

## Yokogawa's New Synaptic Business Automation Aims to Transform Industry

By Janice Abel

### Keywords

Industrial IoT, Expert Services, Process Simulation, Digital Twin, Yokogawa, Synaptic Business Automation, Digital Transformation

### Summary

As global competition increases, operations and manufacturing must improve flexibility and agility while maximizing ROI to ensure sustainable profitability. To do this, businesses must adapt and improve operational efficiencies, asset utilization, and productivity, while ensuring safe, environmentally compliant operations. Increasingly, companies look to digital

**With its new Synaptic Business Automation concept, Yokogawa is shifting its co-innovation focus:**

- From products to customer business
- From delivering products to delivering value
- From implementing solutions to value co-creation with customers
- From an automation supplier to a trusted business partner

transformation to accomplish these. Yokogawa is addressing digital transformation for industry through a combination of new services, technologies, solutions, and proven expertise that it refers to as "Synaptic Business Automation."

At the company's press conference at the recent ARC Industry Forum in Orlando, Yokogawa presented some details on this interesting new concept, which focuses on leveraging new technologies and proven expertise to support industrial organizations

in their respective digital transformations to achieve operational excellence and profit-driven operations.

### Synaptic Business Automation Concept

At the press conference, Satoru Kurosu, Executive Vice President, Head of Premium Solutions and Service Business Headquarters at Yokogawa outlined Synaptic Business Automation. He described how it addresses end user's challenges, including digital transformation; supply chain visibility and optimization; more profitable operations; and the changing business



environment, including the need to address both the “circular economy” and the changing workforce by synthesizing and bringing together people, systems, data, services, and supply chains. To this end, Yokogawa’s expanded offering includes both consulting and solution services.

According to Mr. Kurosu, Synaptic Business Automaton connects production to business operations - synchronizing sensors, data, system, people,

### The value of Synaptic Business Automation



### Synaptic Business Automation Designed to Drive Profitable and Sustainable Growth

businesses, and supply chains. Yokogawa is increasing its value add by expanding technologies and solutions horizontally and vertically across the enterprise.

By combining Yokogawa’s expertise in operational technology (OT), plant operations and management, industrial applications, IT, consulting, and services, the Synaptic Business Automation concept aims to enable customers to achieve an ideal business state. Yokogawa defines this as a state in which the synthesis of data, systems, organizations, knowledge, and supply chains add value and strengthens competitiveness. Synaptic Business Automation is designed to enable transformation at all operational levels from manufacturing plant and operations to the management level. The linked data from manufacturing processes, plant operations, human resources, and supply chains can be organized, integrated, controlled, and analyzed to yield insightful decisions at each level, from the field to corporate management.

The solution includes strategic consulting, simulation technology, and automation technology to enable profitable and sustainable growth, which the company estimates to be worth between \$10 million and \$100 million per year for a typical refinery.

### Operational Excellence

Simon Rogers, Head of Advanced Solutions Business Division, Premium Solutions and Service Business Headquarters, discussed the operational excellence transformation that can be achieved through collaboration and

co-innovation. According to Mr. Rogers, operational excellence involves a multi-year journey that starts with a strategy for operational design. To support this journey, Yokogawa combines its own comprehensive operational and information technologies and services with KBC's well-proven process solutions and consulting services to provide sustainable value. He explained that the four components for achieving operational excellence are:

- Supply chain optimization
- Operational risk management for effective shift team operation
- Asset operations and optimization
- Asset management and integrity

### Supply Chain Optimization

The company uses an integrated optimization model to help ensure high levels of efficiency and productivity. This model encompasses planning, production accounting, production scheduling, supply chain management, and budget and investment planning. Key components of the model are KBC's Petro-SIM process simulation and domain knowledge. These integrate supply chain optimization with process optimization, asset design and improvement.

### Operational Risk Management

Operations management is about using best practices and digital technologies effectively. KBC's best practices and domain expertise in this area in combination with Yokogawa's operations management solutions can help companies empower their operators, supervisors, and managers with data-



**Key Functionalities in Operational Risk Management**

driven operational insights. Solutions include work instructions, field mobile tools, advanced operator graphics, alarm management, operator effectiveness benchmarking, shift handover, operations logbooks, and operator training simulators.

By using best practices in operations, companies can reduce unplanned shutdowns by reducing human error, avoid or manage abnormal incidents,

and better manage changes with on-time shift reporting that enables shift team effectiveness.

### Asset Operations and Optimization

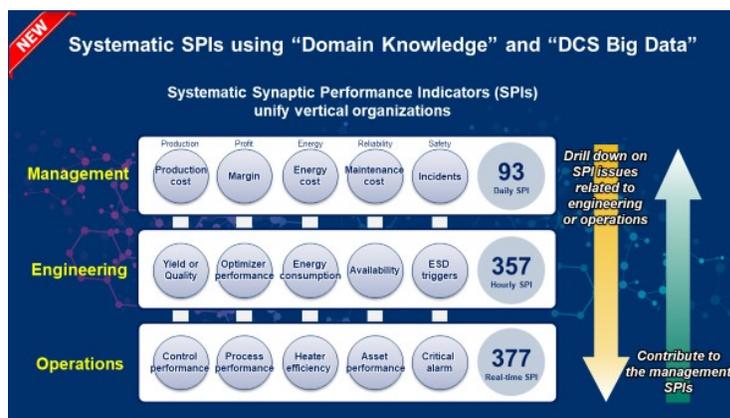
By optimizing assets, clients can achieve operational excellence, sustainable growth and profitability. In just one example of this, Yokogawa worked with Shell to develop the next generation of advanced control and optimization technology called PACE (Platform for Advanced Control and Estimation). Yokogawa combines PACE with KBC's process consulting domain expertise, Petro-SIM process optimization software, and the VISUAL MESA energy optimizer to help customers optimize their production facilities.

### Asset Management and Integrity

KBC consultants can provide training to help operations, maintenance, and other plant personnel improve their effectiveness. The consultants also help plant personnel reduce human errors that can cause safety and integrity issues and by developing and implementing best practices and operating procedures. Effective use of best practices can reduce maintenance costs significantly and increase asset availability. Yokogawa offers products and solutions to automate those best practices and procedures. In addition, Yokogawa offers a comprehensive suite of solutions to help improve reliability.

### Profit-Driven Operations

Often, the C-level executives do not have visibility into how the business is



**Synaptic Performance Indicators Unify Vertical Organizations**

operating because the KPIs are not connected or conflict with each other. Also, a lot of available information is not used. As workers retire and experience and competency decline, companies must adapt their businesses.

Masatoshi Nakahara, Director, Executive Vice President, Head of IA Systems and Service Business HQ, described Yokogawa's Profit-

“By connecting the data from the DCS, which is often not fully utilized, connecting operations to the business by eliminating conflicting KPIs, and capitalizing on Yokogawa’s consulting expertise; companies can improve profits every year.”

driven KPIs business. He indicated that these KPIs, which Yokogawa refers to as Synaptic Performance Indicators (SPIs), need to be constructed systematically so that everyone can collaborate using consistent KPIs. “By connecting the data from the DCS, which is often not fully utilized, connecting operations to the business by eliminating conflicting KPIs, and capitalizing on Yokogawa’s consulting

expertise; companies can improve profits every year,” he explained. According to Mr. Nakahara, “The profit-driven operation can change work processes and worker knowledge to improve performance by automating business processes for sustainable value.”

KBC’s domain knowledge is embedded into the structured operations, engineering, and management SPIs. These provide knowledge, best practices, and advice to help operations understand what is happening and get the insights needed to know what action to take to make operational and business improvements.



**Digital Dashboards**

### **Digital Dashboards Identify Opportunities**

According to the company, clear, concise, and easy-to-understand digital dashboards, along with its expertise, can help customers identify opportunities, balance operational priorities, and motivate operators to improve operations. The Synaptic Business Automation concept includes role-based digital dashboards and synaptic performance indicators, combined with expert advice based on benchmarking, root cause analysis, and consulting for continuous improvement.

### **“Co-Piloting” for Operational Excellence**

Yokogawa’s KBC Co-Pilot/OpX Consulting Services are designed to provide users with benefits equivalent to having an expert on site 24/7. This is especially important as knowledgeable workers leave the workforce. In a similar manner to how a co-pilot assists an airplane’s pilot, the KBC Co-Pilot includes implementing online models or “digital twins” of the asset. These continuously monitor and forecast unit equipment performance and

energy consumption and share the information with centrally based experts that, in turn, share knowledge with and provide advice to plant staff.

The ability to extract real-time plant data enables operators to compare planned value to actual value and optimize profit in real time. This type of capability is becoming increasingly important due to the retiring knowledge base and demographics of the new workforce.

### **Co-Innovation**

Yokogawa is developing and co-innovating these solutions with well-known, industrial knowledge-based partners such as Shell, Baker Hughes-GE, and Chevron.

For example, Yokogawa and Shell are collaborating on PACE for advanced control and estimation. The platform combines multi-variable control, quality estimation, complex custom calculations, and operator user interface design into one application to reduce deployment time and simplify maintenance. With Chevron and others, Yokogawa is co-innovating a supply chain production planning solution. Yokogawa has also partnered with Baker Hughes-GE to develop a molecular-enabled digital twin that combines GE analytics with that company's experience on rotating machinery and jet engines.

### **Conclusion**

With the company's comprehensive Synaptic Business Automation concept, Yokogawa appears to be well-positioned to deliver value-adding consulting, technology, services, and solutions to its customers. These solutions leverage the combined technology and expertise of Yokogawa, KBC, and third parties, with the industry and application knowledge of their customers to help link plant operations to the business. This "synaptic" approach is designed to support effective co-innovation and digital transformation to enable sustainable plant and business performance improvements.

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