# Use Case

**Supply Chain**
**AI and Edge Computing**

**intel.**

# Using Video Analytics to Improve Digital Signage Engagement

## With today's supply chain challenges, businesses are exploring new ways to use intelligent data from edge to cloud to motivate and inspire manufacturing workers.



The digital signage market has experienced steady growth over the past three years as nearly every industry explores new ways to engage, motivate, and inspire customers and workers. Inside manufacturing plants, leaders are under pressure to meet the demands of the evolving global supply chain and are looking for ways to boost worker satisfaction and escalate productivity in the factory. A digital signage solution may enhance the timeliness and effectiveness of worker communications and help improve operational excellence goals.

### Manufacturing Needs

Today's tech-savvy workers are visually oriented learners who are accustomed to moving-screen messages, which is why communicators who support a constantly changing manufacturing environment are exploring the use of digital displays to deliver fast and effective communications to all workers regardless of role or shift. For example, digital displays may be used to facilitate timely communications about productivity metrics, safety updates, bonus incentive goals, motivational topics, meeting dates and times, or onsite news.

At the digital sign, it is possible to gather intelligent data as messages attract and engage workers. The data results in digital signage analytics that may be used to improve worker engagement and optimize content delivery. In addition, data collected can be tailored to a specific type of worker, creating an opportunity to improve worker engagement with the message being communicated.

An increased investment in digital signs creates a need to understand how effective the displays are communicating information to workers. Communicators can leverage audience analytics to optimize messaging consumption and solve specific challenges, including:

- Identify the level of engagement with a message.
- Pinpoint the forms (appearance, images, colors) that attract attention.
- Target content based on worker characteristics to determine the value of the time workers are in front of a digital sign.

These challenges can be overcome by employing creative artificial intelligence (AI) on real-time video as workers pass by a digital display.

## Intelligent Video Solution

Enabled with AI, a video analytics solution can employ real-time data that allows for identification of workers looking at a sign versus passing by it. When pairing the attention metrics of the audience with the content being displayed on the screen, an altered presentation layer during A/B testing may be used to identify how worker attention patterns change. In addition, an AI capability that is designed to understand the duration a person looks at a sign versus walking past it could also be trained to identify a certain type of worker, such as a person with a hard hat, a specific badge type, or other defining feature.

A video analytics solution requires a limited hardware footprint adjacent to the digital sign that connects to one centralized AI processing system, and a network to stream data to the cloud. In the case of multiple cameras and signs, they can be installed to report to the same real-time processing server. The diagram below provides a simple reference for the topology:



| Audience | Digital screen with camera | Real-time AI server | Cloud-based analytics |
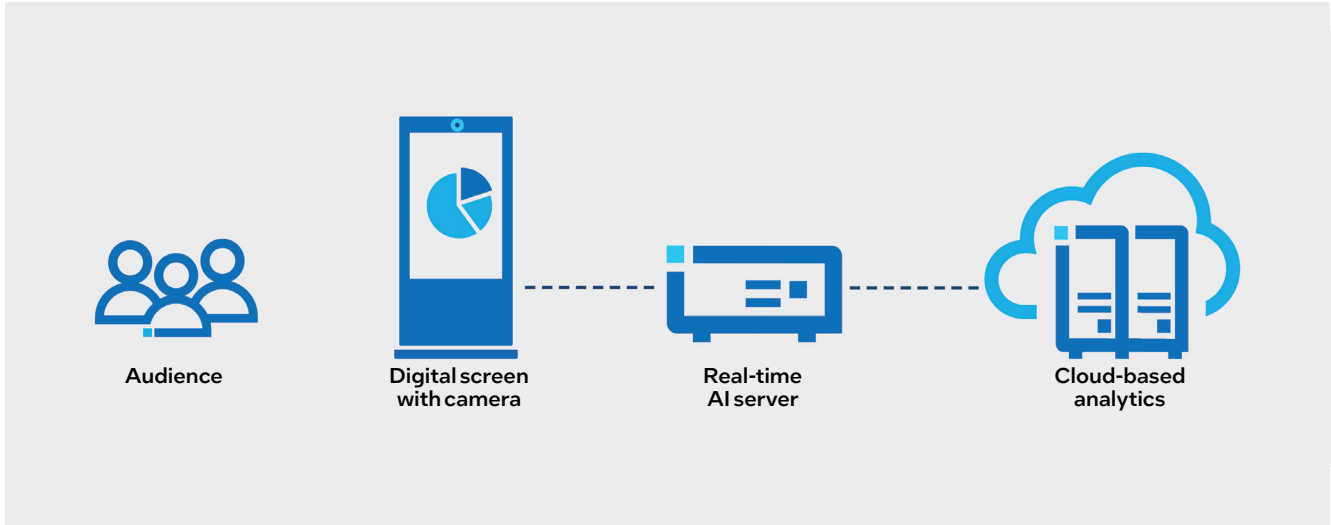
At the screen, a camera collects metrics on engagement and exposure from the audience near the digital sign then sends only telemetry data to a cloud-based data center. At no time are images of workers stored on the device or in the cloud to ensure privacy. The telemetry data sent to the cloud for analysis may include audience count, behavior (viewing, passing by), and demographics (approximate age, gender).

Once the data is collected it is aggregated and statistics are derived to improve or customize the content being displayed on the screen. The statistics can be used to enable an iterative process, such as A/B testing, and aid communicators in their efforts to optimize messages and formats based on audience attention throughout the day. With machine learning, it is possible to train the platform to identify types of worker roles as well as gender and age group variables, allowing for more targeted content.

To understand return on investment, begin by outlining the cost components of the digital signage infrastructure and content delivery model. The table below provides a typical estimation of the cost of an intelligent video analytics solution, based on deployments in the United States. The initial investment of a display screen, installation and maintenance may be significant; however, over time, audience analytics will help communicators optimize message delivery and consumption by analyzing and iterating results in real-time, thereby improving overall return on investment.

| Cost Component | Use Case References and Assumptions |
|---|---|
| Digital Display Screen | Full cost of a LED screen |
| Installation | Installation of a LED screen is **approximately 5 times** the cost of the screen and includes electrical power and network connectivity |
| Maintenance | Annual maintenance is **approximately 30%** of the cost of the LED screen |
| Media Content | Cost of curating content on a regular basis is **approximately 9 times** the cost of the LED screen and accrues annually |

## Intel® IoT Market Ready Solutions

In the workplace, finding innovative ways to captivate and inspire workers has become a new imperative. Intel and its ecosystem of partners offer Intel® IoT Market Ready Solutions (Intel® IMRS) that harness the power of video analytics while Intel® technologies enable and accelerate AI, including software and hardware. Intel® IoT Market Ready Solutions (Intel® IMRS) provide access to innovative companies that offer scalable, end-to-end solutions that yield greater business insights, efficiency, and productivity.

## Optimizing AI with Intel® Technology

At Intel, we are democratizing AI so more people and organizations can benefit from its transformative powers. Our processors, memory and storage innovations, and high-speed data fabrics deliver the performance needed to gain new intelligence in minutes or seconds, versus weeks or months. In addition, faster decisions can deliver more value and reduce costs, and our optimized software libraries and tools make it easier for developers to create new applications and solutions. The ingredients below optimize machine learning models:

- Intel® Core™ Processors
- Intel® Xeon® Scalable Processors
- Intel® Distribution of OpenVINO™ Toolkit
- Intel® Movidius™ Vision Processing Units (VPUs)

## Where to Get More Information

To learn more about edge computing solutions, please contact us at SupplyChainIoT@intel.com or visit https://www.intel.com/content/www/us/en/edge-computing/overview.html

Find out more about NEXCOM* digital signage end-to-end solutions.

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