

CENTER FOR ADVANCED MANUFACTURING AND SUPPLY CHAIN

Frontline Talent of the Future Initiative

DECEMBER 2024

Frontline Talent of the Future Initiative

Background






Despite the many advancements in the 4IR, **companies continue to face challenges in maintaining frontline talent stability and productivity.** This is due to a global talent shortage, shifting worker preferences, and the rapid adoption of new technologies that have fundamentally changed the role of operators.

To address this, we charted the “Frontline Talent of the Future” initiative about a year ago – this initiative aimed to codify learnings from world class manufacturers about the talent innovations and transformations that enabled them to achieve world class performance.

As part of our pilot program, we developed a **robust assessment** informed by leading experts, **conducted 80+ interviews** and feedback sessions, collected a library of **60+ impact-oriented talent innovations**, and **visited 8 sites.**

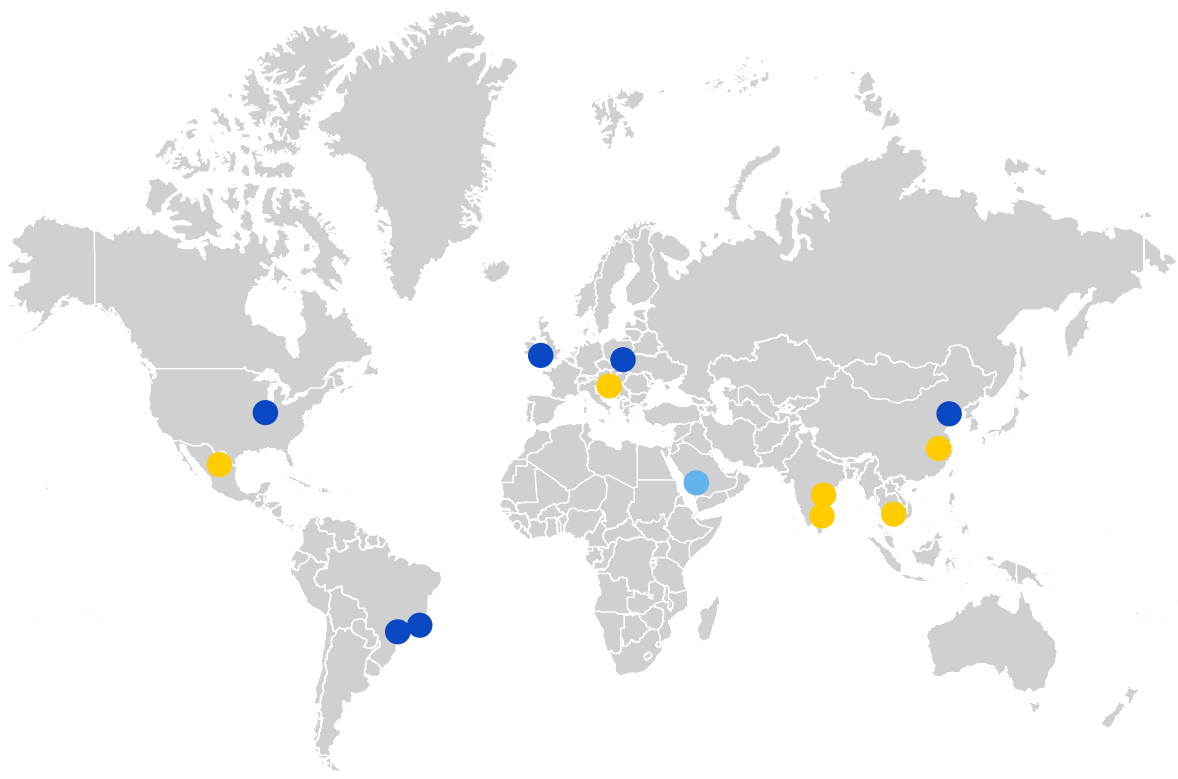
Now, this initiative is **joining forces with the Global Lighthouse Network.** This means starting in 2025 **sites can apply to be recognized for achieving world-class performance with distinction in talent transformation.**

Focus of document

- 
Pilot overview
- 
Why Talent
- 
Talent Capabilities
- 
Participant Stories
- 
Next steps

Pilot participants spanned geographies and industries

Site locations



■ CPG
 ■ Industrials
 ■ Oil and gas

- aramco
- Coca-Cola
- First Solar
- flex
- FORTUNE BRANDS
- 卡奥斯 COSMOPlat
- Nestlé
- Schneider Electric
- Unilever
- WD Western Digital

13 Sites participated in Pilot from 10 companies²

8 Sites visited

~80 Number of feedback sessions company leaders and academics

61 Number of talent innovations identified

Manufacturing is struggling with frontline productivity and stability driven by 5 root cause

- 1 Talent shortages** Demand for frontline workers is outpacing supply and there is increased competition for talent

- 2 Widening skill gaps** Technical skills are lagging behind the pace of investment in digital & automation.

- 3 Insufficient wages** Earnings below living wage¹ are leading to attrition and workplace switching.

- 4 Struggling supervisors** Supervisors often lack soft skills and are spending less than 1/3 of their time on people.

- 5 Evolving worker needs** Today's frontline want a discernible career path, respond to inspiring leaders, value meaningful work, and seek more scheduling flexibility.

What the data tell us

Productivity growth is slowing, in developed economies it **averaged 1% percent** between 2016-2022 compared to 2.2% between 1997-2002

37% of manufacturing employees from a recent survey are **planning to leave their jobs** in the next 3-6 months

More than **71% of manufacturers** cited the **inability to attract and retain employees** as their top primary challenge.

Only **5% of respondents** in a recent McKinsey survey said their organizations have the **capabilities needed to succeed**

Sources: McKinsey analysis, McKinsey Talent Trends, McKinsey <https://www.mckinsey.com/mgi/our-research/investing-in-productivity-growth>, NAM [Manufacturers Outlook Survey 2024 Q1 – NAM](#),

Pilot participants have all seen improved performance across financial, productivity, stability, and operational health and safety metrics

◆ Delta% change in metric for site from baseline over an average period of 2.8 years

	Metrics	Impact range observed	100%	Percent Δ %	Average Δ % in category	
	Financial Metrics	Revenue Growth	◆	◆	3-112	34%
	Throughput	◆	◆	4-32		
	Productivity	OEE	◆	◆	4-62	28%
	Labor Productivity (vol/FTE)	◆	◆	3-113		
	Labor Productivity (rev/FTE)	◆	◆	4-114		
	Stability	Vacancies	◆	◆	13-92	52%
	Absenteeism	◆	◆	9-70		
	Attrition	◆	◆	42-88		
	Time to Fill	◆	◆	6-73		
	Operational Health	Schedule adherence	◆	◆	1-16	28%
	Safety	◆	◆	14-100		
	Quality	◆	◆	34-67		
	Engagement	◆	◆	2-29		
	DE&I	◆	◆	8-80		
	Sustainability	◆	◆	4-43		

Work Design & Safety

Reimagine the frontline work to create safe and productive workspaces and processes.

What Best-In-Class Looks Like

Talent requirements are clearly linked to a future technology roadmap. Job roles and organizational structure are updated regularly to meet evolving needs, with augmentation, automation, regionalization, and outsourcing deployed appropriately. Technology is used to augment and protect workers, reducing their time spent in manual, repetitive, or dangerous tasks; meanwhile, a strong safety program proactively identifies and mitigates risks. Employees have easy access to tools and resources that support mental and physical wellbeing.

Examples from our Pilot Participants

Western Digital uses a digital control room to transform operator roles – Thailand

A digital control room fundamentally shifted work of operators away from repetitive manual jobs. The new approach integrated automation, redesigns shopfloor process flow, engaged touchless WIP control, and incorporated IIoT signals & alerts into a Command Center. The initiative improved OEE and reduced flow disruptions, boosting labor productivity 21%; likewise, it reduced equipment failure diagnostic times from 2 hours to 10 seconds with >90% accuracy. ML/AI-enabled predictive maintenance provides operators and technicians with prescriptive solutions allowing for faster response time. The Command Center has contributed to achieving a 91% engagement score. The system provides both operators and technicians with an upward career path—46% of job roles have been redefined, with 37% shifting upward to involve higher skill levels.

Unilever factory implements agile and Continuous Organizational Restructuring - USA

Operating in a highly competitive talent market with high attrition risk, Unilever Kilbourn initiated a process that systematically reviews and revises the plant's organizational structure every six months to create roles that align with both current business needs and the available talent pool. A focus on developing opportunities in various roles across all levels of the organization has retained top talent, to the extent that 81% of local management has come from intentionally developed roles. The site has also seen a large improvement in employee retention, with an attrition reduction of 68%, attributed to this newfound ability to create development opportunities in a flexible and agile way.

Talent Planning

Understand the organization and site-level needs for frontline talent; match demand and supply through dynamic scheduling.

What Best-In-Class Looks Like

Skills identification—both technical and non-technical—is completed for each role. The organization’s competency levels are integrated in the planning process and are used determine hiring and development targets. There is a clear understanding of potential future gaps between talent demand and supply by leveraging ML demand forecasting at the site level. The company uses flexible labor scheduling to respond to changing demands and employee preferences while optimizing productivity.

Examples from our Pilot Participants

Haier COSMOPlat’s Dynamic Line Balancing affords scheduling flexibility - China

Driven by the need to provide increased flexibility for workers, especially new parents, Haier developed a novel “virtual industrial engineering system” that creates customized work instructions by position based on the product, the number of employees available, and the available employees’ skill levels. Using AI algorithms, the system allocates tasks and assigns workers to stations to balance the line. It can generate new work instructions within 3 seconds, allowing flexibility to continuously rebalance the line. Operator satisfaction has improved, and the system has significantly reduced daily workload of IE engineers, freeing them from tedious work to focus on higher value tasks. The system helped Haier achieve an overall balance rate improvement, from 65% to 85%.

Schneider Electric’s competency management system enables smart talent planning - India

Schneider Electric’s digitized competency management system enables planning for global, regional, and site level competency needs while offering assessment and development tools for workers. Given the broad range—11 technologies in technical competency with 131 sub technologies along with 9 domains in digital competency covering 25 job codes—the tool helps managers identify priorities, set detailed plans, and choose the most critical technologies for current and future operations. The system also maps employee competencies and provides visibility on skills across sites, facilitating the borrowing of talent when business needs arise. Schneider’s “Be Green” metric was implemented to ensure at least 2 experts in critical competency levels at each site, supporting redundancy and process stability. The company has achieved 100% dual coverage for digital competencies at their sites.

Attraction & Onboarding

Find and activate the next generation of Frontline talent.

What Best-In-Class Looks Like

The organization employs a multifaceted approach to talent attraction, including the articulation of clear, targeted Employee Value Proposition (EVP) and collaborates with talent sources to create a robust pipeline. It uses tech-enabled solutions to streamline its sourcing /screening processes, minimizing time-to-fill. Onboarding ensures exposure to the work environment ahead of signing, provides relevant skill training in an environment that simulates actual job (e.g., using training lines and VR) while building connection to the company’s mission, vision, and culture. The company extends ‘hyper care’ for new employees in their first 100 days, and has a program in place to identify and cultivate diverse talent.

Examples from our Pilot Participants

Flex offers apprenticeship program for young talent - Austria

Facing challenges in attracting talent to its rural site, Flex expanded its traditional apprenticeship program which enables students aged 15 or 16 to enter a four-year program and specialize in electrical engineering, mechatronics, or metal techniques. It blends academic learning with professional training. Investments in the program have allowed Flex to grow the number of apprentices by 20% since 2020 while increasing the participation of women to 25%.

Aramco AI Matching to optimize talent selection – Saudi Arabia

To streamline the hiring process and optimize talent attraction, Aramco implemented an AI-Matching selection and forecasting tool. By filtering resumés and accurately aligning candidate profiles with the organization’s needs based on analysis of large data sets, the tool highlights potential hires with skills anticipated to be in demand. For example, it flagged digital and instrumentation technician candidates with expertise in emerging technologies, ensuring strategic hiring decisions. This refined process has not only enhanced the quality of new hires but has also improved operational efficiency. It reduced the overall time to fill by 43%; meanwhile new hire satisfaction percentage rose by 36%, reaching a 99% satisfaction rate.

Talent Development

Build distinctive Frontline capabilities for Operators and Supervisors

What Best-In-Class Looks Like

Continuous learning is part of the organizations culture, and learning journeys are tied to business needs. Partnership with universities, schools, and technical programs develop tailored curricula. Promotes career growth through cross training, rotation, and mentorship programs; individual sites develop teaching capabilities through ‘train the trainer’ and on-the-job training. The company has a clear skill matrix and understands how it maps to development, providing opportunities for operators to work their way into more senior roles. It also provides tuition reimbursement options for higher learning.

Examples from our Pilot Participants

Western Digital builds a leadership essentials program - Thailand

Facing challenges in finding and hiring talent with the right skill set, the company collaborated with a university to develop a multidisciplinary curriculum for its employees optimized to develop skills for digitized manufacturing, with competencies in areas such as software, database, ML/AI, and advanced mathematics. Western Digital co-designed specialized tools such as IIoT sensors and software for frontline upskill/reskill training in conjunction with universities and suppliers, enhancing workforce competency & labor productivity. Participating professors provide onsite training, and participating employees can earn academic credit toward a degree. Through this initiative, Western Digital has increased its frontline workers trained in IIoT fundamentals by 49% while boosting the number of employees promoted due to upskilling and reskilling by 26.8%.

Aramco implements gamified training – Saudi Arabia

Aramco designed a gamified training program to improve training while addressing workforce safety and process skills gaps among a site’s young workforce. The program provides an immersive, multi-player, collaborative space offering 60+ certified courses covering operational requirements as well as elements of leadership, onboarding, safety, and wellbeing. The investment allowed for a 43% reduction in OpEx cost by reducing the need for training-related travel and in-person training sessions. The training enables operators and technicians to safely and successfully perform preventive maintenance to essential equipment under rigorous conditions, simulating real life scenarios that cannot be replicated in a classroom environment, and without having to shut down production. The initiative has improved maintenance technician competency, reducing the maintenance backlog by 11%.

Talent Effectiveness

Manage performance for Operators and Supervisors that drives the right behaviors to achieve performance aspirations.

What Best-In-Class Looks Like

The company has used digital solutions to enable clear visibility of hour-by-hour performance metrics mapped to specific goals, and engages in performance-oriented huddles. It recognizes and rewards employees based on performance linked to overall business goals. It uses automated, streamlined processes to track time and attendance. Frontline workers receive coaching focused on how their impacts organizational success; meanwhile, the company trains managers to enable them to provide effective coaching and feedback. Managers and supervisors spend the majority of their time on the shop floor observing and coaching their teams

Examples from our Pilot Participants

Unilever Kilbourn implements creative performance-based rewards - USA

Kilbourn implemented a creative, performance-based rewards system designed to energize the workforce through gamification and a rewards structure built around a monthly point system designed to comply with collective bargaining agreement rules. Employees are rewarded for achieving common site goals, shift goals, and individual goals; then, points can be redeemed for gift cards. The site has introduced bi-weekly town halls, during which site leadership shares updates regarding factory performance and awards points for best performing shifts. These gatherings foster friendly competition and provide a venue for sharing improvement ideas. This has not only boosted engagement, but also sparked innovation across the factory floor. The results have been transformative. OEE has been boosted by 16%, product waste decreased by 34%, employee engagement increased by 26% and absenteeism rate improved by 48%.

Haier COSMOPlat deploys an innovative approach to salary accounting - China

Haier has revolutionized frontline worker payroll with its innovative Salary Accounting System, replacing an old paper-based payroll model that was time-consuming, error-prone, and a source of frequent employee dissatisfaction. The new digital solution integrates with the Manufacturing Execution System to automatically gather data on output and attendance. The system uses facial recognition to identify employees and calculates employee salary based on output, quality, and safety, with additional credits for innovations. Employees can see exactly how their salary was calculated, which increases transparency. The system has helped to increase employee satisfaction by 10 percentage points.

Culture & Experience

Define and deliver a compelling Employee Value Proposition.

What Best-In-Class Looks Like

Multichannel approach to ensure robust 2-way communication between employees and leaders within a psychologically safe environment that facilitates a culture of openness. The organization cultivates a lively and inclusive community through activities that foster connectivity and deep connection. It has structured DE&I programs with clear KPIs in place to foster inclusion, support career development, and mentorship.

Examples from our Pilot Participants

Nestle creates an inclusive environment for deaf and hard of hearing employees - Brazil

Nestle set out to create a safe and inclusive work environment for deaf and hard of hearing employees, both by retrofitting machines alerts that relied on audio signals to include visual elements and by implementing several measures toward education and integration. Nestle developed a comprehensive training plan, which includes courses in Basic Portuguese, Mathematics, and Financial Management. To ensuring the integration of deaf employees, the company hired a full time Brazilian Sign language (BSL) interpreter, offered BSL classes to all managers and supervisors, and translated all training and communication into BSL. The site has trained over 200 employees in BSL, creating a more inclusive environment for the ~6% of employees who are deaf or hard of hearing.

Haier COSMOPlat implements a social platform for employee innovation - China

Haier has tapped into the creative energy and experiential capital of its own workforce by implementing a dynamic social platform that allows employees to share and upload ideas for innovations and factory improvements. Ideas can earn their originators corresponding creative points that equate to financial rewards. A unique feature of the system is that employees can propose ideas pertaining to areas outside of their department, which bringing fresh, cross-departmental perspective. Moreover, all employees can view ideas on the social platform and can interact with ideas by 'liking' them. This networking element has compounded the submission of excellent ideas, with 95% of employees participating in creative proposals. Over 500 ideas were submitted last year, achieving a combined cost savings of \$1 million. Employees can receive approximately 30% of the cost-savings value of an idea once implemented.

Aramco Yanbu Refinery transforms workforce with AI and upskilling for vision 2030 goals



Change story

To address the changes associated with the evolving energy landscape, Aramco site at Yanbu has faced challenges pertaining to attracting and retaining skilled workers.

Recognizing this risk, the site embarked on a transformative six-year journey to reshare its workforce and work model.

This journey was powered by cutting-edge technology and the principles of the Fourth Industrial Revolution implementing talent innovations such as Artificial Intelligence Matching (AIM), the Generative AI Meta Brain Solution, and a Citizen Development Upskilling Platform.

As a result, employee productivity surged by 51%, overall equipment effectiveness (OEE) improved by 16%, female workforce participation rose by 38%.

Talent innovations

Digital Upskilling Programs & Citizen Development program upskill engineers with Low-code/No-code

Gamified Training Programs to enhance competency & skills enhance training with a gamified VR program, reducing training costs

Young Leaders Advisory Board (YLAB) to retain young talent by engaging young employees, increasing satisfaction and retention

AI Matching to optimize talent selection with AI-Matching tool, boosting new hire satisfaction to 99.4% and operational efficiency

Meta Brain Generative AI to enhance productivity empower frontline workers with Meta Brain AI, boosting satisfaction by 20% and productivity by 59%

Innovation Portal to encourage frontline ingenuity boosting idea submissions and patents by frontline workers

Impact

 **+25%** engagement

 **+16%** OEE improvement

 **+25%** training effectiveness



Unilever factory addresses workforce concerns through always on Gemba philosophy, focus on career development, and creative incentive program

Change story

Kilbourn is a 106-year old unionized site that reached a crisis point 3 years ago, driven by a shift in consumer preferences, evolving workforce preferences, and moderate performance. The site had a large number of vacancies and high turnover.

To stay relevant, site leadership embarked on a structured people transformation journey to dramatically improve the culture and improve the site's agility to respond to evolving preferences. This transformation was underpinned by shifting from a management versus Union mentality and embracing the need for the people agenda to be a continuous cycle, always on, and evolving with time.

Kilbourn is now seen as the hub of talent within North America Nutrition, scaling people innovations to their Independence site in Missouri and Rexdale site in Ontario, Canada.

Talent innovations

Performance and behavioural incentive program aligns team around factory KPIs, and shares goals, actuals, and gaps in real time and during bi-weekly and townhalls for feedback and continuous improvement.

Locally developed scheduling application optimizes complex labor schedules while respecting Union CBA rules, fostering trust and transparency between the employees and company by being accessible to all employees on personal mobile devices and facility kiosks.

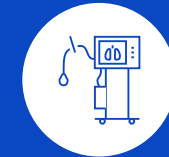
Dynamic organizational structure is reviewed every 6 months, adapts to business, factory and personal needs, creating evolving succession and development plans as long as it stays within the allocated budget.

Always -on GEMBA philosophy is supported by digital tools to eliminate non-value added activities (NVAA), empowers teams to focus on floor activities, openly share losses, and foster transparency, care and performance through regular Town Halls and the GEMBA structure.

Impact



+19%
engagement



+16% OEE
improvement



-34% finished
goods business
waste



1000+ days
recordable free



Flex overcomes Talent Shortages with Strategic Skill Development and Enhanced Career Pathways

Change story

In recent years, Flex, in the small Austrian town of Althofen, faced significant challenges that prompted us to further invest in talent.

Demographic changes led to a shortage of skilled workers, driving fierce competition for talent, particularly in technical and commercial areas. We identified root causes and developed tailored solutions to enhance managers' skillsets, employee engagement, and career development pathways.

Our focus aims to create a supportive, efficient (overtime reduction), and safe work environment that attracts top talent and fosters long-term retention and satisfaction.

Apprentices at our training center doubled, and employee skills improved through development programs. We collaborated with the commercial academy to align training with industry needs. A good company has become excellent, creating a secure and attractive workplace that can compete beyond a small town in Austria.

Talent innovations

Over 1000 apprentices trained yearly in electronics, encouraging women, creating a skilled talent pipeline

Trainee to technician, train potential technicians in six months, enhancing careers and company's future

Application Tracking System implemented for quick applications, feedback, reports, and brand strengthening

First Industry High School in Austria established vocational schools, recruit skilled specialists, improved hiring efficiency, reduced training

Developing competencies model implemented to track skills, react to demands, enhance satisfaction, and improve automation

Leadership Community was established to support managers, enhance retention and satisfaction, share best practices, provide mentoring, and offer specialized training

Impact



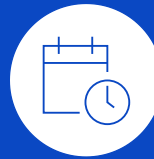
20% increase in the number of apprentices



85% decrease in absenteeism



60% decrease in attrition



26 days reduced time to fill

COSMOPlat Haier expands across industries, upskills workforce, and boosts employee engagement



Change story

The corporate planning and products development of Hefei Lingzhi has expanded from the single home appliance controller industry to 15 major industries such as automobiles, industrial control, and health equipment, which poses huge challenges to the demand for new industry talents, the complexity of frontline employee management, and the satisfaction of frontline employees.

Haier needed to build additional flexibility into their operations, upskill it's employees, and find ways to keep employees engaged and motivated.

Through a series of innovations, the employee turnover has been reduced from 7% to 3%, on-time delivery has reached 99.9%, and employee satisfaction has increased by 12%

Talent innovations

Personnel dynamic arrangement system developed a virtual industrial engineering system to enhance worker flexibility and optimize task allocation

Talent Skills Certification Competiton elevated operator talents using skill evaluations, competitions, and a digital matrix, increasing high-skilled talent to 47%

Social platform for employee improvement ideas was established for employees to share innovation proposals, achieving 95% participation and \$1M in savings

Frontline Employee Salary Accounting System developed a salary system for real-time, accurate pay data, improving transparency and employee experience significantly

Impact



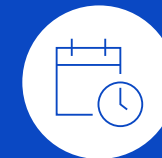
+12%
engagement



+19% OEE
improvement



-3%
attrition rate



-50%
time to fill - days

Western Digital adopts 4IR technology and upskilling to boost productivity and engagement



Change story

Prachinburi encountered a significant technology shift and lack of qualified labor due to its rural location, In addition, learning from COVID impact (high quarantine rate), they revolutionized their manufacturing through 4IR technology adoption with highly automated and intelligent work re-design.

They created a digital leadership essential program through partnerships with universities and technological institutes, resulting in 21% improvement in labor productivity. They upskilled/reskilled the workforce by 97%, shifted 37% workforce to higher level jobs, and changed 46% of how jobs are done.” Stability indices like employee engagement improved to 91% (a 13-percentage point improvement) & attrition maintained at 7.7%.

Talent innovations

Intelligent Operations with new work design through technologies and automated processes, enhancing productivity and career paths, improving operational efficiency

Frontline Workforce Augmentation was implemented to reduce diagnostic times and boost maintenance efficiency

Digital Leadership Essential by collaborating with universities to develop 4IR curriculum, enhancing workforce competency

Empowering remote technical support and collaboration combined IIoT, Agile, remote sharing to enhance workforce flexibility and retention

Talent Pipelining enhanced university engagement and national competitions, inspired 4IR tech adoption

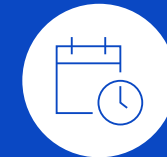
Impact



+13 p.p.
engagement



+12 p.p
OEE improvement



21%
Increase in
productivity



-41%
safety incidents

Schneider Electric boosts global market readiness through internal upskilling and talent retention initiatives

Change story

To meet global market demands, the plant needed to strengthen its workforce with advanced technical skills and create an ecosystem for nurturing and retaining talent. The plant's remote location made recruiting for key roles challenging, so the focus shifted to upskilling and reskilling the internal workforce:

- Internal talent was nurtured through the Open Talent Market (OTM) platform, enhancing technical and functional skills
- Talent retention was prioritized through career enhancement, rewards strategies, and engagement initiatives like local festivals, team events, well-being programs, onsite daycare, and recreational activities
- The Competency Management Execution Tool (CoMET) platform was leveraged to build necessary talent capabilities.
- The workforce was prepared for the future by focusing on digital and technological skills.
- The CoMET BeGreen initiative ensured certified experts in key technologies at every plant.
- Direct Labor Productivity: Labor hours spent on production were compared year-over-year.

Talent innovations

Competency Management Execution Tool, a digital platform that assesses, develops, and tracks job-specific technical competencies

Operators to Associates, the scientific assessment center identifies potential for white-collar talent development

Open Talent Market and mentoring portal (AI-Powered Platform) that connects employees to global positions and mentorship

Electrifier Program supports global SME/Technical careers through rigorous assessment and certification

Digital Employee Engagement in continuous improvement through the Idea & I See I Do Scheme, which enables operators and associates to participate in the suggestion scheme, fosters a continuous Improvement culture using Digitized Idea and SIM Systems (DISS)

Impact



41% increase in digital competency



+11% OEE improvement

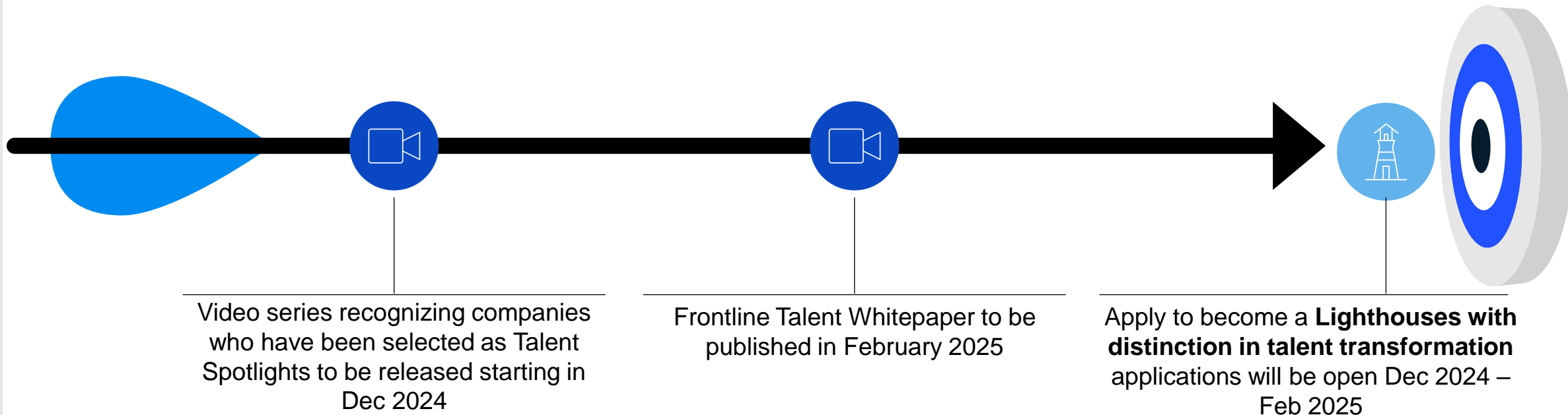


8% decrease in attrition rate



6% improvement in engagement

The Frontline Talent of the Future Initiative is expanding in 2025



In 2025, the **Global Lighthouse Network** will deepen its focus on talent by including additional talent-related achievements and solutions into its framework. **Starting in December 2025 sites can apply to be recognized for achieving world-class performance with distinction in talent transformation.**

If you believe you have achieved world-class performance through talent transformation, we encourage your application to the Global Lighthouse Network at: <https://initiatives.weforum.org/global-lighthouse-network/home>.

Additionally, we will **continue to share learnings from the initiative** through a series of media to be published in the coming months.