Latest developments in Control & Safety Systems

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Elbert van der Bijl

November, 2017

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Industrial Automation Portfolio – Control Domain

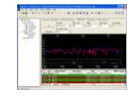
Production Management

Information Management

Information Management System

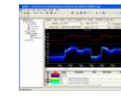
Exaquantum

Advanced Control



Multi-Variable Model Predictive Control

Exasmoc



Robust Quality Estimator

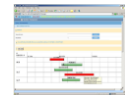
Exarqe

Asset Management and Operational Efficiency

Operational Efficiency

Operation Efficiency Improvement Package

Exapilot



Terminal Automation System

Terminal Logistic Suite VP

Training Systems

Training Simulator System

mega Land

Asset Management

Plant Resource Manager

PRM

Production Control and Safety Management

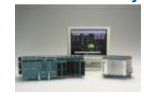
Production Control and Safety Management

Integrated Production Control System

CENTUM VP

Network Based Control System

Supervisory Systems FAST/TOOLS



Network Based Control System

Network-based Control System STARDOM

Safety Shutdown Management System

ProSafe-RS

ProSafe-SLS

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Agenda

1. IA Trend and Customers' Challenge
2. Latest Technology: DCS and SIS
3. Agile Project Execution
4. Cyber Security Approach

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IA Trend and Customers' Challenge

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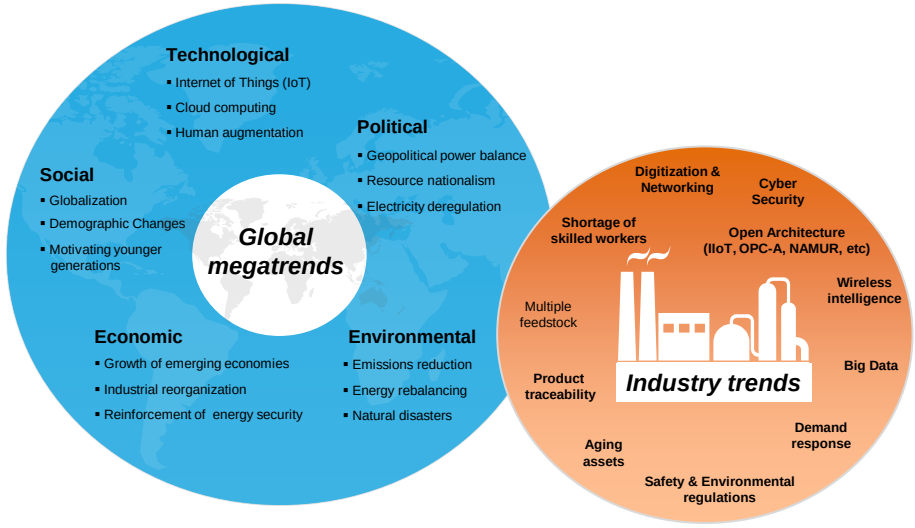
IA Treads – Global Mega Trend and Industry Trends



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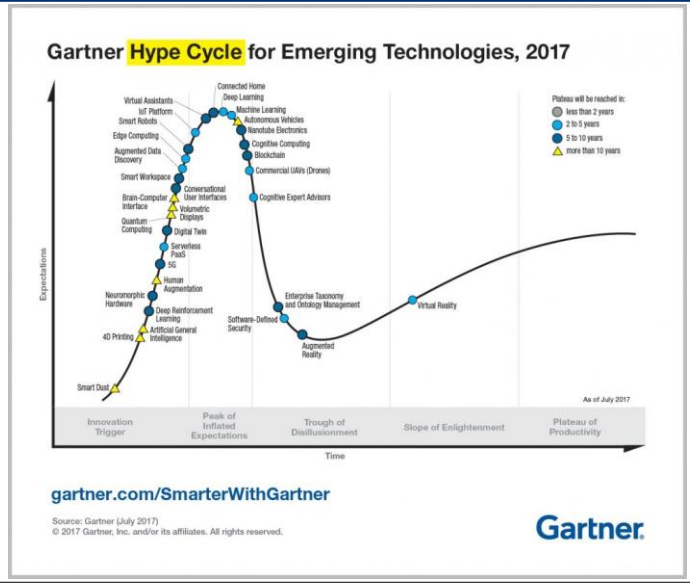
Market Trends Hype vs. Reality



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Technologies Enabling Digital Transformation

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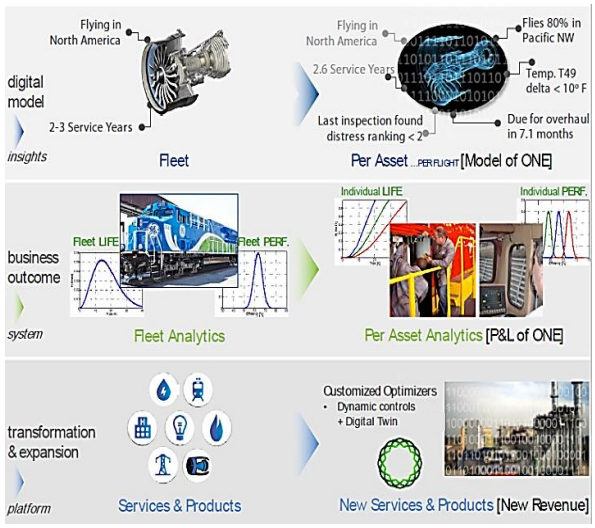
Digital Twin



Source: GE Digital

Digital Replica of physical assets, Process & systems

KBC & BAKER HUGHES(GE) 19th Sept
"For 1st time O&G customers can build Digital twin of a Plant, refinery or Rig with KBC's Petro-SIM"

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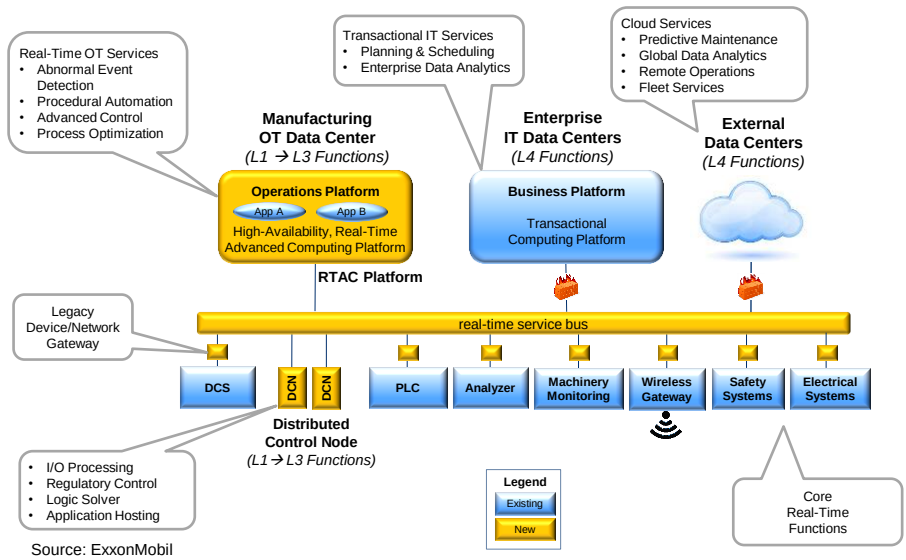
Open Process Automation Forum

- Open Process Automation Forum is part of The Open Group
  - www.opengroup.org
- ExxonMobil selected The Open Group
- The Open Group is a non-profit, global consortium for IT standards

THE Open GROUP

THE OPEN GROUP OPEN PROCESS AUTOMATION™ FORUM

ExxonMobil Automation Vision

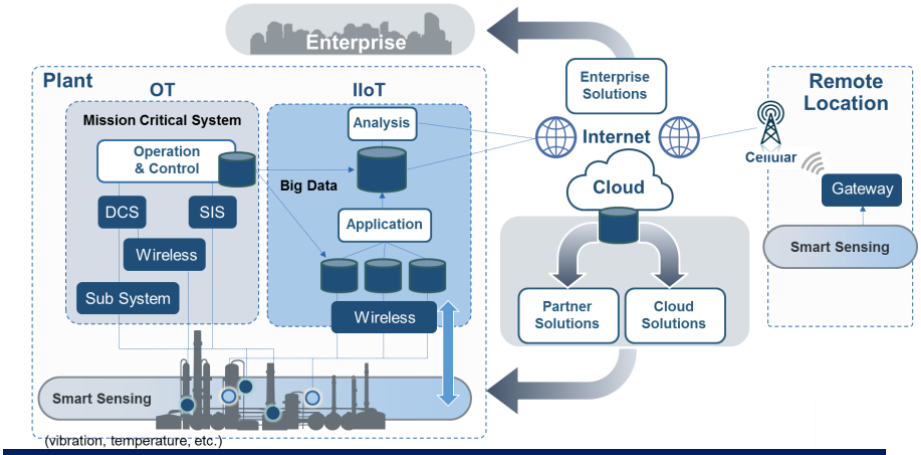


Source: ExxonMobil

OT and IIoT

Process Automation and IIoT Integration

Enabling users in mission critical industrial plants to leverage IIoT derived benefit



Can you imagine cloud computing replacing our traditional controllers!

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Customers' Challenges and Concerns

Plant lifecycle

Project execution

Managing uncertainty, project complexity, late changes, cost overruns, and deploys. The challenges are even greater when the lack of manpower and technical resources are factored in.

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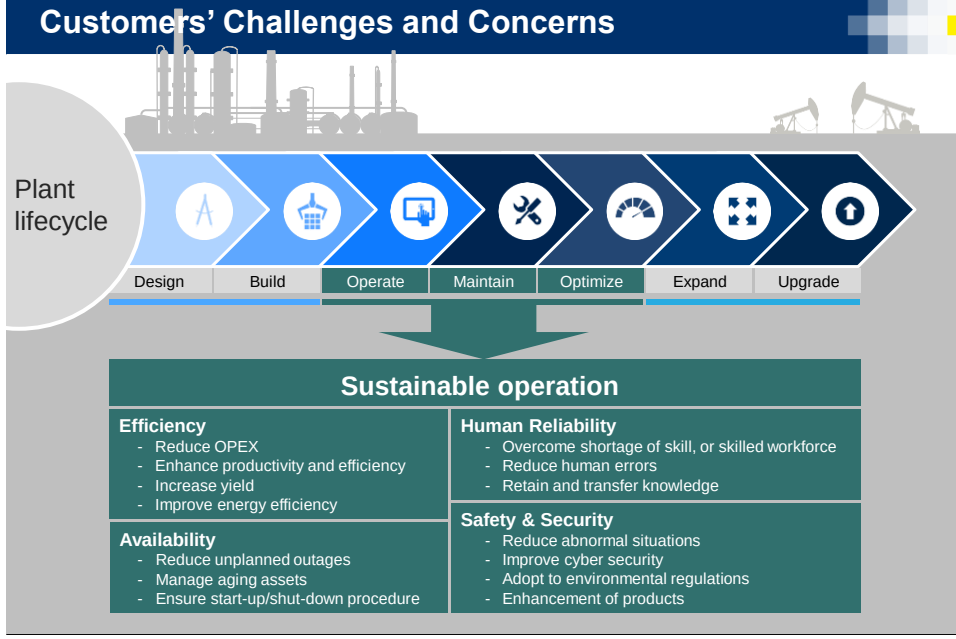
Customers' Challenges and Concerns



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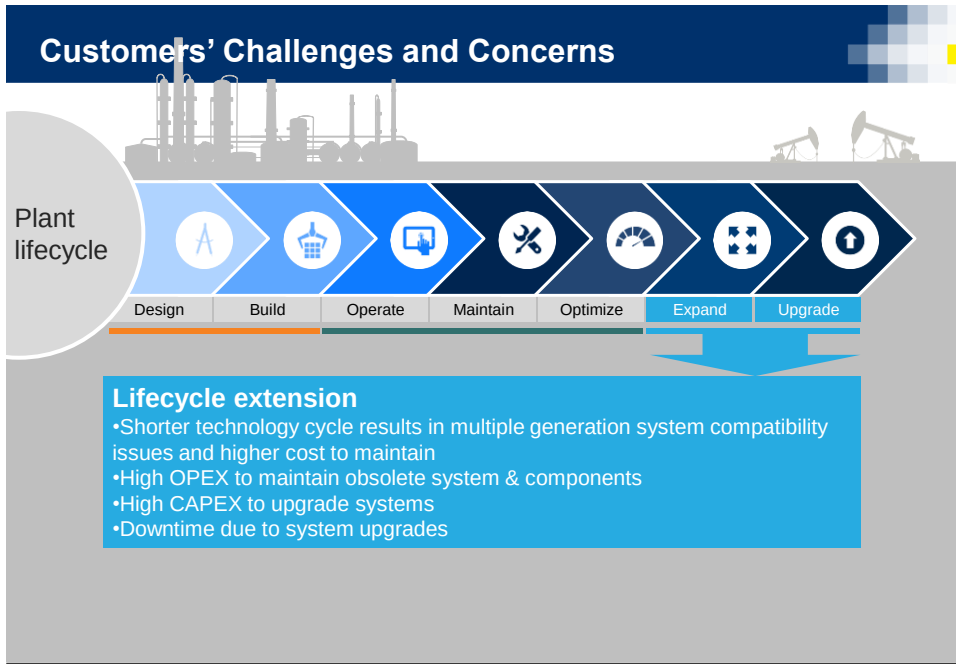
Customers' Challenges and Concerns



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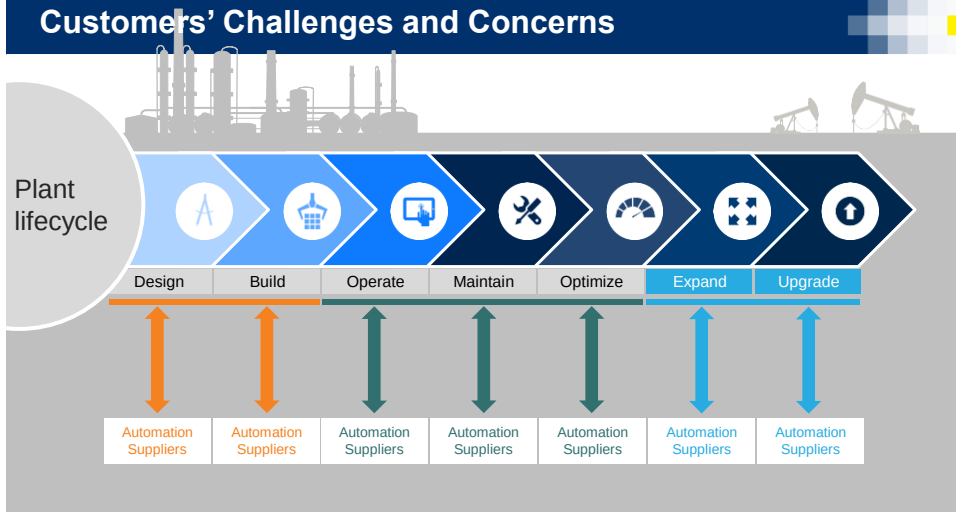
Customers' Challenges and Concerns



Results in higher OPEX & gaps between solutions and services throughout the plant lifecycle.
Some problems cannot be solved without considering an integrated approach.

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How do we help our customers achieve and sustain optimum performance throughout the entire plant lifecycle?

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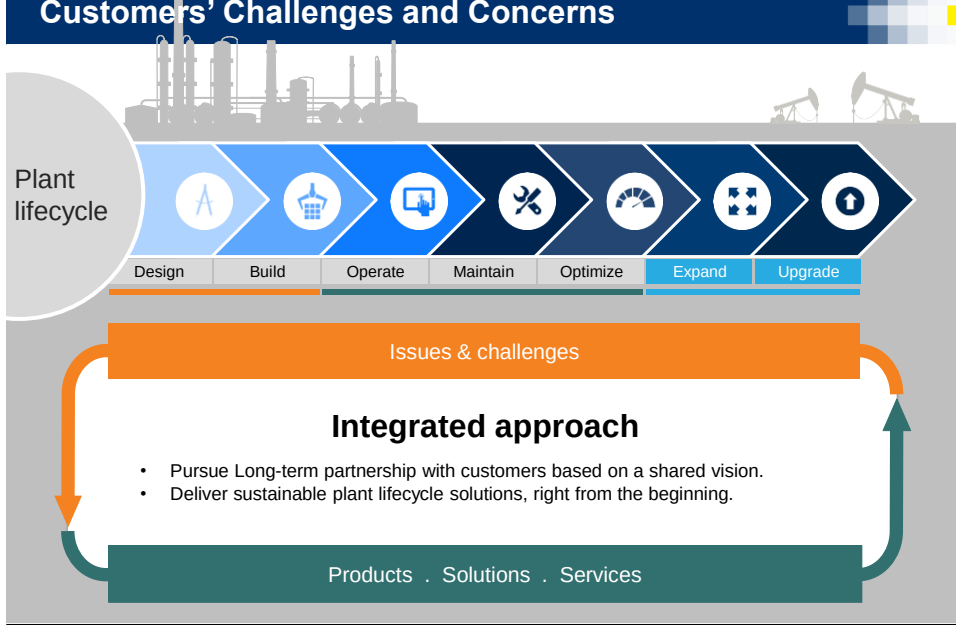
Customers' Challenges and Concerns



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2. Latest Technology to Distributed Control System (DCS) and Safety Instrumented System (SIS)

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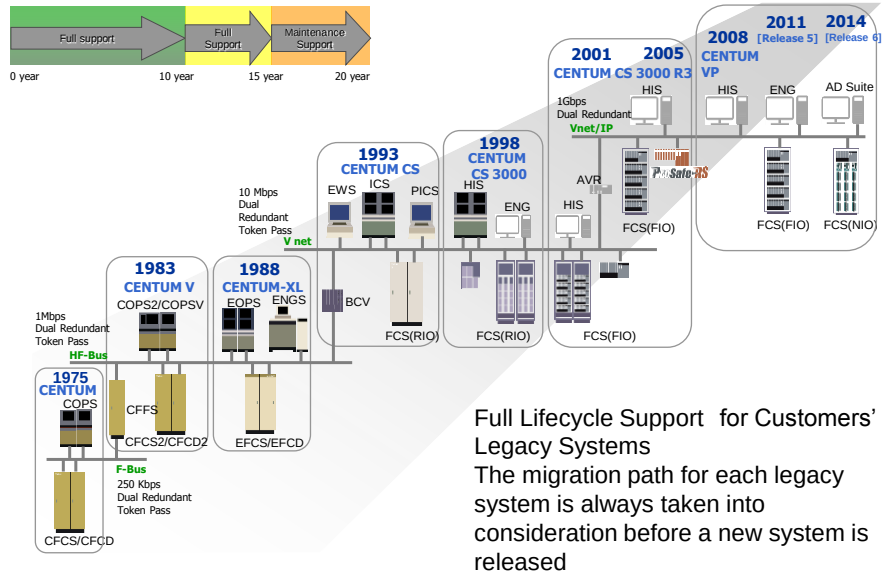
Long Term Support & Migration



Full Lifecycle Support for Customers' Legacy Systems
The migration path for each legacy system is always taken into consideration before a new system is released

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Enablers to Solve Customers' Challenges

CENTUM VP Release 6

ProSafe-RS Release 4

Smart Engineering

A new engineering ecosystem that delivers certainty and confidence.

System Agility

System agility that provides flexibility, adaptability and extensibility to cater for plant upgrading or extension needs, in tandem with changes in plant operations and business exigency.

Advanced Operation

An advanced operation that empowers operators to make smarter decisions.

Sustainable Plant

Optimum system performance throughout the entire lifecycle of the plant.

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CENTUM VP R6 – New Release Components

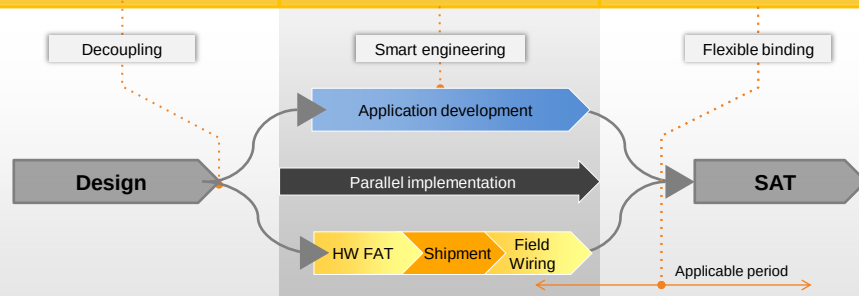
Next Generation Smart I/O	Integrated Engineering Environment	Field Validation Tool

CENTUM VP Release 6

ProSafe-RS Release 4

FieldMate Validator

Smart I/O	Centralized Engineering	Field Device Adjustment Tool



Yokogawa's agile project execution model

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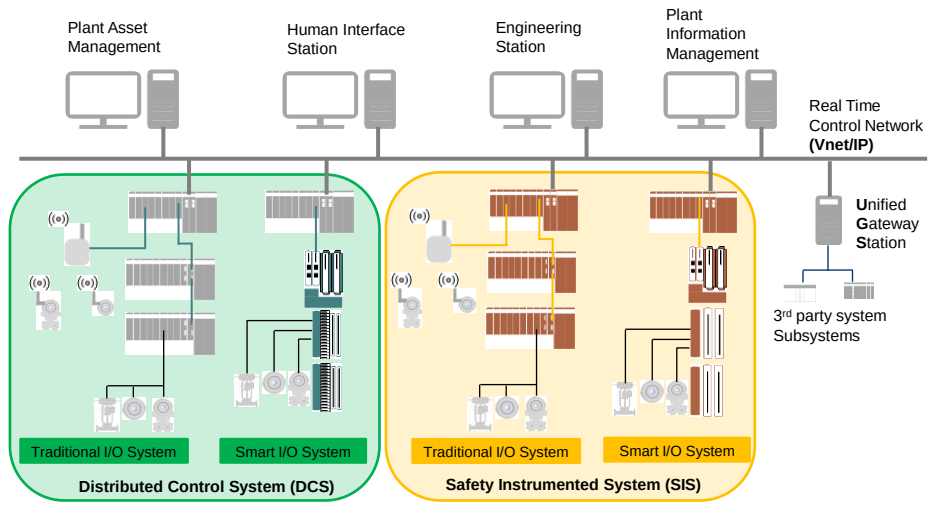
Yokogawa's ICSS System Architecture

Integrated Control and Safety System (ICSS)



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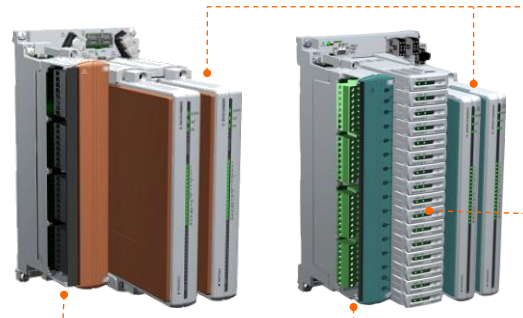
Yokogawa's Smart I/O Solution

- Yokogawa Smart I/O is designed with fewer components.
  A single module can be configured to support AI/AO/DI/DO
- An optional signal conditioner can be plugged in to support a wide range of I/O signal types (to DCS Only)
- The backplane allows I/O redundancy by design, resulting in a smaller footprint



Smart I/O module
- 16 I/O channels
- Signal: AI/AO/DI/DO
- Software configurable
- HART 7 support
- Full redundancy

Signal conditioner (optional)
•Wide range of I/O
•Pulse, relay, DO, etc.

Termination block

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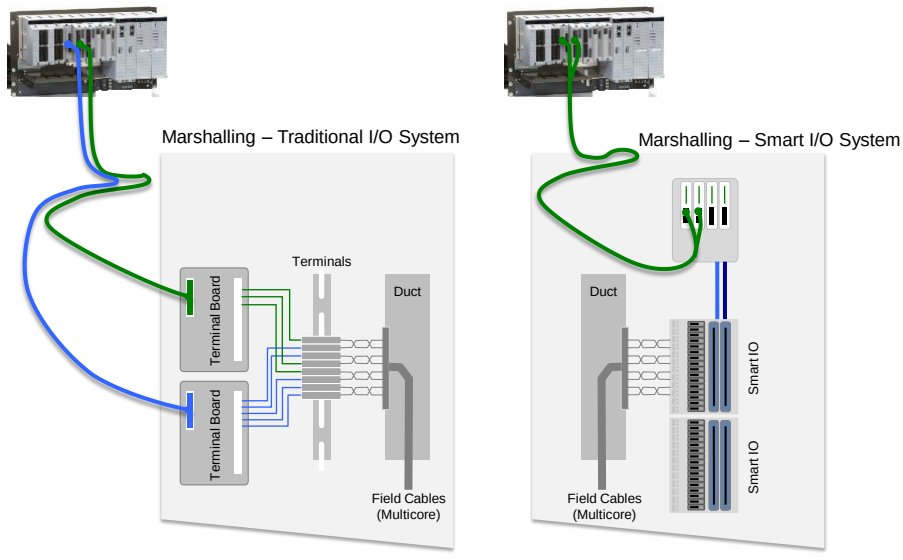
Comparison between Traditional and Smart I/O System



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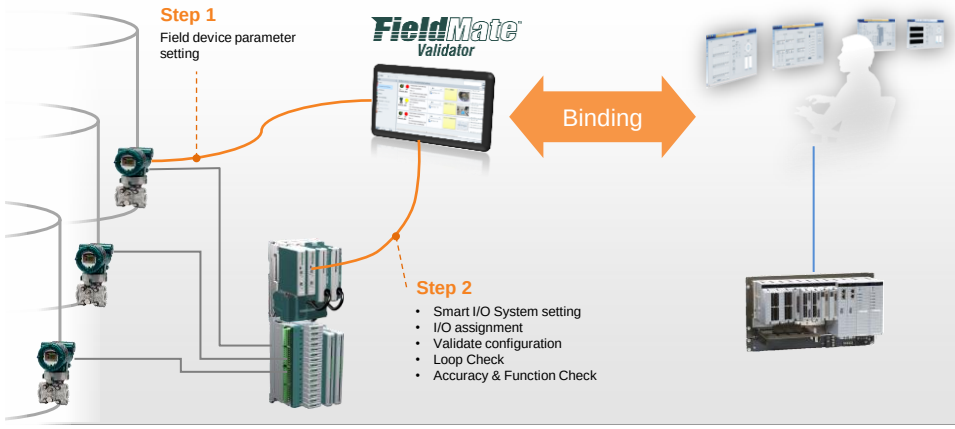
Field Validation Tool – FieldMate Validator

- Facilitate early completion of field work without requiring the entire system to be ready at site.
- Enable flexible binding with DCS at any stage of SAT.



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3. Agile Project Execution

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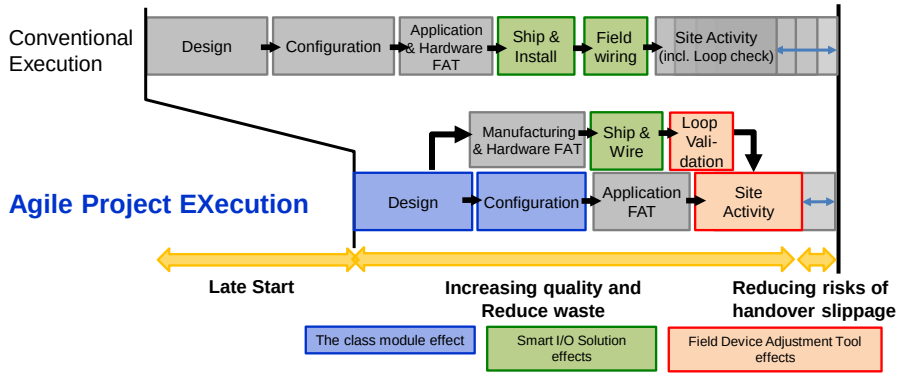
Yokogawa's Proposed New Project Execution



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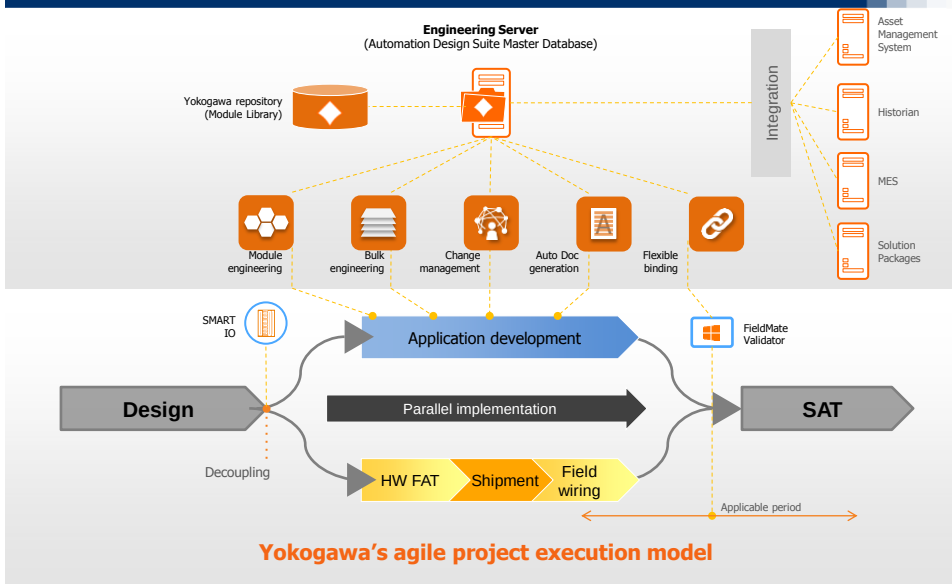
Smart Engineering



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4. Cyber Security Approach

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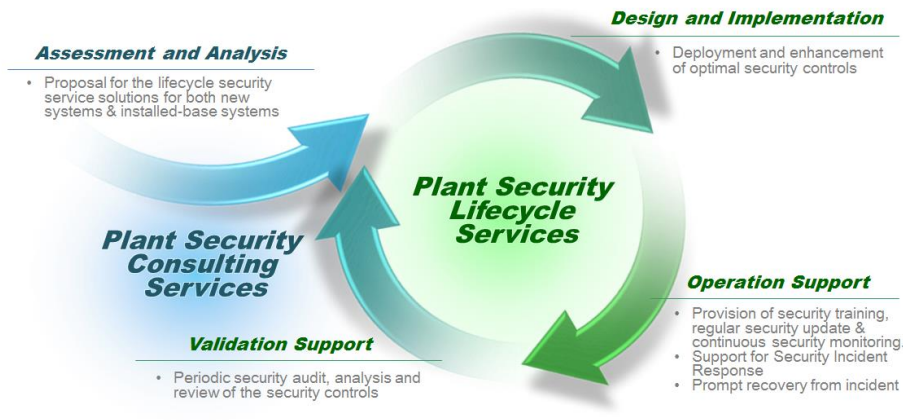
Yokogawa Security Lifecycle

Yokogawa provides the solutions to implement a comprehensive security lifecycle based on the “defense in depth” strategy.



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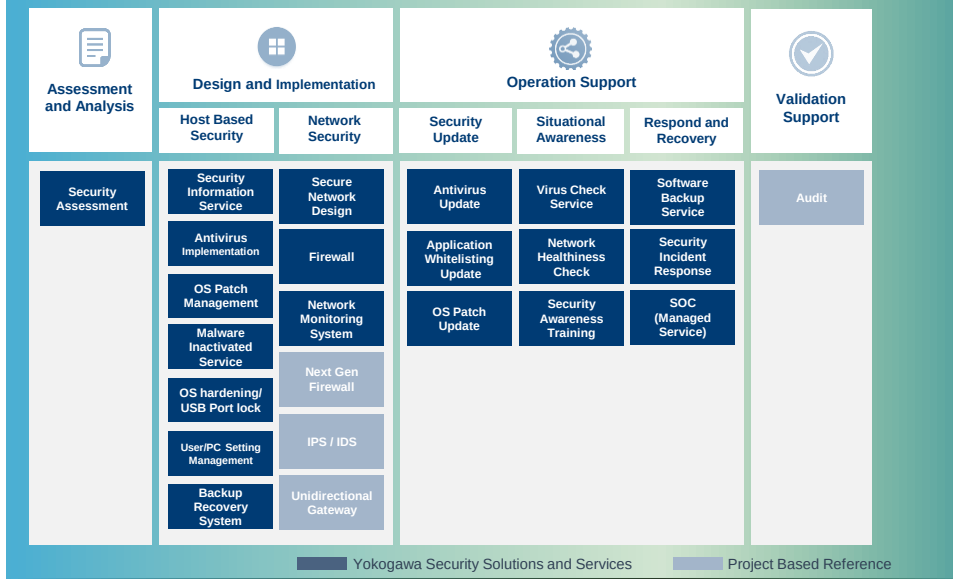
Plant Security Lifecycle Service Portfolio



Co-innovating tomorrow™

Thank you for your attention!