Challenges to the Automation Profession in Response to Technology Trends

Don Bartusiak

Presentation to ISA Annual Leadership Conference, San Diego CA, 26 Oct 2019
ISA’s heydays; Emergence of DCS; “Hardwareization” of the Purdue model

- 30,000+ at ISA Shows
- Vendor User Group meetings
- Disconnect with the science
- A decomposition of decision-making becomes a hardware design
Relative pace of progress: ICS, networking, communications

Data flows around the DCS are increasing

Wireless instruments to business system

NAMUR Open Architecture
I/O and compute are distributing even more

Field-mounted electronic marshalling

Open Process Automation
Distributed Control Node

- Compute
  - AI
  - PID
  - AO

- IO
  - TB
  - TB

- TA

- 4-20mA/HART Transmitter
- 4-20mA/HART Transmitter
Engineering support of manufacturing is moving above-site

Emergence of the Data Lake

- **Data Lake**
  - **Types of data**
    - Structured
    - Semi-structured
    - Unstructured

Above-site

- Data Lake
- Historian
- DCS

At-sites

- Data concentrator
- Access points

Remote third-party support
Engineering skills are converging

- Digital networks
- Cybersecurity
- IT/Control Systems/Instrumentation/Electrical/Analyzers managed environments
IT/OT convergence (a positive take)

• “The 99% availability world and the 99.9999% availability world are very different.” (Bartusiak (2019))

• From: Static locked configuration

• To: Elastic configuration and orchestration
Open Process Automation

A standards-based, open, secure, interoperable process automation architecture

https://publications.opengroup.org/p190
Conclusions

• We are at an inflection point greater than any I’ve seen in my process control career since 1984.
• The question is not why we can’t do it. Our survival requires innovation.
• The question is how to do it.

“[one cannot] play the game the way it’s supposed to be played. The very decision-making and resource-allocation processes that are key to the success of established companies are the very processes that reject disruptive technologies.” (Christensen, CM. The Innovator’s Dilemma. Harvard Business School Press. 1997.)

• What abides? Requirements for safety, reliability, security, real-time determinism, workforce productivity, intra-company and external communications.