

SUMMARY

Industry
Mining

Company
Cemin

Location
Valparaiso, Chile

Key Outcomes

45
MINUTE
DEPLOYMENT

for social distancing
and mask detection
monitoring

\$4M+
LOSS PREVENTION
in one month

346k
EVENTS PER MONTH
monitored automatically

THE CHALLENGE

Fast, economical mask and social distancing detection with contact tracing

Cemin is a copper and gold mining company with two operations in the Valparaíso region of Chile. More than 300 Cemin employees live and work in close proximity at each location, so Covid-19 posed potentially catastrophic risks. An outbreak among workers could spread fast with major impact on employee health, mining operations, jobs, and company revenue.

Protecting employees is an important part of the culture at Cemin. In the early days of the pandemic, the company acted quickly to develop a comprehensive system to safeguard employees, including mask wearing and social distancing requirements, health screening questionnaires, and education and training programs. While the company had strong protocols in place, there was no efficient way to monitor compliance, identify problem areas, and track anomalies. It was essential for safety that people followed the guidelines, especially in public spaces such as cafeterias, break rooms, transportation areas, and during work within each of the mines.

THE SOLUTION

45-minute deployment

Lima-based Quipu Consulting, a technical solutions provider specializing in image processing, artificial intelligence and other next-generation technologies, led the project. Quipu recognized early on how Camio real-time video search and alerting used for tailgating and other security functions could easily help with Covid-19 mitigation regulations and compliance. Because Camio is a Software-as-a-Service platform that uses existing cameras, it took less than 45 minutes to "light up" cameras at Cemin's remote mining locations without being on premise. Cemin did not need to purchase any additional hardware and wait for delivery and installation. The Camio Box VM runs on their existing VMware ESXi servers.

Real-time video search

Camio's real time video search immediately detects areas where Covid-19 mitigation protocols are not being met. Entering simple natural language queries like "too close without mask" into the Camio search box reveals potential problem areas.

AI-driven insights

Camio uses AI and machine learning to turn regular 2D cameras into 3D sensors capable of detecting the distance between people. It anonymously tracks people as they move on a virtual 3D floor-plane grid — analyzing movement without storing any personally identifiable information (PII). Measuring distance is safer than taking temperatures since people without fevers can still be contagious. And even when people are 6-feet apart, Camio automatically detects whether they are wearing masks.



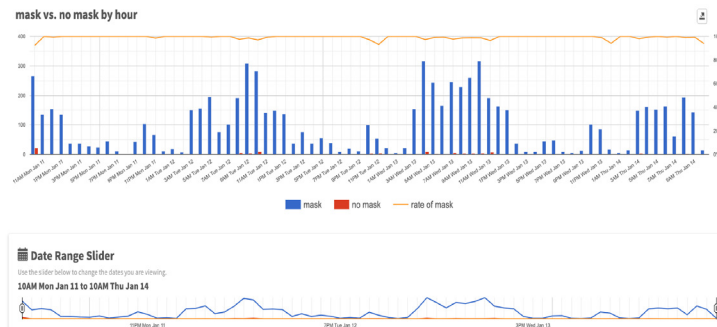
"We deployed Camio in remote mining locations in 45 minutes to protect people from COVID-19 transmission risks. The automated vigilance helped the team operate safely and confidently with no business interruption."

-Jose Borroni
Chief Information
Technology Officer, Cemin

"Our board of directors asked for reports on social distancing and mask compliance rates the week before Chilean Independence Day. Camio made it easy. The automated real-time data and reports even link to the corresponding video events for quick review."

Interactive dashboards

Real-time dashboards track the rates at which people wear masks and maintain social distance to measure policy effectiveness. Camio "Event Streaming" pushes only important events directly to the Cemin team, who view alerts on their desktops or phones. "Event stacking" condenses and summarizes contiguous events, so time isn't wasted reviewing unimportant or acknowledged events.



INTERACTIVE DASHBOARDS REVEAL PROBLEM AREAS AND UNCOVER TRENDS.

Modern IT security

Security best practices such as TLS encryption with Perfect Forward Secrecy and 256-bit AES encrypted storage meet the most stringent IT requirements. Remote access is secure with no open in-bound network ports, and Camio operates securely by isolating the camera network from the corporate network.

Usage-based pricing

Camio's usage-based pricing makes actively monitored safety affordable. The flexible usage model also enables resources to be shifted precisely where and when needed. Query filters like "human or vehicle" optimize ROI by monitoring only the events related to the risks being mitigated. Camio scales to any size, so there is no limit to the number of cameras. Storage is equally scalable and can be retained on-premise or in the cloud for as long as required.

THE RESULTS

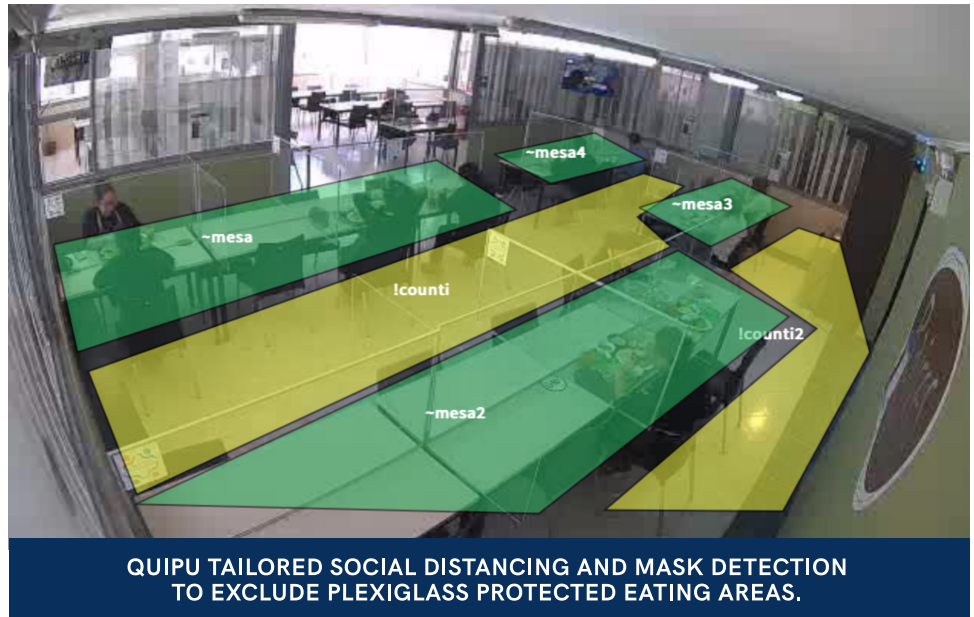
Fast, easy deployment

At the outset of the Covid outbreak, Cemin's board of directors acted quickly, giving the onsite management team only one week to implement a system to monitor and report Covid-19 mitigation strategies. Once Camio was selected to provide AI-driven intelligence, Quipu identified cameras in the most critical areas. After several days of analysis and planning, Quipu deployed Camio without ever being on site. It took less than 45 minutes to activate all cameras and be completely operational.

Agile system fine tuning

Quipu provided critical guidance to improve the accuracy of tracking and classification. Initially, there were false positive "no mask" detections in dining areas because people took off their masks to eat. Quipu added exclusion zones covering the transparent plexiglass barriers in those seated dining areas to reduce those false positives. Camio also deployed AI model updates weekly based on examples donated by Quipu to improve accuracy in each scene.

"It's so easy to forget that something previously so harmless — like sharing a bag of olives — creates risk. Camio's automated vigilance made it easier for everyone to view mask and social distancing compliance as a shared responsibility."



QUIPU TAILORED SOCIAL DISTANCING AND MASK DETECTION TO EXCLUDE PLEXIGLASS PROTECTED EATING AREAS.

"The Camio system instills confidence in our team that we are keeping people safe while continuing operations."

Accurate audits and reporting

Real-time alerts accessible from any browser indicate issues as they happen. Automatic dashboards provide comprehensive insight and enable communication between team members for immediate response. The Cemin team uses dashboard metrics to manage compliance and to report weekly to its corporate board. "Our board of directors asked for reports on social distancing and mask compliance rates the week before Chilean Independence Day," said Jose Borroni, Cemin's chief information technology officer. "Camio made it easy. The automated real-time data and reports even link to the corresponding video events for quick review."

Deterrence via transparency, accountability and fewer violations

More than 364K events per week are automatically monitored with real-time dashboards for immediate detection and visibility into problem areas. The team also uses video clips as an educational tool. "Sharing video with the team was a great way to remind people," said Marcos Joo, corporate project manager at Cemin. "It's so easy to forget that something previously so harmless — like sharing a bag of olives — creates risk. Camio's automated vigilance made it easier for everyone to view mask and social distancing compliance as a shared responsibility."

\$4M in loss prevention

Halting operations for even one month across all mines would have cost the company more than \$4 million. By acting quickly with technology that puts cameras to work to understand the problems that warrant human attention, Cemin was able to sustain operations with no business interruption and protect employee health and well-being. The system also gives peace of mind. As Borroni adds, "The Camio system instills confidence in our team that we are keeping people safe while continuing operations."

"Deploying Camio for Covid-19 mitigation has shown that the same technology can help us identify ways to improve operations and productivity as well as protect employees."



NEXT STEPS

Expansion to plants and mines

The system worked so well that Cemin, with Quipu's support, is expanding its use for applications in plants and mines. For example, Cemin plans to train Camio to detect mining equipment and PPE like headlamps, hardhats and gloves that are required safety equipment.

Cemin is also exploring Camio to evaluate interactions between people and machinery. "Deploying Camio for Covid-19 mitigation has shown that the same technology can help us identify ways to improve operations and productivity as well as protect employees." The software-based platform makes it easy to respond to multiple challenges addressed by AI visual identification and analysis — quickly and economically.