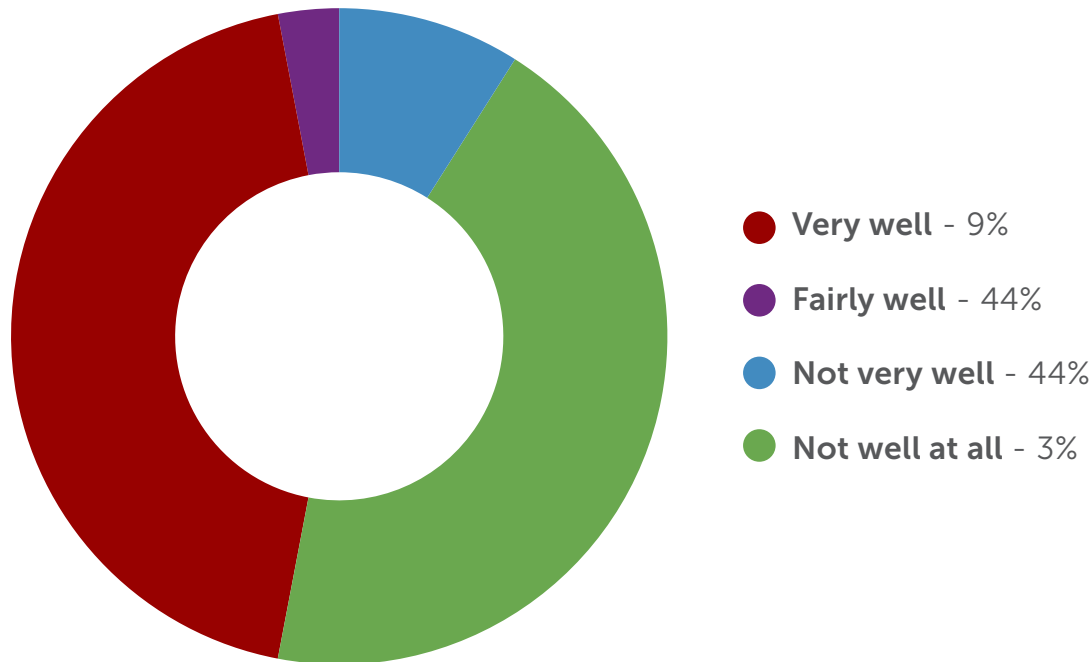# DCD

Trends in data center automation

Spring - Summer 2021

Commissioned by

ABB

In your experience, how well advanced are data centers in automating their operations and management?

- ● **Very well** – 9%
- ● **Fairly well** – 44%
- ● **Not very well** – 44%
- ● **Not well at all** – 3%

ANALYST COMMENT:

The sample divides evenly between those considering that industry adoption of automation is very or fairly well advanced (53%), and those considering it is not (47%).

Only a small minority of 12% hold a strong opinion either way. Most opinion stays closer to the midpoint. These findings indicate uncertainty and the sense that it may be too soon to hold strong opinions.
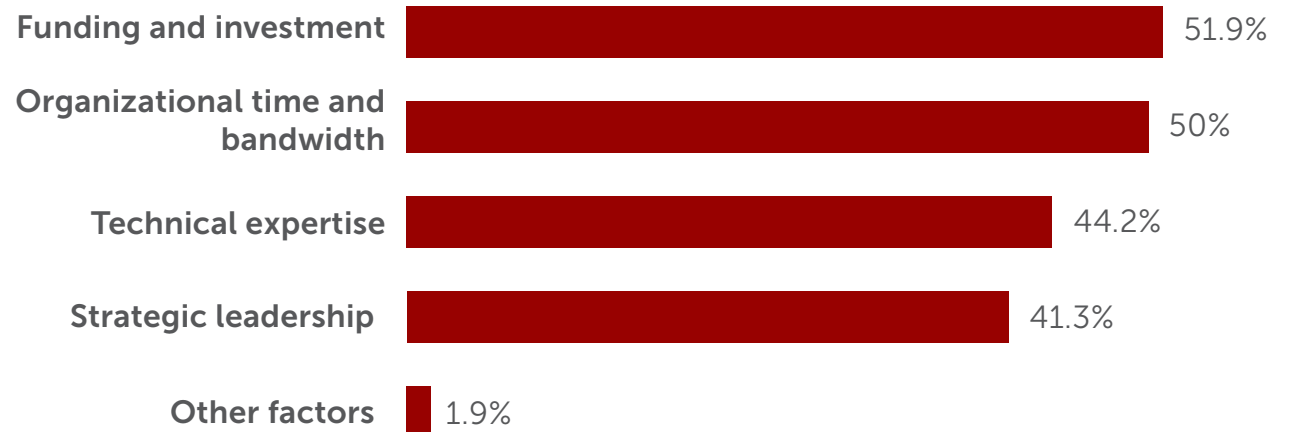
They therefore suggest there's still a lot of work ahead for the industry and an opportunity for those able to supply them with the guidance and technologies they need.
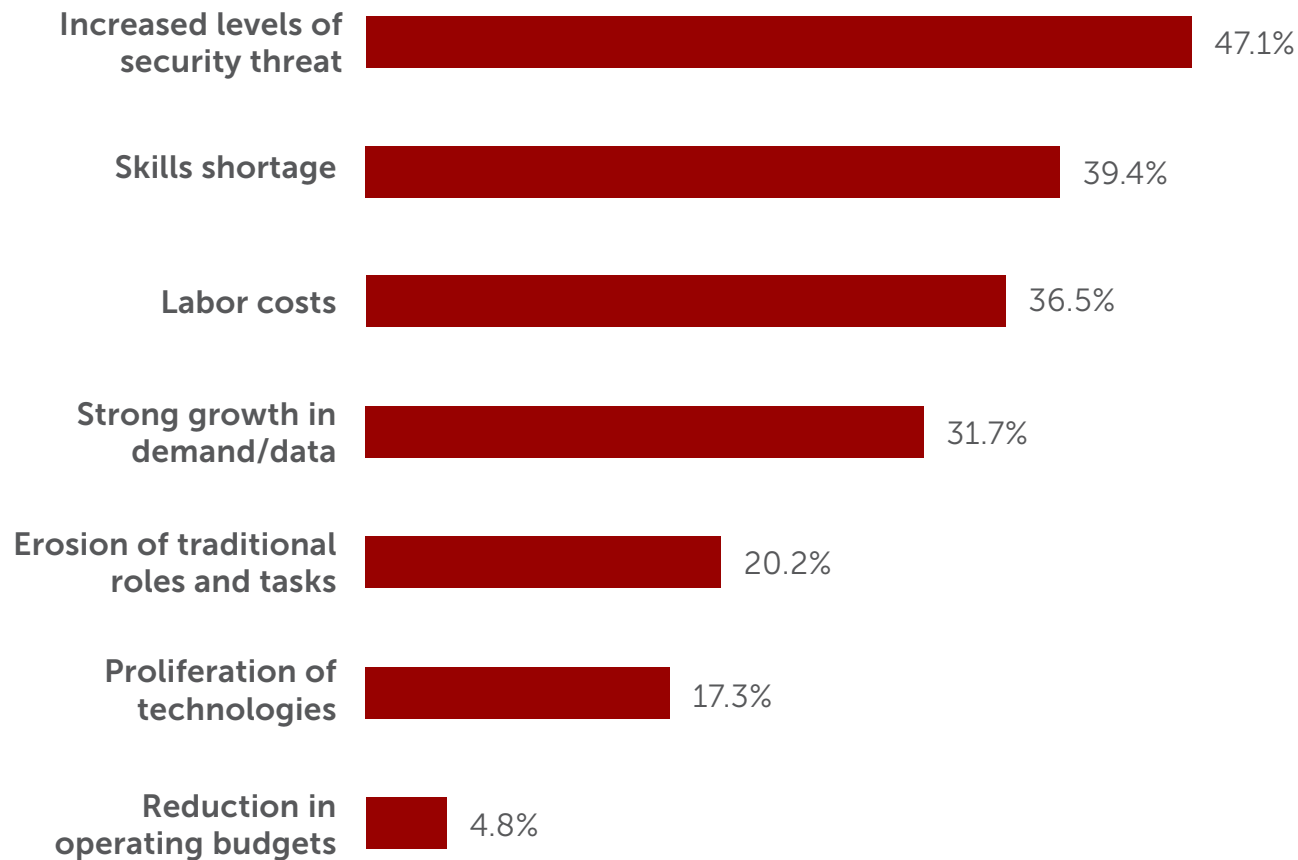
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All the factors listed are important in enabling data center operations to improve. Funding and investment, and organisational time/bandwidth are marginally more significant than leadership from the C-Suite or technical expertise.

However, it is not about one factor. All of those listed need to be in place to achieve improved operations. Initiatives need to be based on a 'whole of organisation' approach.

What are the most significant factors that enable data center operations to improve?

_____

Factor	Percentage
Funding and investment	51.9%
Organizational time and bandwidth	50%
Technical expertise	44.2%
Strategic leadership	41.3%
Other factors	1.9%

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What are the greatest challenges faced by data center operations today?

Increased levels of
security threat — 47.1%

Skills shortage — 39.4%

Labor costs — 36.5%

Strong growth in
demand/data — 31.7%

Erosion of traditional
roles and tasks — 20.2%

Proliferation of
technologies — 17.3%

Reduction in
operating budgets — 4.8%

ANALYST COMMENT:
_____

Increased security threats are viewed as the biggest challenge facing operations today.

Over the past few years, DCD surveys have also repeatedly indicated that the skills shortage remains a considerable concern to data center owners and operators. This chart reinforces this concern. Increasing labour costs — the consequence of demand for skills outstripping supply — follows closely. Owners and operators may still be getting used to the idea that if you need to acquire the skill, you will have no choice but to do so, regardless of cost.

There is also concern about satisfying the strong rise in demand that the industry has experienced throughout the COVID-19 pandemic.

Findings based on 104 respondents

The data here indicates that automation is still considered the domain of those at the top end of the industry, i.e. the hyperscalers, but is now a widely accepted part of the industry. As indicated in a previous question, industry attitudes are marked by uncertainty.

It is also agreed that automation will bring DCIM into a situation where it can realise its full potential, although the sample falls well short of giving wholehearted endorsement to DCIM.

While the emergence of online cyber security is seen as a source of concern and risk, only a minority link the threat vector directly to increased automation.

How much do you agree or disagree with these statements

● **Fully agree**   ● **Somewhat agree**   ● **Somewhat disagree**   ● **Completely disagree**

Automation is only really a worthwhile investment for large/hyperscale data centers

| 38% | 38% | 18% | 7% |

The more you automate your data center operations, the greater the security risk

| 7% | 24% | 48% | 21% |

Greater data center automation gives DCIM the opportunity to finally deliver on its potential

| 28% | 57% | 13% | 3% |

DCIM is "jack of all trades, master of none" software

| 6% | 27% | 51% | 16% |

The key to evolving data center automation will be bridging IT and OT

| 17% | 64% | 16% | 2% |

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To what extent has COVID-19 increased the following?

59.6%

26%

14.4%

Workforce re-skilling

27.9%

48.1%

24%

Reliance on existing automated systems

22.1%

47.1%

30.8%

Deployment of new automation technology

● **Significantly**　　● **To some extent**　　● **Not at all**
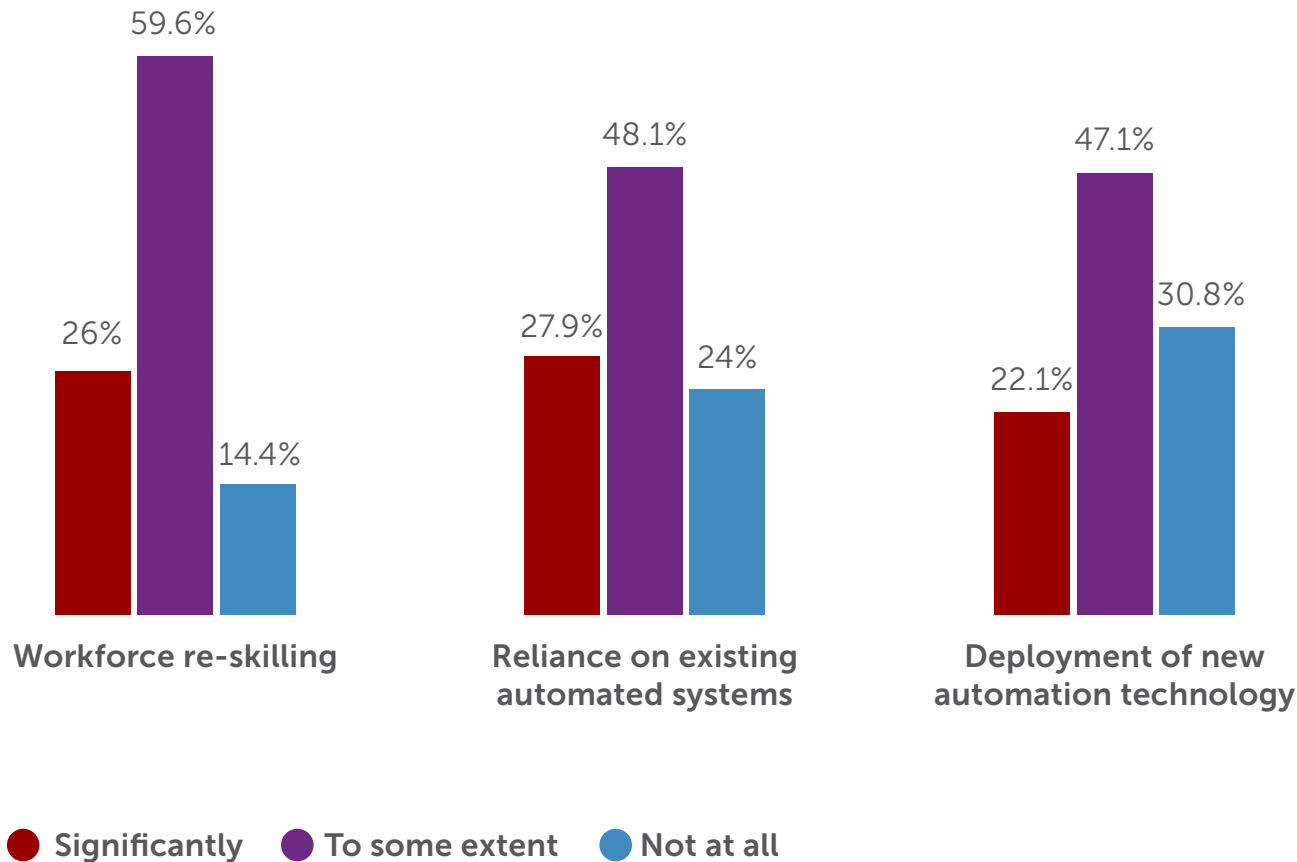
ANALYST COMMENT:
_____

There's no real disagreement within our sample that COVID-19 has led to a significantly greater reliance on existing automation systems or encouraged the deployment of new ones. Rather, the pandemic appears to have further accelerated trends evident before it struck.

There is also a correlation in the belief that, to a large extent, an organization had to be automated pre-COVID in order to make the most of any opportunity the pandemic presented.

This chart further underlines the importance of skills, of an evolving workforce and the need to be flexible when it comes to keeping pace with changing demands and expectations, particularly where access to necessary skills may be more limited.

Findings based on 104 respondents

How much do you agree or disagree with these statements?

● **Fully agree**　　● **Somewhat agree**　　● **Somewhat disagree**　　● **Completely disagree**

Without a cast-iron management strategy, automation will end up a wasted investment

| 63% | 31% | 4% | 2% |

If the information provided by monitoring isn't real-time, then forget it

| 16% | 50% | 29% | 6% |

The data center of the future will still need people

| 86% | 14% |

The digitization of data center operations will be driven by Edge

| 15% | 58% | 23% | 4% |

The hunger of automation and AI systems for CPU is an obstacle to deploying such systems

| 4% | 23% | 56% | 17% |

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Why do organisations pursue automation strategies for data center operations?

Reduce operational costs ██████████████████ 85.4%

Reduce errors/downtime ████████████████ 76.7%

Deploy analytics to understand operations better ██████████ 49.5%

Meet customer expectation ████████ 41.7%

Get/keep accreditation ███████ 37.9%

Comply with legislation/regulation █████ 27.2%

Meet skills shortage ██ 14.6%

ANALYST COMMENT:

Reducing operational costs, as well as errors and downtime, are the key reasons given here for pursuing automation strategies. The use of analytics to understand operations better is also considered important.

Interestingly, while the skills shortage is highlighted in other questions, here it is not highlighted as a key reason for organizations pursuit of automation. As stated in the previous question, data centers into the future will very much remain reliant on people.
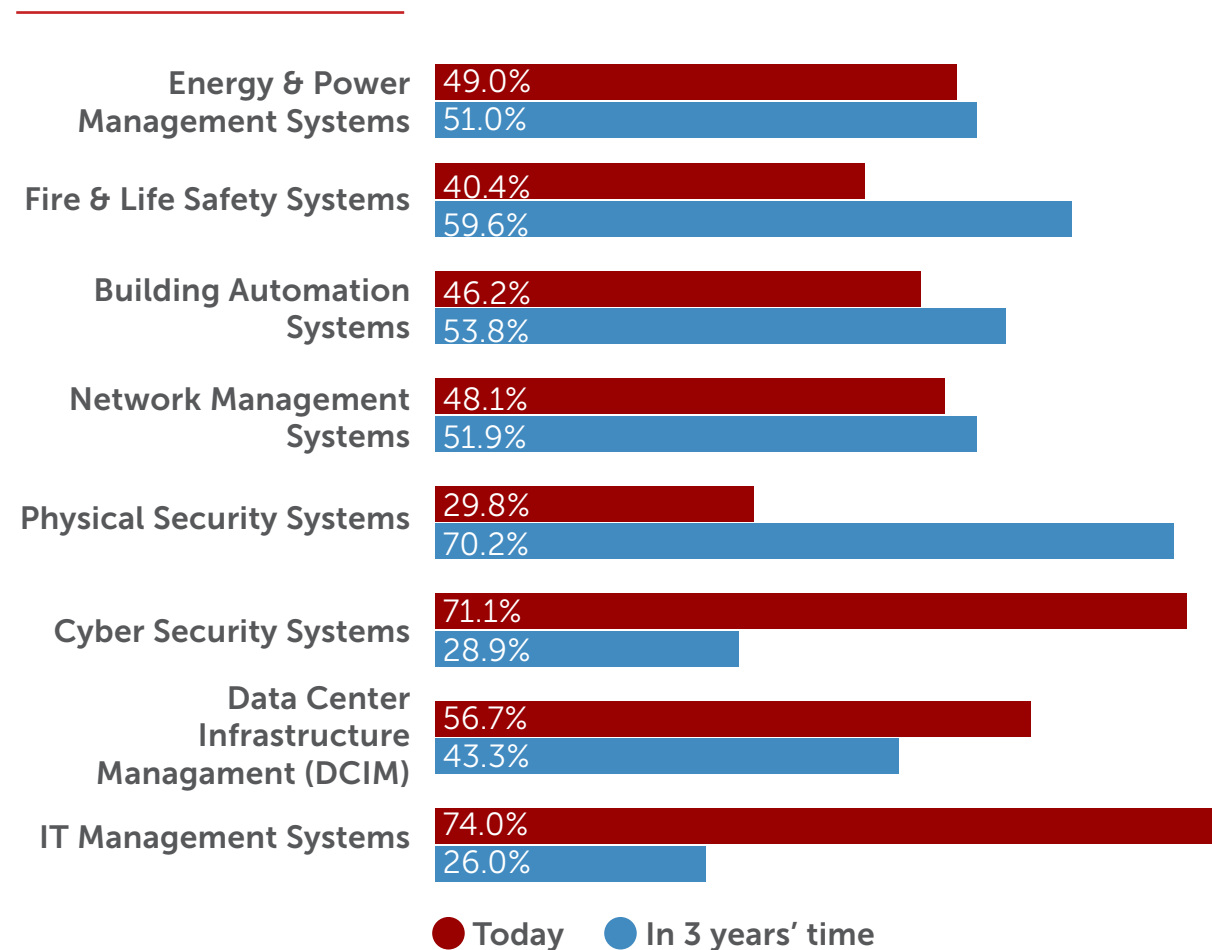
IT management and cyber security are considered the two systems that would benefit immediately from AI-driven automation. Conversely, physical security systems are seen to benefit more in the longer term (three years' time).
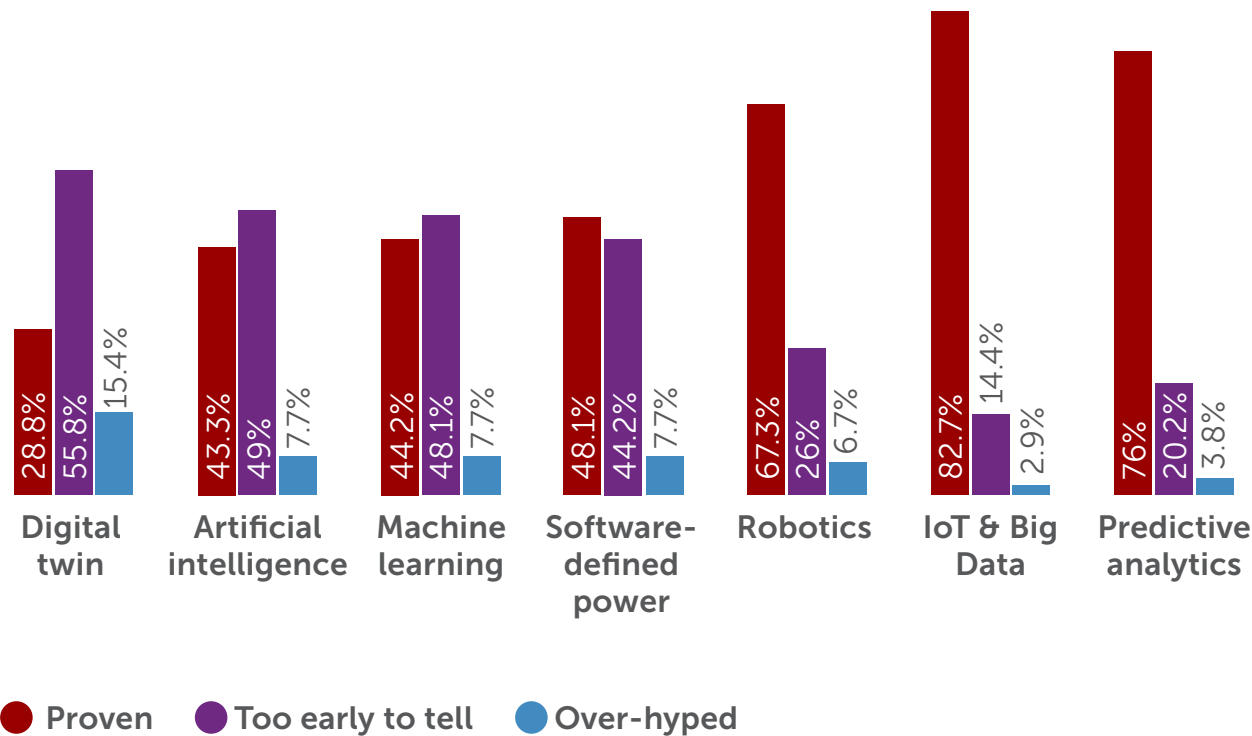
It is possible to read this chart in terms of levels of human involvement taking longer for AI to benefit. Physical security largely monitors human and natural risks, as do fire and life safety systems.

The other systems and tasks are more evenly balanced between benefits today and in three years' time.

Which of the following data center sub-systems/tasks have most to benefit from AI-driven automation?

System	Today	In 3 years' time
Energy & Power Management Systems	49.0%	51.0%
Fire & Life Safety Systems	40.4%	59.6%
Building Automation Systems	46.2%	53.8%
Network Management Systems	48.1%	51.9%
Physical Security Systems	29.8%	70.2%
Cyber Security Systems	71.1%	28.9%
Data Center Infrastructure Managament (DCIM)	56.7%	43.3%
IT Management Systems	74.0%	26.0%

● Today   ● In 3 years' time

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Which of these solutions do you believe have proven their value in the data center, and which do you see as over-hyped?

Digital twin: Proven 28.8%, Too early to tell 55.8%, Over-hyped 15.4%
Artificial intelligence: Proven 43.3%, Too early to tell 49%, Over-hyped 7.7%
Machine learning: Proven 44.2%, Too early to tell 48.1%, Over-hyped 7.7%
Software-defined power: Proven 48.1%, Too early to tell 44.2%, Over-hyped 7.7%
Robotics: Proven 67.3%, Too early to tell 26%, Over-hyped 6.7%
IoT & Big Data: Proven 82.7%, Too early to tell 14.4%, Over-hyped 2.9%
Predictive analytics: Proven 76%, Too early to tell 20.2%, Over-hyped 3.8%

● Proven   ● Too early to tell   ● Over-hyped

ANALYST COMMENT:
_____

The sample considers IoT/big data, predictive analytics and robotics to be solutions of proven value to the data center.

Artificial intelligence, machine learning and software-defined power are all divided between being considered proven and still needing to prove their value. There is greatest uncertainty around digital twin solutions, which are the only solutions attracting significant sample numbers considering it over hyped.

Confidence seems to be, in part, based on the link mentioned earlier between IT and OT. The significant use of robotics, IoT and predictive analytics in OT environments bolsters the sense of opportunity for data center applications.

Findings based on 104 respondents

The stakeholder group with the greatest impact on data centre operations is very much the executive leadership. This underlines, again, how critical data centers have become to 24-7 company performance.
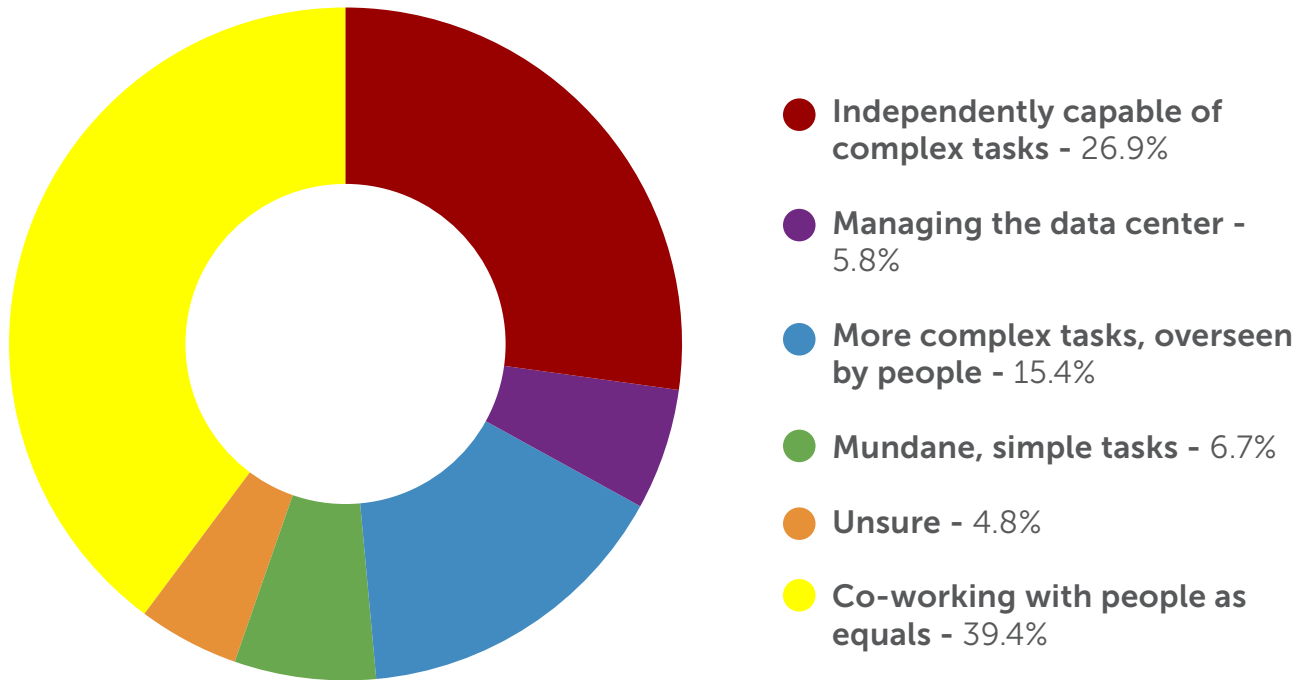
Procurement is rated second here, indicating the responsibility to purchase solutions and services that meet broader corporate objectives.

Both IT operations and facilities have lesser roles, although they are likely to play their part in providing information and context for corporate decisions, and in implementation/review. While the process is not democratic, different groups will usually make different contributions to improving operations.

Which of these major stakeholders can have the greatest impact on improving data center operations?

- IT Operations
- Executive Leadership
- Facilities
- Vendors & suppliers
- Procurement
- All

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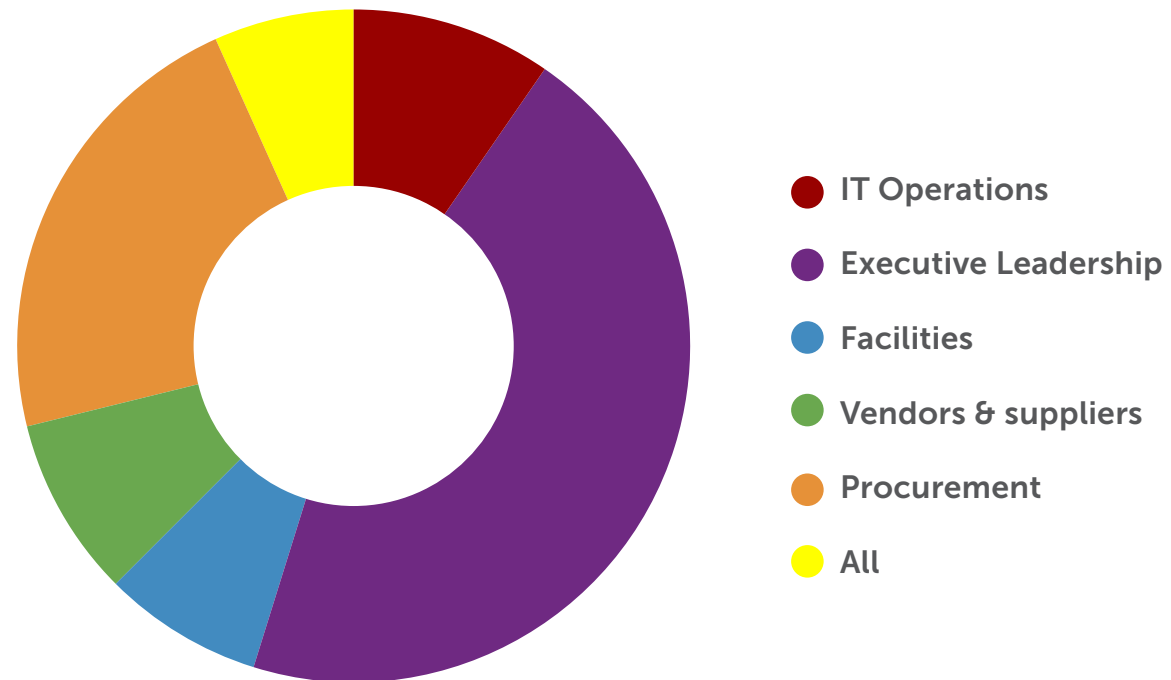
How far do you think robots will have advanced in data centers by 2030?

- ● **Independently capable of complex tasks -** 26.9%

- ● **Managing the data center -** 5.8%

- ● **More complex tasks, overseen by people -** 15.4%

- ● **Mundane, simple tasks -** 6.7%

- ● **Unsure -** 4.8%

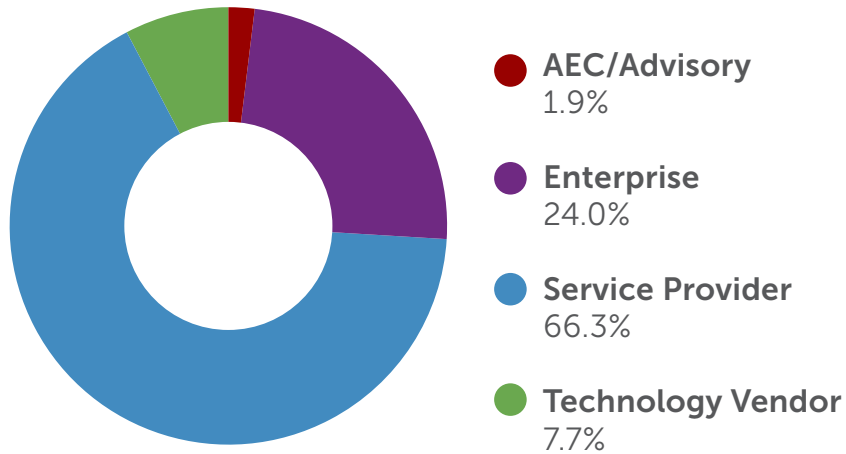- ● **Co-working with people as equals -** 39.4%

ANALYST COMMENT:

Despite the increasing use and evolution of robots, the largest proportion of our sample, believe that humans will continue to play the leading role in data centers throughout the next decade, most usually co-working with robots or overseeing them. Just over one-quarter consider that robots will be capable of carrying out complex tasks independently.

Even as automation and mechanistic processes continue to develop, only a small minority of our respondents see robots as capable of managing the data center outright.

Participant Profile - Company Type:

Company Types:

● **AEC/Advisory**
1.9%

● **Enterprise**
24.0%

● **Service Provider**
66.3%

● **Technology Vendor**
7.7%

Seniority:

● **C-Level Executive, President, Owner**
8.7%

● **Individual, Specialist, Consultant**
9.6%

● **Project, Technology or Team Leader**
41.3%

● **Senior Manager, VP, Department Head**
40.4%

The sample balances different data center sectors — 66% are service providers and 24% work in enterprise sectors. The remaining 10% come from technology vendors and work in AEC/consulting.
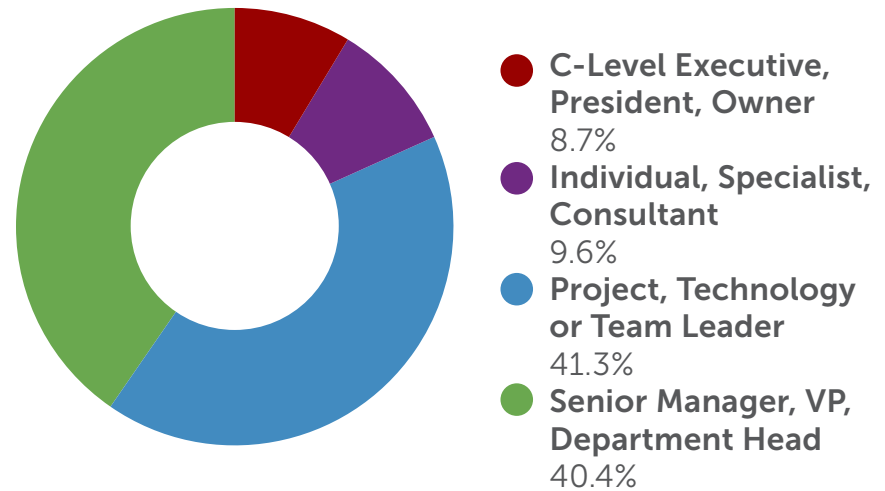
Just over 41% of our sample are project technology or team leaders, and 40% are senior managers, VPs or department heads. C-Level Executives, Presidents or Owners and individual specialists or consultants each account for less than 10%.

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Conclusion

This survey offers key insights into the biggest trends driving (or hindering) the adoption of data center automation systems, replacing traditional control and monitoring solutions.

With the questions asked towards (what we hope is) the end of the Covid-19 pandemic, we see the influence that this crisis has had on the industry, not just accelerating existing trends but also adding to existing industry problems, such as the perennial challenges of recruitment, retention, and skills.

The somewhat piecemeal industry approach to the automation of data center operations is highlighted in the results, with a fairly wide range of technical challenges mentioned and differing opinions given on their level of importance. Essentially, the industry position is marked by uncertainty with small numbers of advocates/early adopters at one end of the spectrum, and small numbers of people suspicious of the latest tech at the other.

In line with our previous surveys from 2021, the development of automation is increasingly directed from the C-Suite, indicating the importance of strategic leadership in making major changes in a data center, and the increasing recognition of the critical role that the data center plays in organizational performance.

As demand increases further, and technologies such as 5G and the Internet of Things push data center designs to new levels of complexity, this survey not only highlights the work that has been done, but also the work still to do in order to ensure that data centers are sophisticated and robust enough to support these and other tech in the future. All but a minority acknowledge that automation is a key part of this journey but there is consensus that expert guidance, good leadership and proven data center solutions and technologies are needed to help the industry evolve.

Findings based on 104 respondents