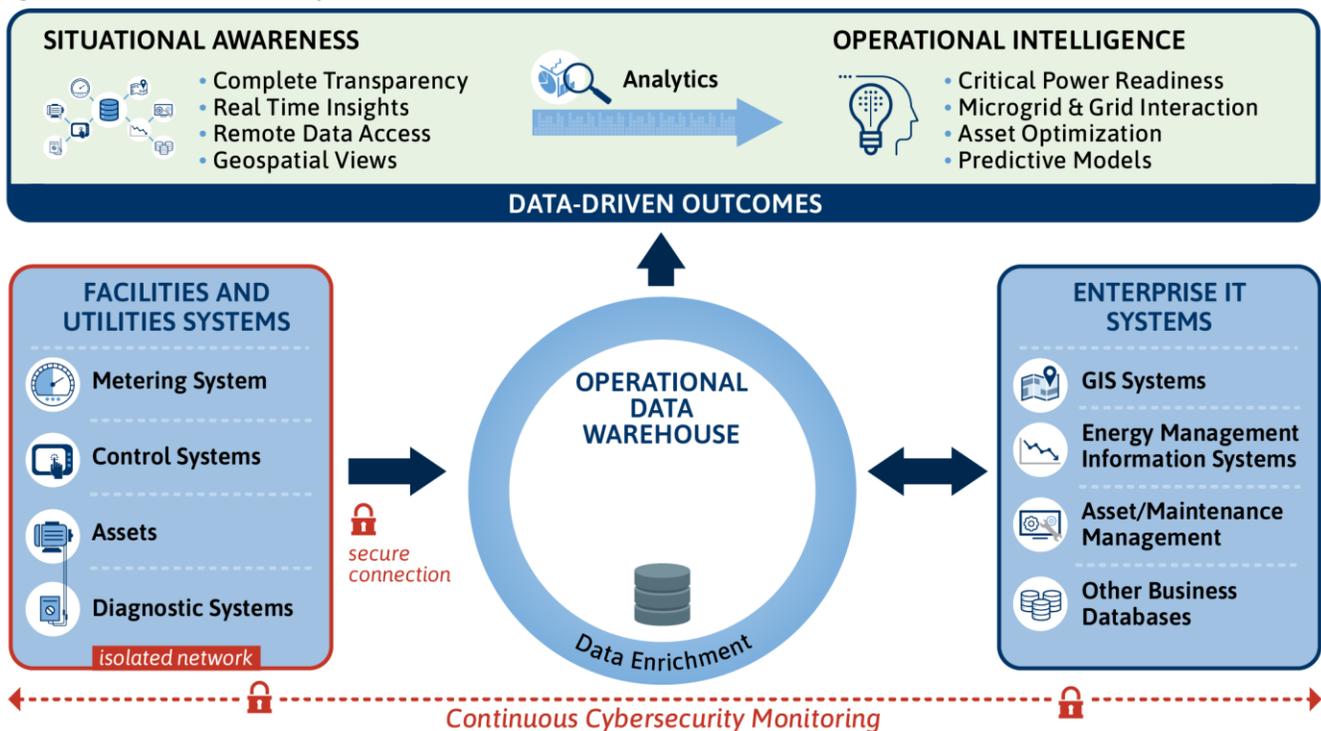


# Smart & Secure Campus Solutions

**The Campus Challenge.** In campus settings, a wide range of facilities, utilities, and business systems are required to provide safe, comfortable, and compliant environments. These systems are functional; however, they are often highly customized and not integrated. This is especially true for the Supervisory Control and Data Acquisition (SCADA) systems, Building Automation Systems (BAS), Energy Management Systems (EnMS), and Computerized Maintenance Management Systems (CMMS) that frequently operate as standalone platforms. As organizations look to become more resilient and improve efficiency, data-driven decision-making is now a critical component of the business process. The integration of these isolated systems to a central location is a major creator of value as the usable information obtainable from data increases exponentially when it is linked with other data streams. From this perspective, multi-building campuses present a significant improvement opportunity.

**The DSA Solution.** To address the challenges associated with fragmented systems, Data Systems Analysts, Inc. (DSA) has developed a framework that securely centralizes all of the operational and business information in one system to empower facilities and utilities organizations. Importantly, the DSA framework incorporates a critical, and often overlooked, aspect of campus operations: cybersecurity. To ensure the connection of various systems - and different campus networks - does not increase an organization's risk profile, DSA performs penetration testing and continuous vulnerability management to harden the central Operational Data Warehouse (ODW) and the previously isolated source systems. Our Approach (Figure 1) leverages DSA intellectual property alongside best-in-class software applications to deliver campus-wide situational awareness and operational intelligence.

**Figure 1. DSA's Smart Campus Solution Framework**



**Situational Awareness.** By centralizing data from multiple systems, campus stakeholders have access to information that was not previously available. **Delivering real-time information from all campus systems to facilities and utilities engineers is a prerequisite for a smart, resilient campus.** Without situational awareness, engineers must make decisions without all of the necessary information leading to suboptimal outcomes. For example, the production, distribution, and consumption of chilled water on a campus is controlled by multiple isolated systems. Typically, the utilities group manages the plant-side chilled water control system and the facilities department is responsible for building automation systems and the demand-side. The reality is that the generation and consumption of chilled water are connected and must be viewed as a single system; DSA’s integration framework provides a unified platform that delivers complete situational awareness to all campus stakeholders.

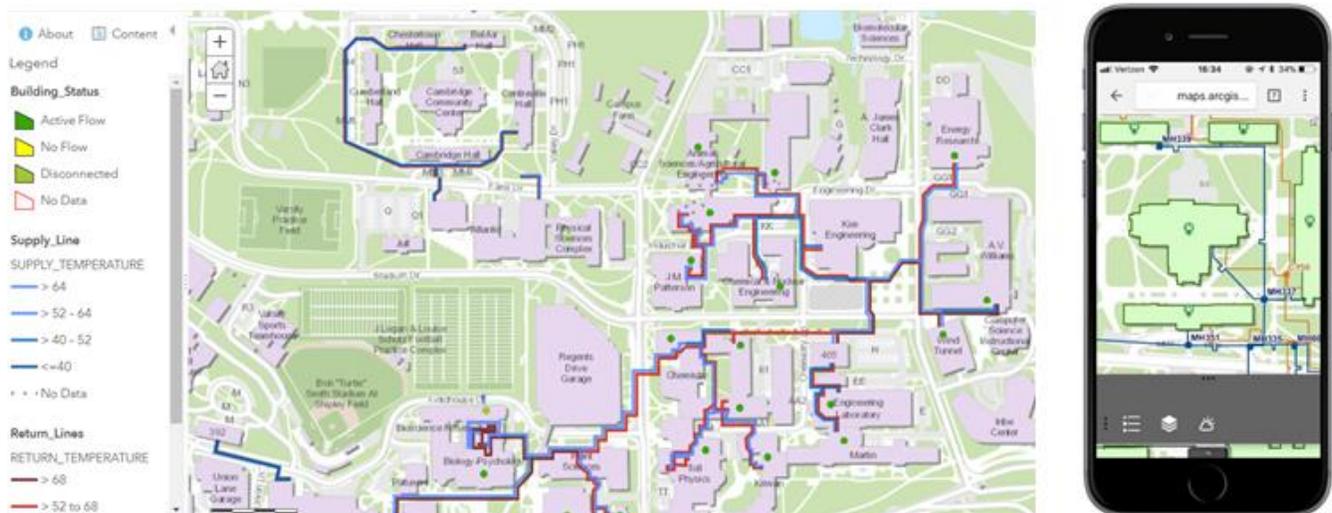
## No Operational Transparency

*“DSA challenged the University of Maryland to understand the most vulnerable circumstances on our campus. DSA introduced the University to new opportunities for situational awareness... using integrated data and geospatial awareness... which would never be met by one individual’s knowledge on campus.”*

**David Shaughnessy**, Assistant Director for Utilities, **University of Maryland** at an OSISO Conference in Washington, DC

**Operational Intelligence.** Applying advanced analytics to this new consolidated platform uncovers insights and improvement opportunities that were previously inaccessible. Specific to utility distribution, DSA’s utility monitoring solution leverages weather forecast data and machine learning to project consumption patterns, optimize asset operation (e.g. thermal storage tank discharging), and proactively notify stakeholders of non-standard system performance. This operational intelligence is a critical component of resilient campus operations. Our Geospatial Information System (GIS) integration is another example of the new value created by integrating multiple campus systems and applying analytics. By integrating with a GIS platform, DSA transforms static design drawings into information-rich GIS views. The geospatial views are enhanced with asset-specific control system data that delivers dynamic information on critical assets in real-time. DSA’s analytics continuously identify non-standard asset operation and relay information to stakeholders through alerts, notifications, and visualizations, while field technicians can access the information through smart device apps designed to support rapid response.

**Figure 2. DSA’s Geospatial Utility Monitoring Overview**





**The DSA Framework.** Our suite of smart campus solutions leverage OSIsoft’s PI System as the central data platform. The PI System is designed to collect, analyze, visualize and share large amounts of high-fidelity, time-series data from multiple sources to people and systems across all operations. In a multi-building campus environment, the PI System’s off-the-shelf interfaces for BACnet, Modbus, and OPC, combined with manufacturer-specific interfaces for typical SCADA platforms, make it a powerful integration tool. DSA’s PI System Engineers and Data Scientists then build an asset-centric tree structure with targeted analytics that provide the situational awareness and operational intelligence necessary to improve performance. To ensure the newly integrated system is hardened from a cybersecurity standpoint, DSA leverages the RiskSense vulnerability management software platform. DSA’s Cybersecurity subject matter experts work with your IT group to design a secure deployment that appropriately connects systems and networks (e.g. firewalls, data diodes) and also integrates with existing campus IT security policies (e.g. Active Directory). Once the system has been deployed, DSA’s hybrid cyber-monitoring approach combines continuous vulnerability management with periodic penetration tests to ensure the overall architecture remains secure throughout its entire lifecycle.



**DSA Success.** Founded in 1963, DSA is a leader in delivering Information Management, Energy Management, and Cybersecurity solutions to the Federal Government, State, Local, and Commercial entities. Building on experience spanning 55 years, DSA has expertise in and a comprehensive understanding of the business, operational, security, and collaboration challenges our customers must address. The integration framework presented here has been refined over more than 14 years since DSA first deployed the PI System at the Nuclear Regulatory Commission (NRC) for the Emergency Response Data System (ERDS). The ERDS platform we deployed in 2006 improves NRC’s situational awareness of every civilian-operated nuclear reactor in the United States. The NRC uses DSA’s Integration Framework to monitor each plant from a central control room. We have continued to operate and maintain this system since we were first selected in 2006. Some of our other Critical Infrastructure customers are listed here.

