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# Getting started

## Becoming a quantified organization

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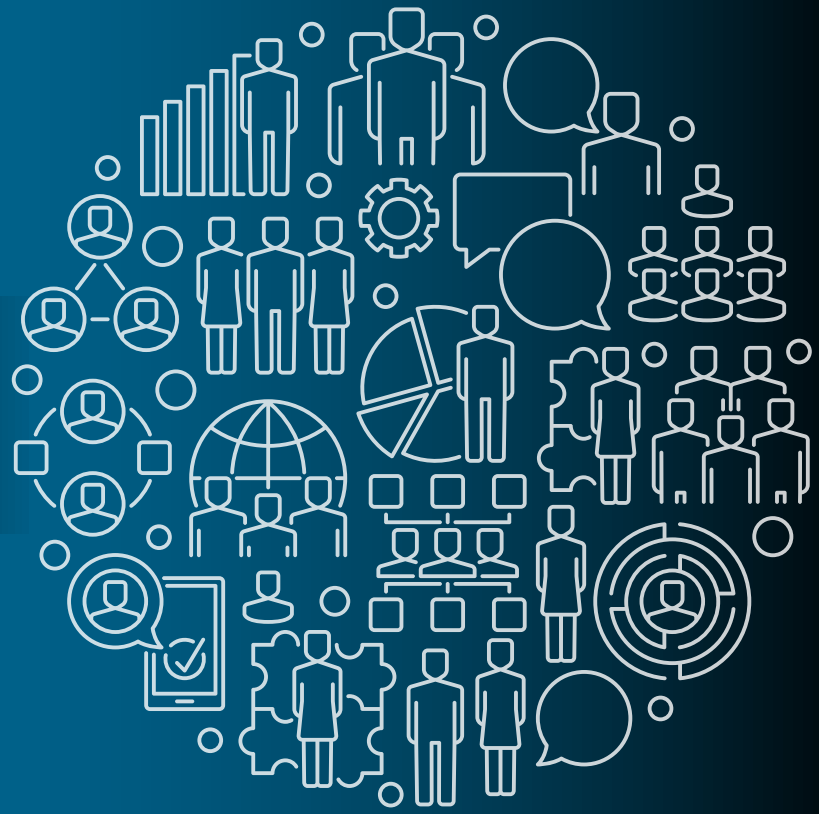
# Operations

## Optimizing processes and improving workplace safety



# Operations

## Optimizing processes and improving workplace safety

Advances in activity sensors and location intelligence, coupled with new tools to analyze data in real-time, are giving organizations improved insight into how workers interact with physical workspaces. Already, organizations are using this kind of data to inform operational performance in office settings, on factory floors, and more.

For instance, analysis of active and passive data generated by workers and machines can reveal how workers are collaborating within the organization and how they are using physical equipment. Data collected through cameras and wearables can highlight areas of improvement to increase the safety of the workers on the production floor by measuring movement and designing ergonomic workplaces. Indoor location services can help workers navigate complex production floors in a safe and efficient way.

As advances in sensing and location technologies continue to emerge, organizations will be able to gain increasingly detailed information about how to continually improve operations at a micro and macro level. As the cases here highlight, organizations will be able to apply these tools to a wide variety of physical settings and operational needs.

# Identifying safety infractions

## Representative data sources

- Worker movements

## Representative technology areas

- AI (computer vision and existing CCTV infrastructure)

## Shared value creation

### Individual level

- Improved workplace safety
- Targeted trainings

### Enterprise level

- Improved operational visibility
- Development of training programs

## Use case maturity

| Exploratory | Emerging | **Maturing** |
|---|---|---|

## Key challenge[1]

A retailer's distribution center was witnessing an increase in customer orders. The distribution center increased their headcount to manage the growing demand, but they wanted to ensure the safety of the workers and minimize any safety incidents.

## Solution and approach

The company integrated AI with their CCTV systems at the distribution center, helping their health and safety teams to identify unsafe events. The solution was able to autonomously capture unsafe events while allowing the team to see exactly what occurred.

Events were flagged to safety officers and by analyzing the patterns, the team was able to educate their workers about any behaviors that could be potentially dangerous.

It also allowed the safety team to replay the unsafe events and behaviors to the workers and launch specific trainings to address core behaviors.

## Impact

After implementing this system, the company saw a reduction of 80% of safety incidents in the warehouse in the first three months. Additionally, near miss reporting increased by 10% due to increased operational visibility.

The company was able to continuously detect safety infractions and ensure that the training and onboarding of additional workers is as expected to train them for the job.

# Improving visibility in supply chain operations

## Representative data sources

• Video footage of drivers' routes

## Representative technology areas

• AI (computer vision and cameras)

## Shared value creation

### Individual level

• Increased workplace safety

### Enterprise level

• Risk mitigation
• Asset safety

### Societal level

• Improved safety on the road

## Use case maturity

| Exploratory | **Emerging** | Maturing |
|---|---|---|

## Key challenge[2]

An e-commerce company wanted to increase the safety of their delivery service drivers, who are responsible for the company's last mile deliveries.

## Solution and approach

The company equipped its delivery vans with AI enabled cameras in the vehicles of their contracted delivery drivers to increase the safety of their operations. The cameras recorded the drivers' routes and with the help of AI, flagged any safety infractions such as speeding, distracted driving, and failure to stop at stop signs.

The system, which consists of four lenses, captures the road, the driver, and both sides of the vehicle and consists of an AI program capable of detecting 16 different safety issues. Certain violations can also trigger an audio alert for the driver highlighting instructions such as "maintain safe distance" or "please slow down."

The cameras record 100% of the time but upload the footage to a secure portal only if the worker engages in any unsafe driver behavior. The system requires an opt-in consent from the driver and records only video; it does not record audio. Drivers can switch off the cameras during break times.

## Impact

As a result of the ongoing effort, accidents declined by 48% and the number of drivers not using seatbelts was reduced by 60%. Stop sign violations were also reduced by 20%, and distracted driving saw a decline of 45%.

# Using field data and predictive analytics to improve business operations

## Representative data sources

- Drivers' navigation data

## Representative technology areas

- Process automation

## Shared value creation

### Individual level

- Work effectiveness

### Enterprise level

- Optimized routes
- Increased service coverage
- Time savings

## Use case maturity

| Exploratory | Emerging | **Maturing** |
|---|---|---|



## Key challenge[3]

A waste management company's truck drivers followed routes assigned by route analysts and dispatchers based on a variety of factors. However, drivers often deviated from the identified route based on personal preferences or their familiarity with the area.

## Solution and approach

The company developed a route-optimization tool based on historical data about routes and time taken and current road and traffic conditions.

The tool helped the company reduce the miles driven and the required time to complete each route. Drivers were also provided a monetary incentive to follow their assigned route.

## Impact

Data indicated that route optimization saved an average of 30 minutes per route compared to previously used manual approaches. Time savings enabled drivers to service six dumpsters per shift compared to five before the pilot while improving the company's dispatch efficiency.

# Using wearables to measure physical activity and safety in the workplace

## Representative data sources

- Workers' arm movements

## Representative technology areas

- Activity sensors and connected devices

## Shared value creation

### Individual level

- Increased workplace safety
- Personalized trainings

### Enterprise level

- Increased operational visibility
- Development of safety training programs

## Use case maturity

| Exploratory | **Emerging** | Maturing |
|---|---|---|

## Key challenge[4]

The meat industry typically has one of the highest injury rates in the US. The repetitive, fast, and taxing nature of cutting and packing meat increases the risk of injuries among workers. A meat processing company was looking for ways to reduce workplace injuries resulting from repetitive heavy movements.

## Solution and approach

The company launched smartwatch-like wearables to detect workers' movements to identify the need for any ergonomic changes. Sensors on the wearables collected data on the force, rotation, speed, and directional movement of a worker's arm.

An AI algorithm analyzed the data to determine if the movement was safe. Sensors also detected when a worker was dehydrated and needed a break. What qualified as a safe behavior depended on the job description and was customizable in the algorithm. Individual as well as aggregated data was visualized on a dashboard displaying safety metrics which was analyzed by supervisors.

The solution was implemented after seeking permission from and building trust with the workers' unions.

## Impact

Before the solution, the company did not have a scientific and systematic way to identify unsafe behaviors. By integrating this solution as a part of their business operations, the company was able to drive better safety in the workplace, implement focused trainings for workers, and build trust with the workers' unions.

# Endnotes


1 Charlotte Healy, **UK: AI's Impact on Workplace Safety**, SHRM, June 2 2023.

2 Annie Palmer, **Amazon is using AI-equipped cameras in delivery vans and some drivers are concerned about privacy**, CNBC, February 2023 ; Rosie Perper, **Amazon is Asking Delivery Drivers to Consent to Having Their Biometric Data Collected**, Hype Beast, March 24 2021.

3 Deloitte client solution

4 Tatyana Woodall, **Big Meat Companies Want to Use Smartwatches to Track Workers' Every Move**, Vice, November 2 2022.

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