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# 2024 INDUSTRIAL AI SURVEY

Leveraging the  
Untapped Potential of  
Industrial AI

Presented by  
**Fero Labs**

**Together we'll build a sustainable future**

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# Leveraging The Untapped Potential of Industrial AI



Factories Using AI Technology Are 3X More Confident of Meeting 2024 Targets Than Those Without

In the ever-evolving world of manufacturing, 2024 presents a landscape fraught with challenges and opportunities shaped by myriad global and economic factors. From supply chain disruptions to technological advancements, manufacturers are facing a multitude of influences that require change management, innovation, and strategic agility to navigate effectively.



“The industrial sector is undergoing a seismic shift, from the transition to renewable energy to the circularity in raw material utilization, all while grappling with increasing labor shortages.

Many of the fundamental assumptions that drove efficiency in manufacturing will no longer hold. In this era of transformation, AI emerges as the linchpin propelling the industrial sector into its next stage of evolution.”

–Berk Birand, CEO, Fero Labs

Despite AI technology’s reported benefits and proven successes, only **18%** of the industrial sector are currently using AI or ML software to get the most out of their productivity and production, and only **11%** are using a digital twin solution to adapt, innovate, and solve problems faster. **Why is industrial AI adoption slower than expected?**

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Fero Labs surveyed managers and executives in the industrial sector to identify their primary goals and which barriers are inhibiting their ability to adapt, thrive, and survive in 2024.



## Key Findings

- Factories using AI-powered digital twin solutions are 3X more confident of meeting their 2024 targets than those without
- Increasing profits and cutting costs are the most important targets for 2024 for two-thirds of the industrial sector, which increased in importance over 2023 targets
- Despite increased emission reduction regulations, and 30% of senior managers now being incentivized to reduce emissions, a third of the respondents noted this as their lowest priority
- Managers using AI and digital twins were more likely to have noted “Emission Reduction” as an important business priority in 2024
- Plant Managers have emerged as either AI Champions so they can “optimize productivity” or Technology Blockers who believe workers will “over-rely on technology”
- 42% of industrial managers agree that change aversion is inhibiting their organization’s ability to quickly adapt and transform, missing critical growth opportunities.

# Navigating the Complex Terrain of Manufacturing in 2024

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One of the most pressing issues confronting manufacturers is the ongoing disruptions in global supply chains. Transportation bottlenecks, raw material shortages, and geopolitical tensions have conspired to create significant challenges in sourcing and production.

These disruptions not only impact production schedules but also escalate costs, underscoring the importance of maximizing efficiencies around materials and energy consumption.

Moreover technological advancements in artificial intelligence (AI) are reshaping manufacturing processes at an unprecedented pace and are revolutionizing traditional manufacturing practices, offering opportunities for efficiency gains and product innovation.

However the adoption of these AI technologies has been slower than expected in the industrial sector.



Only 18% of factories are currently using AI or ML technology to get the most out of their productivity and production, and only 11% are using a simulated digital twin environment to expedite and improve the process of experimentation, problem solving, and innovation.

Manufacturers are also facing increased pressure to adopt environmentally sustainable practices. Regulatory requirements, consumer demand for eco-friendly products, and the imperative to reduce carbon footprints are driving investments in renewable energy, waste reduction, and circular economy initiatives.

# Navigating the Complex Terrain of Manufacturing in 2024

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## Sustainability

Sustainability has emerged as a key differentiator for manufacturers, shaping not only their operational practices but also their brand reputation and market competitiveness. Yet reducing emissions is not one of the top business targets for those making plant and production decisions, despite 30% of manufacturers being offered a bonus incentive to achieve it.

## Labor Shortages

Labor market dynamics present another challenge for manufacturers. The availability and cost of skilled labor, demographic shifts, and changing workforce preferences are influencing recruitment, retention, and workforce management strategies. The rise of remote work and flexible arrangements further complicates workforce dynamics, requiring manufacturers to adapt their practices to attract and retain talent in a competitive labor market.

## Retiring Workforce

In a sector where many plants are still recording production details and assigning tasks by hand, much of the sector's valuable IP and production knowledge will walk out the door when their senior staff retire. Factories are at a tipping point right now where they need to incorporate technology into their daily workflows in order to capture, train, and optimize all aspects of their business before this event occurs.

# Navigating the Complex Terrain of Manufacturing in 2024

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## Agile Decision Making

Amidst economic uncertainty fueled by factors such as inflationary pressures and geopolitical instability, manufacturers must exercise caution and agility in their decision-making processes. Uncertainty surrounding the recovery from the COVID-19 pandemic added another layer of complexity, underscoring the importance of scenario planning and risk management. Digitized data, data specialists, and AI technology are key to making agile informed decisions.



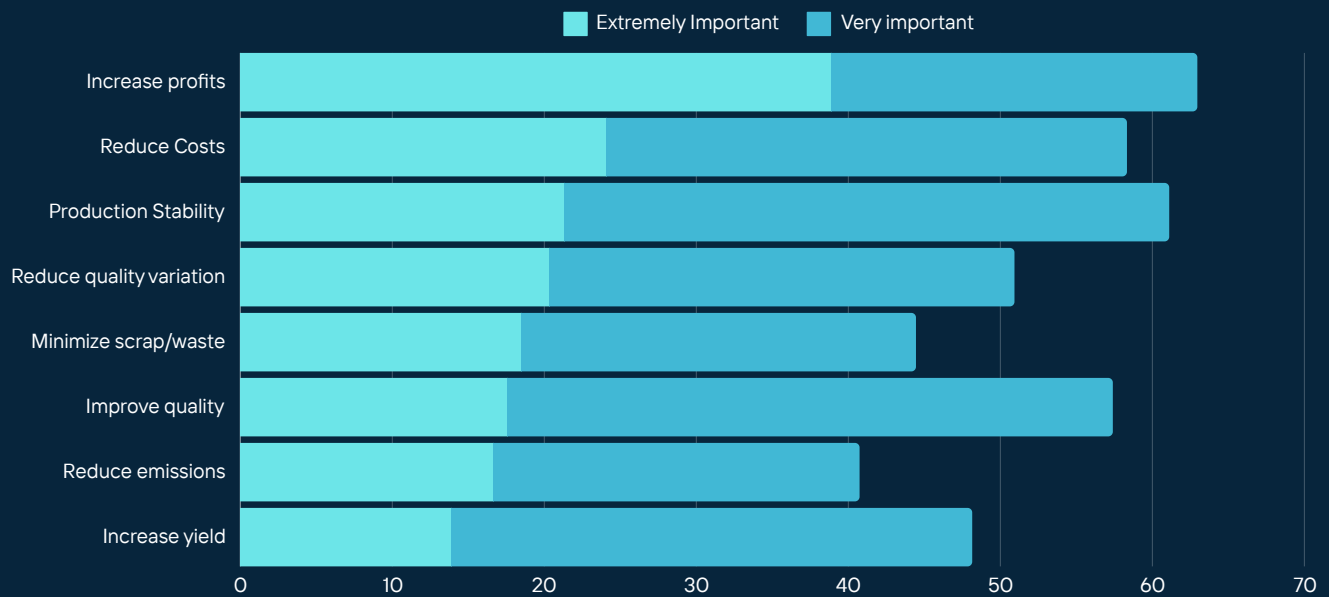
In response to these challenges, manufacturers have increasingly embraced digital transformation initiatives to enhance operational efficiency, agility, and customer engagement.

However, the pace of digital adoption has varied across industries and regions, with some companies facing challenges related to legacy systems, data and staffing readiness, and digital talent shortages.

# Factories Intensify Focus on Profits and Cutting Costs



The most important 2024 targets for two-thirds of the industrial sector are to **increase profits and cut costs**. These showed the greatest increase in importance over 2023 targets.



"What are your business priorities for 2024? (Rank the priority for each)"

The two targets overlap, as taking efficiency measures such as reducing costs by making better use of energy sources and minimizing scrap, will directly impact the goal of driving profits.

However, inflation and rising energy costs mean many of the fundamental assumptions that previously drove efficiency in manufacturing will no longer hold in 2024 and beyond.

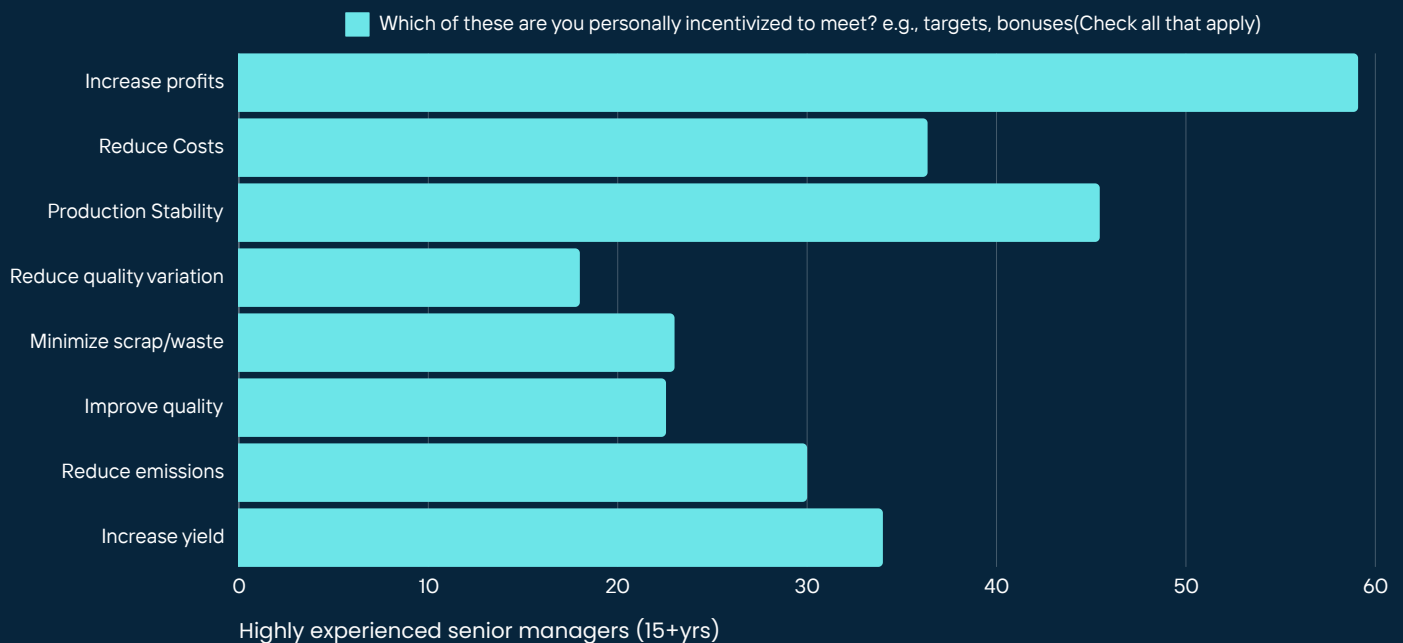
The 2024 playing field is brand new for those in charge of making production and process decisions, and yet these professionals are often resistant to change.



More experienced managers (15+ years) inside industrial plants are incentivized in a number of ways, but achieving a bonus by meeting their personal targets is the key motivation behind where they focus their efforts.

By contrast, the managers with less experience (10 years or less) value promotion opportunities that can come through achieving their targets. However, a clear correlation exists which favors the bonus incentivized targets.

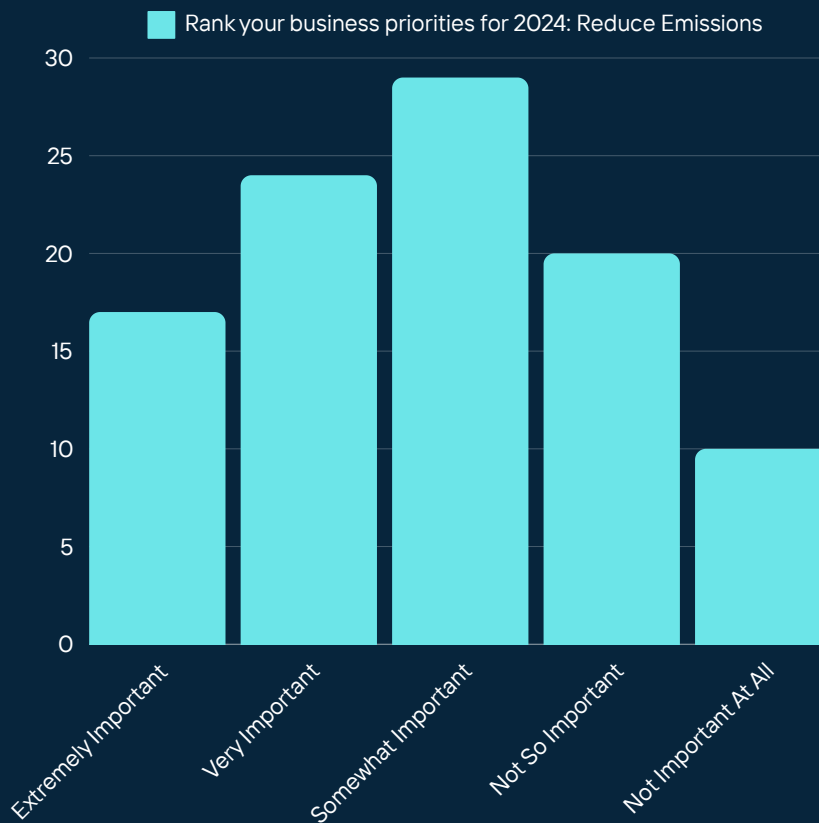
The primary targets for highly experienced managers are to increase profits (59%) and maintain production stability (45%), with reduce costs (36%).



This order of importance also reflects which of their goals are incentivized with bonuses.

Conversely when we look at overall targets for **all senior managers**, **emission reduction** was at the other end of the spectrum of importance.

Despite an increase in public pressure, regulations, and governmental funding to support emission reduction initiatives, **one-third** of those in charge still consider it to be **'Not important / Not so important'**.



All respondents, Importance of Emission Reduction target



Workers involved in process optimization roles like Engineering, Data Science, Operations, R&D, and Data Analytics, were **3X more likely** to be champions for sustainability practices compared to all other functional roles, who were **more likely** to say that reducing emissions is "not important at all".

# Why Is Sustainability Still Being Deprioritized?

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Many circular processes necessitate the use of AI and ML technology in order to achieve these outcomes, and to do so efficiently without compromising quality or through-out, at Fero Labs we refer to this as **Profitable Sustainability**.

In fact, by utilizing industrial AI, engineers no longer need to make a trade off of one target for another. This was outside the realm of possibility prior to the digital revolution which begs the question: Why is sustainability still being deprioritized?

In a recent [report](#), **ABI Research** noted that deploying AI is essential to unlock the value from the goldmine of data available to modern factories and driving ESG initiatives for cleaner and safer production. They highlight that **legacy infrastructure** is a primary hurdle to AI deployment.

**Roland Berger**, identified a lack of readiness as a roadblock for steelmakers to overcome barriers and improve implementation of AI. They note that a lack of clear **AI use cases** and **data-readiness** are the primary bottlenecks limiting AI adoption.

They also shared that company **vision and culture** play a big part in the change management required to embrace the benefits of AI capabilities.



Factories using AI & Digital Twin technology are **3X** more confident in achieving their 2024 targets than those without



# Early AI Technology Adopters Reap The Benefits

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Factories using AI & Digital Twin technology are 3X more confident in achieving their 2024 targets than those without

44% of early adopters of AI powered digital twin technology are more likely to be “extremely confident” in their ability to meet their 2024 targets compared to only 13% of those without.

Notably, none of the AI and digital twin users lacked confidence in achieving their targets, whereas 13% of the digital twin laggards were “not confident at all” that they would meet their current targets with their existing strategies.

## Early Adopters of Digital Twins

“We have set up everything, which we can control to meet the targets, despite challenging circumstances (market demand, geopolitics)”

“There's a strong drive for innovation within the company at the moment and that will bring my team the necessary resources”

“Projects are in place to achieve these goals.”

“Helps to show gaps to potential”

“We use it for chemical process modeling to help with reaction kinetics and with time cycles/ unit operation utilization”

“Minimizes downtime with preventative maintenance”

“We optimize reaction conditions and model conditions for process safety.”

## Digital Twin Laggards

“Project buy-in can be difficult”

“Next year will be similar to the last one”

“Management places production over safety (risk minimization and management)”

“[This is the] tipping point on corporate commitment”

“Probably could be more efficient with AI”

Early adopters of AI were more likely to describe their current approach to production optimization as “Innovative” and “Enterprising”. A smaller portion of AI laggards also consider their optimization approach as “Innovative”, they also identify it as “Cautious” and “Preventative” without the support of AI technologies.

| <b>Early AI adopters</b> | <b>AI laggards</b>      |
|--------------------------|-------------------------|
| <b>Innovative 45%</b>    | <b>Innovative 35%</b>   |
| <b>Enterprising 35%</b>  | <b>Cautious 19%</b>     |
| <b>Conservative 35%</b>  | <b>Preventative 18%</b> |

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## 🗨️ Early Adopters of AI/ML Technologies

“We achieve better results in less time spent”

“[We use it to] optimize productivity”

“We access faster and more advanced data analysis.”

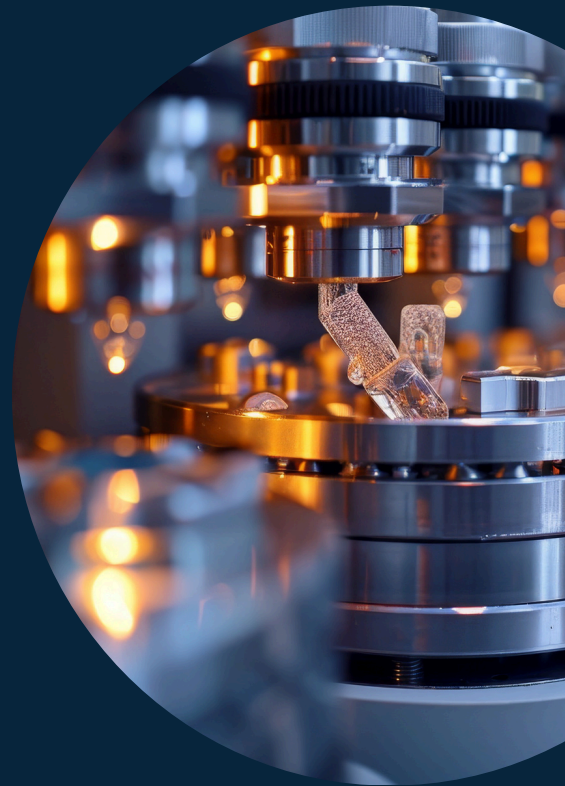
“Improves the process to draw conclusions from operational data”

“Lots of potential. I am working on vision systems to use AI/ ML to identify defects.”

“[We make] Incremental improvements only, to not affect product quality or performance.”

“My company is using first of a kind technology to reduce emissions while improving reliability.”

“We’re seeking technology that is good for bottom line and environment”



Markedly, those using AI and digital twins were more likely to have noted “Emission Reduction” as an important business priority in 2024.

This suggests that laggards are still making a trade off between what their team can address using traditional methods, versus the many addressable possibilities available to teams supported by AI technologies.



“The key to achieving true circular production lies in leveraging AI to adapt to the inherent variability in recycled feedstocks. This transformational integration of AI will propel plants towards increased competitiveness and sustainability, ultimately driving the green manufacturing transition.”

**- Alp Kucukelbir, Chief Scientist, Fero Labs**

## **Circular Efficiency Is Only Possible with AI**

Steel manufacturing has the greatest potential to apply circular processes due to the easy availability of recycled scrap materials across the globe.

However, the complexities of taking a more circular approach are great, as the chemical make-up of a batch of scrap could be from an old Toyota or include from a recycled refrigerator.

The typical scenario would be to lean into over-designing processes to allow for these uncertainties by increasing additives, batch temperatures, process times, and to increase the frequency of lab tests; but all of these come at high cost and uncertain success rates.

Therefore, in order to remain cost effective and to maintain the highest quality product, AI is necessary to address these complexities together.

Many of Fero Labs’ steel customers are using **100% of scrap steel** in their process, using Fero’s industrial grade AI to enable them to maintain the integrity of their end product and ensure they’re not over-using their energy sources or alloy additives.



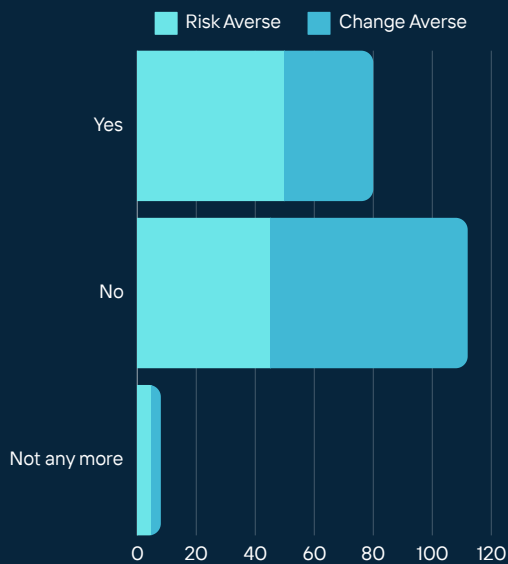
# A Lack of Change Management Inhibits Innovation & Growth



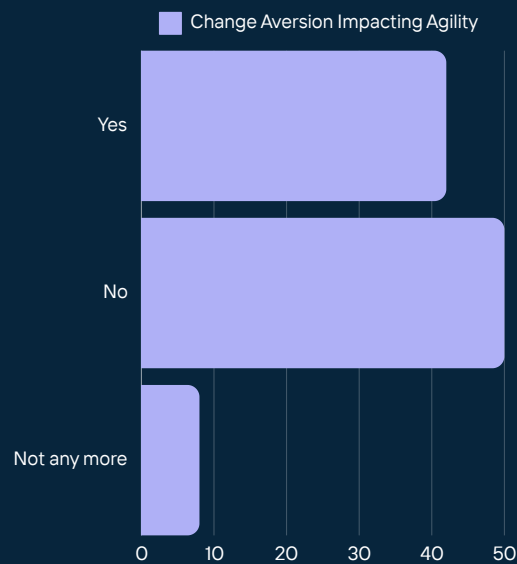
42% of industrial managers agree that change aversion is inhibiting their organization's ability to quickly adapt and transform

We wanted to understand whether manufacturers believe their business is risk averse, change averse, and whether change aversion is inhibiting their ability to quickly adapt and transform.

What we identified was that 50% of respondents believe their business is risk averse. Twice as many experienced workers (15yrs+) shared this belief than their less experienced coworkers (less than 10yrs).



Do you consider your business risk averse?  
Do you consider your business change-averse?



Do you think change aversion is impacting your organization's ability to quickly adapt and transform?

Only 30% of respondents consider their business **averse to change**, citing that "change is a constant in a manufacturing environment".

# A Lack of Change Management Inhibits Innovation & Growth

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**45%** of respondents felt that risk aversion was **not** an issue at their organization.



“Management pivots quickly”

“Taking lots of time to do everything correctly”

“It takes much time”

“We have always been innovative, thus always open to change. Innovation is a core value.”

“Quickly - yes. Change in general - no. Take small steps. Monitor the impact. Institutionalize the change. Reap the benefits.”

However, **42%** of respondents felt that **change aversion** is inhibiting their organization’s ability to **quickly adapt** and **transform**.



“My team does not want to do anything new or think outside of the box, which makes it difficult to change anything.”

“Always have to overcome the “not how we have done it” resistance.”

“We wish to be change agents”

# A Lack of Change Management Inhibits Innovation & Growth

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Many expressed frustration over missed business opportunities.

“There is potential to expand into new markets, but the organization does not have a lot of experience in exploration and implementation.”

“We miss too many opportunities to improve”

“Slow response to foreign competitor's rapid expansion.”

With others sharing that budget limitations and misaligned interest factors are inhibitors of change management and transformation.

“Understanding of changes and interest factors within the organization are what hinder the implementation of technology and change”

“Our ability to change is highly dependent upon budget”

“The inertia to change is the cost and time commitment required to implement it, not the psychological barriers to deciding to change”

# Plant Managers Emerge as a Technology Champion or Blocker

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**Plant Managers** are pivotal influencers impacting the factory's ability to either adopt and embrace new technology or to set up roadblocks to keep the status quo. They decide whether their role will be as the key **AI Champion** or **Technology Blocker** inhibiting the procurement and adoption of industrial AI technologies across production teams.

The **AI Champions** are encouraging AI digitization to expedite their team's knowledge retention and problem solving, and to better connect their cross functional teams resulting in "optimized productivity". Many approach this AI implementation as their legacy to the organization prior to retirement to leave their mark and future-proof the business.

The **Technology Blockers** have a perception that new workers "lack common sense" and will "over-rely on technology", and other misconceptions that AI will "take too long to implement".

In actual fact, if a plant is data-ready typically with 12-months worth of data, integration and deployment is not a barrier to entry.

**Technology Blockers** also perceive that "human interface into the manufacturing process cannot be replaced by technology".

# Plant Managers Emerge as a Technology Champion or Blocker

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In reality, Industrial AI for process optimization does not replace humans. In fact it requires their expertise and input to learn, function, and improve.

As such, humans are able to work faster and easier with the support of trained AI technology to augment their functional role but not to eliminate them.

This is similar to how tax and accounting software has minimized our effort and human error, whilst ensuring we are able to identify the most opportunities to maximize our refunds, and provide confidence if we are ever audited.

Using AI across every process does the same, optimizing outcomes and recording actions taken which can be accessed for future training or auditing purposes, in addition to training the AI models.

## Plant Manager: People Are More Important than Technology

“People are more important than technology. No matter how technical your business is, it still depends on people. Take good care of people and meet them where they are.”  
- Plant Manager, 20+ yrs.

# Plant Managers Emerge as a Technology Champion or Blocker

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The safety of workers inside a factory is a very real and important problem, and is a core focus and responsibility of the Plant Manager. However, fully deployed industrial grade AI would help to relieve many of the daily requirements of a Plant Manager so they have more bandwidth to focus on worker safety.

“Focus on the basics with an emphasis on taking good care of people” – Plant Manager, 20+ yrs

The fear that adding something new into a factory process is valid but should not apply to the addition of AI and digital twin technology. In fact, using AI within a simulated factory environment removes safety risks entirely by solving problems, testing, innovating, or experimenting in real time using a virtual production.

By supporting an operational team with AI, the burden of keeping their team safe and their environment risk free no longer sits entirely on the shoulders of the **Plant Manager**. AI can monitor and optimize in real time. It can identify risks earlier or prevent them entirely to give Plant Managers more confidence at the end of their shift that their production and team will be safe. AI technology will minimize the unexpected 2am phone call from the night shift and will greatly expedite the process of resolving any problem that may occur.

Additionally, overall productivity will be tracked and optimized which ensures that the **Plant Manager** is able to get the most out of their team and production even when they are off-site.

# Conclusion: How Can Factories Achieve Their 2024 Targets?

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2024 is a pivotal year for the industrial sector as it faces unprecedented and often unexpected changes to supply chains, rising production costs, and the transition to renewable energy and circular processes.

Two-thirds of the sector are pushing hard to cut costs and increase profitability as their primary targets, which requires an overhaul of a plant's efficiency processes. However, many of the fundamental assumptions that drove efficiency in manufacturing in the past will no longer hold.

43% of factories using industrial AI technology and digital twin solutions feel "extremely confident" about meeting their targets in 2024, compared to only 13% for digital laggards.



In addition to the increased levels of confidence, AI users are reaping the benefits of optimizing their productivity, achieving better results in less time, accessing faster and more advanced data analysis, and they're able to drive profitable sustainability without compromising quality.

By contrast, the digital laggards report missed opportunities to improve, slow responses to business growth opportunities, and an inability to innovate.

# Conclusion: How Can Factories Achieve Their 2024 Targets?

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**Plant Managers** have emerged as either an **AI Champion** to drive the deployment and uptake of AI technology, or as a **Technology Blocker** with fears that workers will over-rely on technology over human experience.

**Technology Blockers** still have time to deploy AI in 2024 and make the necessary changes to achieve their targets.

They will need industrial grade AI in order to build trust in the solution and its decision-making.

Industrial AI like **Fero Labs** is transparent and highly explainable. Providing white-box machine learning, explainable AI predictions, and confidence bands on every optimization and recommendation.

A solution with Industrial AI will enable plants to learn about their production faster than ever before, driving profits and reducing emissions at the same time so they can adapt, thrive, and survive in 2024 and beyond.







# INDUSTRIAL GRADE AI

## ABOUT FERO LABS

Fero Labs is a Profitable Sustainability Platform which uses industrial grade AI for factory optimization. Trusted by the world's largest producers of steel, chemicals, cement, oil and gas to make confident decisions that drive profit and sustainability.



## THE SOLUTION

The solution gives users the tools for rapid nonlinear root cause analysis, anomaly detection, multivariate forecasting, scenario testing, and live predictions and optimization to target and eliminate process inefficiencies to reduce overall emissions without compromising product quality.

# SURVEY METHODOLOGY

Fero Labs surveyed 115 senior managers (Manager, Director, VP, Executive, Partner, Owner) in functional roles such as Plant Manager, Process Engineer, Data Scientist, Research & Development from the steel, chemical, and oil industries.

## RESPONDENT DEMOGRAPHICS

Respondent Location:

- 74% North American
- 25% European

Manufacturing experience (years):

- 20+ (51%)
- 15 - 20 (10%)
- 10 - 15 (5%)
- 5 - 10 (25%)
- Less than 5 (9%)