IT Transformation: Trends

Enterprise Strategy Group | **Getting to the bigger truth.**™

Agenda

- ESG Overview

- Peer based spending insights for 2016

- Insights by tech segment (*Trends, Skills, Peer Data, and Vendor Questions*)

- Q&A

Enterprise Strategy Group is an IT analyst, research, validation, and strategy firm that provides market intelligence and actionable insight to the global IT community.

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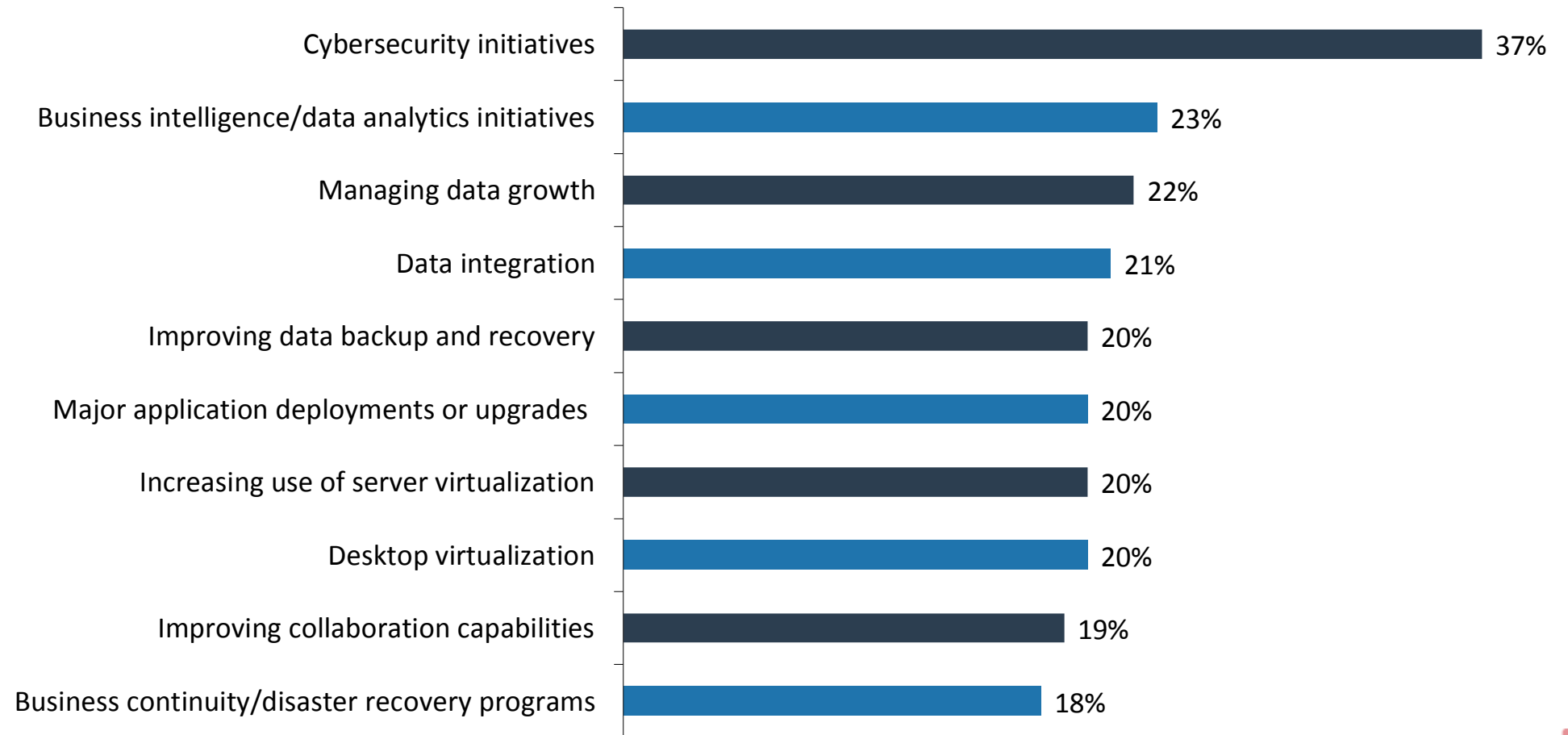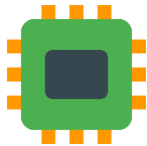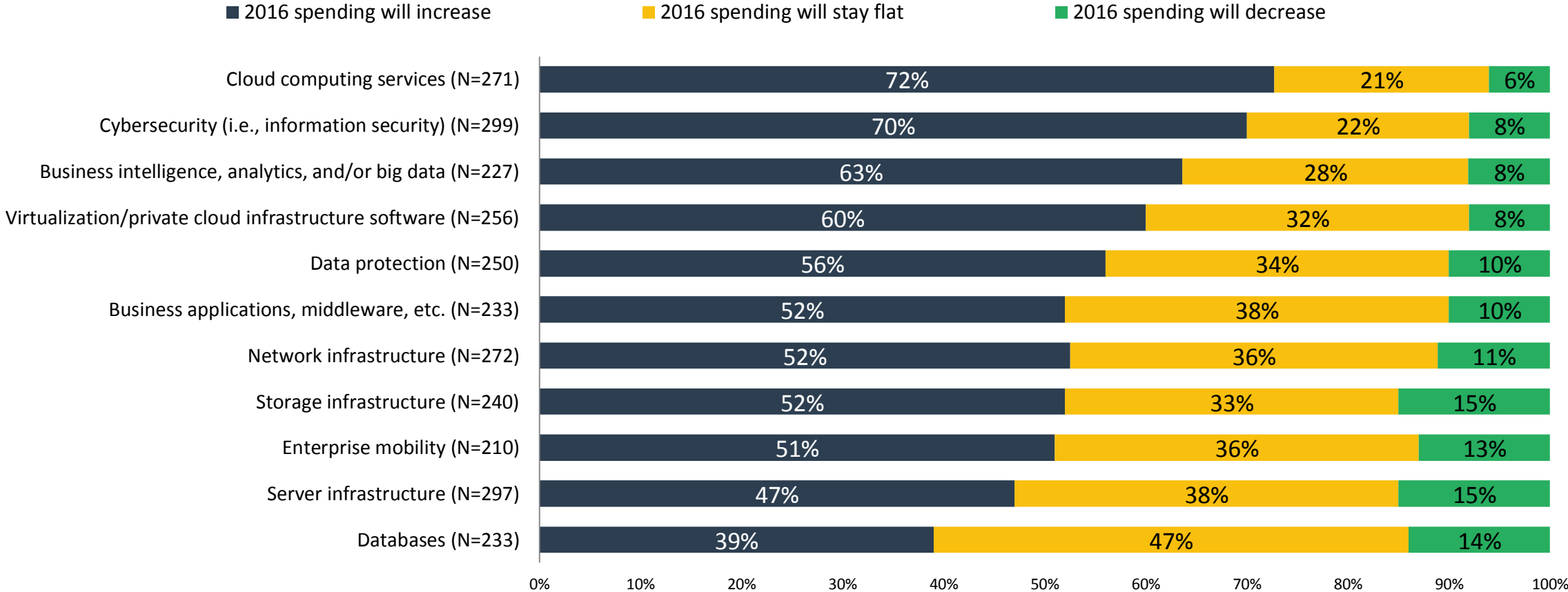
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2016 Peer based insights

Top 10 2016 IT Priorities

Top 10 most important IT priorities over the next 12 months.

Priority	Percentage
Cybersecurity initiatives	37%
Business intelligence/data analytics initiatives	23%
Managing data growth	22%
Data integration	21%
Improving data backup and recovery	20%
Major application deployments or upgrades	20%
Increasing use of server virtualization	20%
Desktop virtualization	20%
Improving collaboration capabilities	19%
Business continuity/disaster recovery programs	18%

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2015-2016 Spending Change, by Technology

To the best of your knowledge, to what extent will your organization's 2016 IT spending for each technology listed below change relative to 2015? (Percent of respondents)
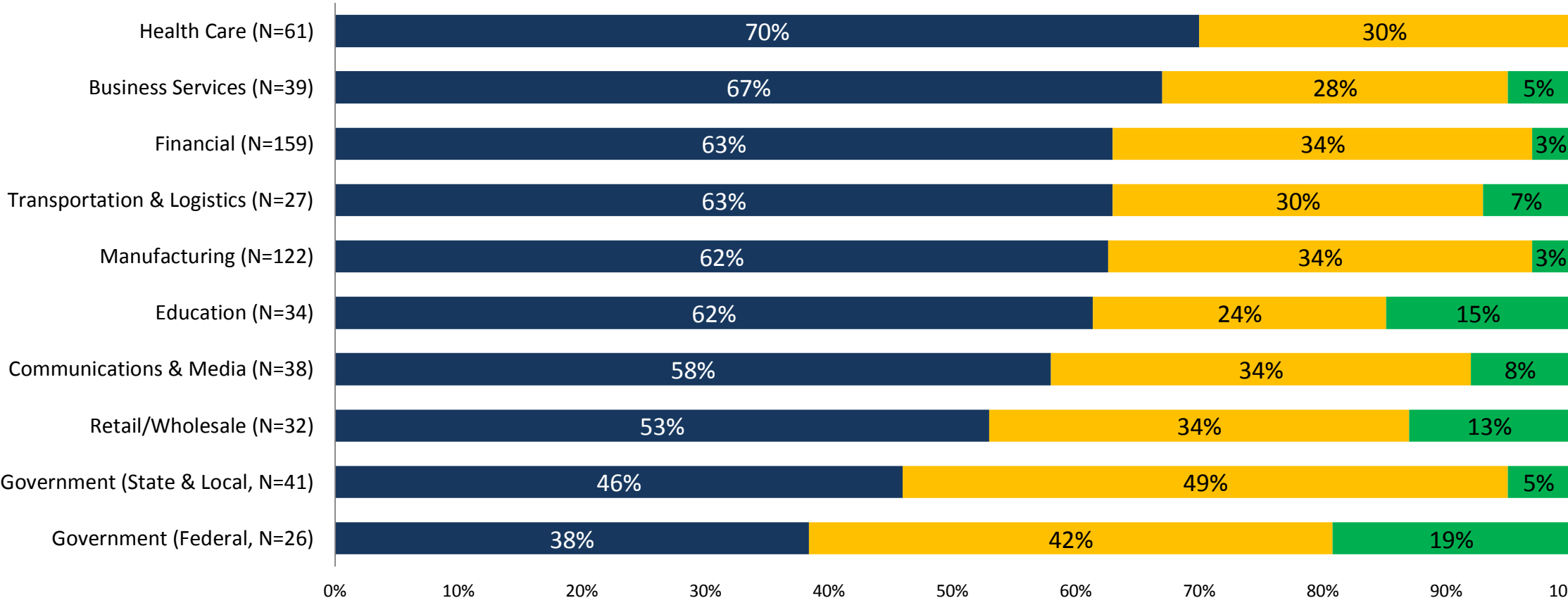
- ■ 2016 spending will increase
- ■ 2016 spending will stay flat
- ■ 2016 spending will decrease

Technology	Increase	Stay flat	Decrease
Cloud computing services (N=271)	72%	21%	6%
Cybersecurity (i.e., information security) (N=299)	70%	22%	8%
Business intelligence, analytics, and/or big data (N=227)	63%	28%	8%
Virtualization/private cloud infrastructure software (N=256)	60%	32%	8%
Data protection (N=250)	56%	34%	10%
Business applications, middleware, etc. (N=233)	52%	38%	10%
Network infrastructure (N=272)	52%	36%	11%
Storage infrastructure (N=240)	52%	33%	15%
Enterprise mobility (N=210)	51%	36%	13%
Server infrastructure (N=297)	47%	38%	15%
Databases (N=233)	39%	47%	14%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

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2016 IT Spending Change by Industry

2015 to 2016 IT spending change, by industry (Percent of respondents)

- ■ 2016 IT spending will increase
- ■ 2016 IT spending will stay flat
- ■ 2016 IT spending will decrease

Industry	Increase	Stay flat	Decrease
Health Care (N=61)	70%	30%	
Business Services (N=39)	67%	28%	5%
Financial (N=159)	63%	34%	3%
Transportation & Logistics (N=27)	63%	30%	7%
Manufacturing (N=122)	62%	34%	3%
Education (N=34)	62%	24%	15%
Communications & Media (N=38)	58%	34%	8%
Retail/Wholesale (N=32)	53%	34%	13%
Government (State & Local, N=41)	46%	49%	5%
Government (Federal, N=26)	38%	42%	19%

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Business Initiatives Driving IT Spending in 2016

Which of the following business initiatives do you believe will drive the most technology spending in your organization over the next 12 months? (Percent of respondents, N=633, five responses accepted)
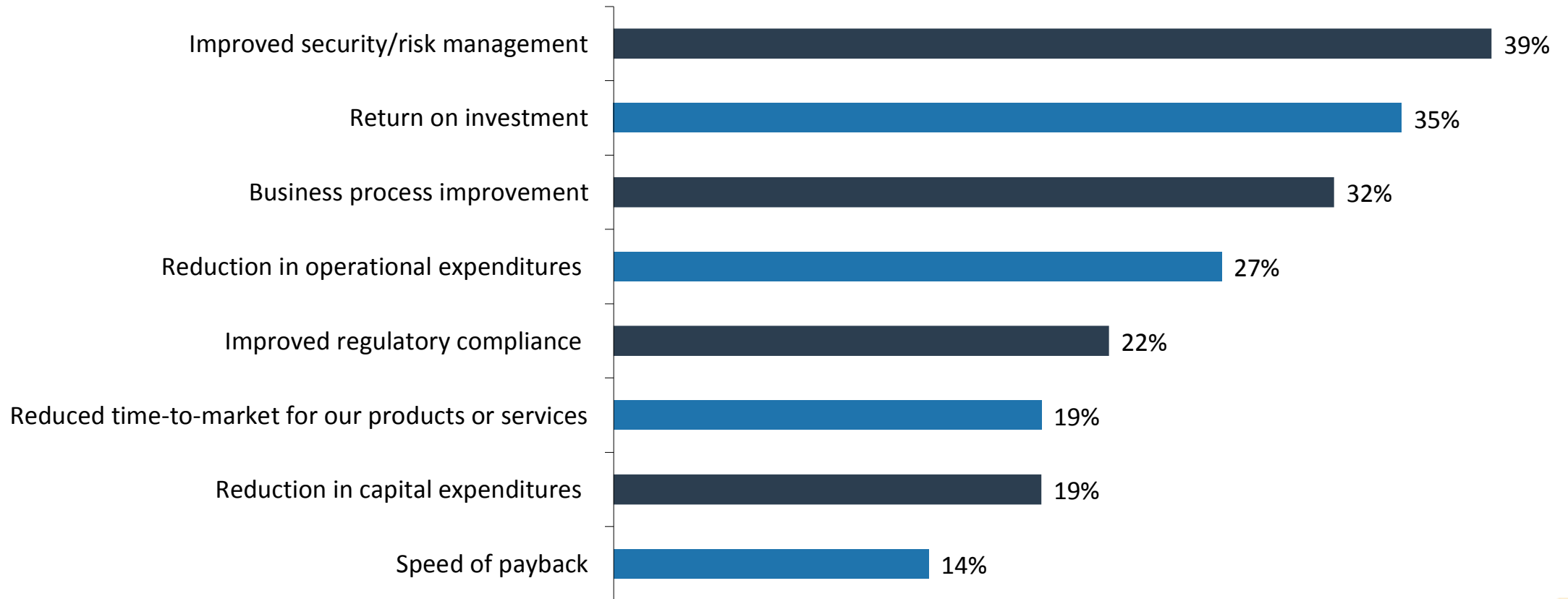
Initiative	Percent
Increasing cybersecurity	43%
Reducing costs	38%
Improved data analytics for real-time business intelligence and customer insight	32%
Ensuring regulatory compliance	27%
Providing our employees with the mobile devices and applications they need to maximize productivity	22%
Developing strategies to ensure we interact with our customers on their mobile devices	20%
Business growth via mergers, acquisitions, or organic expansion	20%
Improved internal collaboration capabilities	20%
Increased use of social media technology for marketing, customer outreach, brand awareness, market research, etc.	19%
Research and development	18%

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IT Investment Justification

Which of the following considerations do you believe will be most important in justifying IT investments to your organization's business management team over the next 12 months? ?
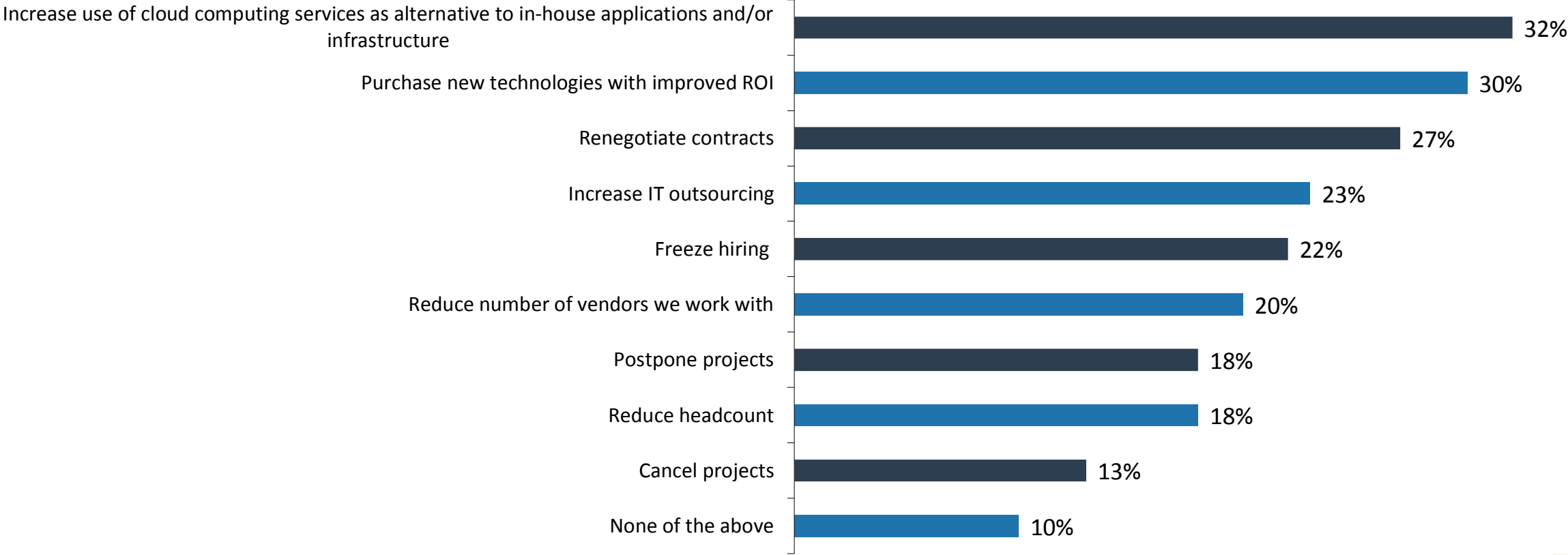(Percent of respondents, N=633, three responses accepted)

Improved security/risk management	39%
Return on investment	35%
Business process improvement	32%
Reduction in operational expenditures	27%
Improved regulatory compliance	22%
Reduced time-to-market for our products or services	19%
Reduction in capital expenditures	19%
Speed of payback	14%

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2016 Cost Containment Measures

Which of the following measures – if any – is your organization taking to reduce or otherwise contain IT expenditures over the next 12 months? (Percent of respondents, N=633, multiple responses accepted)

Measure	Percent
Increase use of cloud computing services as alternative to in-house applications and/or infrastructure	32%
Purchase new technologies with improved ROI	30%
Renegotiate contracts	27%
Increase IT outsourcing	23%
Freeze hiring	22%
Reduce number of vendors we work with	20%
Postpone projects	18%
Reduce headcount	18%
Cancel projects	13%
None of the above	10%

Apps, Data, and IoT **Trends**

PaaS Growth.

- Enabling widespread immediate access to AD&D tools and services

Application Development Pipeline.

- Well conceived DevOps strategies are accelerating mode 2 application development.

Big Data & BI closing the gap.

- Advanced analytics and machine learning embedding behind familiar tools to facilitate developers, data scientists and architects.

Data Platforms are changing.

- Hadoop and data lakes are impacting data warehouses (now landing and pre-processing)

Leading organizations focusing on IoT though organizational innovation

- Alignment of data journey from OT through IT

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Apps, Data, and IoT **Skills**

- **Cultural acceptance of agile development and DevOps is leadership driven**

- **IT skills in Data stewardship, preparation, governance are critical**

- **Proactive IT engagement with Industrial Ops & Engineering a common them with IoT leaders**

- **Strategically coordinated employee development cross discipline key to maturity**

Apps, Data, and IoT **Peer Data**

How would you characterize your organization's Internet-of-Things (IoT) initiatives?
(Percent of respondents, N=633)

Don't know, 1%

We already have IoT initiatives underway, 19%

We have no plans for IoT initiatives at this time, 20%

We are developing IoT initiatives and will launch them in the next 12 months, 27%

We are currently considering IoT initiatives, 21%

We are developing IoT initiatives and will launch them in the next 24 months or later, 12%
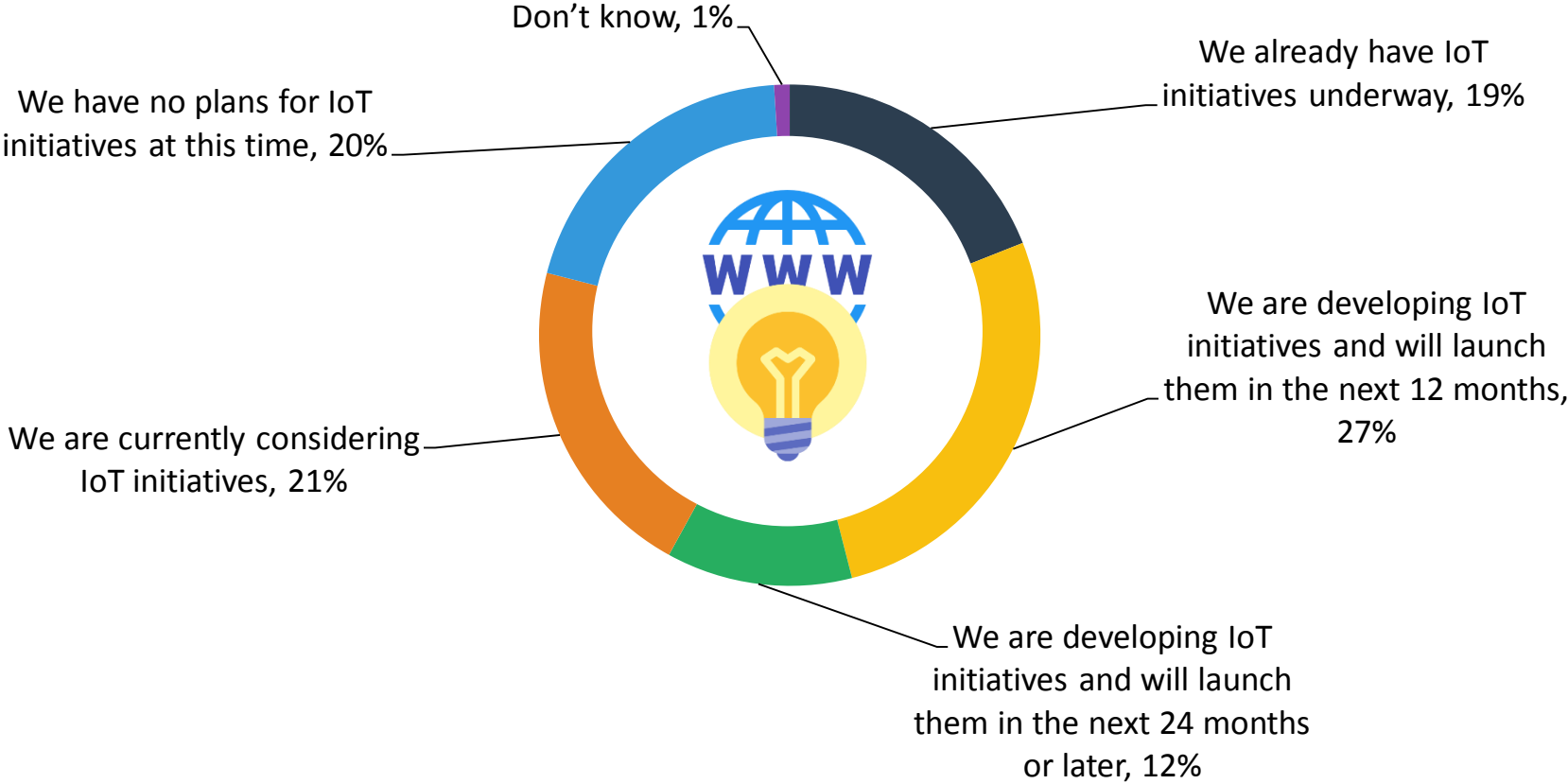
58% have developed IoT initiatives already, or are in the process of launching them in the next 24 months.

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Apps, Data, and IoT **Peer Data**

The Business Impact of IoT

How would you best characterize the anticipated impact of IoT on your organization?
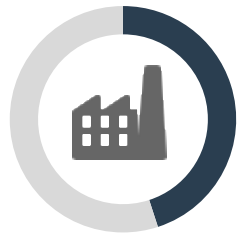
45% say it will help them become more *operationally efficient*

39% say it will help provide better and differentiated *customer service*
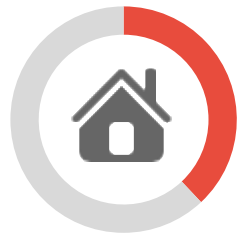
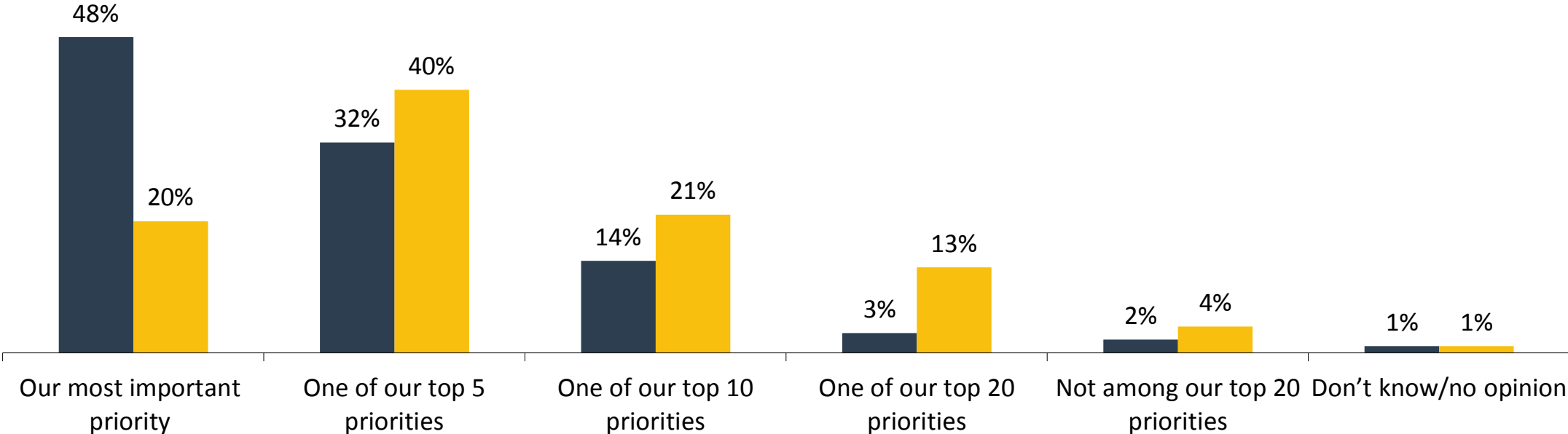**38%** say it will help them develop *new products and services*
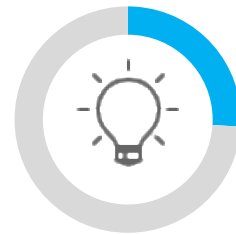
26% say it will enable them to create entirely *new business models*

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Apps, Data, and IoT **Peer Data**

Relative to all of your organization's business and IT priorities over the next 12-18 months, how would you rate the importance of its big data analytics projects and initiatives? (Percent of respondents, N=475)

■ Importance of big data analytics projects and initiatives relative to all business priorities

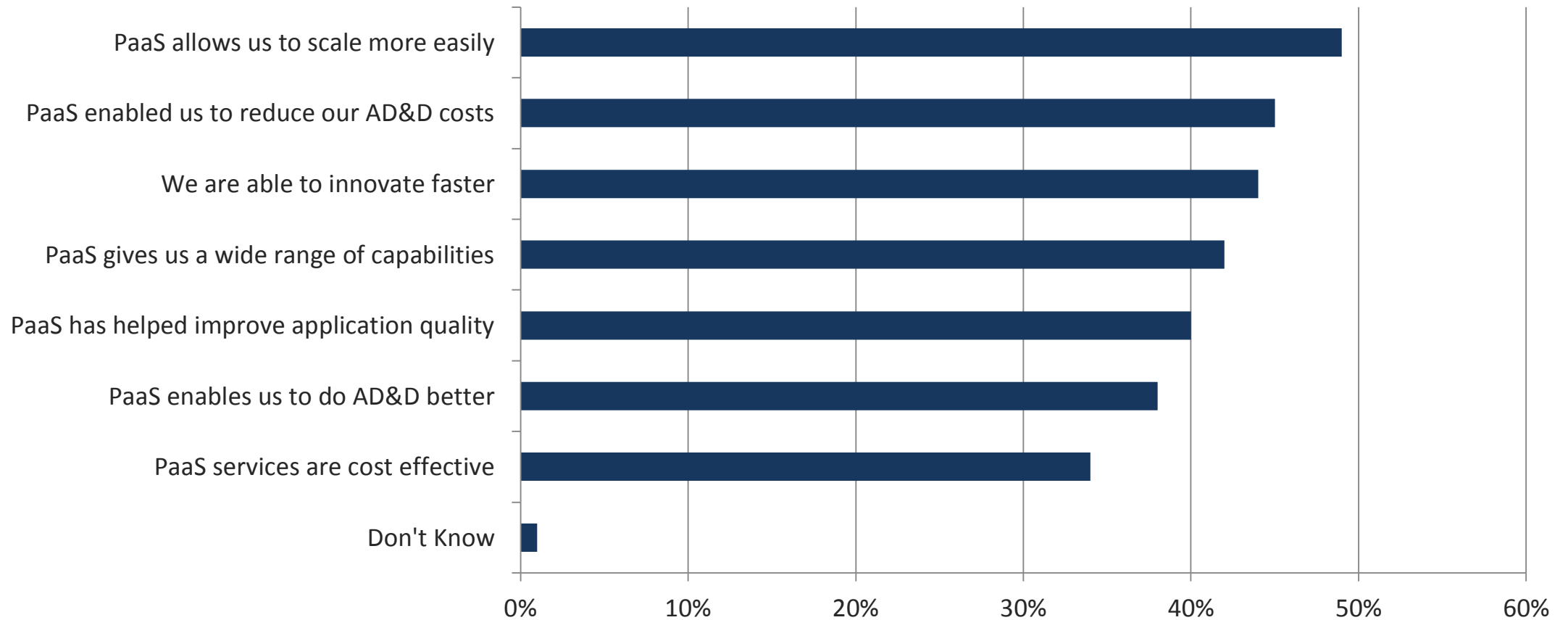■ Importance of big data analytics projects and initiatives relative to all IT priorities

	Our most important priority	One of our top 5 priorities	One of our top 10 priorities	One of our top 20 priorities	Not among our top 20 priorities	Don't know/no opinion
Business	48%	32%	14%	3%	2%	1%
IT	20%	40%	21%	13%	4%	1%

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PaaS Importance

Over the next 2 years, how do you expect platform-as-a-service to be factored into the IT needs of your organization? (Percent of respondents, N=244)
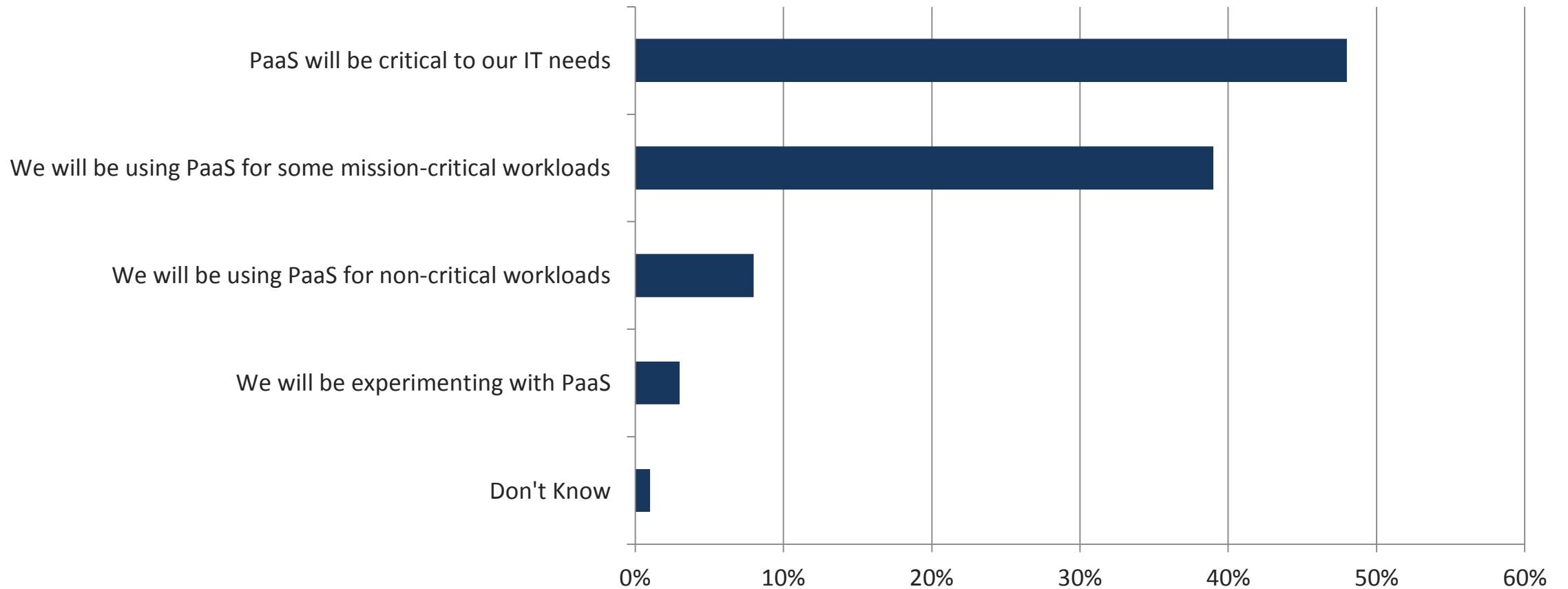
PaaS Benefits

Which of the following benefits has your organization experienced since using your primary PaaS? (Percent of respondents, multiple response, N=179)


Benefit	Percent
PaaS allows us to scale more easily	49%
PaaS enabled us to reduce our AD&D costs	45%
We are able to innovate faster	44%
PaaS gives us a wide range of capabilities	42%
PaaS has helped improve application quality	40%
PaaS enables us to do AD&D better	38%
PaaS services are cost effective	34%
Don't Know	1%

PaaS Deployment Models in Use

Which PaaS model is your organization currently using?
(Percent of respondents, N=179 in 2016 and N=227 in 2014)

Legend: In Use 2016, In Use 2014
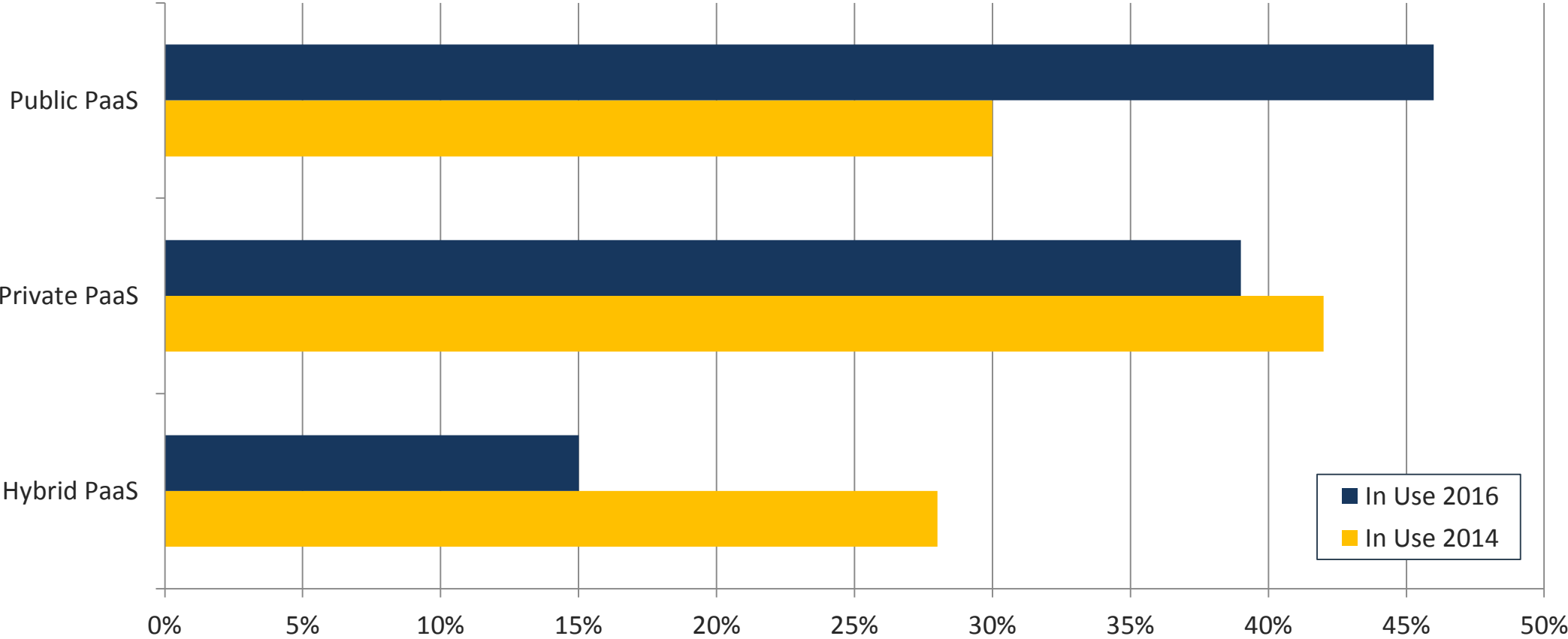
PaaS Products in Use

Which of the following products does your organization primarily use for its PaaS needs?
N=179 in 2016 and N=227 in 2014
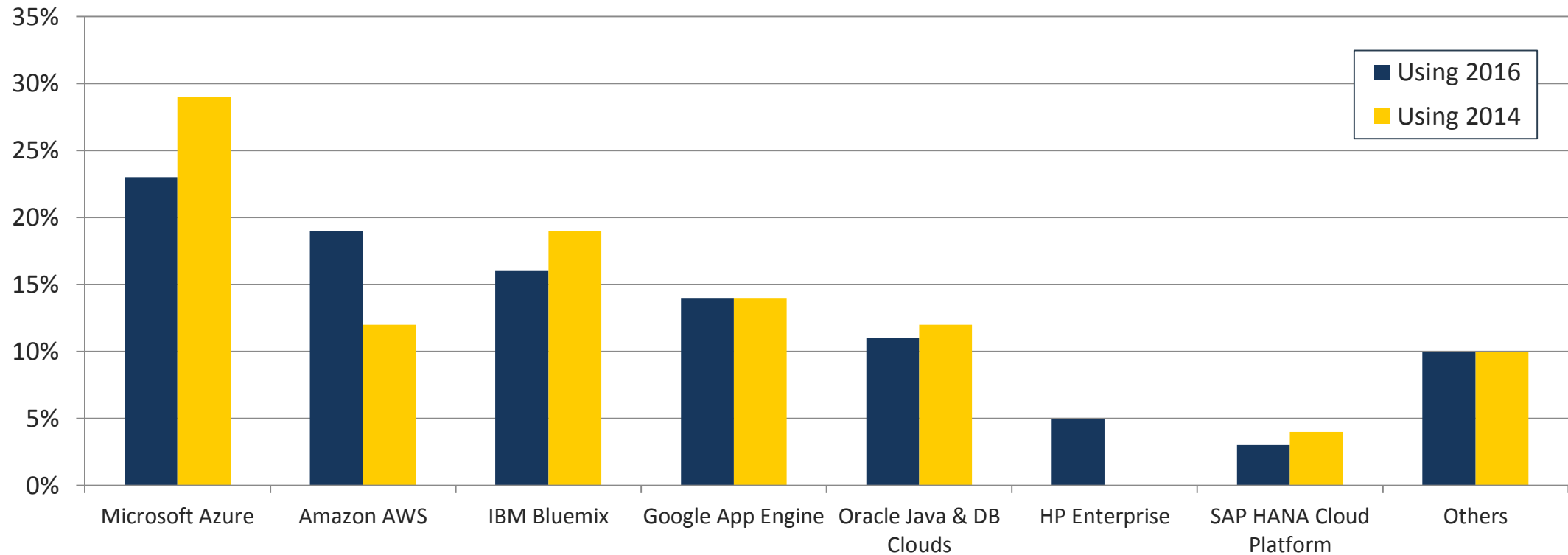
Apps, Data, and IoT **Peer Data**

Peer directions for big data and analytics

- Hadoop adoption: 20% in production, 37% very interested

- Spark adoption: 16% in production, 47% very interested

- Hadoop as alternative to data warehouse: 36% as complement, 26% as replacement

- 95% believe open source is important, 40% will combine open with proprietary

- Up to 43% considering cloud for databases, data warehouse, analytics, and BI

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Apps, Data, and IoT **Peer Data**

USEFUL ESG RESEARCH

1. The DevOps Reference Model: The Foundation for Transforming Application Development & Deployment, ESG Research Report, March 2016

2. The Decision to Embrace Decision Analytics, ESG Brief, May 2016

3. The Six DevOps Questions that Matter, ESG Brief, July 2015

4. Platform-as-a-Service Usage and Satisfaction Study, ESG Research Report, April 2015

5. Platform-as-a-Service Feature Preference Study, ESG Research Report, May 2015

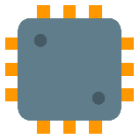# Apps, Data, and IoT **Vendor Questions**

- How can you help us build analytics into our business activities?

- Can you offer strategic approach to skills development?

- Do you offer a maturity model approach to transform IT process/culture ?

- How can you prove the operational maturity of your solution?

- How are you leveraging and contributing(!) to open source?

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Cybersecurity

Cybersecurity **Trends**

- **Threat Landscape:** Ransomware is an epidemic (in Healthcare recently)

- **Attack Surface Area:** Hybrid and Shadow IT are expanding the perimeter from the network to transient users, apps, and workloads

- **Security Controls:**

  – Advances in machine learning is improving endpoint security efficacy

  – Contextual analytics via endpoint, network, user, app, cloud and threat telemetry is enabling threat hunting

  – Federate IAM, SSO, and MFA is more critical than ever

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Cybersecurity **Skills**

Business Skills:

- Agile software development literacy so that security is included early in the dev cycle

- Grounding in IT-as-a-service to negotiate with vendors on utility/consumption-based pricing
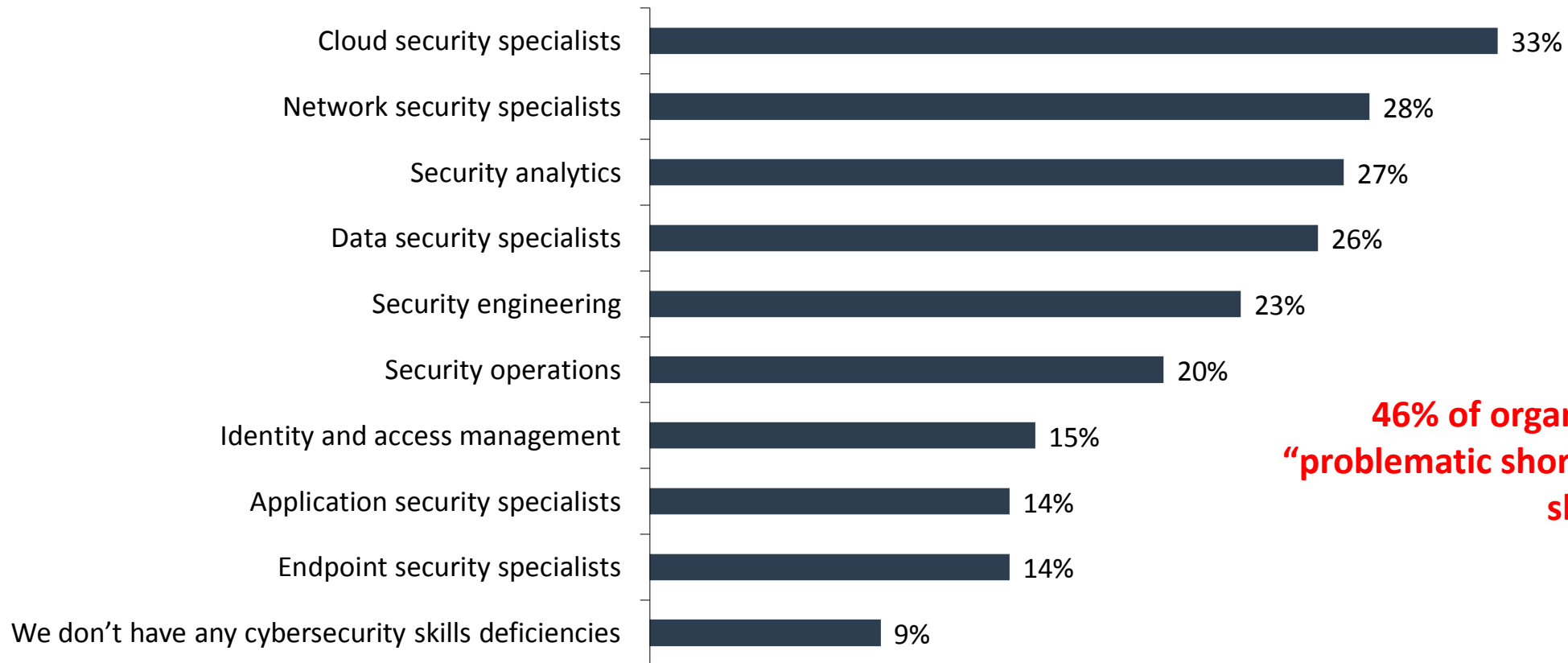
Technical Skills:

- API literacy for the inclusion of security in DevOps (SecDevOps)

- Bad actor attack campaign behavior aware for internal situation awareness

Cybersecurity **Skills**

Which areas of cybersecurity would you say that your organization has the biggest skills deficiency? (Percent of respondents, N=299, three responses accepted)

Category	Percent
Cloud security specialists	33%
Network security specialists	28%
Security analytics	27%
Data security specialists	26%
Security engineering	23%
Security operations	20%
Identity and access management	15%
Application security specialists	14%
Endpoint security specialists	14%
We don't have any cybersecurity skills deficiencies	9%

46% of organizations have a "problematic shortage of cybersecurity skills"

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Cybersecurity **Peer Data**

80% of organizations say on-premise security more mature than cloud indicating a cloud adoption readiness gap

52% of organizations state that storing sensitive data in the cloud is their top cloud security concern

65% of organizations are aware of the use of Shadow IT app even when may have approval policies and risk vetting methodologies

74% of organizations abandon traditional solutions for securing their organization's use of the cloud

73% of organizations state it is difficult to recruit cybersecurity professionals

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Cybersecurity **Peer Data**

70% of organizations will increase cybersecurity spending in 2016

47% of organizations will select security technologies they can eliminate as they utilize cloud computing more extensively

92% of organizations use or plan to perform technical integration or deploy new technologies intended to help automate and orchestrate incident response processes

42% of organizations will invest in more training for network security monitoring while **39%** will invest in new types of network security monitoring tools

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Cybersecurity **Vendor Questions**

- **Describe the internal processes you use in order to develop and maintain highly-secure products**

- **Do you offer:**

  - Open and documented APIs in your products? (automate IRP)

  - Partnership agreements for technical integration?

  - Ecosystems for partners to participate in? (ie:hybrid)

- **How can your product/solution help me streamline security operations and make my staff more productive?**

Infrastructure

Infrastructure **Trends**

- **Cloud Service Orientation:** Business are placing an emphasis on truly combining private and public cloud resources, yet different workloads, data types and access patterns impact storage costs differently (note: internally 'clouds' can manifest as [hyper]converged systems).

- **All-Flash Storage/Data Center:** In the first half of 2016, multiple AFA suppliers have released high density / massive capacity flash storage systems targeted at scale-out file environments, hence expanding the economic reach of flash storage (but hybrid *infrastructures* – as opposed to storage systems – will remain dominant)
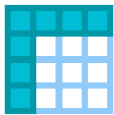
- **Software-defined Data Center:** the number of storage-as-software players is steadily increasing, with a variety of solutions ranging across multiple data types, protocols and varying between open source and proprietary (94% of Storage Leaders committed to SDS)

- **Persistent memory (e.g. NVDIMMs, 3D XPoint**): The storage industry is at the forefront of a new era of persistent memory technologies which could dramatically impact data center architectures.

Infrastructure **Skills**

- **Hybrid Cloud Skills:** Differences – as well as spikes - in workload patterns and data access can dramatically impact the cost infrastructure, so new skills are required to model access by workload to make on- versus off-premises decisions, or enable IT to leverage the cloud on an as-needed flexible basis

- **More generalist, less specialist:** Convergence means that the need for lots of sub specialty experts in IT is reduced. In a hyperconverged, software-defined infrastructure there is less/no need for storage and SAN administrators – the stack is virtualized and done at an aggregate software level, rather than managing discrete hardware components.

- **IT as a Business Utility Decision:** These new approaches mean IT consumption can finally be determined by business needs *and* outcomes, rather than simply being an operational plan. This changes the emphasis of IT management from "doing" to "getting".

Infrastructure **Peer Data**

- **Cloud:** The #1 IT initiative that will impact storage spending is using cloud storage to source capacity instead of deploying on premises infrastructure. (37%)

- **Flash Storage:** Non-performance related flash storage purchase rational led performance by a rate of 3 to 1 (i.e. more people deploying flash for reasons other than performance alone)
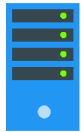
- **Software-Defined Storage:** 94% of IT storage decision makers identified their organization as either committed to SDS as a long-term strategy (68%) or conceptually interested (26%)

Infrastructure **Peer Data**

- **Hybrid IT:** 60% of IT organizations migrate VMs, applications, and data between their on-premises private clouds and public cloud environments

- **Converged systems:** Most mature for on premises cloud delivery model, with 88% of IT decision makers having deployed (32%) or planning to deploy converged systems (eg: EMC VxBlock or NetApp FlexPod)

- **Hyperconverged systems:** IT decision makers have deployed (15%) or plan to deploy (70%) these types of systems
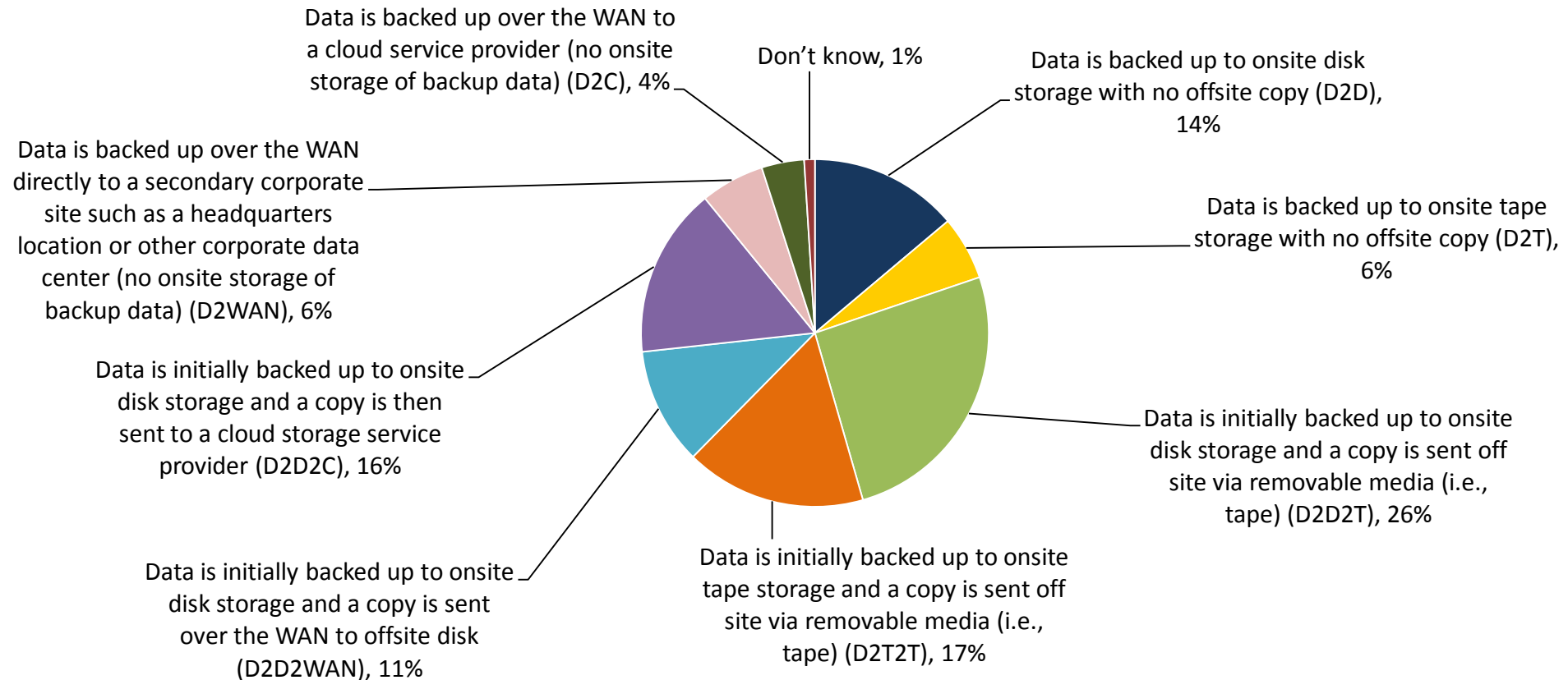
Infrastructure **Peer Data**
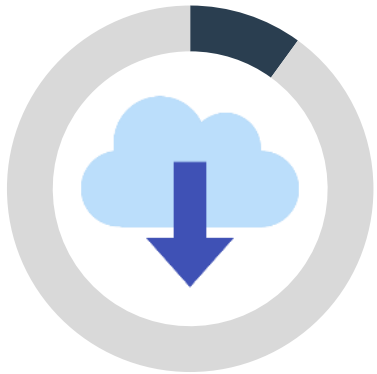
Health care industry are laggards in cloud adoption.

10% show no interest or plans in adoption.

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The "Status Quo" for backup media in 2015

Thinking about your organization's environment today, which of the following best describes how the data backup process is generally managed? (Percent of respondents, N=375)

Data is backed up over the WAN to a cloud service provider (no onsite storage of backup data) (D2C), 4%

Don't know, 1%

Data is backed up to onsite disk storage with no offsite copy (D2D), 14%

Data is backed up over the WAN directly to a secondary corporate site such as a headquarters location or other corporate data center (no onsite storage of backup data) (D2WAN), 6%

Data is backed up to onsite tape storage with no offsite copy (D2T), 6%

Data is initially backed up to onsite disk storage and a copy is then sent to a cloud storage service provider (D2D2C), 16%

Data is initially backed up to onsite disk storage and a copy is sent off site via removable media (i.e., tape) (D2D2T), 26%

Data is initially backed up to onsite disk storage and a copy is sent over the WAN to offsite disk (D2D2WAN), 11%

Data is initially backed up to onsite tape storage and a copy is sent off site via removable media (i.e., tape) (D2T2T), 17%

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Top Ten Data Protection Challenges in 2015

Which of the following would you characterize as challenges with your organization's current data protection processes and technologies? Which would you characterize as the top challenges for your organization? (Percent of respondents, N=375)
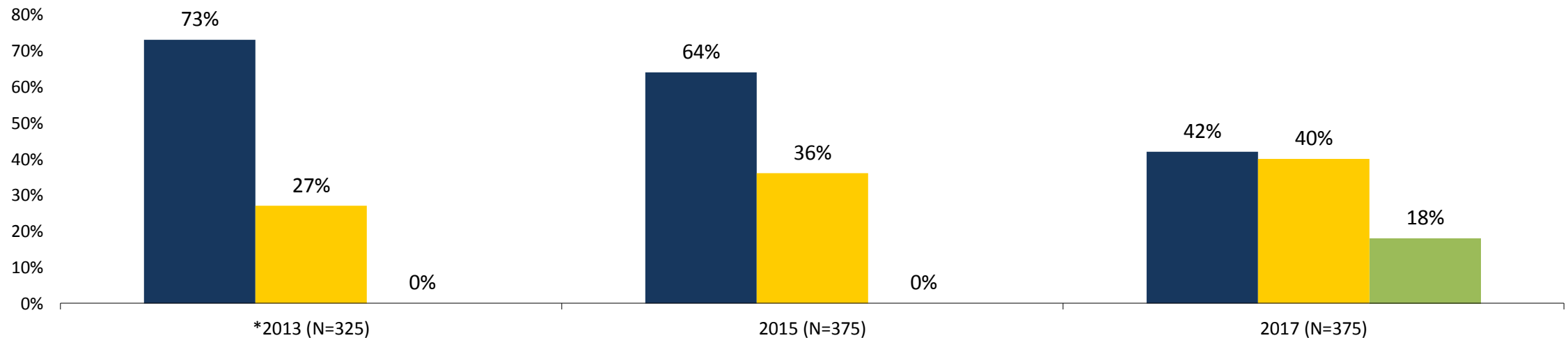
Challenge	Primary data protection challenges	All data protection challenges
Cost(s)	22%	43%
Keeping pace with capacity of data to protect	15%	35%
Managing the complexity of our data protection environment	13%	29%
Data protection for virtual environment	11%	32%
Remote site backup/recovery	10%	30%
Managing multiple data protection vendors/solutions	9%	27%
Protection of SaaS-based applications/workloads (e.g., Office365, SalesForce.com)	9%	27%
Need to improve backup and recovery reliability	9%	29%
Need to reduce backup time	9%	33%
Bandwidth availability/cost for transferring copies off site	8%	23%

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Strategy for Backing up Virtual and Physical Servers: 2013 vs. 2015 vs. 2017

Organization's strategy for backing up virtual and physical servers 2013 vs. 2015 vs. 2017.

- ■ Unified – we use the same backup tool for physical servers and virtual machines
- ■ Separate - we use separate backup tools for physical servers and virtual machines
- ■ Undecided - open to considering staying unified or separating, based on the best fit for us

Bar chart:

	*2013 (N=325)	2015 (N=375)	2017 (N=375)
Unified	73%	64%	42%
Separate	27%	36%	40%
Undecided	0%	0%	18%

*Source: ESG Research Report, *Trends for Protecting Highly Virtualized and Private Cloud Environments,* June 2013.

Enterprise Mobility

# What are the important technology trends in Mobility?

Monolithic applications will be replaced with microservices

Applications will be designed and maintained as compilation of services stitched together with API calls creating numerous benefits for developers and users. IT organizations will be faced with monitoring and securing the API traffic.

Voice input and augmented reality will drive how employees (and customers) interact with apps & devices

Applications will leverage the coherency of voice recognition and AI to create a personal and productive experiences for users. The experience will be further be enhanced with an augment reality view that places the users closer to a real life experience.
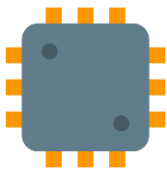
Machine learning will augment business and customer insight

Cloud based consumption models will provide access to statistical pattern recognition and machine learning for business to obtain productivity, security and overall user experience improvements.

Email communication will transition into social business interactions

Team collaboration and interaction (written, voice and video) will take place of email as business process and workflows adapt to modern generation applications.
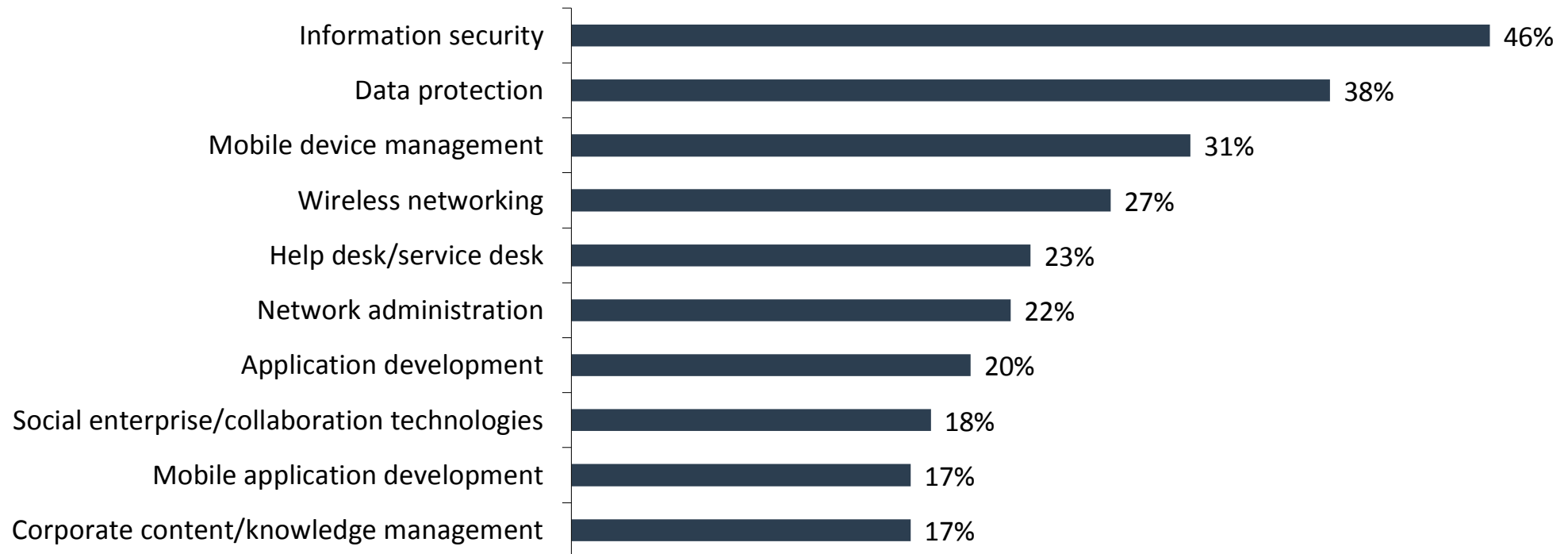
What are the important people skills for Enterprise Mobility?

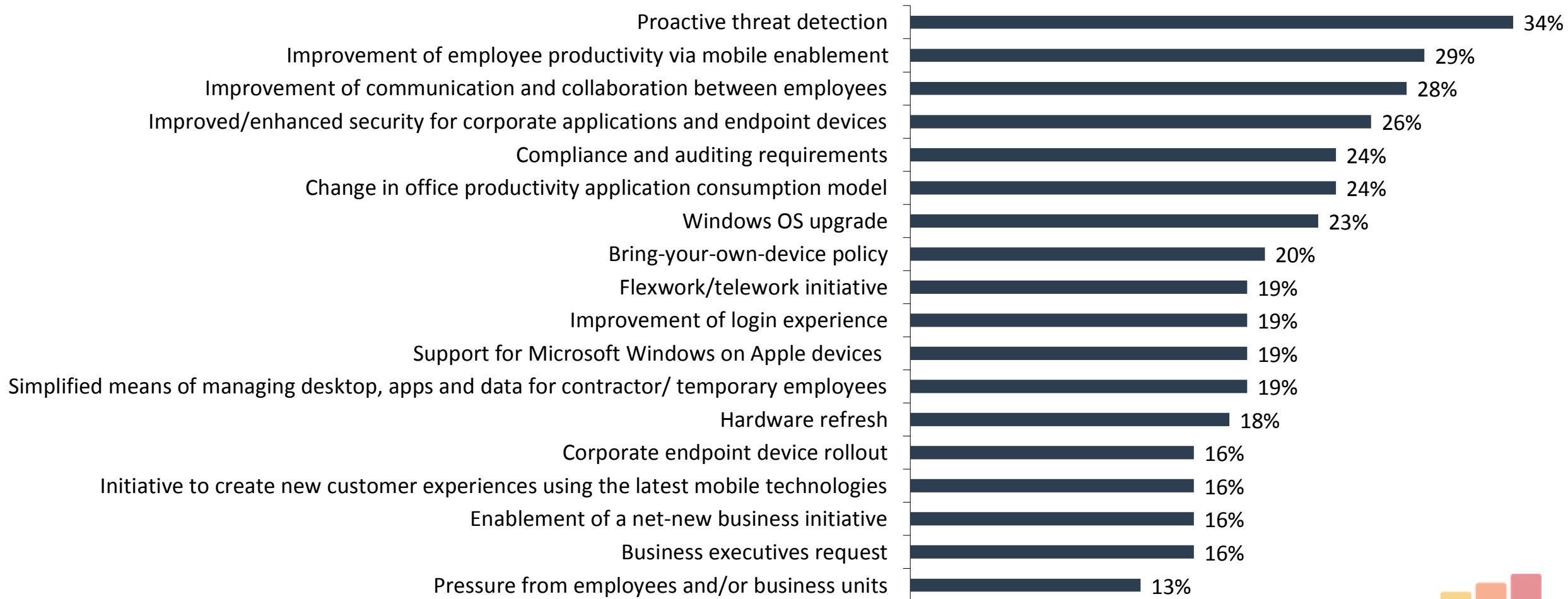**Technology convergence creates an opportune time to execute on organizational adjustments**

As an example, mobility strategies require tiger teams or formal center of excellence teams that have application and security skills as well as daily business insights.

Which of the following technologies and skillsets are or will be most important to the ongoing support of your organization's enterprise mobility strategy? (Percent of respondents, N=395, three responses accepted)

Skill	Percent
Information security	46%
Data protection	38%
Mobile device management	31%
Wireless networking	27%
Help desk/service desk	23%
Network administration	22%
Application development	20%
Social enterprise/collaboration technologies	18%
Mobile application development	17%
Corporate content/knowledge management	17%

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Influential Factors on Enterprise Mobility Strategy

Which of the following have had the greatest influence on shaping your organization's enterprise mobility strategy? (Percent of respondents, N=395, five responses accepted)

Factor	Percent
Proactive threat detection	34%
Improvement of employee productivity via mobile enablement	29%
Improvement of communication and collaboration between employees	28%
Improved/enhanced security for corporate applications and endpoint devices	26%
Compliance and auditing requirements	24%
Change in office productivity application consumption model	24%
Windows OS upgrade	23%
Bring-your-own-device policy	20%
Flexwork/telework initiative	19%
Improvement of login experience	19%
Support for Microsoft Windows on Apple devices	19%
Simplified means of managing desktop, apps and data for contractor/ temporary employees	19%
Hardware refresh	18%
Corporate endpoint device rollout	16%
Initiative to create new customer experiences using the latest mobile technologies	16%
Enablement of a net-new business initiative	16%
Business executives request	16%
Pressure from employees and/or business units	13%

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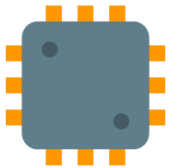# What are the important technology trends in Backup & Archiving?

Backup is for recovery. Archive is for discovery.

If data was worth creating, it is worth keeping.

We don't know why we might want to query an ancient data set, but we know we might want too.

There is no truly valid economic reason NOT to actively archive. The only reason to delete data is because you HAVE too.

Thank You!

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