

A photograph of a large industrial manufacturing facility. The scene is filled with complex machinery, including multiple levels of metal walkways with railings, structural beams, and a large robotic arm with a hook on the right side. The lighting is dramatic, with warm orange and yellow lights illuminating parts of the structure, while other areas are in deep shadow. The overall atmosphere is one of a busy, modern industrial environment.

Reopening Manufacturing Facilities

PLUGANDPLAY

Reopening Manufacturing Facilities

PLUGANDPLAY

Times of change and uncertainty like the global COVID-19 pandemic serve us as a reminder of how vulnerable and fragile our everyday life is. The virus outbreak earlier this year hit manufacturers in an unprecedented way - for the very first time in modern manufacturing history, demand, supply and workforce availability are all affected globally at the same time. Almost every major manufacturer has seen disruptions across their global supply chains of materials and parts.

A lot of us hope that the COVID-19 pandemic will end within the next few months. Factory operators, logistics companies and retailers are considering how to proceed with their regular operations to a certain degree. However, companies also have to take measures to keep their employees safe and maintain a safe distance from each other. Social distancing and staff safety measures put an additional level of pressure on these companies since large parts of the workforce are not going to be able to perform their functions on-site. For work activities where social distancing is challenging, it is encouraged to consider limiting the duration of specific activities and/or implementing innovative approaches, for example temporarily moving or repositioning workstations to create more distance or installing barriers between workstations. There are also technologies for remote health and social distancing monitoring, reorganization and repurposing of existing manufacturing lines and assets as well as orchestration of cleaning and disinfecting procedures. Many modern and high-technology enabled factories already have some systems in place, but additional capital investment in automation and remote operation technologies can certainly ease the process and add an additional layer of safety.

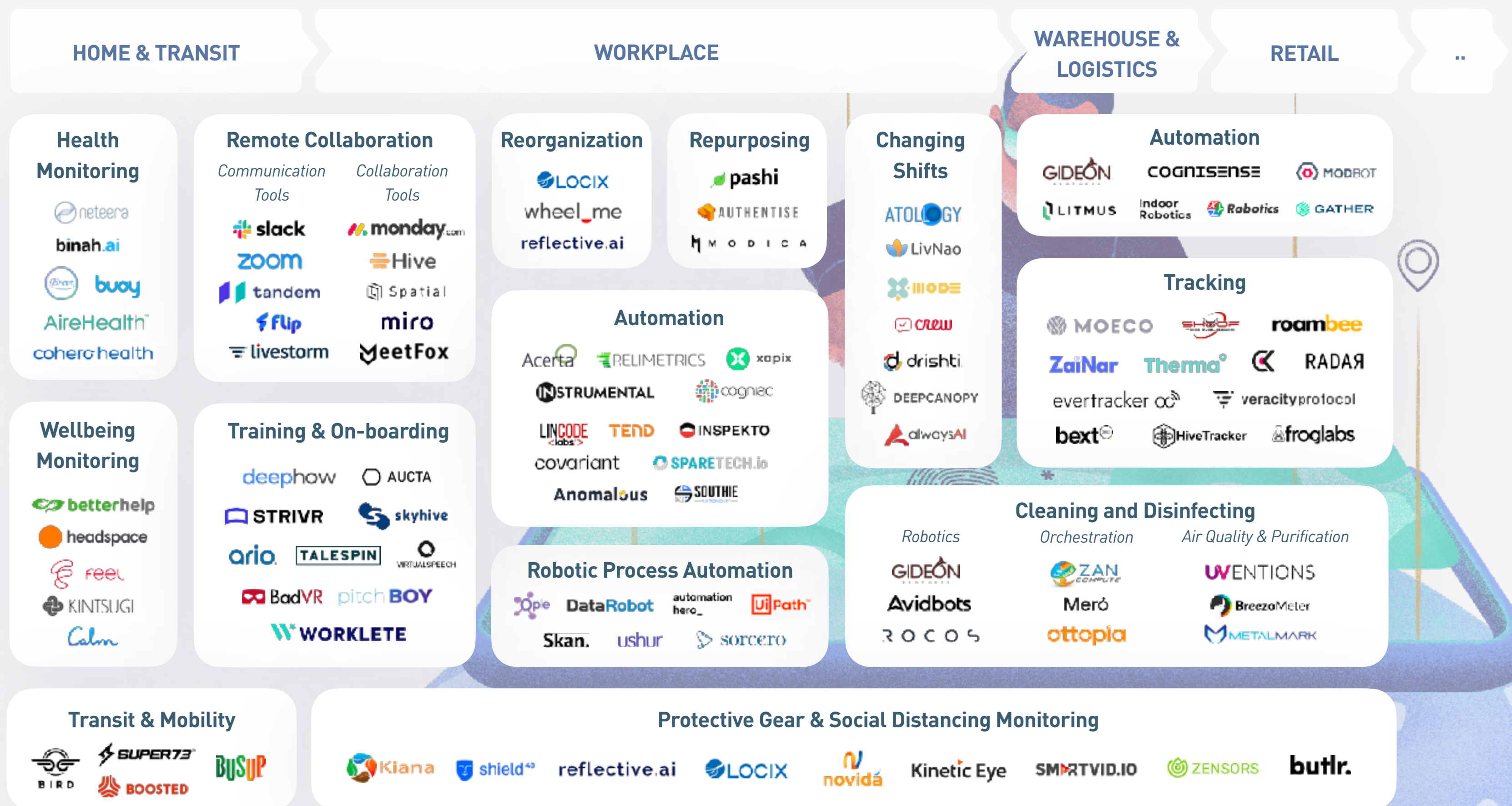
It is of utmost importance to closely follow the public health communications about COVID-19 recommendations for the workplace and ensure that workers have access to and understand that information.



Reopening Manufacturing Facilities

PLUGANDPLAY

During this time of uncertainty and economic slowdown, safeguarding consumer and workforce health is highly important among businesses and governments. The market map below illustrates the steps to focus on when considering resuming business operations and reopening facilities as well as companies developing technologies to address these problems.



Reopening Manufacturing Facilities

Home & Transit

The safety of employees should be the number one priority when it comes to reopening facilities, especially when dealing with a highly contagious virus that could spread again in no time. Prevention will be imperative in order to not only reopen facilities but also to maintain a secure working environment for everyone.

Health Monitoring

Telemedicine and platforms that allow distance monitoring of the patients' vital signs and health can alleviate the strain on healthcare organizations dealing with the virus emergency. Wearables and health analytics technologies leverage data gathered from the devices to allow patients to better manage their own healthcare solutions as well as streamlining communication and actions between medical staff and patients.

Wellbeing Monitoring

Shifts in habits and new distancing rules have changed the ordinary workspace: virtual mental health resources can make an improvement for heightened levels of stress and anxiety, through apps providing mindfulness, meditation and therapy frameworks, leveraging emotion recognition technologies and AI. Streamlining self-care, diagnostics and behavioral insights can simplify the wellbeing monitoring of workers.

Companies addressing this topic

(More related companies [here](#))



Revolutionizing personal wellness and medical services delivery



Wearable that helps to cope with stress



Developer of AI-powered digital health solutions



Contact-free vital sign sensing system



Digital health company for respiratory patients



Provider of patient engagement and medication adherence tracking

Companies addressing this topic



Platform for professional counseling with licensed therapists



Platform for employee health and happiness



End-to-end solution for mental healthcare



Talk therapy software for mental health



App for sleep, meditation and relaxation

Reopening Manufacturing Facilities

PLUGANDPLAY

Home & Transit

The safety of employees should be the number one priority when it comes to reopening facilities, especially when dealing with a highly contagious virus that could spread again in no time. Prevention will be imperative in order to not only reopen facilities but also to maintain a secure working environment for everyone.

Transit & Mobility

Once people get back to work, transit solutions that allow social distancing will shift the norm of usually crowded commutes. To guarantee security, private cars are not the only option and staggering work days will not be sufficient. Keeping distance in crowded buses or trains is one challenge, while e-mobility provides a secure and sustainable alternative to individual transportation.

Companies addressing this topic



*Dockless electric scooter
company and vehicle
sharing platform*



*Manufacturer and brand of
electric bicycles for
personal use*



*Developer of lightweight,
wireless, remote-controlled
motorized vehicles*



*Corporate bus ride-sharing
platform for companies and
schools*



Reopening Manufacturing Facilities

PLUGANDPLAY

Home & Workplace

With most businesses not being considered essential during the COVID-19 pandemic, workforces had to shift towards work from home and therefore find new ways to communicate and collaborate in a digital working environment. It is possible that companies will continue to offer work from home as an alternative to coming to their facilities, yet it will most likely not fully replace on site work.

Remote Collaboration

Work from Home has become imperative during these last months since a safe working environment couldn't be provided across offices, manufacturing plants, and other facilities, with very few exceptions that were considered essential businesses by the governments. Since reopening facilities will most likely not happen without a proper transition phase, we will still require tools that help us coordinate the workforce and collaborate productively.

Communication Tools

Video conferencing and business communication tools had already gained momentum before the outbreak of the virus, and even more so with new work from home policies.

Collaboration Tools

Cloud-based project management solutions improve efficiency for sharing deadlines, documents and tasks, especially across teams working remotely, simplifying work from home and allowing real-time collaboration between team members.

Companies addressing this topic

Communication Tools



Business communication
platform



Provider of modern
enterprise video
communications platform



Virtual office for remote
teams



Employee app for internal
communication branded in
the enterprise CI



Platform to make webinars
simpler, smarter and more
efficient

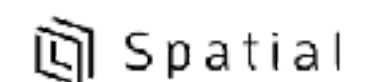
Collaboration Tools



Platform for remote teams
to run processes, projects,
and everyday work



Collaboration platform for
efficiency, productivity and
team work



Augmented Reality
platform to collaborate
from anywhere



Online collaboration and
whiteboarding platform for
teams



Platform for online
meetings and team
productivity

Reopening Manufacturing Facilities

PLUGANDPLAY

Home & Workplace

With most businesses not being considered essential during the COVID-19 pandemic, workforces had to shift towards work from home and therefore find new ways to communicate and collaborate in a digital working environment. It is possible that companies will continue to offer work from home as an alternative to coming to their facilities, yet it will most likely not fully replace on site work.

Training & On-boarding

AI powered learning platforms can become a useful enterprise knowledge repository for digital workflows and virtual learning opportunities. Automating industrial training through immersive technologies can optimize training techniques, making them more scalable and efficient.

Companies addressing this topic

deephow

AI-powered learning platform for manufacturing, service, and repair

AUCTA

Platform to automate industrial training with immersive technologies

STRIVR

STRIVR utilizes VR to train individuals and improve performance

VIRTUALSPEECH

Realistic training platform that combines e-learning with practice in VR

pitchBOY

Platform to improve employee soft skills using their own voice

skyhive

Platform for large-scale workforce reskilling through AI

ario

Platform to see and search your data in the real world

TALESPIN

Connected suite of VR and AR training and field tool applications

BadVR

VR tools to craft immersive data experiences

WORKLETE

Reducing injuries, costs, and inefficiencies of frontline workforces

Reopening Manufacturing Facilities

PLUGANDPLAY

Workplace

With most businesses not being considered essential during the COVID-19 pandemic, workforces had to shift towards work from home and therefore find new ways to communicate and collaborate in a digital working environment. It is possible that companies will continue to offer work from home as an alternative to coming to their facilities, yet it will most likely not fully replace on site work.

Reorganization

In order to practice effective social distancing and ensure a safe working environment, many facilities will need to have their common areas and office spaces reorganized in order to meet the requirement of more physical distance between co-workers.

Repurposing

Several manufacturers have quickly adapted their factory lines to shift production towards necessary goods and critical supplies to respond to the virus crisis including masks, ventilators, cleaning products and hand sanitizer. For example, *LVMH* has switched its perfume production to making hand sanitizer, and manufacturers including *Ford*, *GE*, *Tesla* and *3M* have partnered together to produce ventilators and respirators.

Companies addressing this topic



Cloud-based solutions to digitize physical spaces



Technology enabling everything indoors to move effortlessly on smart wheels



Video recognition for intelligent worksite and operational insights

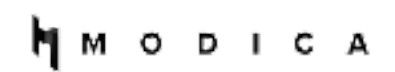
Companies addressing this topic



Platform to to design, monitor, and optimize production lines



Process automation software for additive manufacturing



Modular automated factories-as-a-service

Reopening Manufacturing Facilities

PLUGANDPLAY

Workplace

With most businesses not being considered essential during the COVID-19 pandemic, workforces had to shift towards work from home and therefore find new ways to communicate and collaborate in a digital working environment. It is possible that companies will continue to offer work from home as an alternative to coming to their facilities, yet it will most likely not fully replace on site work.

Automation

Machine learning and computer vision technologies can help detect product anomalies by collecting data and transforming it into insightful knowledge to inform decisions in real-time. Aside from inspecting quality and reliability of the manufacturing processes, these technologies play an important role in the maintenance operations of the machinery and equipment, by automating visual inspection tasks through AI and deep learning.

Companies addressing this topic



AI-enabled platform that detects manufacturing defects of parts



Full stack computer vision and machine learning software for QA



Fast & simple data connections for the connected world



Platform to improve product manufacturing process



Cogniac enables automation of any visual task using the latest in AI



AI for manufacturing quality control



Provider of visual inspection and shop floor automation using AI



Predictive Analytics for Industrial Robotics



Inspekto is a developer of autonomous machine vision platform



AI software to teach robots new, complex skills



Data based spare part management



Southie Autonomy makes a no-code software platform for robot arms

Reopening Manufacturing Facilities

PLUGANDPLAY

Workplace

With most businesses not being considered essential during the COVID-19 pandemic, workforces had to shift towards work from home and therefore find new ways to communicate and collaborate in a digital working environment. It is possible that companies will continue to offer work from home as an alternative to coming to their facilities, yet it will most likely not fully replace on site work.

Robotic Process Automation

Integrating computer vision and AI knowledge through manufacturing adaptive robots can automate repetitive, complex and time-consuming tasks, improving the efficiency of operations and ensuring the safety of the factory workers. Increasing speed, accuracy and reducing costs through robotic process automation does not require a complete infrastructure upgrade, and can be integrated alongside existing infrastructure while enabling skilled workers to focus on other parts of the operations.

Companies addressing this topic



End-to-end platform to harness the power of AI

DataRobot

AML platform for data scientists to build and deploy ML models

automation hero_

RPA combined with AI to form an intelligent process automation platform



Intuitive and feature-rich automation development environment

Skan.

Cognitive engine that leverages computer vision and AI

ushur

Intelligent customer engagement platform through virtually any channel

 **sorcero**

Platform to access, understand, and leverage content and expertise



Reopening Manufacturing Facilities

PLUGANDPLAY

Workplace

With most businesses not being considered essential during the COVID-19 pandemic, workforces had to shift towards work from home and therefore find new ways to communicate and collaborate in a digital working environment. It is possible that companies will continue to offer work from home as an alternative to coming to their facilities, yet it will most likely not fully replace on site work.

Changing Shifts

Shift changes often come with lots of human interaction since for many co-workers it is the only time of the day to exchange thoughts, news, and generally have conversations with each other. Under the new post-COVID circumstances, human interaction will need to be minimized to prevent spreading of the virus. This will require careful scheduling and monitoring of contact between workers, to determine how far the virus could potentially spread if one worker falls ill.

Companies addressing this topic



Developer of a platform to
turn physical operations
into data



Platform for contact
tracing, compliance and
productivity analytics



Empowering innovation
with precise and accurate
location



Communications app for
everything work-related



Technology platform to
digitize human actions
inside the factory



Software to automatically
track safety and productivity
in the workplace



Deep Learning computer
vision on the edge



Reopening Manufacturing Facilities

PLUGANDPLAY

Workplace & Logistics & Retail

With most businesses not being considered essential during the COVID-19 pandemic, workforces had to shift towards work from home and therefore find new ways to communicate and collaborate in a digital working environment. It is possible that companies will continue to offer work from home as an alternative to coming to their facilities, yet it will most likely not fully replace on site work.

Protective Gear & Social Distancing Monitoring

Tools able to analyze real-time video streams from cameras need to be coupled with tools capable of detecting distances: a socially-aware AI can automate the monitoring process and establish procedures to ensure that new workplace protocols are respected at all times. With calibration, detection and measuring steps these technologies could create alerts to remind the workers to maintain safe distances in case of violation. These social distancing tools further emphasize the importance of data privacy, as they have the potential to capture and store personal data such as recognizable facial images.

Companies addressing this topic



*Cloud-based device
detection platform*



*Manufacturer and provider
of face shields*



*Video recognition for
intelligent worksite and
operational insights*



*Cloud-based solutions to
digitize physical spaces*



*Automatic operational team
management platform
through IoT and AI*



*Computer vision AI
platform to make industrial
workspaces safer*



*AI platform to improve
safety, productivity and
process quality*



*Sensing platform for
answers to critical
business questions*



*AI-powered real-time
behavior analytics platform*

Reopening Manufacturing Facilities



Workplace & Logistics & Retail

With most businesses not being considered essential during the COVID-19 pandemic, workforces had to shift towards work from home and therefore find new ways to communicate and collaborate in a digital working environment. It is possible that companies will continue to offer work from home as an alternative to coming to their facilities, yet it will most likely not fully replace on site work.

Cleaning & Disinfecting

Although it may be obvious, cleaning and disinfecting work spaces will be a crucial part of returning to work post-COVID-19. Platforms and automation tools that help manage robot operations remotely will help deploy factories cleaning and disinfecting operations at scale, while cleaning schedules can be optimized when it comes to more traditional janitorial practices.

Robotics

Be it through industrial IoT platforms or purpose-built cleaning robots, sensors, cameras and AI tools can be integrated with cleaning team operations.

Orchestration

Orchestrating these new cleaning schedules will be a challenge, but by using sensor data to monitor supply levels, a large piece of the process can be automated.

Air Quality & Purification

Purifying the air and removing all pathogens in the workplace will ensure workers' peace of mind and comply with any new regulations.

Companies addressing this topic

Robotics



Autonomous mobile robots designed for crowded industrial environments



Platform for cleaning teams to deliver best features and maximum productivity



Provider of a cloud platform to build and manage robot operations remotely

Orchestration



AI platform that automates commercial cleaning



Provider of supply and labour analytics



Platform that enables remote humans to securely guide vehicles

Air Quality & Purification



Smart UV light solutions for disinfection and hygiene management



Real time air quality and health recommendation application



Technology platform which treats airborne pollutants and toxins

Reopening Manufacturing Facilities

PLUGANDPLAY

Logistics & Retail

Transportation, storage and delivery of goods have all been affected by the virus, slowing down manufacturing lines across the globe and revealing vulnerabilities in modern supply chains. Moving forward it is of utmost importance to have visibility into supply chain priorities and automate processes to adjust the planning and inventory systems.

Automation

With new vision systems, robotic material handling and automation for material handling have gained momentum, improving reliability and efficiency of manufacturing processes, as well as reducing human interactions and risks of spreading the virus. Be it for navigating through crowded industrial environments or inventory management, autonomous robots and AI platforms can reduce costs by increasing productivity while ensuring quality, and have the flexibility to perform a variety of tasks.

Companies addressing this topic



Autonomous mobile robots
designed for crowded
industrial environments



Automatic incoming material
inspection for high-volume
manufacturers



Industrial precision and
power technology for
consumer assembled robots



Litmus Automation is an
Edge Computing platform
provider for Industrial IOT



Robotics operator for
every-day dull, dirty and
dangerous tasks



Robotic perception and
manipulation technology
for industrial automation



Software-only autonomous
inventory management platform
developed for warehousing



Reopening Manufacturing Facilities

PLUGANDPLAY

Logistics & Retail

Transportation, storage and delivery of goods have all been affected by the virus, slowing down manufacturing lines across the globe and revealing vulnerabilities in modern supply chains. Moving forward it is of utmost importance to have visibility into supply chain priorities and automate processes to adjust the planning and inventory systems.

Tracking

The disruption of the supply chain and its impact on manufacturing operations emphasizes the importance of asset tracking to limit risk exposure. Real-time monitoring of location and conditions of goods allows manufacturers to gain insight on products through sensors and automated data collection.

Companies addressing this topic



End-to-end solution for
valuable data generation
and delivery



Advanced wireless
technology for tracking and
monitoring assets



Supply chain and
enterprise asset visibility
company



Tracking platform of the
real time location of assets
and goods



Wireless temperature and
humidity sensors



RFID & computer vision
platform that automates
inventory management



Provider of full predictability
and visibility along the entire
logistics process



Security standard of
fingerprinting physical
objects



Developer of technologies
that streamline critical
supply chains



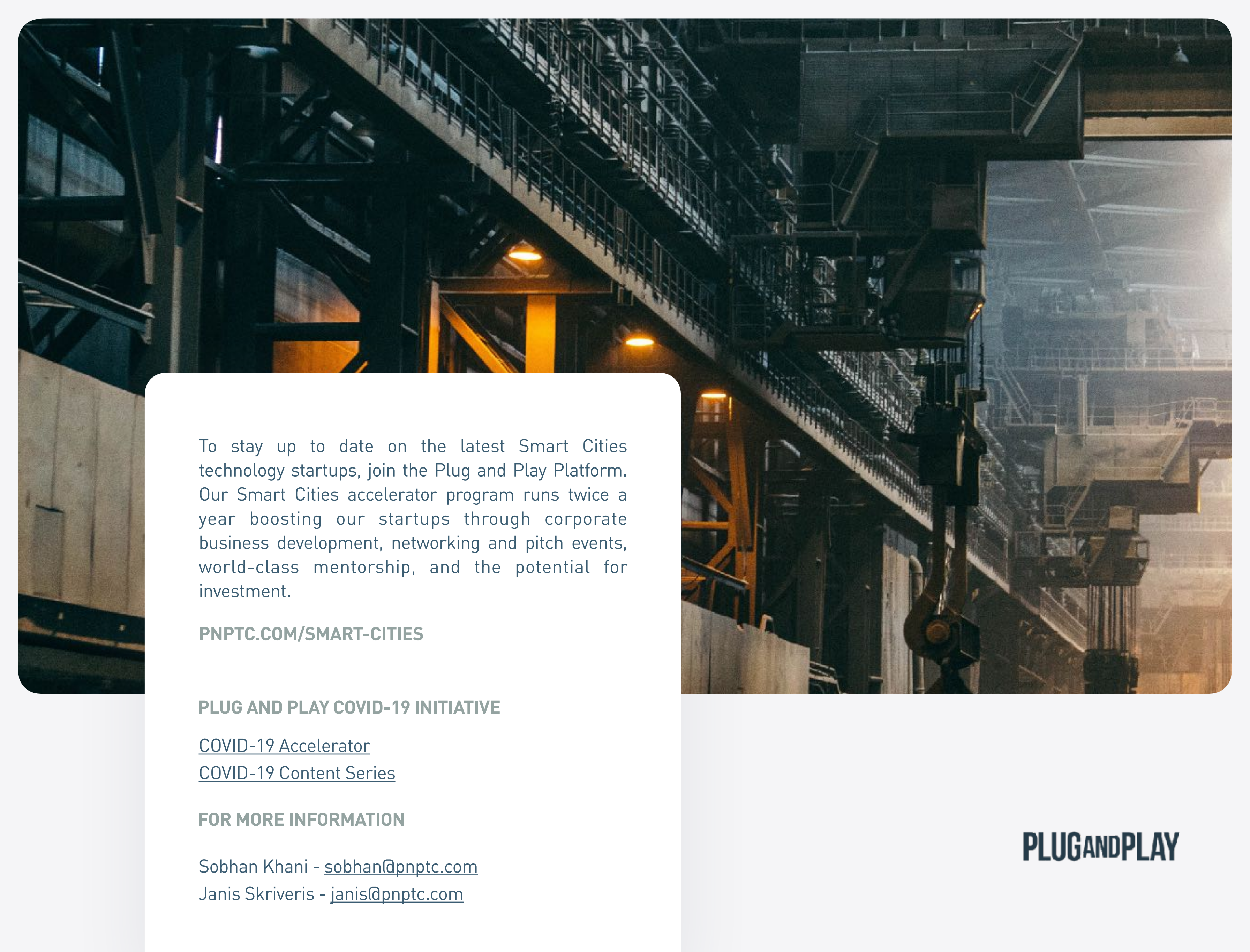
Supply chain tracking
solution with an all-in-one
visualized BI platform



Bringing light to the dark
spots of the supply chain



Optimizing all aspects of
supply chain using weather
data and AI

The background of the slide is a photograph of an industrial facility, possibly a refinery or chemical plant. It features multiple levels of metal walkways with railings, complex piping, and structural beams. The lighting is dim, with some warm, yellowish light sources visible, creating a moody and industrial atmosphere. A large white rounded rectangle is overlaid on the left side of the image, containing text.

To stay up to date on the latest Smart Cities technology startups, join the Plug and Play Platform. Our Smart Cities accelerator program runs twice a year boosting our startups through corporate business development, networking and pitch events, world-class mentorship, and the potential for investment.

[PNPTC.COM/SMART-CITIES](https://pnptc.com/smart-cities)

PLUG AND PLAY COVID-19 INITIATIVE

[COVID-19 Accelerator](#)

[COVID-19 Content Series](#)

FOR MORE INFORMATION

Sobhan Khani - sobhan@pnptc.com

Janis Skriveris - janis@pnptc.com

PLUGANDPLAY