

Stage 1

Baseline assessments

Without a solid infrastructure you can't achieve the desired value you're looking for. Therefore, a comprehensive infrastructure and network assessment will establish to what extent it can be upgraded, or whether it needs replacing. The assessment covers:

- **Information hardware and software infrastructure**
- **Automation controls and devices**
- **Networks**
- **Security policies**

At this point we will identify how to implement technologies such as business intelligence software or cloud capabilities, and how to minimize security vulnerabilities.

Key questions include:

Network infrastructure

- *Are there currently multiple, disparate networks?*
- *Do you have an accurate inventory of your site's hardware, software and infrastructure?*
- *How well are operations connected to enterprise and business systems?*

Manufacturing and industrial environment

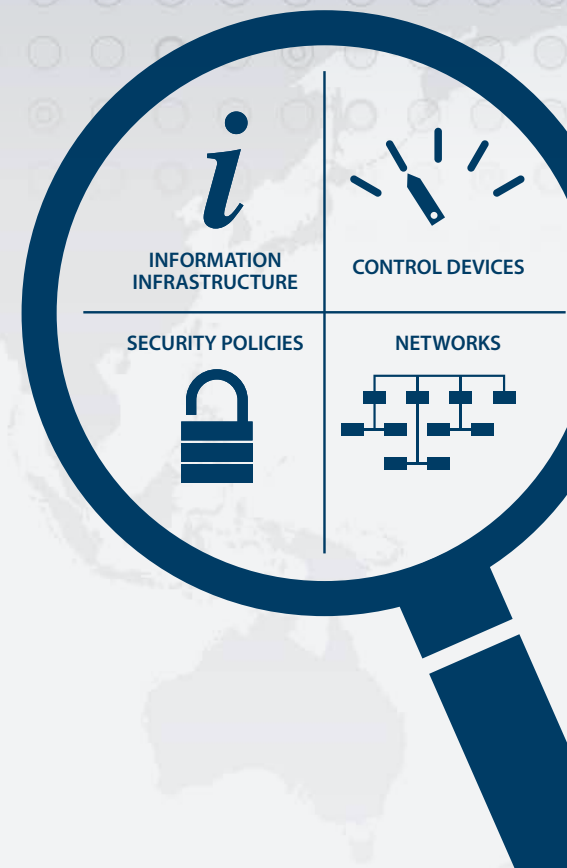
- *Are you challenged with outdated controls and networks in your operations?*
- *Is your access to data limited due to islands of automation?*
- *Where can outdated hardware and redundant applications be eliminated?*

Data and reporting

- *How much data collection and reporting is automated versus manual?*
- *What metrics need to be captured that aren't being captured today?*
- *How is operations performing against key performance indicators?*

Security

- *Are there security policies and procedures in place, and are they enforced?*
- *Does your security approach follow recommended standards like ISA 99?*
- *Do you allow your vendors remote access to your control systems?*



Stage 2

Secure and upgrade network and controls

Common network infrastructure

Central to The Connected Enterprise is a common network infrastructure that facilitates communications between automation and control systems and the enterprise network via EtherNet/IP. Yet a challenge for many organizations is the sheer volume and variety of outdated controls and networks in place, and to what extent it can be upgraded or replaced.

Applying standard Internet and Ethernet protocols like EtherNet/IP (CIP version) helps integrate operations data with the rest of the enterprise and future-proofs in relation to the ongoing growth in Internet enabled devices.

The benefits of EtherNet/IP include:

- ***Convergence of multi-discipline applications, such as discrete, continuous process, batch, drive, safety, motion and power***
- ***Seamless automation and enterprise-wide information sharing***
- ***Future-ready network design based on standard IT technology***
- ***Leveraging of standard and established IT security technology and best practices***
- ***Smarter devices and systems***
- ***Modern control systems, networks and software can all help defend against security threats and risks***

Multi-layered security approach

Connecting your site and production assets provides significant benefits, but it's not without its risks. Malicious and accidental threats, both internal and external, need to be considered.

A multi-layered approach to security – using both physical and electronic defenses – helps to ensure that threats can be stopped at numerous levels within the production zone using several safeguards. A single technology or methodology simply won't suffice against the multitude of threats that exist.



Stage 3

Defined and organized working data capital

Capturing data is fundamental, but data without context is not an asset. The Connected Enterprise makes the best use of data, transforming it into actionable business information on which better decisions can be based.

- **Extract good data and turn it into actionable information**
- **Eliminate manual reporting**

Information visibility means:

- **More insight into supplier deliveries**
- **Improved ability to respond to changing customer needs and reduce inventory costs**
- **Better management of workflows for more demand-driven production and supply chains**

An effective IT/OT network incorporates data from OT assets across the enterprise to deliver performance-critical information that can be used for real-time decision-making, even as IT supports more locations via remote monitoring.

Contextualized information helps to optimize life-cycle processes, that better respond to changing customer needs, better manage workflows and reduce inventory.



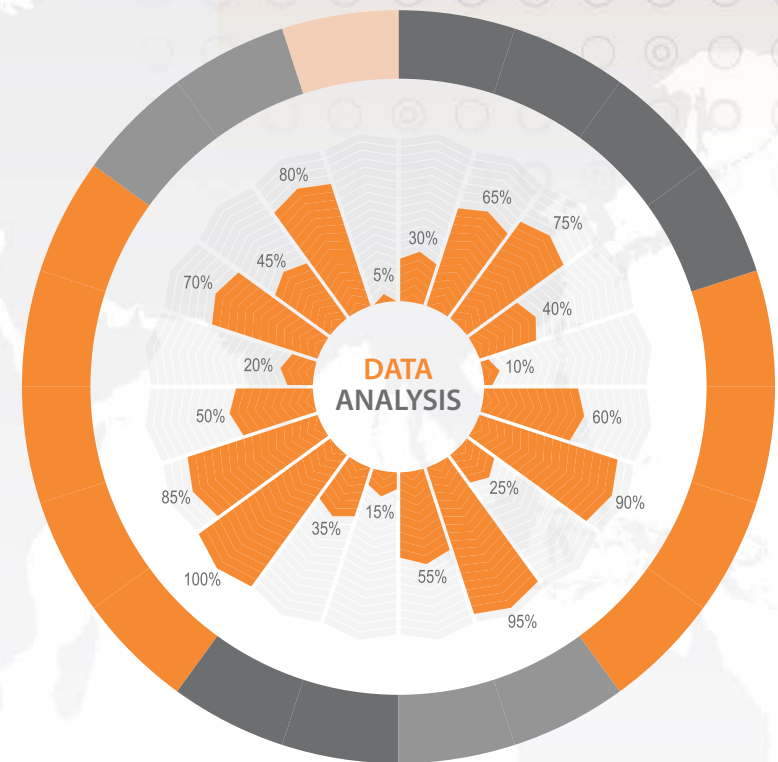
Stage 4

Analytics: Operational benefits

Data-based analytics can be viewed real-time with dashboards, and can be monitored contextually as well as against historical performance data. It also can be securely shared and presented organization-wide using bespoke, secure reports.

How analytics can help

- Access to crucial KPI information including quality, productivity and machine downtime
- Ability to track labor costs against work orders and report the labor data back up to the enterprise to reconcile order pricing
- At plant level, a better understanding of direct versus indirect labor time or the provision of historical data on customer changes
- Automated actions that can be triggered by incoming data and the receipt of notifications and alerts by authorized team members on their mobile devices in real-time, which enables them to take action instantly
- Improvement of supplier performance in delivery, quality, and costs, as well as improved vendor documentation for regulatory compliance





Stage 5

Optimize and collaborate

The Connected Enterprise unites and shares valuable information not just across people, devices and processes but also across sites and even companies and information is shared across the supply chain ensuring processes are optimized end to end. It's important to consider what additional capabilities need to be deployed to help drive optimization and collaboration, whether within a single plant, between a plant and the enterprise, or across multiple facilities and supply chains. This needs to be viewed as a process of ongoing review and assessment, creating a culture that drives continuous improvement in an ever-changing environment.

Mobile devices

Mobile devices give workers on the plant floor access to real-time production information such as overall equipment effectiveness. They also provide valuable diagnostics data to maintenance personnel when a downtime event occurs, so they immediately know where a problem is happening, what the issue is and where they can get the tools they need to fix it.

Cloud and remote technologies

Cloud computing helps people collaborate across the supply chain, improving enterprise-wide access to subject matter experts and information. Remote monitoring technology can connect technicians with distant customer locations to perform real-time diagnostics.



Watch the benefits of The Connected Enterprise video [here](#)

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