WHITE PAPER

Rethinking HMI/SCADA for a digitally connected workforce

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Executive summary:

McKinsey estimates that digital collaboration has the potential to unlock more than $100 billion in value – thanks in part to productivity boosts of 20-30%.[1] HMI/SCADA systems can play an outsized role when it comes to productivity and collaboration for industrial processes. Outdated HMI/SCADA systems present significant opportunity costs. Organizations must rethink their HMI/SCADA management and deployment by taking a holistic approach to operations control. They should implement digital infrastructure for improved data management and adopt hybrid cloud and on-premises solutions, which can help build workforce connectivity and give them access to higher-level capabilities, like AI-derived insights. A connected workforce, enabled to access context-specific information regardless of location, will drive operational efficiency, productivity, and agility.

Introduction

The opportunity costs of continuing to rely on outdated HMI/SCADA systems are increasingly high. Isolated and stale information hinders efforts to promote greater organizational efficiency and agility, and, without effective information usage, organizations risk missing improvement opportunities. Legacy systems place an unnecessary burden on operators, which can translate to an organizational inability to respond to market adjustments nimbly.

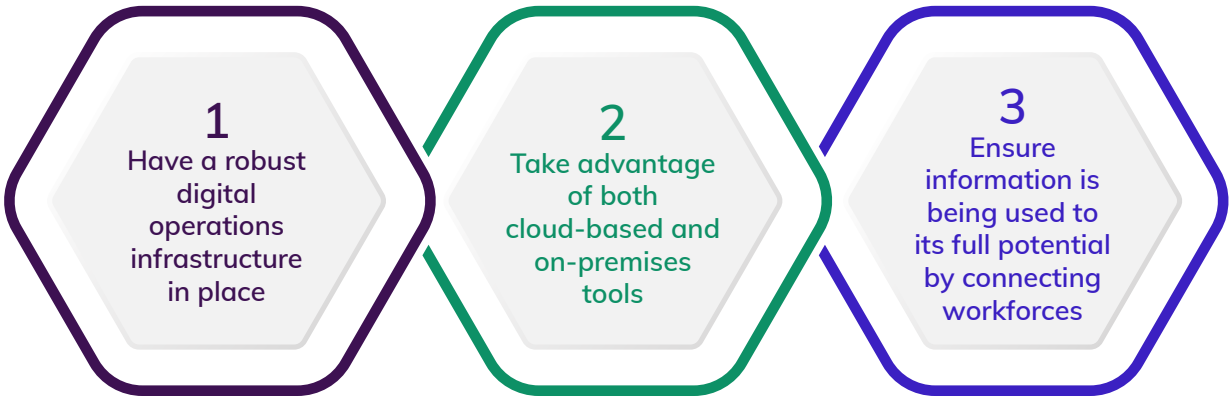
For decades, HMI/SCADA systems have played a crucial role in ensuring efficient, effective operations. However, many companies still rely on outdated HMI/SCADA systems that are unable to keep up with the rapidly changing industrial landscape. Non-intuitive designs, isolated context, and poor feature options lacking access to reporting, mobility, and broader information put operators at a severe disadvantage.

Organizations must not only update legacy systems but also rethink their approach to how HMI/SCADA systems are managed and deployed. As technologies and workforce demographics continue to shift, in some cases, key systems are dependent on a few employees that are nearing retirement. Equipment uptime is dependent on old hardware that can only be maintained by cannibalizing other systems.

Outdated systems stifle continuous improvement, preventing organizations from being agile in the face of market demands. Custom legacy systems abound with no upgrade, maintenance, or replacement strategies in place. In short, operations personnel are not equipped with the tools that set them up for success.

However, many organizations have begun to transform their HMI/SCADA approach. A recent survey suggests that 84% of companies are increasing or maintaining their investment in industrial transformation. This survey data demonstrates that organizations from a broad array of sectors are realizing a return on investment (ROI) in industrial transformation, as over 80% of respondents reduced their COGS, improved operating margins, or grew revenues by at least 3% as a result of their industrial transformation program.[2]

To keep pace with the speed of the market, organizations must embrace a holistic approach to operations control. They must strive to improve collaboration and decision-making, and they must increase operational visibility while maximizing the information already at their disposal.



To meet the coming challenges they face, organizations must find new ways to address operational resilience and agility – starting with improving their information flow.

91%

of employees say that improving their digital dexterity improves their work effectiveness.[6]

-Gartner

84%

of companies surveyed are increasing or maintaining their digital transformation investment despite the labor crisis, supply chain disruptions, and economic uncertainty.[2]

-LNS

20-30%

in part to productivity boosts, McKinsey estimates that digital collaboration has the potential to unlock more than $100 billion in value.[1]

-McKinsey & Co.

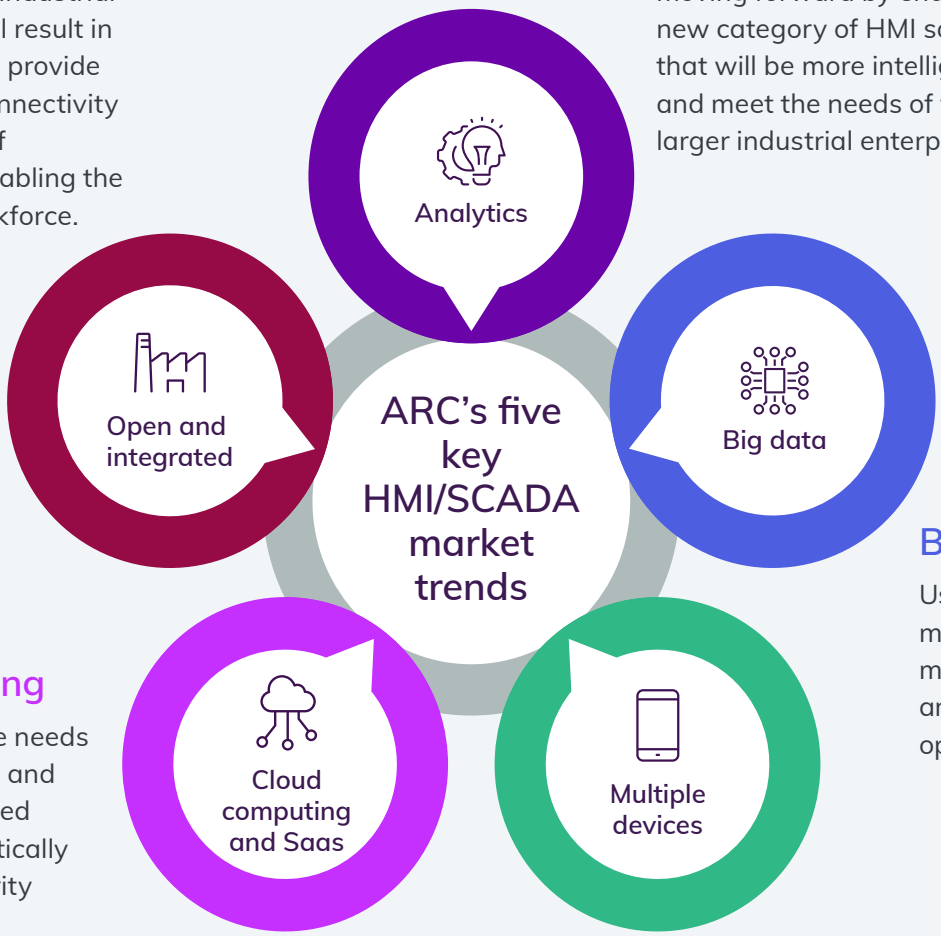
ARC's five key HMI/SCADA market trends[4]

Open and integrated

Increases in the flexibility of industrial processes, driven by Industry 4.0 and Industrial IoT technologies, will result in software needing to provide visualization and connectivity to greater sources of information, thus enabling the new connected workforce.

Analytics

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



Big data

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

Cloud computing

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

Multiple devices

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.

The need for a digital infrastructure

As data has become easier and cheaper to collect than ever, organizations have begun phasing out paper-based systems in favor of digital information. However, while data collection has become commonplace, having data available does not always translate into actionable information. Much of the information organizations collect goes unused or underutilized. This is often the result of organizations deploying solutions that are not designed to visualize the types of data collected, are unable to structure data into a consumable format, and do not empower teams with simplified ways of accessing information.

The ongoing search for new measures of operational agility, efficiency, and resilience lies at the heart of the recent push toward improved digital data management. The last decade has seen a dramatic change in technologies that help organizations drill down through information layers and visualize data. As recent research from IDC suggests, "data, its effective management, and its increasingly central role in operational decision-making is what is driving the transformation of operations. The foundational elements are agility, resilience, and predictability. The enablers/technologies are connectivity, cloud, and contextualization. And the business outcomes are continuous innovation, value optimization, and risk mitigation."[3]

When they have a good digital infrastructure in place, organizations can begin to improve their operational data management immediately. To maximize agility and efficiency, operations teams need tools that simplify common and repetitive tasks, freeing them up to use their time and skills for higher-level activities. Assembling smarter systems that encapsulate best practices into the software reduces the need for operators to be experts to drive sustainable value.

As organizations search for tools that can help them capitalize on all of the operational data at their disposal, they should look for digital solutions that are integrated, streamlined for purposeful objectives, and bring their legacy HMI/SCADA systems into line with today's technology. Any digital tools they select should be built with ease of use in mind and empower operators to access and share information.

Customer story

Major minerals supplier

A major minerals supplier needed to improve its visibility into critical KPIs and address the challenges brought on by its changing workforce. It needed to meet its KPIs faster and find new ways to retain worker knowledge.

It undertook an audit of its operational information management processes to better understand areas for improvement. The results of the audit were clear: Its deployment of multiple outdated, disparate systems would result in significant costs down the road if left unresolved.

The minerals supplier adopted a new strategy to transform its business. To meet its current challenges and prepare for whatever uncertainties the future may hold, it prioritized continuous improvement. It began thinking of its digital solutions portfolio as a long-term asset to maintain and evolve.

With this in mind, it has modernized its software investment approach to implement better tools that deliver business value. The minerals supplier plans to use subscription-based solutions that can deliver the flexibility to deploy and adjust usage over time, so its solutions can grow in tandem with the organization.

The benefits of hybrid architecture

The digital tools that operations teams deploy to modernize their HMI/SCADA infrastructure should be easy to scale. Solutions that offer a hybrid deployment present the best option for organizations looking to future-proof their operations.

An overwhelming number of organizations are investing in cloud-based technologies that can grow as they grow. While process-critical applications will require an on-premises presence for the foreseeable future, secure, cloud-based digital tools can reduce the burden of deploying and maintaining physical IT infrastructure, while delivering added benefits like scalability and improved connectivity and access.

According to recent research from ARC Advisory Group, organizations are collecting more information to optimize their processes, driving a greater need for centralized data storage and connectivity. Organizations are increasingly turning to solutions that enable centralized data storage with global data accessibility for all levels of their organization, which, in turn, enables the highest levels of collaboration and effectiveness.[4]

Solutions that allow for hybrid deployment ensure that remote or dispersed workforces can easily access information from anywhere, while still allowing localized access for operations teams on the front lines.

Moreover, a hybrid model enables higher-level information management applications that can deliver and route AI-derived insights, among other capabilities, back to HMI/SCADA software.

Within the context of shifting workforce dynamics and an impending shortage of skilled labor, the need for organizations to embrace a hybrid architecture is particularly urgent, as hybrid deployment can deliver the safety and security of an on-premises solution alongside the accessibility organizations will need to maximize the efficiency and effectiveness of their evolving labor force.

Getting the most out of your information with a connected workforce

Not only is connecting an organization's workers key to ensuring information is used effectively, but organizations should consider every worker a connected worker. While mobile devices were once cumbersome, expensive, and unreliable, improvements in devices have leveled past barriers to their adoption. Irrespective of a worker's location to the physical asset or plant, a worker's ability to remain connected from any location ensures they are empowered with contextualized, role-specific information.

"Connected workers leverage various digital tools and data management techniques to improve and integrate their interactions with both physical and virtual surroundings while improving decision accuracy, proliferating knowledge, and lessening variability."[5]

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Gartner

Likewise, as formats of information continue to proliferate, it is more important than ever that organizations align with a greater variety of information types. Organizations face a growing need to digitize and integrate additional types of information that support inexperienced personnel and reduce the risk of limited information availability.

Unstructured knowledge, video, and various forms of communication, including one-to-one and many-to-many interactions, have become vital to the efficient flow of operations. It is now necessary to consider how these diverse types of information can be made accessible alongside process-derived information found in HMI/SCADA.

An empowered workforce stands as one of the single most impactful drivers of operational efficiency, productivity, and agility. As a recent survey from Gartner suggests, "91% of employees say that improving their digital dexterity improves their work effectiveness."[6] Any strategy for connecting an organization's workforce should focus on the workers themselves, rather than merely on the technology that facilitates connectivity.

When organizations provide the right information to the user, they encourage effective responses, teamwork, and better decision-making. Organizations should ensure that any technology they adopt sets their workers up for success.

If an organization has embraced tools that allow for a hybrid deployment, it can also leverage subscription-based tools that deliver a greater degree of capability and scalability, while ensuring workers are connected and have access to critical information when they need it – even if they don't know they need it.

Customer story

Gwinnett County Department of Water Resources

Gwinnett County Department of Water Resources (DWR) needed to unify the disparate data silos that made it difficult to optimize water production. To do so, it decided to take a holistic approach to rethinking its HMI/SCADA and operational processes.

By adopting a hybrid software-as-a-service (SaaS) solution to aggregate real-time and historical data from its six water treatment plants, Gwinnett County DWR made it easy for operators to access data when and where they needed it. The hybrid SaaS approach Gwinnett County DWR took offers flexibility for system expansion as the county continues to grow, and has given operators new degrees of access to data, helping to optimize its operations, resulting in water and cost savings – a result that's good for the organization and the planet.

Conclusion

Many organizations that continue to rely on outdated HMI/SCADA systems are missing opportunities to improve their operational efficiency and agility. They simply can no longer ignore the cost of ineffective operations, as a growing number of organizations continue to invest in industrial transformation initiatives. To avert the opportunity costs associated with relying on outdated HMI/SCADA systems and outmoded approaches to operations control, organizational decision-makers must consider: Is our HMI/SCADA suited to our current and future operations?

About the author

Jeremy Wilbert, previously a member of the AVEVA channel partner community, Jeremy's 15 years of experience across sales, marketing and business leadership enhances his keen interest in technology to support customers around the world. In his current role, Jeremy is responsible for managing global product marketing strategy and sales enablement activities as a member of the operations portfolio marketing team at AVEVA.

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