



*Setting the Standard for Automation™*

# Analysis of Automation in Manufacturing in the Pharmaceutical Industry

Automation Technology  
Value of Automation  
Automation Costs

Standards  
Certification  
Education & Training  
Publishing  
Conferences & Exhibits

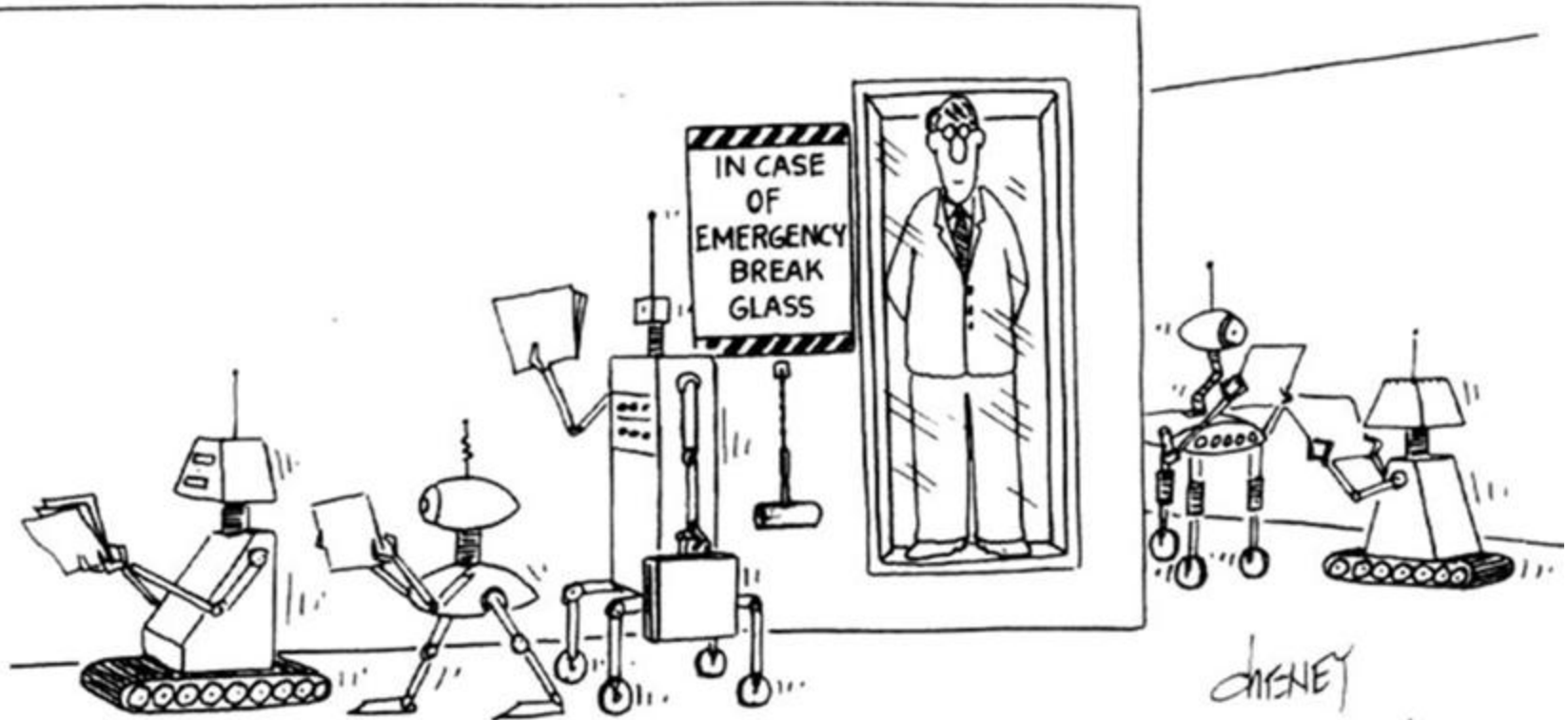
- Automation project management.
- Planning in biotech and pharmaceutical industries.
- 30+ years senior automation consultant large pharma company.
- 5+ years independent senior consultant at Brillig Systems.
- ISA Executive Board and VP of Publications.

Brillig  
Systems  
*Making Projects  
Successful*



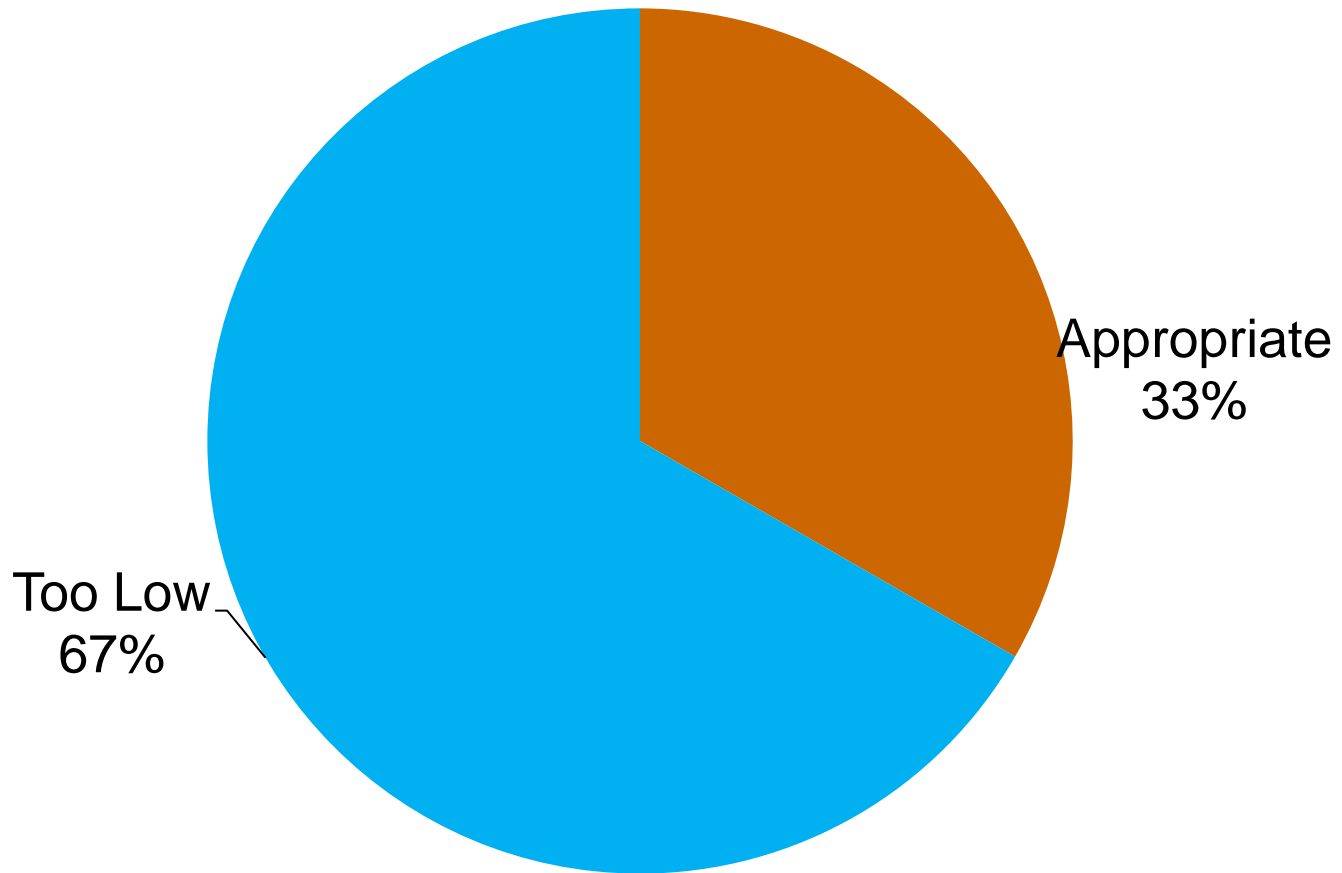
- Conducted over 200 individual surveys with automation and business leaders from 25 Biotech and Pharmaceutical Companies .
- Generated over 500 correlations and graphs comparing the results of 100 automation projects and 300 automated facilities.





What do operations leader's think about the current level of automation?  
What is their their number one requested automation technology?

# How would you assess the level of automation in your facilities?



Senior operation leaders

# What is the technology gap?



When asked about the future, Operations Management's top requested automation technology was:

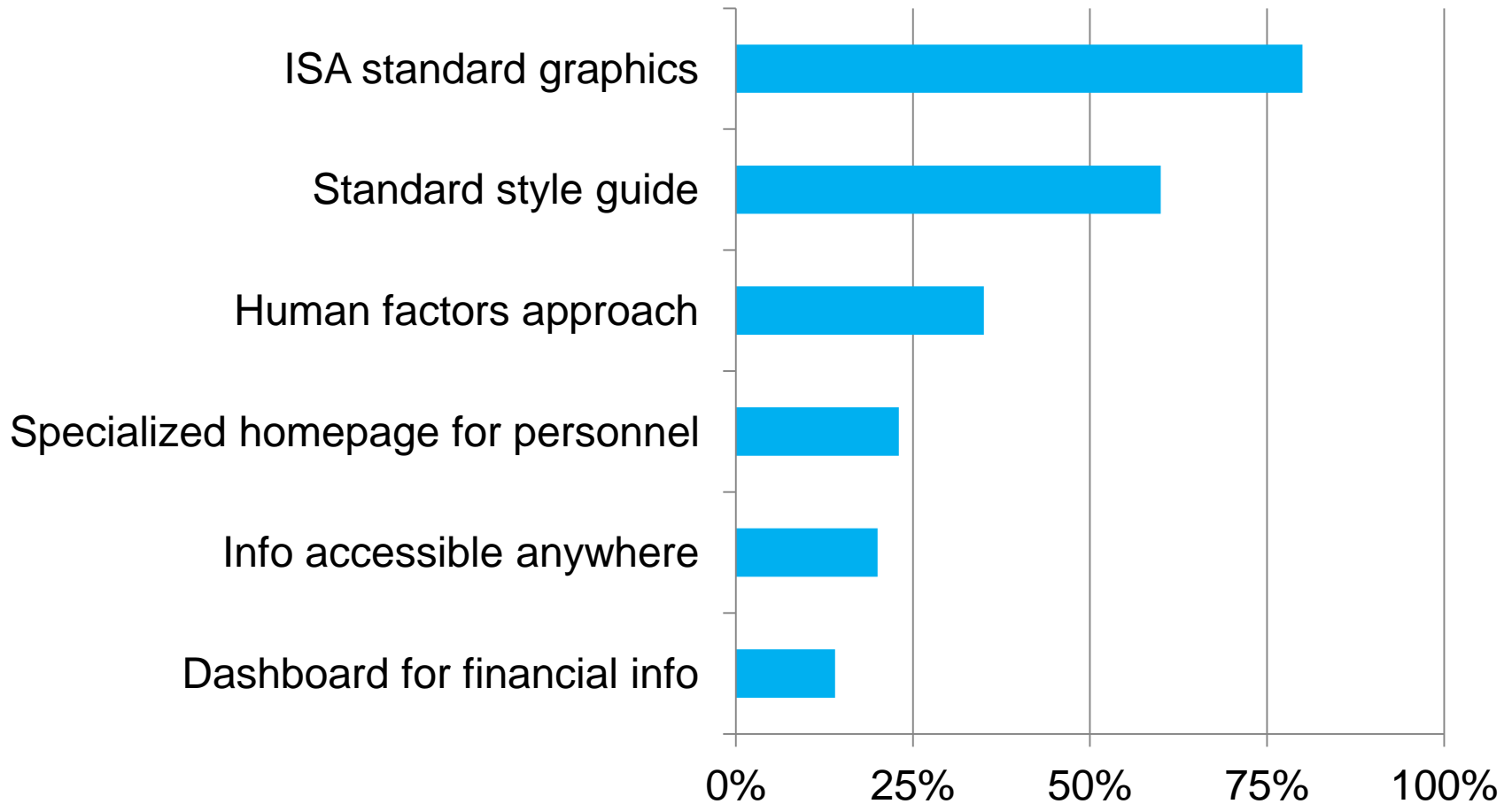
- **Enhanced operator Interface** - simplify users interactions, visualization of performance, increased mobility, and wireless.



# Current Levels of Tools and Capabilities for Operator Interfaces



As reported by automation leaders



Projects implemented with these tools and capabilities



More!



# Value of Automation



*“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?”*

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

**Very high value**

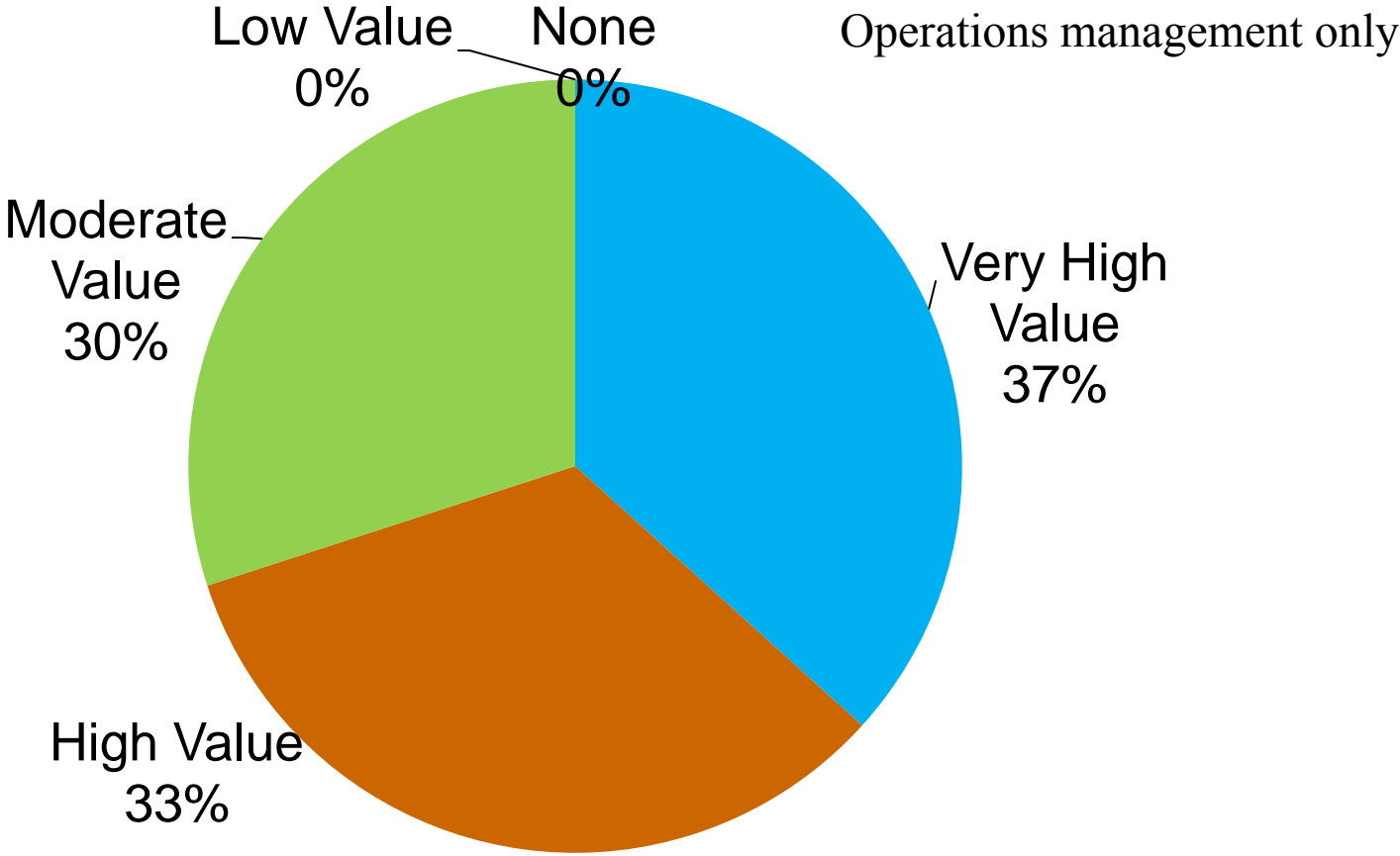
**High value**

**Moderate value**

**Low value**

**No value**

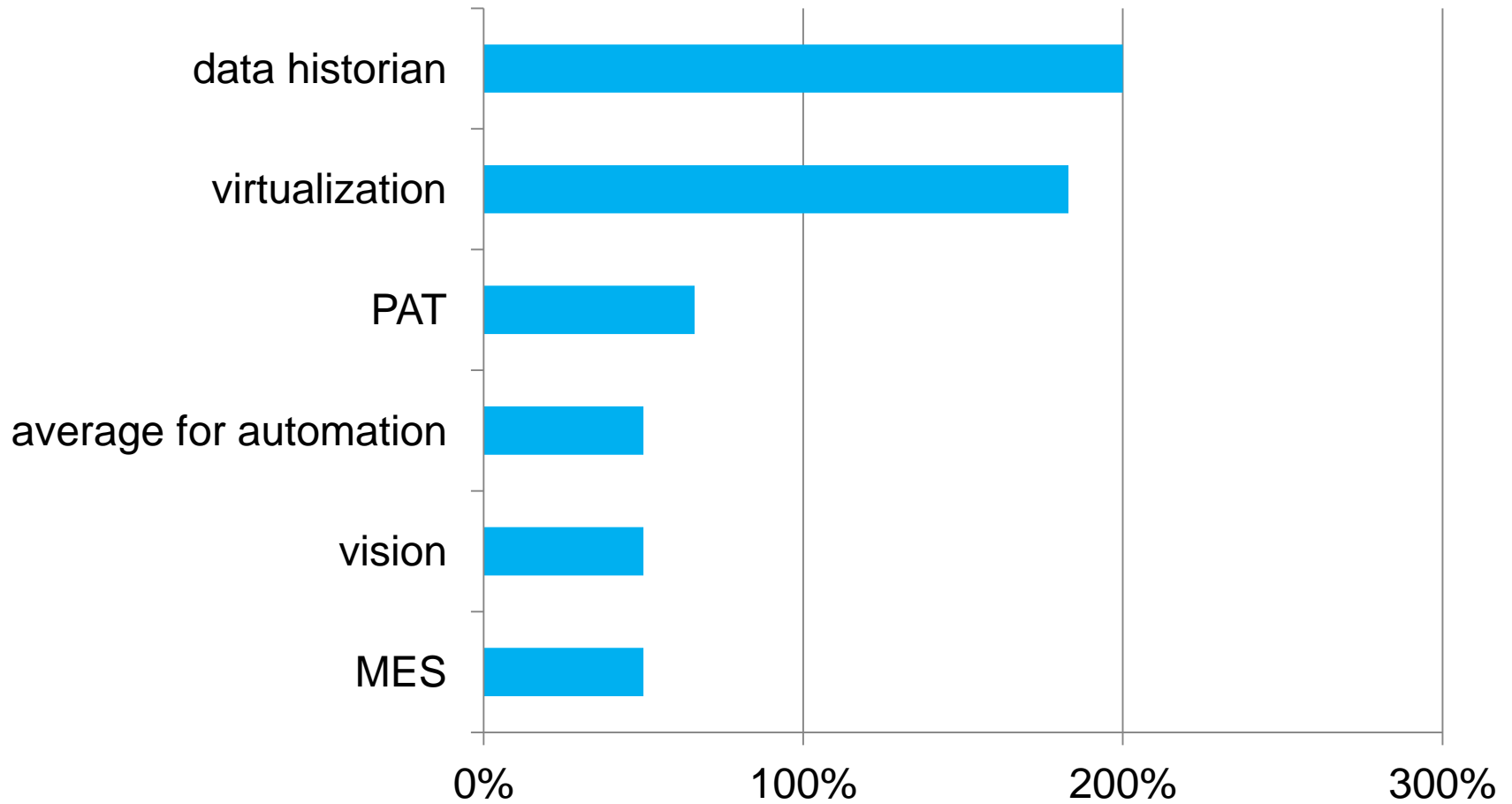
# Overall, what value does your plant's automation provide?



# Average ROI's



As reported by automation leaders

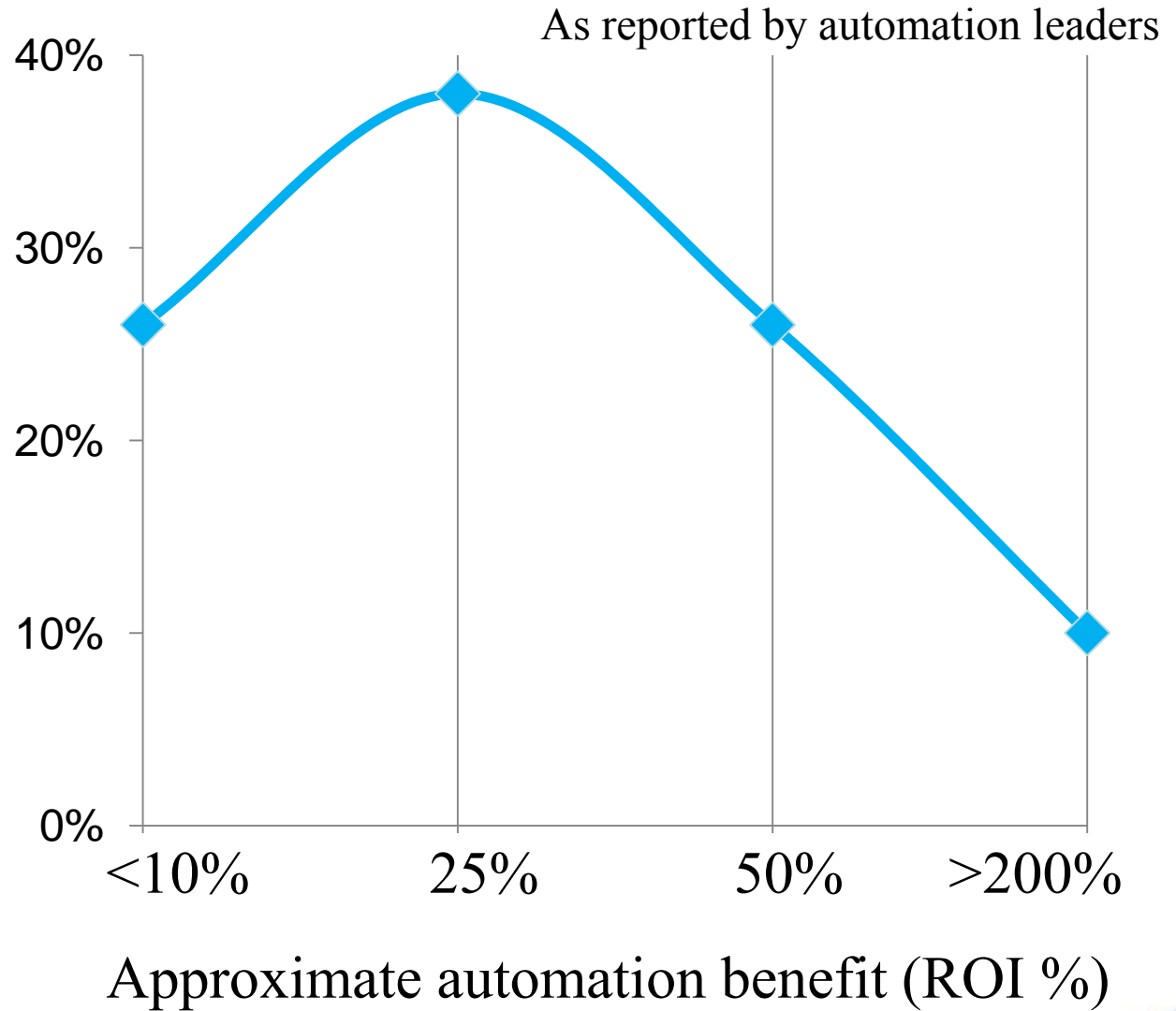


Average ROI's

# Wide variation in ROI's from facility to facility



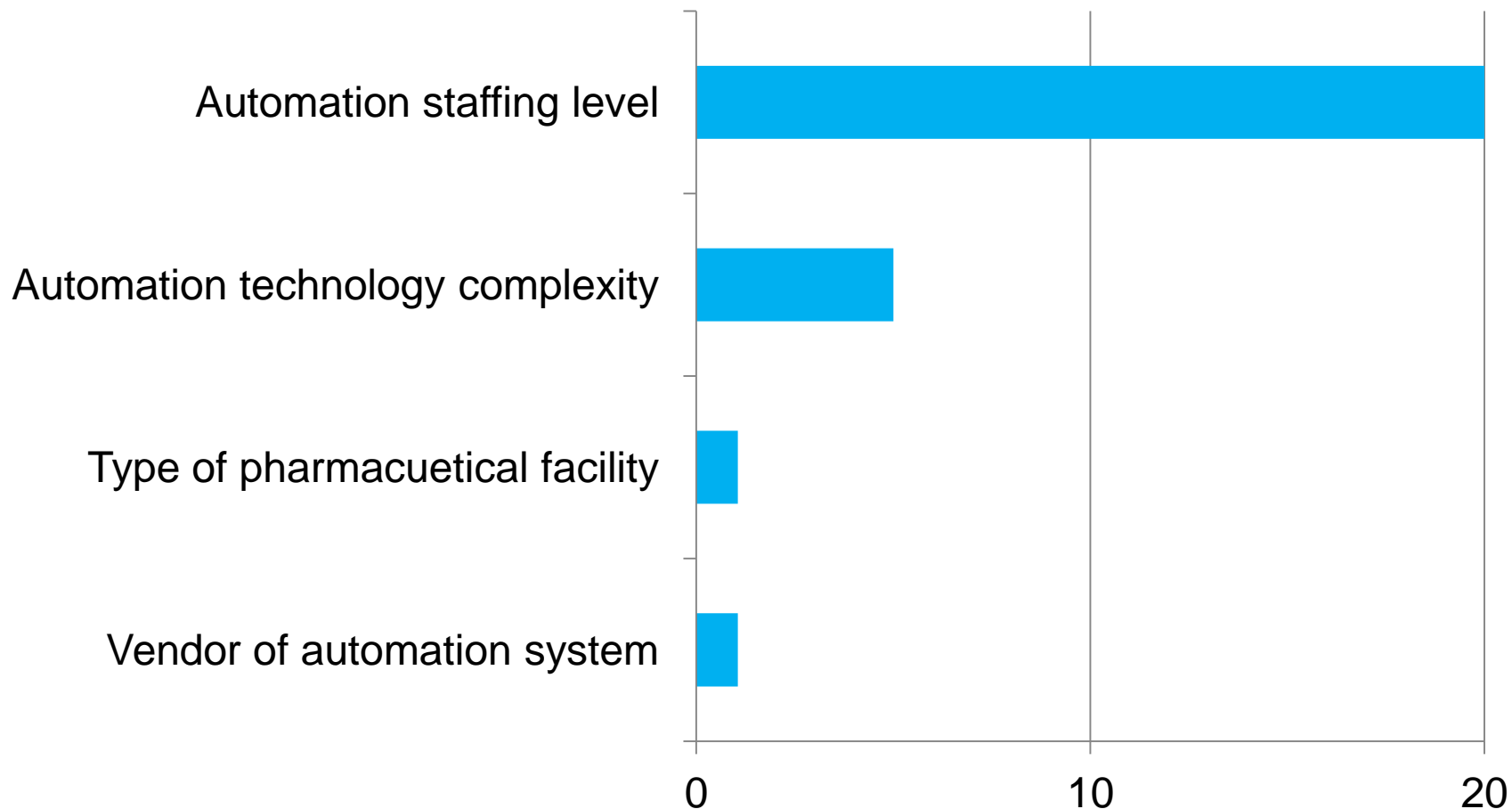
% of automated facilities at each level of ROI



# What Causes Variability in Automation Benefits from Facility to Facility?



As reported by automation leaders



Ratio of ROI's from the analysis of the facilities populations.

# What value does your plant's automation staff provide?



High High Value

Senior operations management only

High Value

Moderate Value

value of automation

value of automation  
personnel





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?



# Automation Cost!



Question from survey: What should the Automation Discipline focus on in the next 5-10 years?

Top survey response: **Reducing automation costs.**

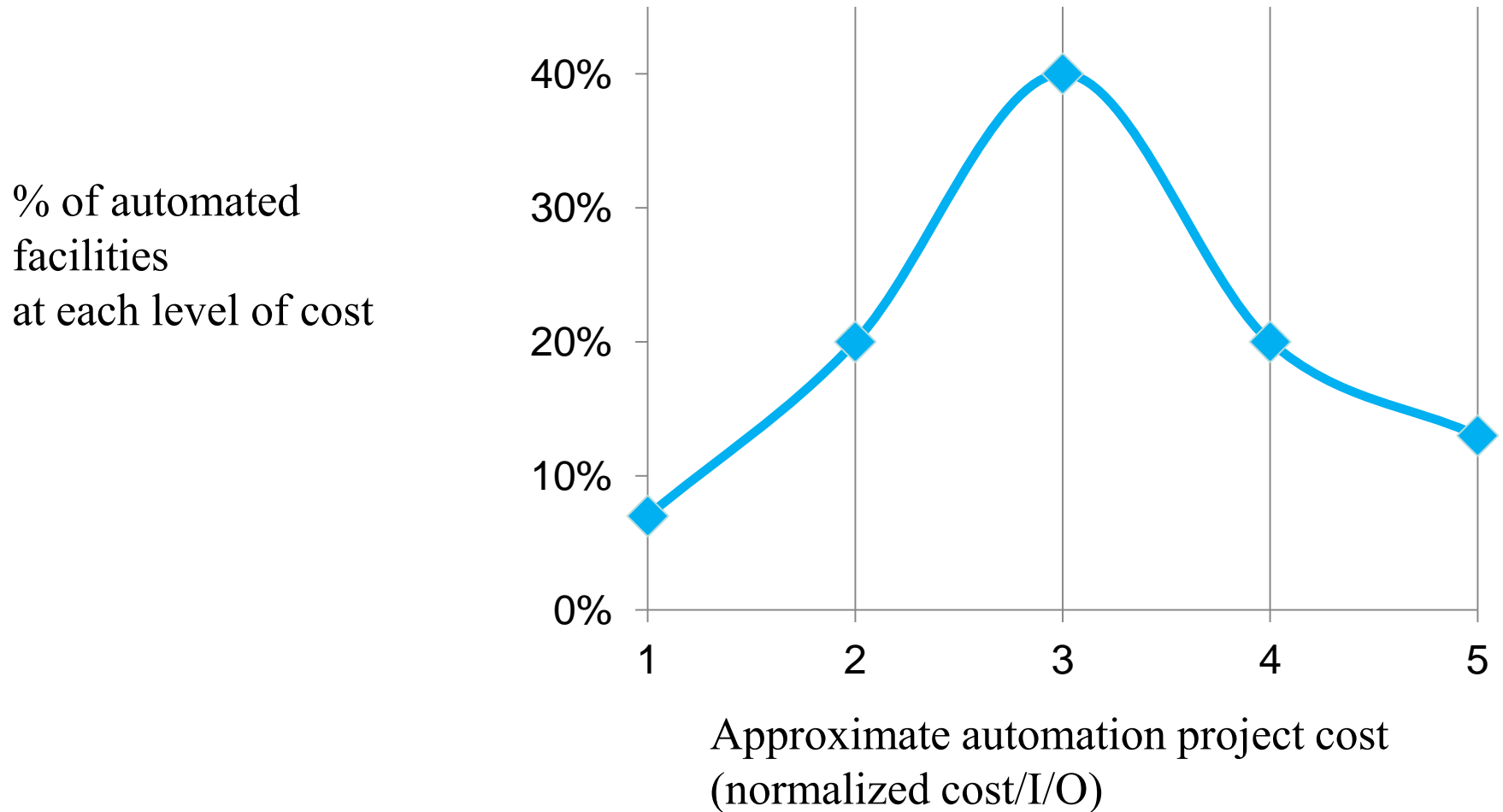
Question from survey: What is your top negative trait of automation?

Top response: **Too expensive.**

# Automation Project Cost Variation



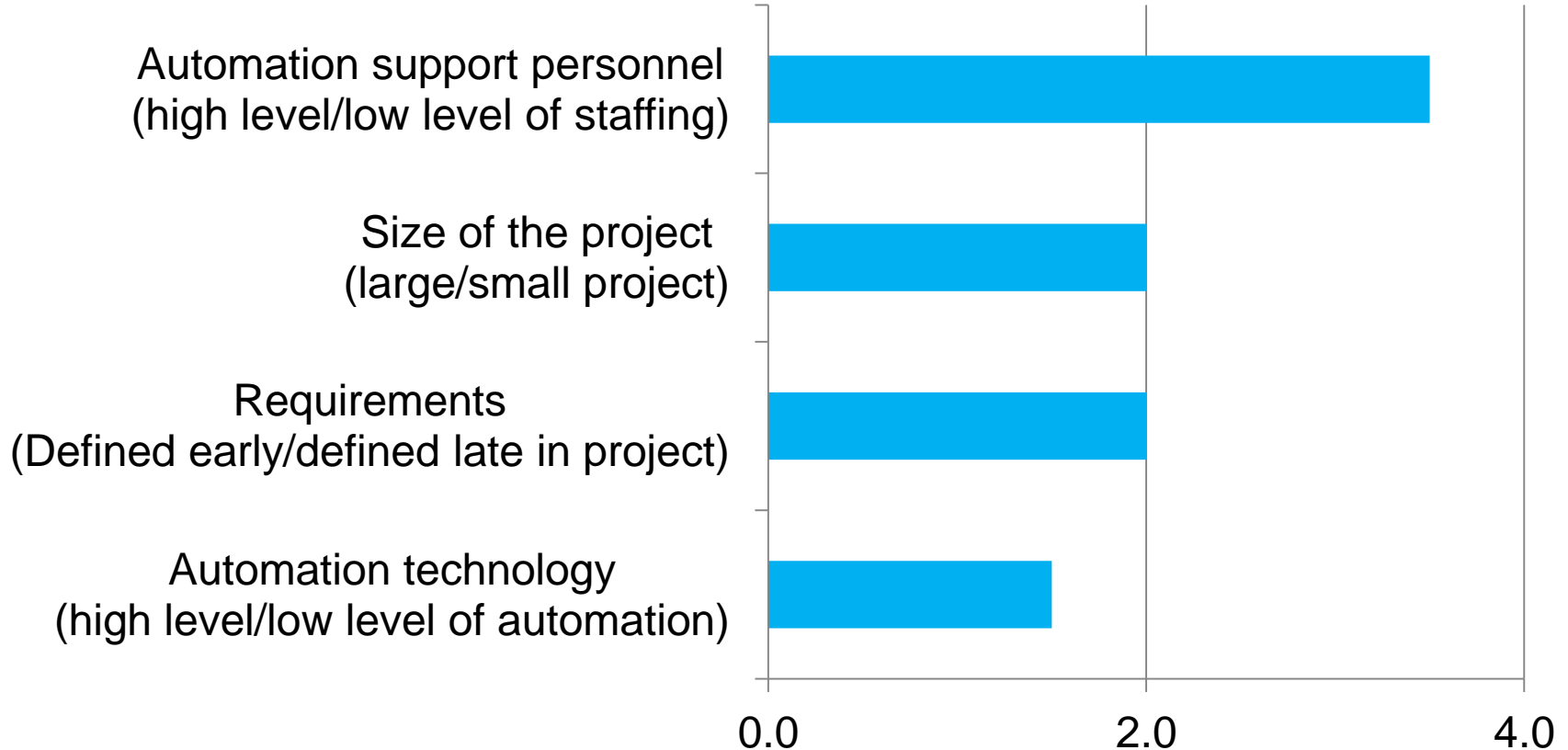
As reported by automation leaders



# Automation Project Cost Variability



As reported by automation leaders



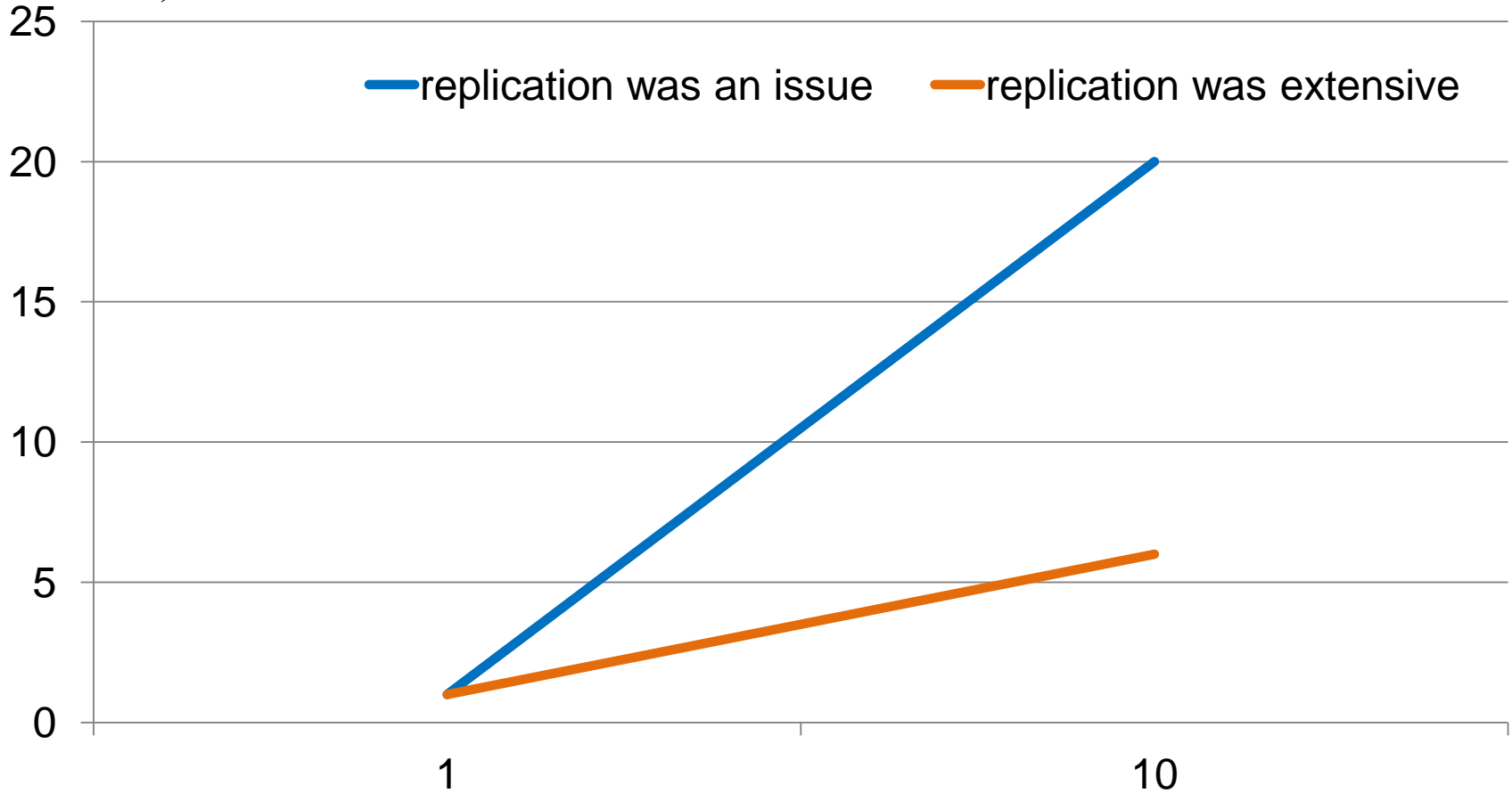
Ratio of normalized cost per I/O from the analysis of the facilities populations.

# Size of the Project



Total cost  
(\$ millions)

As reported by automation leaders

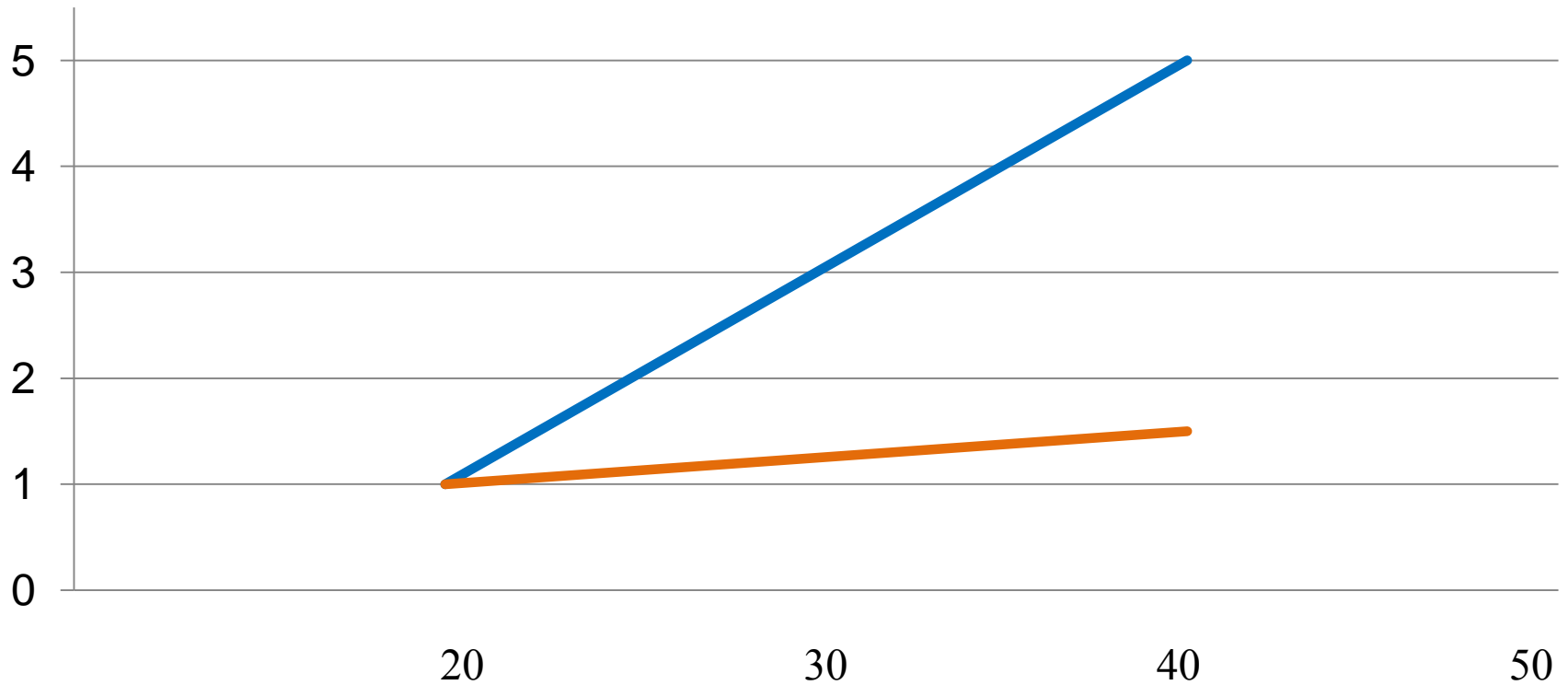


Size of Project (Relative I/O count)

## Relative cost and benefit

As reported by automation leaders

— benefit — cost



Sum of the technology ladders

# Summary - Automation Costs



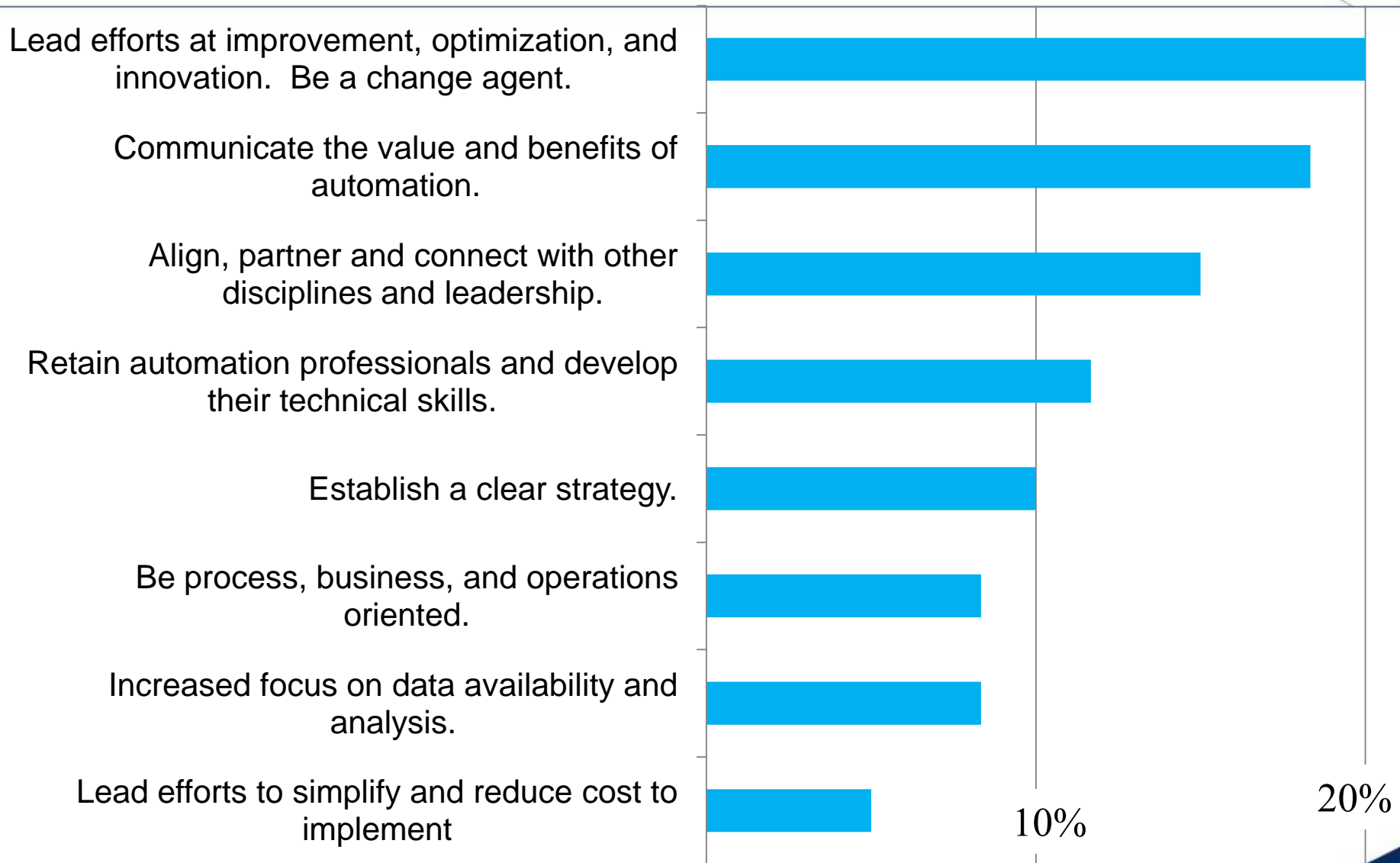
Less!

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?



Frequency factor was cited



# Questions?



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