, and we're not going back. Here's what's actually happening in mass production in 2022.

1. Top Manufacturing Worries and Goals

Supply Chain Woes Aren't the Only Concern

Just-in-time manufacturing was ill-prepared for the crippling combination of supply chain disruptions and explosive consumer demand, and manufacturers are still scrambling to manage the ripple effects. So it's no surprise that the number one concern of engineering and operations leaders in electronics manufacturing is how to adapt to supply chain disruptions.

But it's not the only worry. Close behind is concern about scaling for increased demand, and ability to meet cost reduction goals.

Top 3 Concerns in Mass Production



TIP

Understand the supply chain risks

Dr. Joan Cullinane, Vice President of Supply Chain Operations at Oracle, has research-backed advice on how to overcome supply chain disruptions: strengthen relationships with suppliers. Find her tips on our blog to learn about creating a resilient supply chain risk management strategy.

"A big part of the supply chain is understanding what your risks are. But it can't stop there. You have to invest in mitigation."

One Industry Bucks the Trend: Consumer Electronics Brands

Perhaps more surprising is the fact that consumer electronics brands are noticeably less concerned about supply chain disruptions. Those in consumer electronics manufacturing cited "reduced ability to travel to the factory" as their top concern (41%), with supply chain disruptions coming in third (34%), behind ability to meet cost reduction goals (36%).

Our discussions with engineering leaders revealed a possible reason for this difference: consumer electronics companies can adapt quicker. They're accustomed to rapid design lifecycles, which makes it that much easier to redesign for a new chip or circuit board based on supplier availability. New designs in industrial electronics and medical device manufacturing, on the other hand, are more likely to face regulations that take more time to approve.

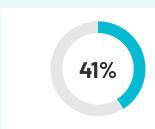
Top 3 Concerns in Consumer Electronics Manufacturing





Industrial electronics companies also have a unique concern: they're worried about their ability to hire in-region to support their programs (29%).

Top 3 Concerns in Industrial Electronics Manufacturing



 Ability to adapt to supply chain disruptions



2. Scaling for increased customer demand



3. Ability to hire in-region

Consumer and Industrial Electronics Manufacturing: two sides of the same industry

The survey data shows that industrial electronics brands are more concerned about hiring in-region than other industries. One reason could be that they're often setting up a factory to sustain itself for a long period of time. They need to train a local team to know their procedures intimately.

Consumer brands, on the other hand, need their established teams to frequently travel to the factory for several reasons: 1) they're developing products more frequently, 2) they can't scale local hiring up and down as easily and 3) travel has historically been the only way to know exactly what's happening on the factory floor — a pattern that's finally beginning to change in a digital age.



Priority For Consumer
Electronics Manufacturing

Sending established teams to the factory to develop products



Priority For Industrial Electronics Manufacturing

Training a local team to deeply understand their procedures

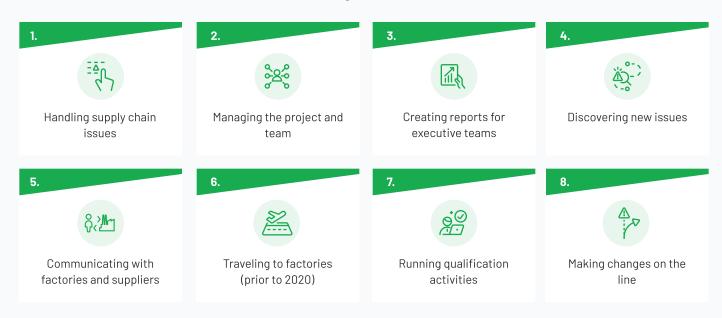
Engineering and Operations Time Gets Eaten by Project Management

Engineering and operating teams face immense pressure during mass production. Reliability testing, failure analysis, quality control checks, meetings, reports, travel — there's a lot on their plates.

Because the way they spend their time has a direct impact on the outcome of the project, it's critical for them to focus on the most important tasks. Unfortunately, teams estimate they end up spending 7+ hours per week on project management alone.

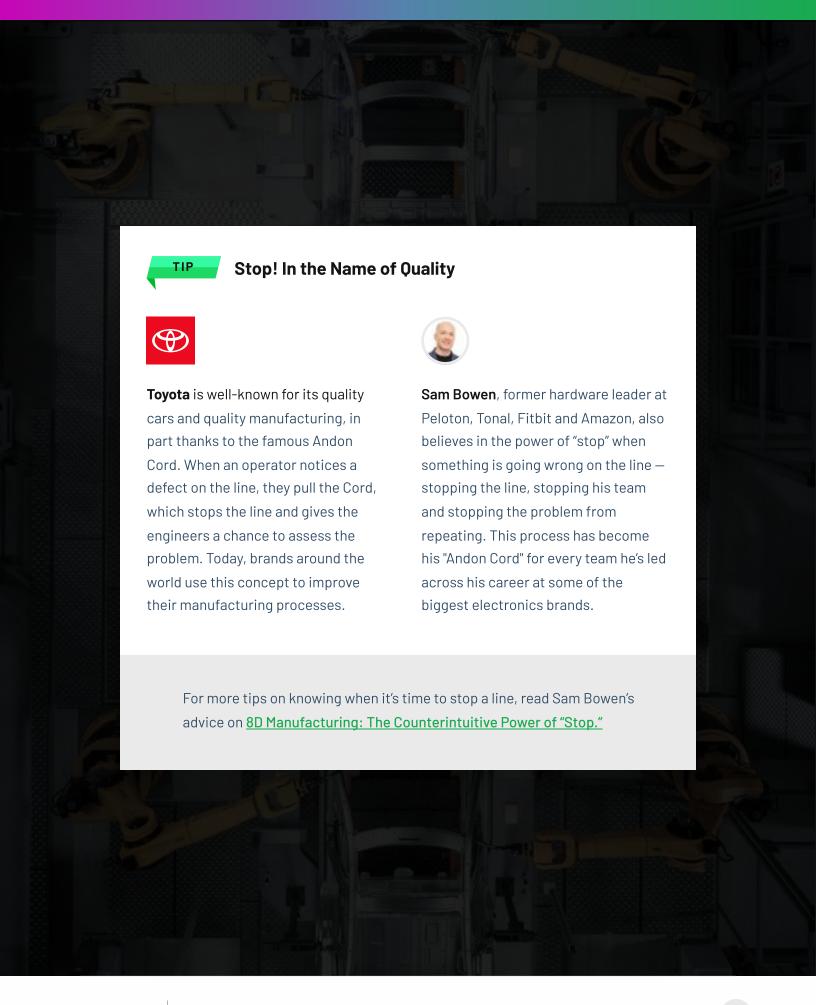
The top three tasks they spend their time on include managing supply chain issues, general project management and creating reports for executive teams. Notice anything missing from that top-three list? We did, too. Making changes on the line — where changes and improvements are put into action — came in last, behind vendor meetings and even pre-2020 travel.

The Most Time-Consuming Tasks for Production Teams



Fortune 50 electronics brands use Instrumental to find failures

faster, eliminating or reducing the need for nearly every time-consuming task on the above list. **Learn how it works**.



2. Data's Growing Role In Employee Satisfaction

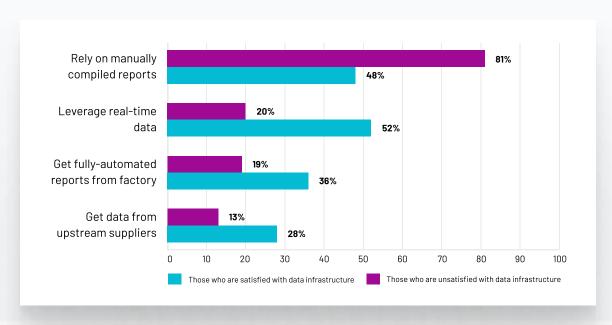
Data satisfaction matters for employee retention

A company's level of manufacturing data maturity depends on a number of factors: amount of time in production, size of the company and more. But regardless of company size, one theme came through loud and clear: the amount of time engineering and operations teams spend with data directly correlates with their satisfaction with their company's data infrastructure.

Essentially, the less time they spend wrangling data, the more satisfied they are. One of the biggest differences showed that over 80% of those who are unsatisfied with their company's data infrastructure rely on manual reports, whereas 48% of those who are satisfied compile manual reports. Engineers are simply more satisfied with companies that have a strong data infrastructure.

This directly impacts those who are concerned about meeting the demands of a fluctuating supply chain, too. Of those who are worried about the supply chain, 85% of them aren't satisfied with their company's level of data maturity. They're also more than twice as likely to be concerned about scaling for increased customer demand.

Engineering and Operations Teams' Relationships with Manufacturing Data

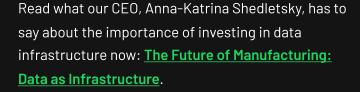


TIP

Keep employees happy with better data access

Two years after COVID-19 hit, the job market remains volatile. More than 40 million people left their jobs in 2021, and in 2022 turnover rates remain at record highs in the manufacturing industry.

In response to this uncertainty, many companies are hyper-focused on finding new ways to retain their talent. One way they can do that in electronics manufacturing is by improving their data infrastructure. Our data shows that engineers tend to be more frustrated when a company has poor data infrastructure. For some of them, it might be the last straw — and they could start the hunt for a new job.





Over 60%

Manual reports are (still) status quo

Despite the fact that dealing with manual data leads to dissatisfaction, over 60% of survey respondents still rely on manually compiled data from their lines. That's nearly twice as much as the second-most leveraged data type, real-time remote access to parametric functional test data.

3. The Working Relationships of NPI and MP Teams

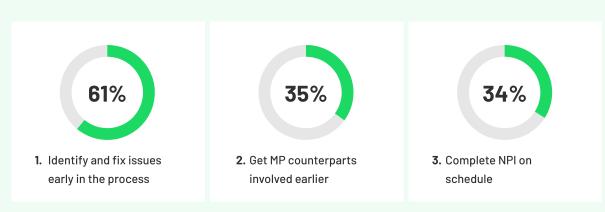
MP teams wants to work with NPI counterparts

Of the many challenges that come up during mass production (MP), those challenges are accentuated during ramp. The problems that go undetected during the new product introduction (NPI) process can halt the lines, and cause product delays and team frustration.

When asked what NPI counterparts could do during NPI that would help MP teams, the number one request was, unsurprisingly, to identify and fix more issues earlier in the process.

But the second thing NPI teams could do to help MP teams shows more nuance: MP teams want to be part of the solution. They say that by getting involved earlier, they can help solve problems sooner.

What Can NPI Teams Do to Support MP Teams?



Breaking down MP and NPI goals

The data doesn't tell us why MP teams want to be part of the solution in NPI — whether due to lack of trust or out of a desire to support their NPI counterparts — but regardless, it's worth understanding the cultural underpinnings of these two teams.

They share the same broad goal: everyone wants to launch on time and on budget. But their day-to-day work affects the way they approach problem-solving in MP.

Differing Goals of NPI and MP Teams

NPI Teams



- Are motivated by creative opportunities to build a new product
- Believe experimentation and failures are essential parts of the design and engineering process
- Regularly sign up for things they've never done before through R&D

MP Teams



- Are motivated by meeting deadlines and yield targets
- Believe consistency and standardization are the best markers of success
- Rely on NPI to deliver an MP-ready product

Seeing these core goals, it's little wonder that NPI and MP teams solve problems differently. In NPI, teams are trying new things all the time, where as in MP, teams are looking for consistency.

Successful teams build collaboration by viewing the manufacturing process from NPI to MP as a relay race: each team has a different role to play at each stage, and fixing the broken handoff between teams by valuing views and cultures of their counterparts can unlock the collaboration needed for a successful product launch.

The COVID-19 pandemic affected NPI programs, too.

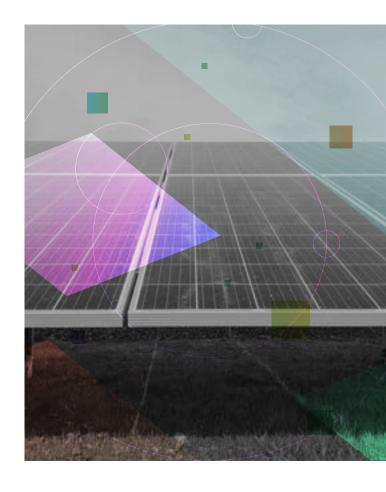
<u>Download the 2021 State of NPI Report</u> to learn more.



Conclusion

Supply chain disruptions continue, and many engineering leaders don't know how to empower their teams to navigate the new state of constant change, while still meeting their schedules and yield targets. But one thing is certain — the manufacturing industry's new future is taking shape, and data and team collaboration are critical parts of that future.

Real-time access to insights from the manufacturing line will directly impact a company's ability to produce great products, launch on time and stay competitive in an increasingly data-centric industry. The next few years will show just how successful we can be in empowering each other to navigate the changes and continue creating innovative products.



Methodology

This report is based on survey data gathered from October 2021-February 2022 from more than 300 professionals in engineering and operations in consumer, industrial, medical, automotive, aerospace and mission-critical electronics. Responses were collected from consultants, individual contributors, managers, directors, VPs and C-suite leaders, and examined to inform our understanding of the trends and future of mass production.

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