The Power of Test

2023 Test Leadership Research

In partnership with

FT LONGITUDE

EMERSON

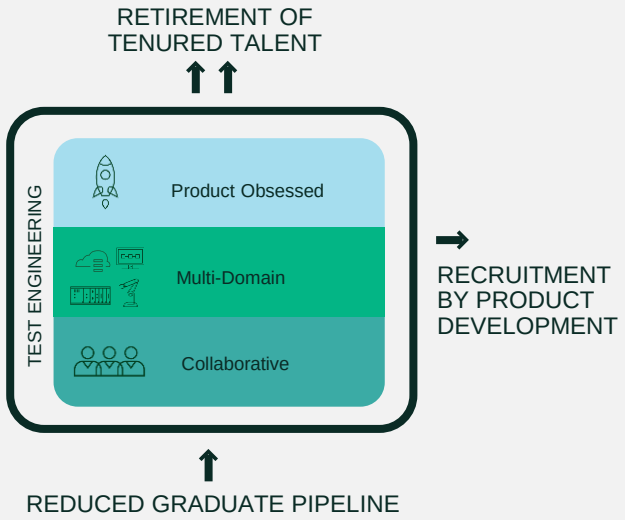
Evolving Engineering Complexity

- USB-C
- BT 5.0
- 3 processors
- 2 buttons
- 2 LEDs
- 4 MEMS Mics
- IP55
- Battery
- Accelerometer

“[We must] reduce test development from months to weeks despite a 2.5X test coverage increase on new products”

CHRISTIAN WOLF
TEST MANAGER, GN AUDIO

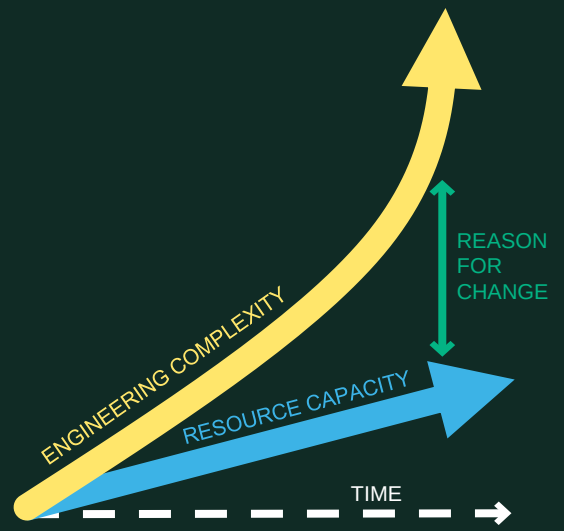
Reduction of Available Talent



“High starting salaries for software engineering graduates disincentivizes specialization in electrical engineering”

BRITTNEY OUTLAW
ACADEMIC ADVISOR, UNIVERSITY OF TEXAS

Change of Test Strategy.



“If we don’t invest, we won't be able to deliver to the customer, and this business will be in trouble in a couple of years time”

PAUL KILBRIDGE
NPI MANAGER, EI ELECTRONICS

Survey Methodology

Size

200

Pre-screened survey respondents – not company aligned

Geo

Global

USA, Germany & China

Level

Leader

60% Manager
40% Director/VP

Industry

4

25% Aerospace
25% Automotive
25% Semiconductor
25% Electronics

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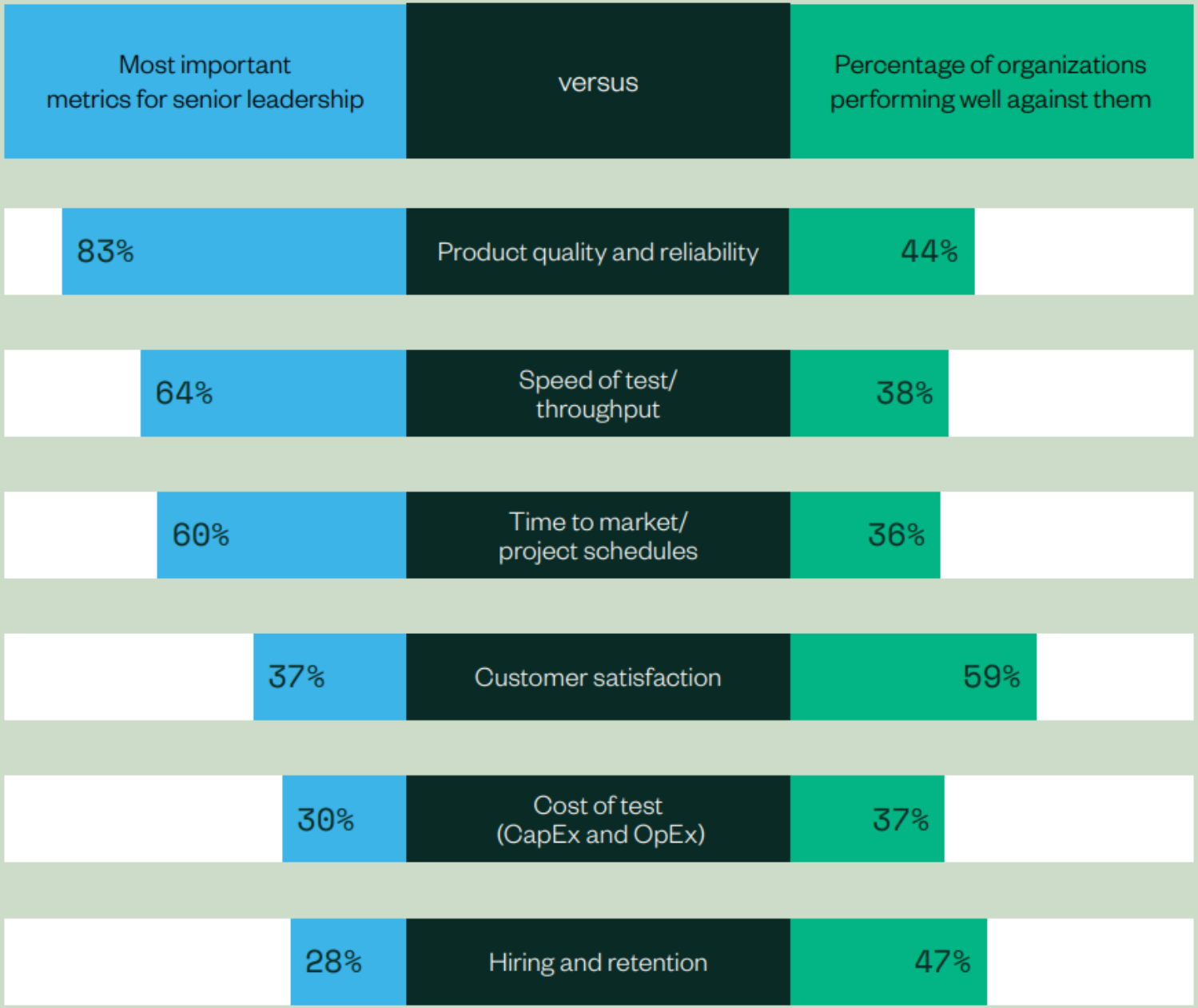
This research report was produced by FT longitude, the specialist research and content division of the Financial Times Group. The views expressed in this report are those of NI.

Test Teams are Failing

Less than half of organizations say they're performing well across most of their important metrics.



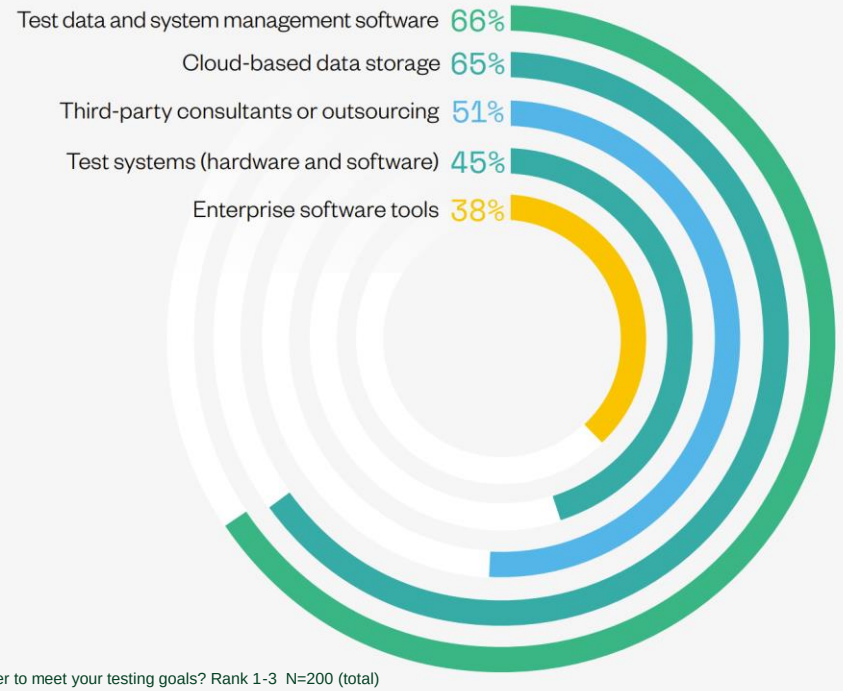
Q: What are the most important metrics for senior leadership at your company today? N=200 Rank 1-3 summary.
Q: How is your company performing against the following metrics? (above or well above expectations) N=200

Data is a Prioritized Investment

Strong focus on data supports NI's previous findings that companies with advanced data strategy outperform across every metric

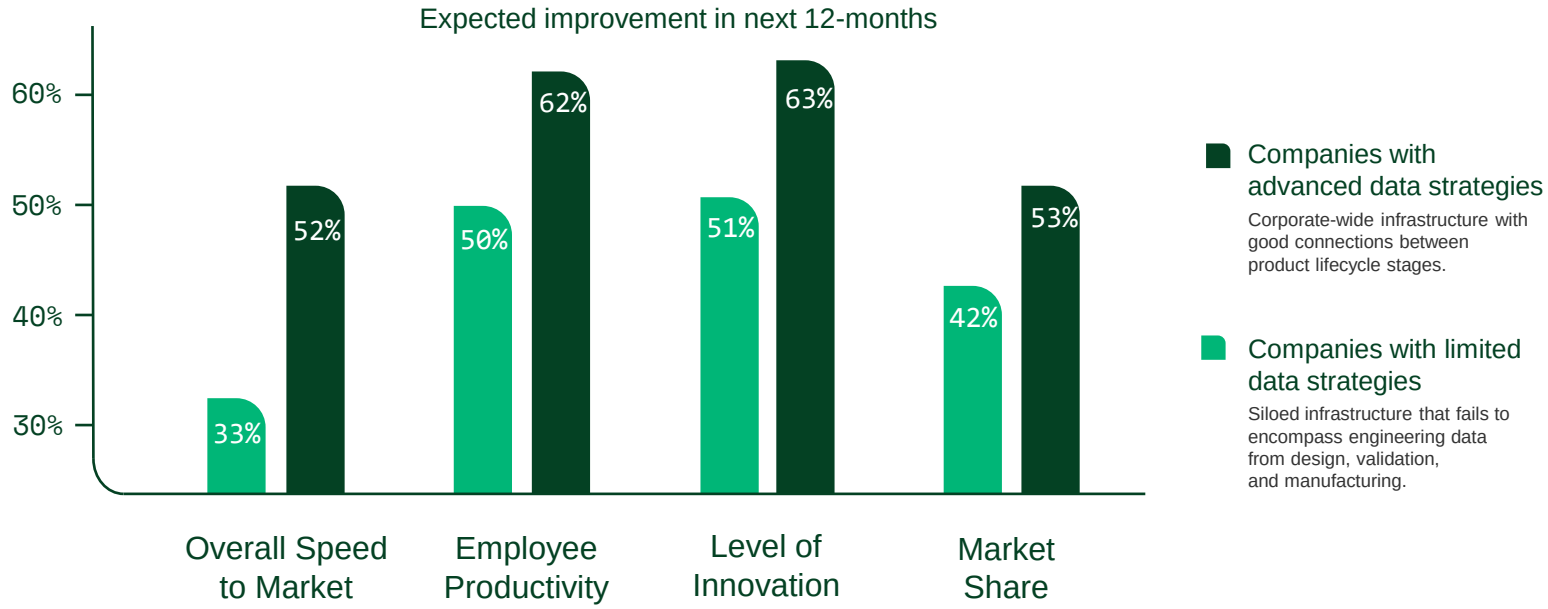
2023 RESULTS

Top 5 investments test teams would like to make to help meet their company's goals



Q: What are the top three investments you would like to make in order to meet your testing goals? Rank 1-3 N=200 (total)

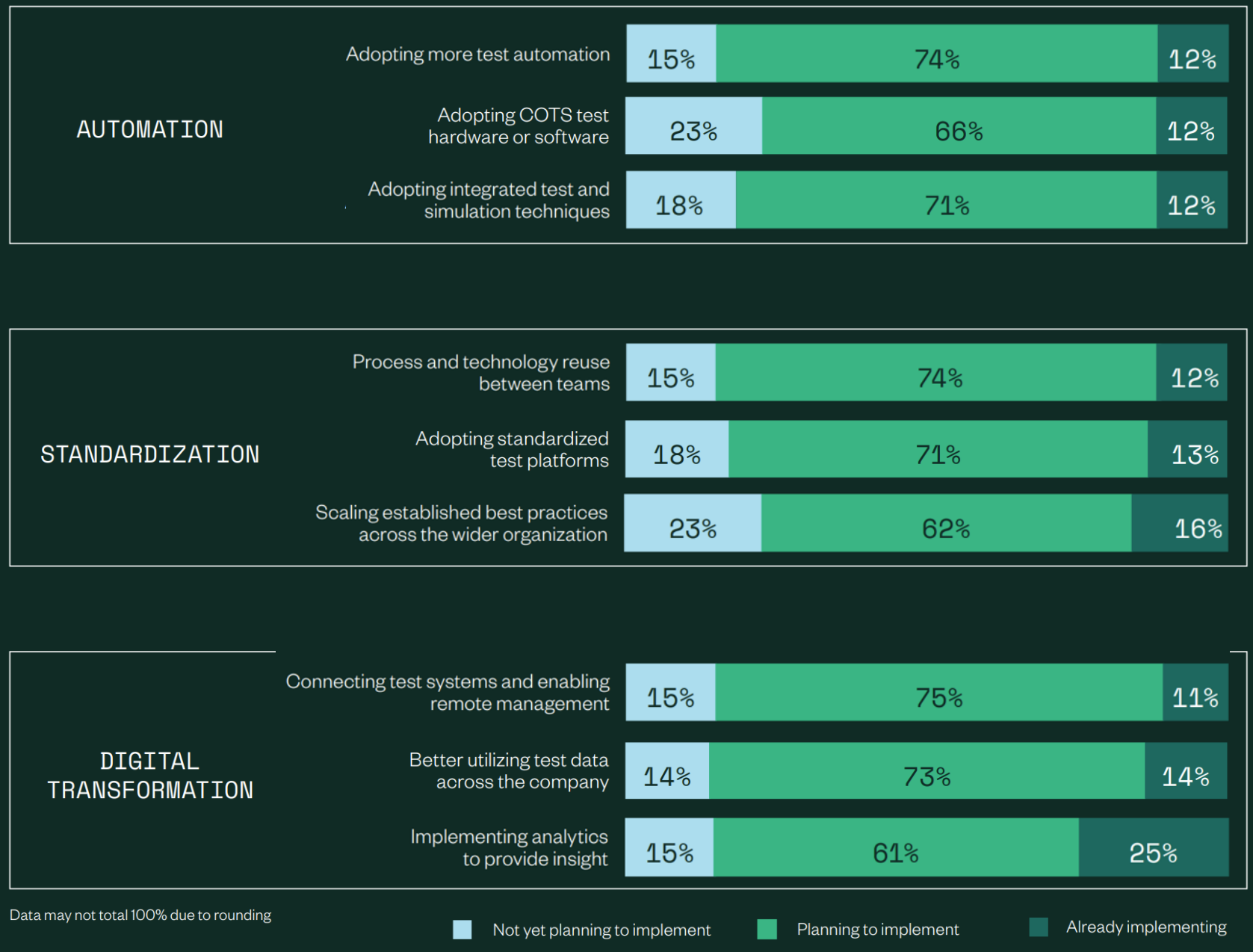
2022 RESULTS



Initiative Sponsorship

Test teams are pressing ahead on important initiatives over the next 12 months

However, outcomes may suffer if prioritization cannot be defined



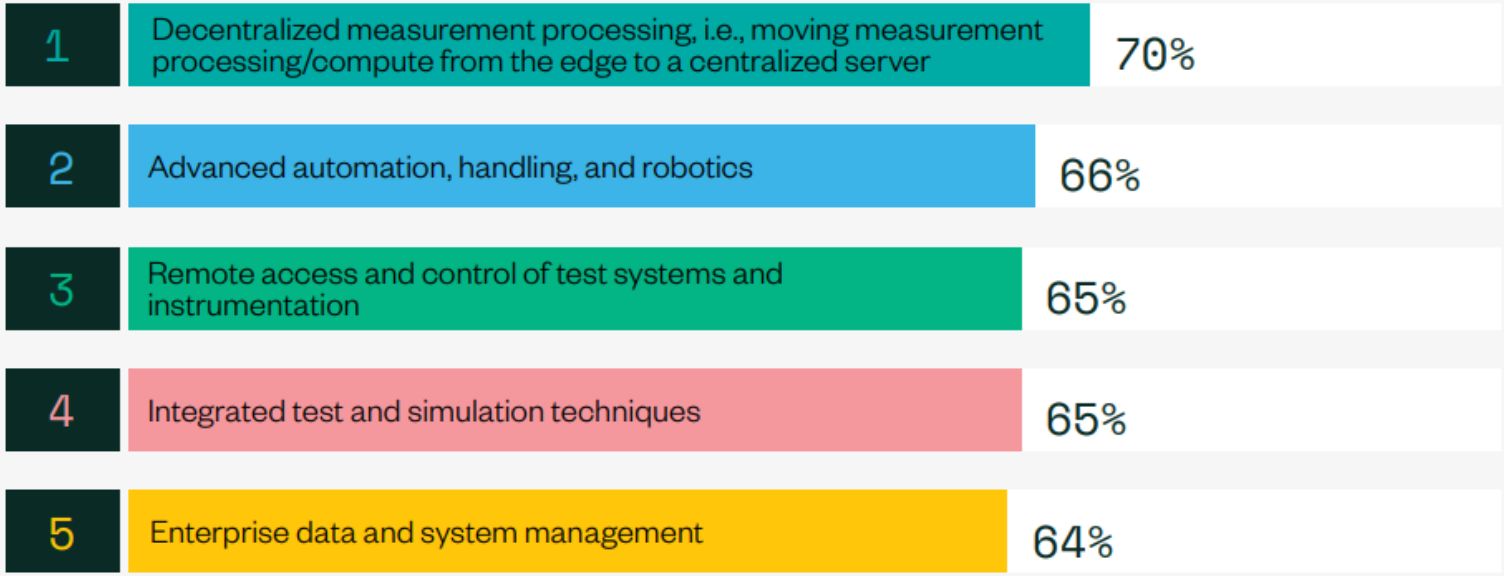
What initiatives are you currently implementing, or looking to implement, over the next 12 months? N=200

Decentralized, Connected Future

Shifting to a decentralized cloud-based instrumentation model promises simpler software maintenance and the ability to scale compute and storage up and down based on user need.

This is likely to be adopted first in validation, as manufacturing groups with more predictable coverage needs prioritize remote access to improve reliability.

Top 5 commercial technologies likely to become part of test systems in next 5 years



Top 3 break out by application

Production and manufacturing	Design, Validation & Verification
1. Remote Access and Control	1. Decentralized Processing
2. Advanced Automation	2. Advanced Automation
3. Decentralized Processing	3. Artificial Intelligence

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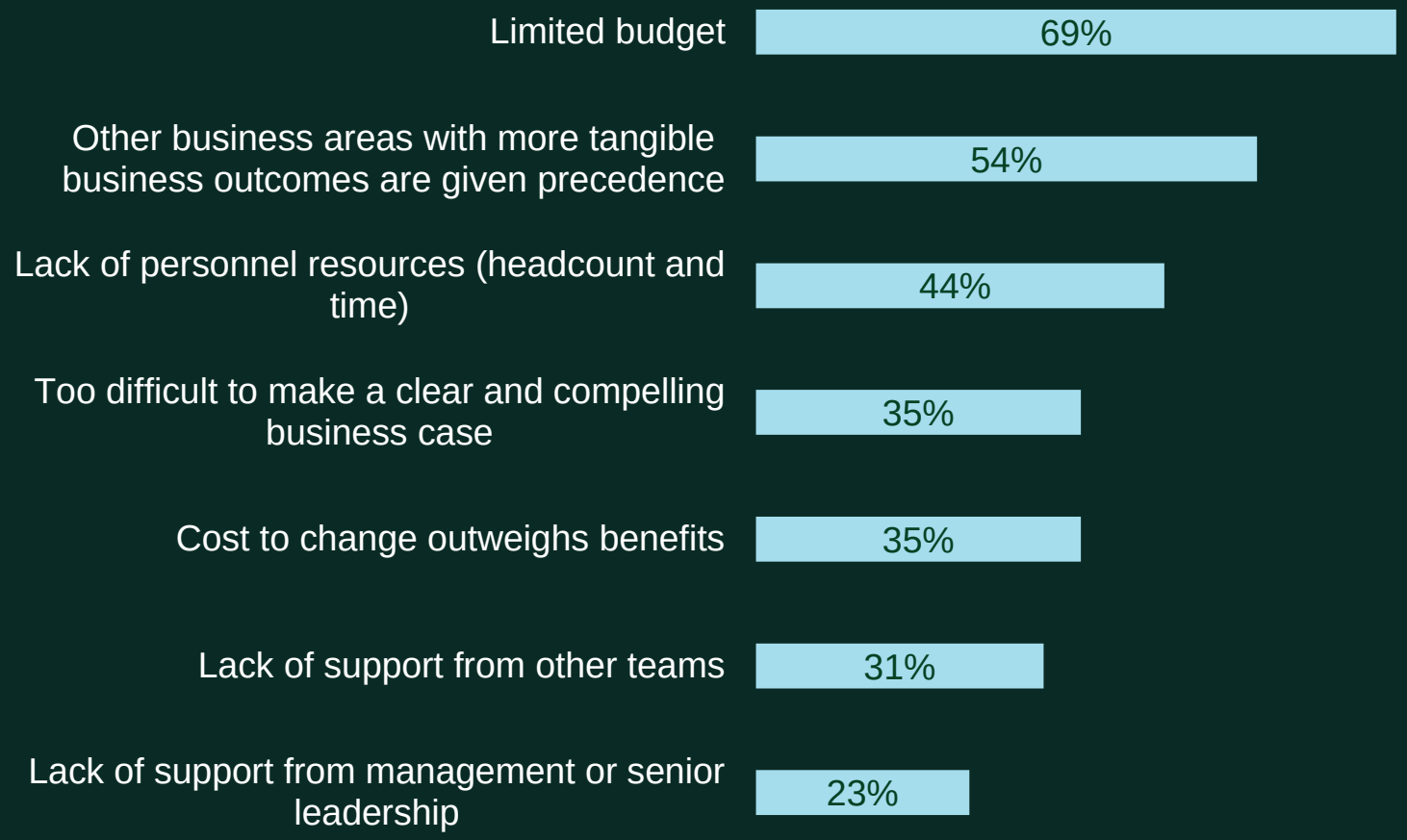
Budgetary Competition

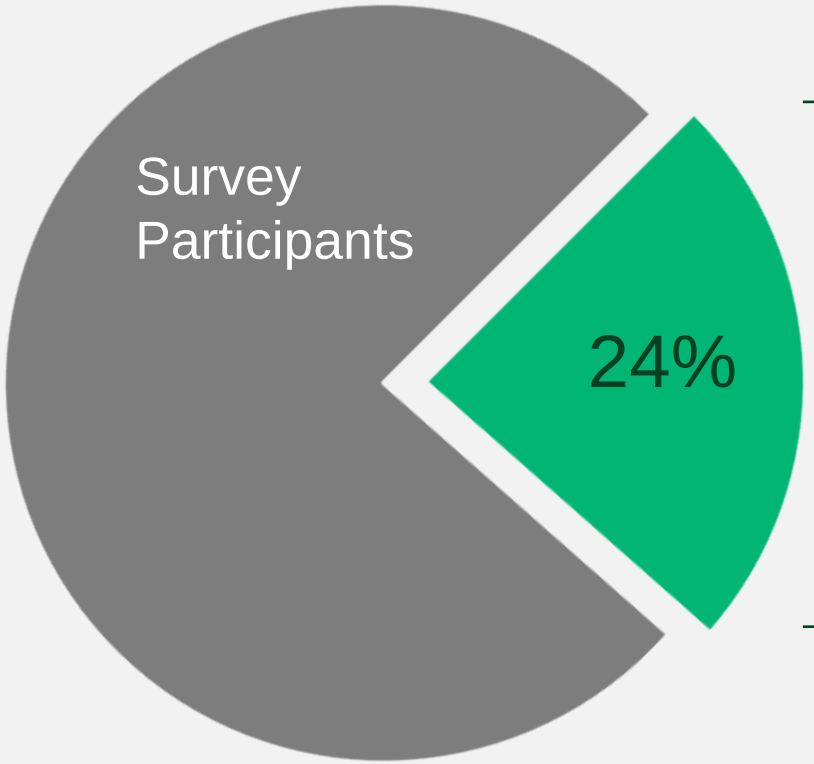
56% of test organizations expect their spending on test hardware, software, and personnel to increase in the next 12 months

BARRIERS TO TEST INVESTMENT



Q6: What are the biggest barriers preventing you from making investments in the test function overall? Rank 1-3 N=200

Learning from Best-in-Class Organizations



Above or
Well Above
Expectations

IN BOTH

Product Quality
& Reliability

Speed of Test
/ Throughput

Leaders Advocate Consistent Incremental Spending

Increasing spending in next 12 months

73%
Best Performers

51%
Everyone

89%
of this group **do not** plan to **significantly** increase their test budget

PHILIPS

> ***The ability to articulate the business value that a test organization could deliver was critical.*** *We forecast the exponential development and sustaining costs in-line with increased product complexity. A vision of breaking the relationship between product complexity and test-system cost provided executive buy-in*

NEIL EVANS
Test Manager, Philips

Software is Central to Leader's Test Strategy

Value in AI/ML

Twice as many leading organizations than the rest rate **advanced analytics as the most important** data investment, they'd like to make in the next two years (48% vs. 21%)

Increased Simulation

Broad adoption of **software centric test methodologies** is called out as a key contributor to accelerated design and test schedules

System Connectivity

All organizations rate **remote access and control a priority**, but leading groups are accelerating faster to meet globalization challenges.

Report Conclusion

- The increasing pace of product innovation is forcing changes in methodology across the development lifecycle.
- Leading test teams are rapidly educating company leadership as to the differentiating business value they can deliver, fueling investment in people, process and tools.
- Connecting test insights into other engineering functions is critical in unlocking the true power of test. This leads to test team leaders becoming business leaders by driving the adoption of new technology.

Harness Technology

The test function must expand its impact within the organization by implementing an intentional and software-connected test strategy

Automation: Increasing test coverage with software-connected and model-based test methodologies directly impacts product quality and creates the data foundation upon further investment depends.

Standardization: Efficiency and quality benefits from harmonizing process, systems and software compound in line with the scale of adoption. Also centralizes technical governance and product decisions.

Digital Transformation: Harnesses standardized test and operational data to direct product development. Insights build from real-time process course correction to complex AI/ML derived product improvement.