Analysis of Automation in Manufacturing in the Pharmaceutical Industry

Automation Technology
Value of Automation
Automation Costs
Dave Adler

- Automation project management.
- Planning in biotech and pharmaceutical industries.
- 30+ years senior automation consultant large pharma company.
- 5+ years independent senior consultant at Brillig Systems.
- ISA Executive Board and VP of Publications.
Database

- Conducted over 200 individual surveys with automation and business leaders from 25 Biotech and Pharmaceutical Companies.
- Generated over 500 correlations and graphs comparing the results of 100 automation projects and 300 automated facilities.
What do operations leader’s think about the current level of automation? What is their number one requested automation technology?
How would you assess the level of automation in your facilities?

- Too Low 67%
- Appropriate 33%

Senior operation leaders
When asked about the future, Operations Management’s top requested automation technology was:

- **Enhanced operator Interface** - simplify users interactions, visualization of performance, increased mobility, and wireless.
Current Levels of Tools and Capabilities for Operator Interfaces

As reported by automation leaders

- ISA standard graphics: 75%
- Standard style guide: 50%
- Human factors approach: 40%
- Specialized homepage for personnel: 25%
- Info accessible anywhere: 20%
- Dashboard for financial info: 10%

Projects implemented with these tools and capabilities.
Summary - Automation Technology

More!
Value of Automation

How did operation leader’s answer the question, Overall, what value does your plant's automation provide?

Very high value
High value
Moderate value
Low value
No value

“What, no year-end bonus? May I propose a 2013 bonus program based on the millions of dollars I’m saving the company by automating the manufacturing facility?”
Overall, what value does your plant's automation provide?

- Very High Value: 37%
- High Value: 33%
- Moderate Value: 30%
- Low Value: 0%
- None: 0%

Operations management only
Average ROI’s

As reported by automation leaders

- data historian
- virtualization
- PAT
- average for automation
- vision
- MES

Average ROI’s
Wide variation in ROI’s from facility to facility

Approximate automation benefit (ROI %)

% of automated facilities at each level of ROI

As reported by automation leaders
What Causes Variability in Automation Benefits from Facility to Facility?

As reported by automation leaders:

- Automation staffing level
- Automation technology complexity
- Type of pharmaceutical facility
- Vendor of automation system

Ratio of ROI’s from the analysis of the facilities populations.
What value does your plant's automation staff provide?

Senior operations management only

Moderate Value

High Value

value of automation

value of automation personnel

High High Value

High Value
Operation leaders feedback: They like automation technology but think automation professionals are bozo’s
What was operations leaders overwhelming negative feedback?

What is the biggest concern that business leaders have about automation?
Question from survey: What should the Automation Discipline focus on in the next 5-10 years?
Top survey response: **Reducing automation costs.**

Question from survey: What is your top negative trait of automation?
Top response: **Too expensive.**
Automation Project Cost Variation

As reported by automation leaders

% of automated facilities at each level of cost

Approximate automation project cost (normalized cost/I/O)
Automation Project Cost Variability

As reported by automation leaders

- Automation support personnel
  (high level/low level of staffing)
- Size of the project
  (large/small project)
- Requirements
  (Defined early/defined late in project)
- Automation technology
  (high level/low level of automation)

Ratio of normalized cost per I/O from the analysis of the facilities populations.
Size of the Project

As reported by automation leaders

- Replication was an issue
- Replication was extensive

Size of Project (Relative I/O count)

Total cost ($ millions)
Technology

Relative cost and benefit

As reported by automation leaders

Sum of the technology ladders
Summary - Automation Costs

Less!
What Should Automation Do?

Operation leaders feedback:
- Want more automation
- Want less expensive automation
- Like automation technology
- Like the technology better than automation personnel

A deeper analysis into the questions raised by these perceptions of operations business executives, specifically, “Why do our customers value the automation we provide but not us?” Automation has morphed from an engineering function to a support function.
What does automation leadership need to do to improve automation’s brand?

- Lead efforts at improvement, optimization, and innovation. Be a change agent.
- Communicate the value and benefits of automation.
- Align, partner and connect with other disciplines and leadership.
- Retain automation professionals and develop their technical skills.
- Establish a clear strategy.
- Be process, business, and operations oriented.
- Increased focus on data availability and analysis.
- Lead efforts to simplify and reduce cost to implement.

Frequency factor was cited

20% 10%
Questions?

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