AVEVA

Deploying next-gen HMI solutions:

A blueprint for increased operational efficiency

aveva.com

Table of contents

Overview

With the growing importance of digital transformation, human-machine interface systems (HMIs) have evolved from mere control panels to vast operational hubs.

Next-gen HMIs bring together data, personalization, and advanced insights to enrich the user experience. To successfully achieve your organizational goals, it's important to think about HMIs holistically within the operations control ecosystem.

To drive digital transformation in the manufacturing sector, leading industrial software vendors now offer scalable operations control solutions that are secure and based on industry standards.

This ebook details the latest advancements in HMI technologies. It can guide you as you work to evaluate your options and deploy strategies to improve your operations control.

Focus on your end users

People are at the heart of your operations. To achieve real transformation, you should empower operators with better situational awareness, so that your teams have the best resources and insight at all levels.

Situational awareness gives operators actionable information, allowing them to quickly identify and resolve abnormal incidents before any process disruption–an added measure of critical decision support that can help you optimize your operations.

Drive operational efficiency by placing the best operator in the system using a proven HMI interface design. Capture experienced worker knowledge and infuse situational awareness and context-driven actions throughout your operations.

Intuitive interfaces

Modern HMIs deliver advancements in technology such as touch screens, gesture controls, and voice recognition, to provide a more intuitive and user-friendly interface. This reduces the learning curve and enables operators to quickly navigate complex systems, resulting in improved productivity.

Seamless integration

Legacy HMI systems are often incompatible with newer software, which limits their functionality and hinders system integration. Upgrading to modern HMIs ensures seamless connectivity, data exchange, and interoperability with other systems, fostering better decision-making and overall system performance.

Visualization

Modern HMIs offer enhanced visualization capabilities, allowing operators to interpret data and trends more effectively, leading to proactive decision-making and improved safety.

Security

As technology evolves and the connectedness of the plant and workforce grows, security threats also evolve. Modern HMIs come equipped with robust security features, safeguarding critical systems from unauthorized access, data breaches, and cyberattacks. Upgrading older HMIs is essential to harnessing the benefits of advanced technology, streamlining operations, and ensuring a secure and intuitive user experience.

Next-gen HMIs unlock new user experiences

What makes a good HMI solution? Just a few years ago, the criteria for answering that question would have been the number of licenses, tags, and screens that the solution provider offered. Not anymore. The digital solutions that support HMI systems are advancing quickly. New features like adaptive interfaces and context-aware automation have arrived, and they're here to stay.

Digital transformation involves adopting entirely new operating processes that empower every individual to drive the organization forward and increase profitability and efficiency.

To transform in ways that drive operational efficiency, operations teams must be armed with greater levels of insight and intelligence to monitor and control operations. They should be empowered to take steps to improve the availability and reliability of assets. They should also be able to make data-driven decisions based on an accurate, holistic view of operational execution and performance.

These transformative tools help fulfill organizational goals, such as serving the end customer, improving the supply chain experience, finding efficiency and value leaks, and discovering cost reduction opportunities.

> "The challenge is how to structure and contextualize information to get only what is needed to the right person at the right time, regardless of where they are located. One way to accomplish this is to employ advanced data visualization technologies that span from HMI/SCADA solutions for the plant or field assets to enterprise solutions for monitoring and managing operations globally."[1]
>
> **Craig Resnick**
> Vice President, Consulting,
> ARC Advisory Group

5 key HMI/SCADA market trends

According to ARC research, industry is embracing five key trends in the HMI space[2]:

Increases in the flexibility of manufacturing and technologies will result in software needing to provide visualization for connected and collaborating devices, thus enabling the new connected workforce.

Process analytics and the cloud will make a difference moving forward and enable a new category of HMI software that will be more intelligent and meet the needs of the larger industrial enterprise.

Users are collecting more information from manufacturing and analyzing big data to optimize processes.

Many more workers are using their own commercial smart devices in plants and factories, requiring HMI software to be capable of deployment to any device using HTML5 technology.

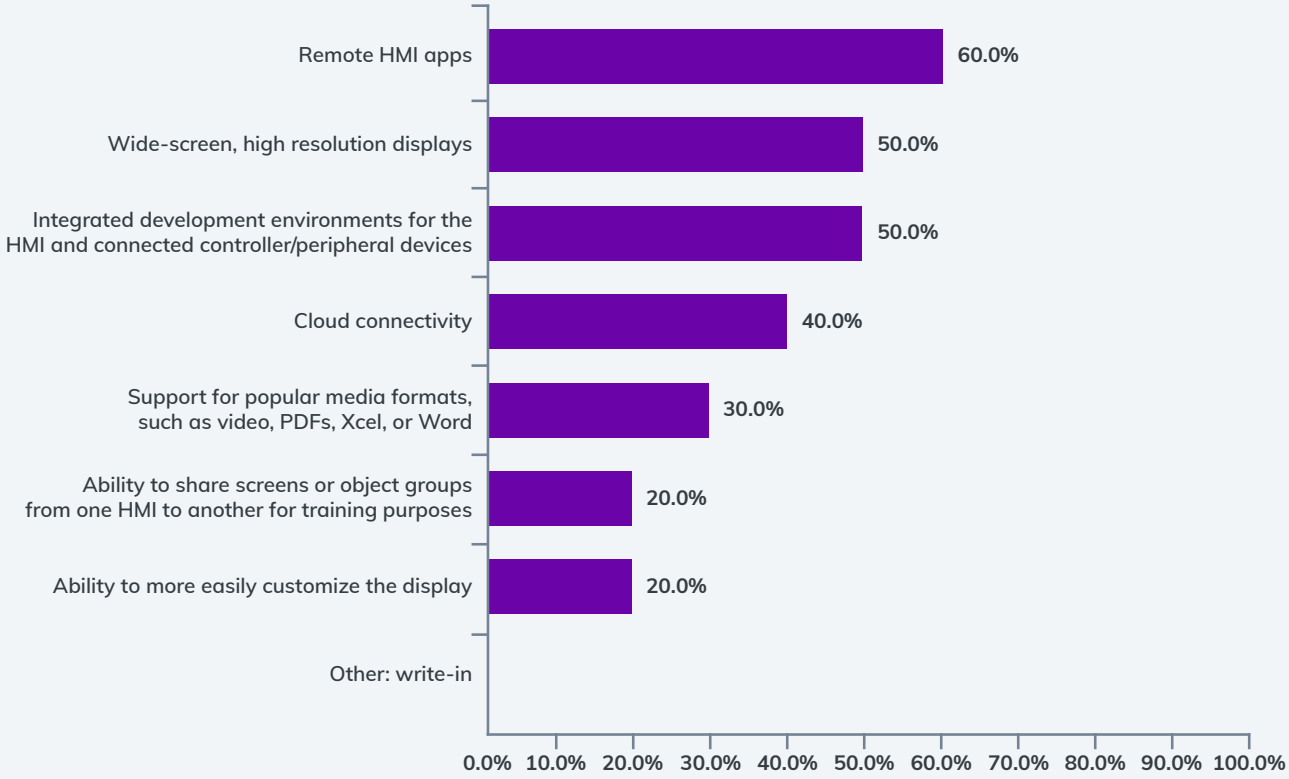
Future HMI software needs to have connectivity and access to cloud stored data, resulting in critically effective cybersecurity architecture.

Adopting best-in-class HMI innovations

HMI survey of system integrators by Automation World[3]

SYSTEM INTEGRATORS

What advances in HMI or SCADA visualization technology in the past decade have you seen that are the most worthy of note?



End user and integrator responses to the Automation World HMI/SCADA survey 2023.

Building uniformity by untangling the complexities of manufacturing

Next-gen HMI systems can help you maximize efficiency, minimize rework, and get the most out of your existing operations control infrastructure. But first, you'll need to untangle the complexities of your operations control. The more standardized and integrated your operations control framework becomes, the easier it is to build uniformity and address value leaks.

Chief among the many obstacles to standardization are minimally compatible platforms (PLC, PAC, DCS, etc.), programming types, and data collection formats. This makes it difficult to build effective standardization, correlation, and root cause analysis across the enterprise. Managers must do their best to standardize systems, so operators can make relevant comparisons.

The following steps can help you standardize your operations:

Eliminate system incompatibilities to enforce a higher degree of consistency and adhere to well-defined standards.

Build once, deploy anywhere with object-oriented engineering and design to enable repeatability and re-usability across assets and sites.

Present data in context, provide support alarm management, and deliver proactive analysis.

Turning technological improvements into business gains

Advanced technology can unlock trapped value in organizations, but it requires maximum utilization of digital tools. It can be difficult to correlate operational and financial information, which leads to decision-making bottlenecks.

To solve this, you should:

Provide functional teams with clear operational context through a common digital thread, enabling the identification of value leaks and new opportunities.

Leverage a central data repository and invest in analytics to lower costs and identify waste.

Implement predictive maintenance strategies to improve asset availability.

Develop standard metrics for business management, focusing on resource management, process operations, and overall equipment effectiveness (OEE).

Preserving gains while seeking the next opportunity for improvement

You can optimize workflow by automating routine decision-making for operational and business procedures and aligning real-time information with employee activities, thereby freeing personnel to focus on higher-level tasks.

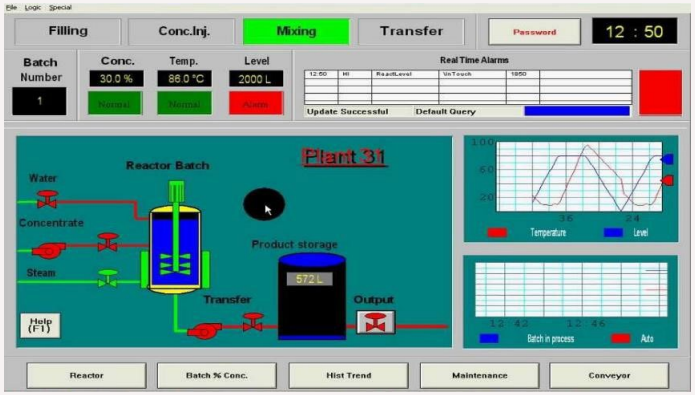
This improves operations and OEE, allowing for comprehensive business integration. You can also enhance real-time resource allocation, planning, and manufacturing agility. Ultimately, this lets you scale your data-driven operations regionally, nationally, and globally, providing further opportunities for optimization and growth.

Secure, unlimited access for peace of mind

Recent research suggests that the industrial internet of things (IIoT) will live up to its promise of increased productivity, predictive maintenance, and reduced asset downtime. It's important to keep this in mind as you look for an HMI solution, as the software you adopt will need to integrate seamlessly with other applications in your technology stack. Or, as ARC Research explains, **"**process industry applications can benefit from the remote management of assets to monitor, control, and/or optimize different components of production equipment visualized by HMI software in the Industrial IoT environment.**"** [4]

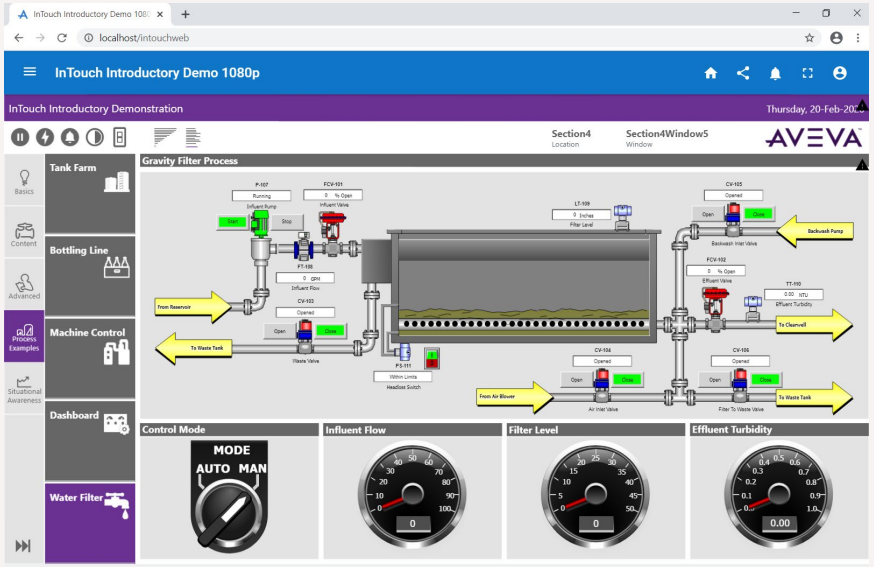
Of equal importance is that your operations control solutions provide top-notch cybersecurity, as cyber threats become commonplace. Adopting a solution that's purely cloud-based invites potential breaches. An on-premises solution that offers users data access through the cloud, however, avoids many of these vulnerabilities, giving your operations control the best of both worlds.

InTouch HMI - 1987



World's 1st MS Windows HMI | Open / vendor agnostic | Resolution independence | Rich animation / scripting

InTouch Web Client - 2022



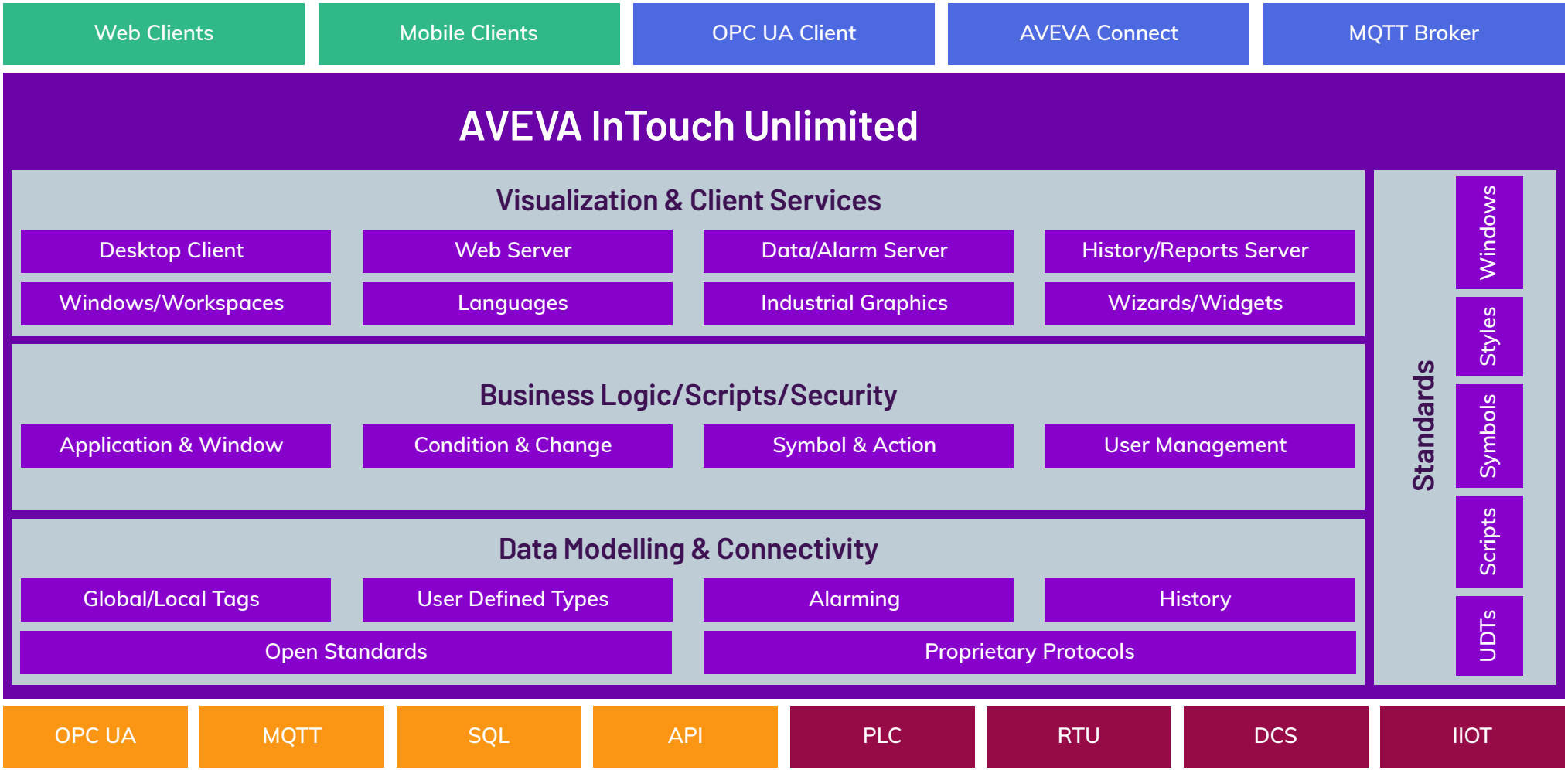
Responsive web browser | Unlimited tags and client | Cloud development | Mobile touch devices

Scalability for sustained growth

You need an HMI system that can keep pace with your business's growth. Unlimited scalability enables flexible expansion and adaptation, accommodating increasing data volumes, sensors, and network connections without overhauling infrastructure.

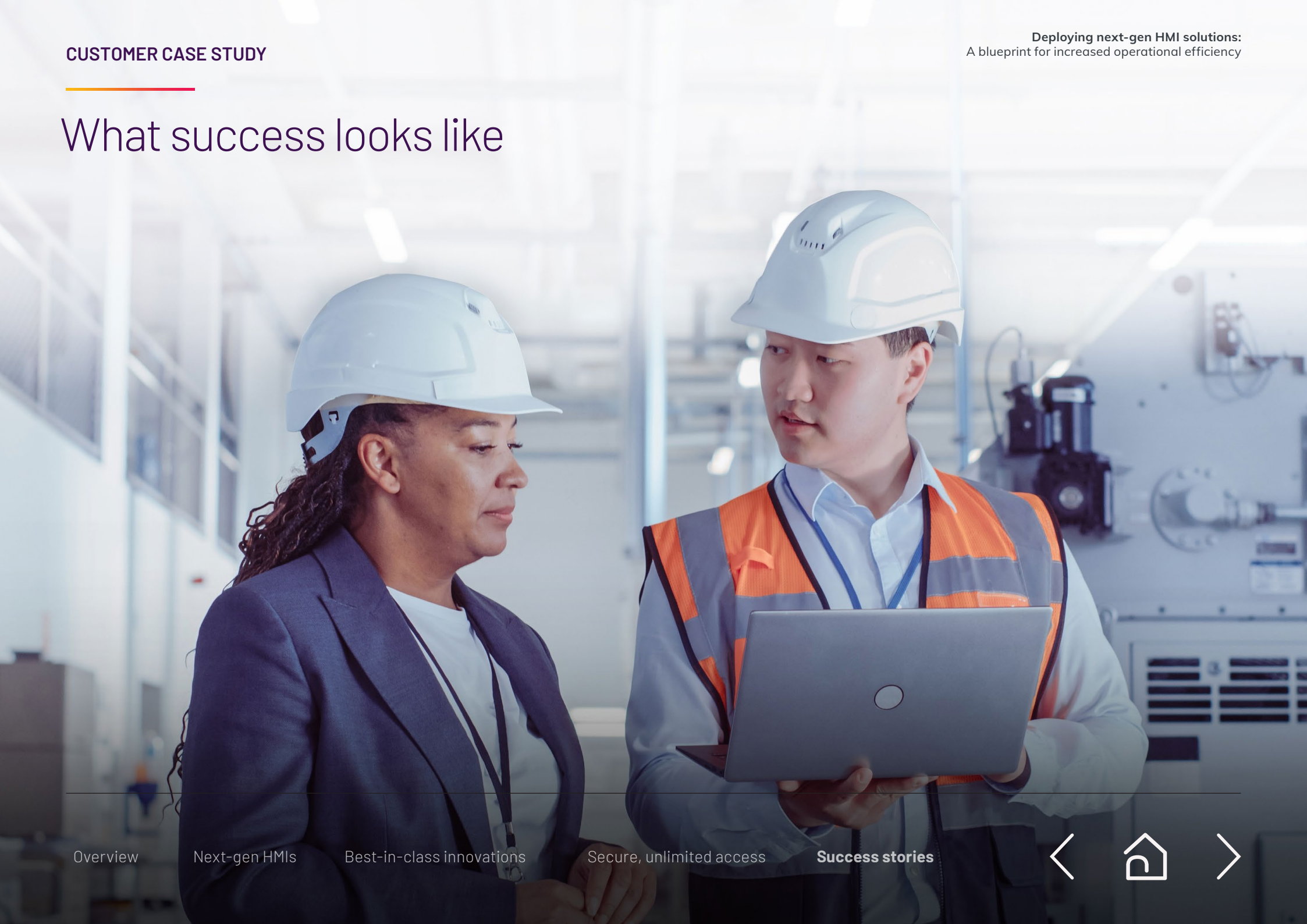
It optimizes system performance and response times, even during peak workloads, by dynamically allocating cloud or distributed resources. Future-proof your operations control with unlimited scalability.

> "Scalability is a lifeblood of future HMI/SCADA systems, empowering industries to grow, adapt, and thrive in the face of evolving operational demands. It ensures that technology can expand seamlessly alongside the organization, fostering a resilient foundation for innovation and sustained success."
>
> **John Krejewski**
> Vice President Product Management, Operations Control, AVEVA



Learn how to Empower connected workers beyond HMI,
with AVEVA InTouch Unlimited, visit: aveva.com/en/products/intouch-hmi/

What success looks like



CUSTOMER CASE STUDY

La Tortilla Factory

La Tortilla Factory is renowned for its tasty wraps. Wrapping its data and reporting into a single view proved far more difficult, with limited visibility into operational data and a reliance on paper-based reporting, which resulted in excess giveaways and waste.

When it adopted the right HMI solution, La Tortilla Factory's line efficiency improved within six months, accounting for a **5%** increase in production and a **2%** decrease in waste.

As a company committed to reducing waste and keeping costs down, La Tortilla Factory sharpened its competitive edge by adopting an HMI solution that afforded it a single view of real-time data.

Read the success story

<6 months
improved line efficiency

5% increase
in production

2% decrease
in waste

CUSTOMER CASE STUDY

Carson City, Nevada

As part of its future growth plans, Carson City wanted to leverage mobile devices to better manage its resources, which include **22 million** gallons of water per day and nearly **750,000 kWh** of solar energy each year. By **"mobilizing"** its administration of these resources, the city hoped to reduce its overhead costs and make these resources more affordable to citizens.

When it adopted an HMI solution that supported mobile devices and remote management capabilities, Carson City hit the jackpot. Less time driving to and from work resulted in a **15% time savings** for administrators, allowing them to shift to a 10-hour, four-day work week. Carson City's new HMI platform gave the city a truly resourceful way to manage its power and water more efficiently.

Read the success story

15%
time savings

Sources:

1. ARC Advisory Group. ARC View. August 18, 2022
2. ARC Advisory Group. “Human Machine Interface Software Global Market Research Study 2020 - 2025” 2021, p. 28
3. Automation World. 2023
4. ARC Advisory Group. “Human Machine Interface Software Global Market Research Study 2020 - 2025” 2021, p. 175

For more information, download the white paper at
aveva.com/en/products/intouch-hmi

linkedin.com/company/aveva

@avevagroup

About AVEVA

AVEVA is a global leader in industrial software, driving digital transformation and sustainability. By connecting the power of information and artificial intelligence with human insight, AVEVA enables teams to use their data to unlock new value. We call this Performance Intelligence. AVEVA's comprehensive portfolio enables more than 20,000 industrial enterprises to engineer smarter, operate better and drive sustainable efficiency. AVEVA supports customers through a trusted ecosystem that includes 5,500 partners and 5,700 certified developers around the world. The company is headquartered in Cambridge, UK, with over 6,500 employees and 90 offices in over 40 countries.

Learn more at www.aveva.com