

# Open Source vs Proprietary: What organisations need to know

Meeting IT and business priorities with a hybrid approach to open source and proprietary solutions



# Contents

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Introduction.....	3
Key findings .....	4
Taking a hybrid approach .....	5
Findings from the research .....	6
The aspiration for increasing use of open source.....	6
Hidden vulnerabilities of open source .....	10
Open source for data analytics .....	11
IT priorities .....	15
Security conflict .....	15
Skills considerations .....	16
Technical debt restricts innovation .....	17
Comparing speed of implementation .....	18
Measuring true costs .....	19
Delivering the best return .....	20
Machine Learning .....	21
SAS and Open Source.....	23
Conclusion.....	25
Summary of results.....	26
Key differences.....	27
References .....	28

# Introduction

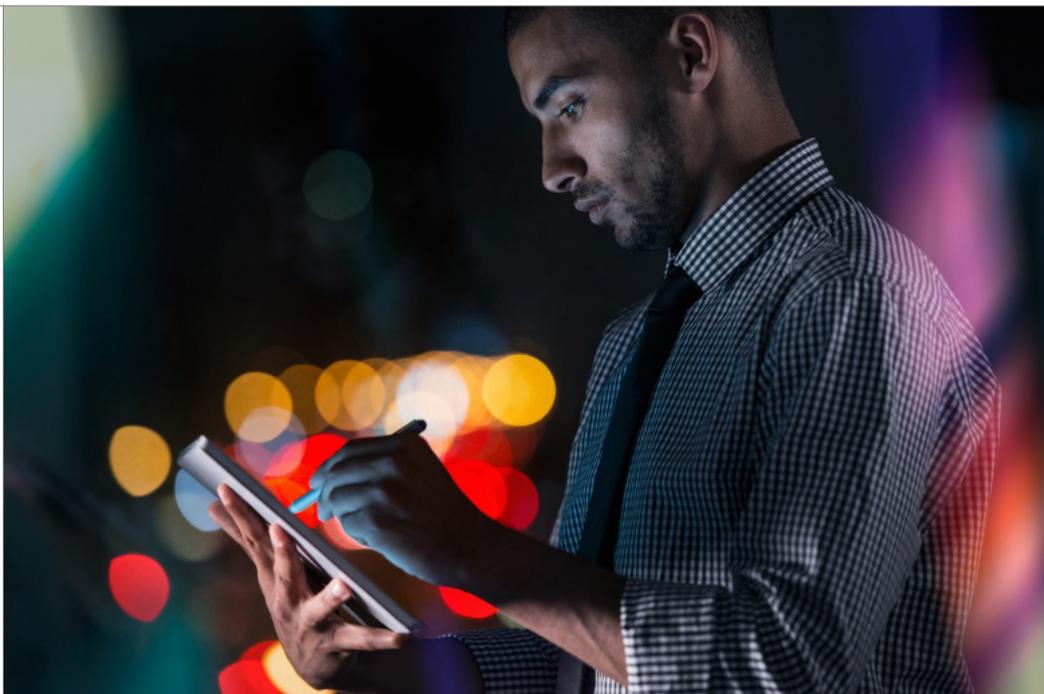
Open source technologies, like Hadoop, R and Python, have been vital to the spread of big data. However, production deployment of these technologies has its own, often unexpected, costs and projects are not necessarily succeeding as hoped.

Deploying open source software at an enterprise level is challenging. Projects may be derailed by the requirement to scale up to operational levels of reliability and performance using a complex set of open source tools - tools that require coding experts who are notoriously hard to find. Some organisations will have the engineering skills and manpower to make it work, but it is not a route that many can contemplate. These challenges are not always appreciated at the outset.

In a recent article, Robin Way of Corios reported:

“Large financial institutions with whom I’ve spoken are getting nasty wake-up calls about failures of their selected open source platforms to provide robust, reliable results. The initial attraction was the price of open source tools; the subsequent feedback is a broader appreciation for total cost of ownership, which isn’t as attractive as they first anticipated.”

Robin Way, Corios<sup>1</sup>



In one example, Way outlines how a bank took four years to consider the roadmap for open source analytics but decided that the total cost of ownership would be more expensive than using a single consolidated platform. In addition to meeting all their functional needs, the ability to scale to meet requirements in both development and deployment was essential. Open source was rejected and, in this case, the platform chosen was SAS.

In another example, an insurer may have to abandon 18 months’ work after standardising all new model development in Python and all model deployment in Scala. Despite substantial work, none of their Scala model translations match the results from their Python model development, and nobody in the company knows how to fix this problem.

SAS is aware of similar challenges in the UK public sector. The anecdotal evidence is mounting that the true costs of open source are not necessarily understood, and that organisations are underestimating the range of considerations when it comes to deploying these systems and keeping them operational.

SAS commissioned a business user survey to understand the attitudes and deployment of open source data analytics among senior IT and digital decision makers. Three hundred executives in the UK and Ireland were interviewed to create a better understanding of the key considerations for open source analytics technology, drivers for business transformation and any limitations to success.



## Key findings

Among respondents, there is clearly a desire to increase use of open source technology. However, the impetus to move organisations forward through innovation and modernisation is balanced by the desire to improve security measures and protect the business.

Respondents report that improving security (62%) is the most common organisational IT priority for 2017. However, security threats are also the most commonly reported potential vulnerability of open source, identified by half of all respondents. The vast majority (95%) of respondents' organisations are encountering barriers to achieving these IT priorities, with a third being held back by a lack of internal skills.

Many organisations aren't taking into account all the relevant factors when it comes to the true cost of

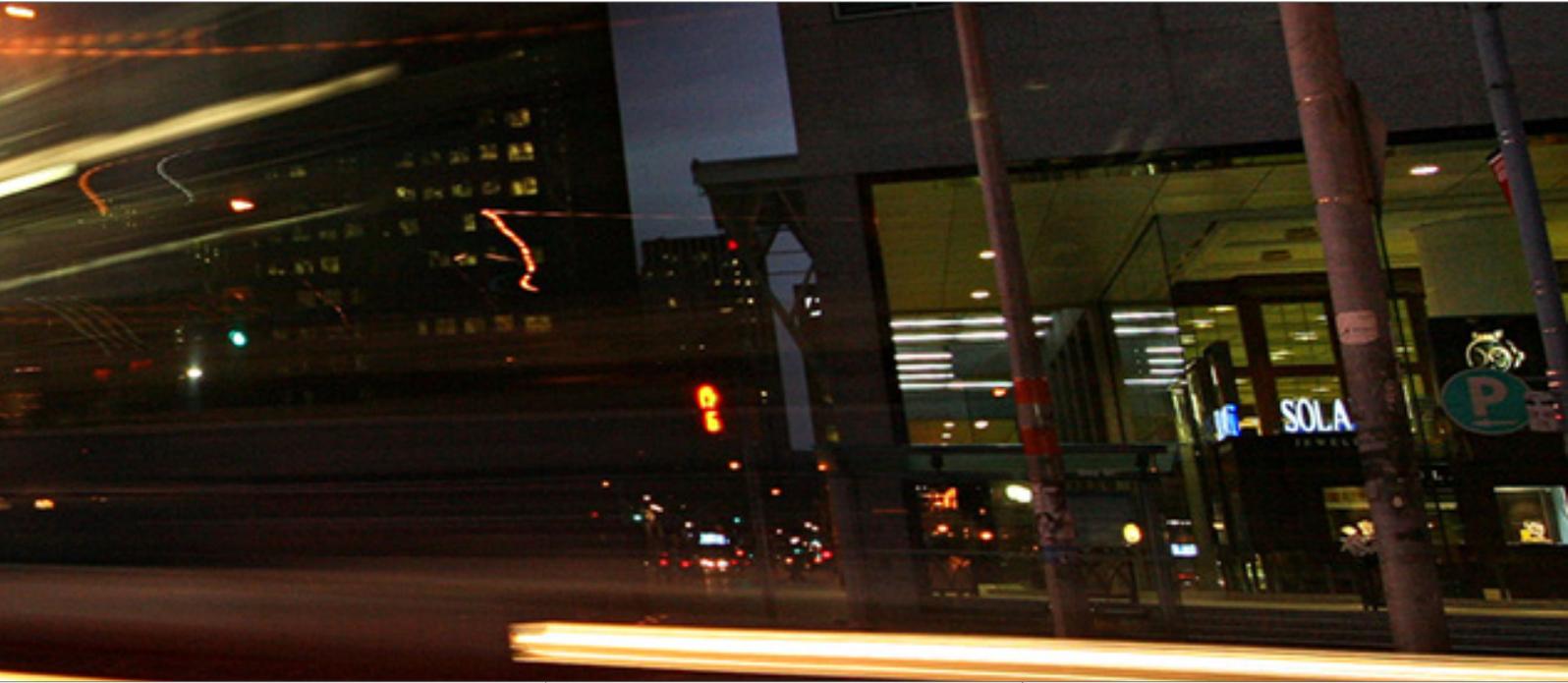
open source, leaving them potentially exposed - for example, only half currently take into account the time to fix/resolve issues and a minority (41%) contemplate the need to replace expertise if employees leave. Plans to increase open source adoption in light of overall objectives will need to be carefully balanced.

According to respondents, use of open source is anticipated to bring new opportunities to both the organisation (95%) and to customers (89%). However, only around half believe that open source is faster to implement than its proprietary equivalent, and around a third believe that they are the same, implying a split consensus or even a lack of full understanding of the best approach to take.

Although around three-quarters of respondents would consider the use of an open source platform for data analytics, nearly all (95%) believe that there are challenges for their

organisation in doing so. A wide range of challenges are reported, with security (50%) and finding a single solution to fit the business (46%) the most common.

In embracing other new technologies, the most commonly reported approach (42%) is for organisations to have their principal focus as operational but occasionally investigate new technologies. Machine learning is a technology that is currently used or planned to be used by just over two-thirds but, as with open source and wider IT priorities as a whole, a lack of skills (40%) is reported by many as a hurdle to achieving this objective.



## Taking a hybrid approach

Most organisations are looking to expand their use of open source while retaining a solid foundation of proprietary technologies – combining the strengths of enterprise software with the benefits of open source. Proprietary solutions are optimised for operational and production analysis and include integrated capabilities for data management, audit, governance and lineage plus much more, while open source can quickly bring new analytic algorithms to market.

However, to embrace collaboration between open source and proprietary systems, organisations must recognise the true costs of adopting open source technologies. SAS' research suggests these true costs are not always being taken into account, nor the risks associated with

them fully understood. Some of the reasons for this confusion may be that people are basing opinion on limited experience of either type of technology and that misconceptions abound.

Advocates of open source technology highlight that understanding the best use of each component of the open source data ecosystem, and how to connect them, are the most valuable skills for companies seeking innovation.

**“As new technologies arrive, it's crucial to understand how they fit in, what they might replace and what they might enable.”**

**Doug Cutting, Information Week<sup>2</sup>**

Rather than seeing open source as a threat, SAS' strategy is to integrate open source components, expand the scope of open source features, and utilise the capabilities of SAS built on open source languages. In

April 2016, SAS announced SAS<sup>®</sup> Viya<sup>™</sup> – an open, cloud-ready, in-memory analytics platform, designed to help organisations keep pace with analytical demands and deliver quick results that drive the best decisions.

SAS recognises that open source versus proprietary is not an either/or decision and is keen to work with all organisations, including those wanting to embrace or increase their use of open source.

The right solution – whether open source, proprietary or a combination of both – will depend on the business problem an organisation is trying to address. Understanding the benefits and true costs of both is vital. Many organisations are realising that they can meet both internal and external stakeholder requirements by finding the right balance.

# Findings from the research



300 senior IT and business decision makers from the UK and Ireland were interviewed in December 2016, split by organisation type, size and sector. An overview of the key findings are provided here.

## The aspiration for increasing use of open source

Respondents report that, on average, their organisation's technology is made up of two-thirds proprietary and a third open source (figure 1). In an ideal world, this split would be more balanced with use of open source up to 40 per cent (figure 2).

Most organisations are looking to expand their use of open source while retaining a solid foundation of proprietary technologies at the same time. Only around a quarter that currently use open source technology do so throughout the organisation. However, for many its use has started to spread to most (34%) or many (18%) parts of the organisation, however a quarter of respondents report that it is only in limited areas.

Despite the desire for an increase in use of open source technologies, it is being approached cautiously with many organisations appearing to face challenges or a reluctance to embrace it more widely throughout the business. For example, just over three quarters of respondents are likely to consider using an open source platform for data analytics to some extent.

However, an open source data analytics platform must prove itself in many aspects for organisations when comparing it as an alternative to a proprietary platform. Respondents commonly reported security (62%), reliability (49%) and flexibility (43%) as the key requirements of their organisation when considering an open source platform for analytics versus a proprietary platform. Around a third say the same for ease of use and scalability.

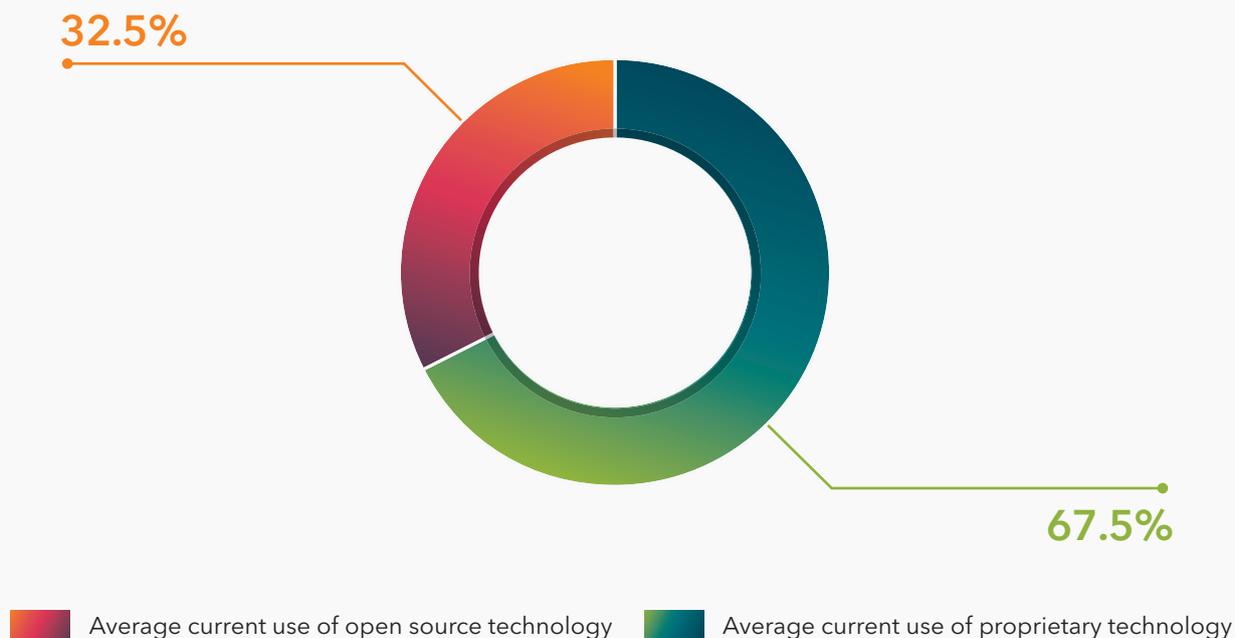
On average, surveyed senior decision makers report that their organisations currently use 67% proprietary and 33% open source technology. In an ideal world, they would increase use of open source to 40%, meaning proprietary would still form the majority of their total technology in use at 60%

Despite the desire to increase its use, most respondents (94%) believe that there are hidden vulnerabilities in using open source technology and almost all (97%) still see certain benefits in proprietary technology over open source

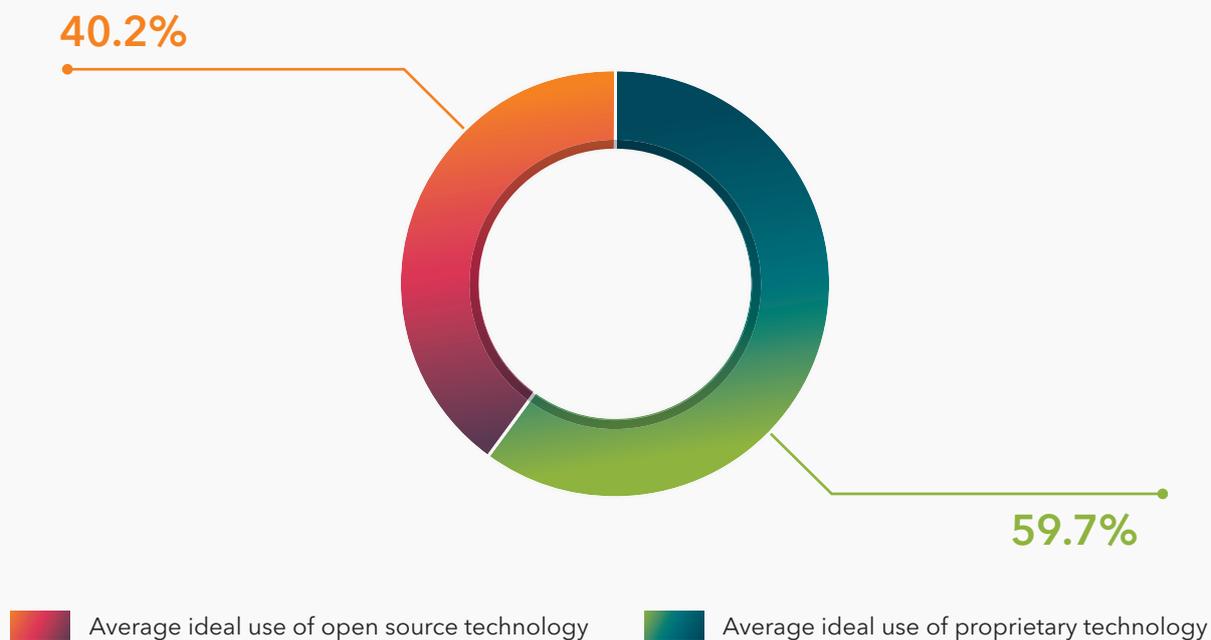
For respondents, a combination of both proprietary and open source technology is most commonly (36%) seen as being able to deliver the best ROI for their organisation

## Current and ideal mix of open source and proprietary technology

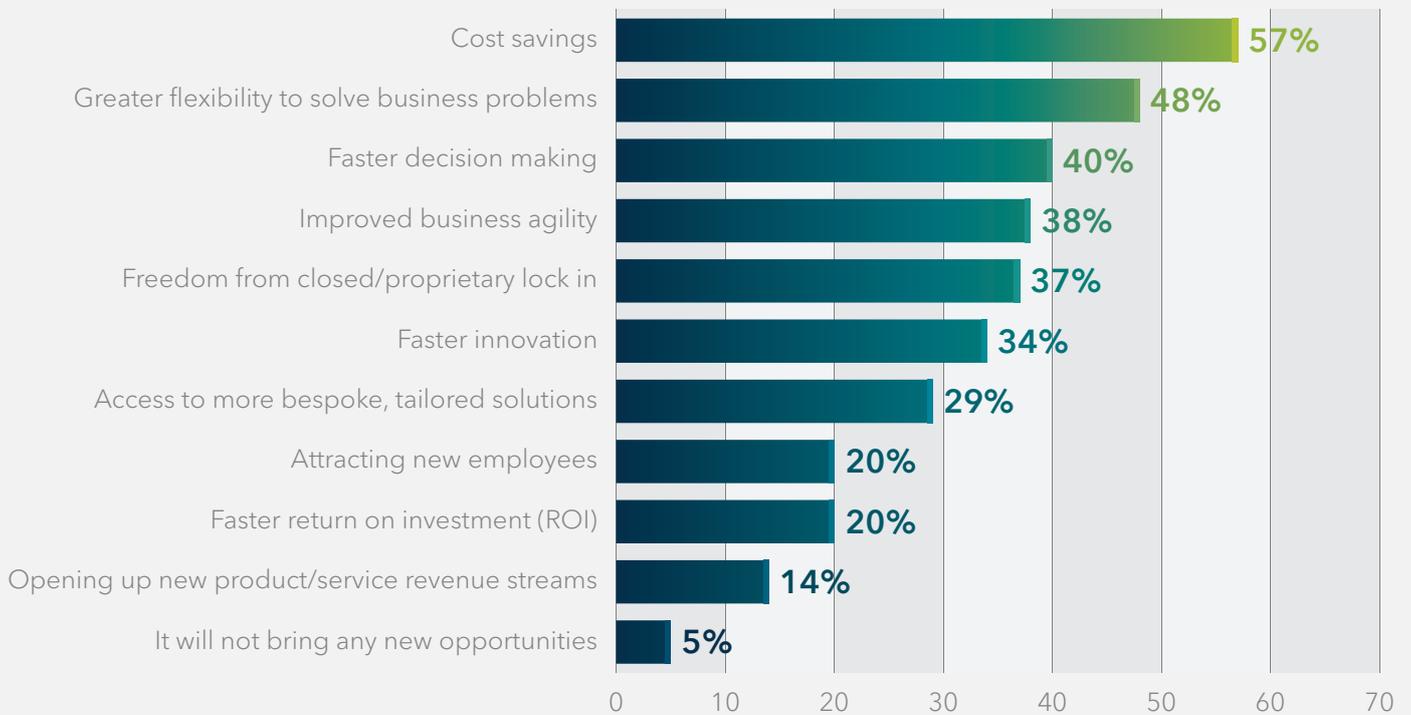
**Fig 1:** 'How would you describe the current split between your organisation's use of proprietary technologies and open source technologies?'



**Fig 2:** 'In your opinion, what would be the ideal split between your organisation's use of proprietary technologies and open source technologies?'



## Business benefits of open source adoption



**Fig 3:** 'What new opportunities do you believe that open source can bring to your organisation?'

## Customer benefits of open source adoption

In addition to offering in-house advantages, open source is understood to lead to customer benefits:



**Fig 4:** 'What new opportunities do you believe that open source can bring to your organisation's customers?'



A combination of both proprietary and open source products are most commonly believed to deliver the best ROI for organisations (36%). Respondents believe that open source can lead to cost savings (57%) and a greater flexibility to solve business problems (48%). Four in 10 believe it can assist with faster decision making.

Most (89%) believe that customers stand to potentially benefit from their organisation using open source. Almost half believe that open source can help bring opportunities in terms of a wider range and more personalised products and services. Around four in 10 feel it can help with faster resolution of problems.

Open source is generally viewed in a positive light, and as something that can bring benefits to both the organisation and its customers - this is reflected in many organisations' desire to further grow their use of open source alongside their existing proprietary solutions.



## Potential vulnerabilities of open source



**Fig 5:** 'What do you see as potential or hidden vulnerabilities of working with open source?'

### Hidden vulnerabilities of open source

Security threats (48%) are the most commonly reported potential vulnerability of open source by respondents.

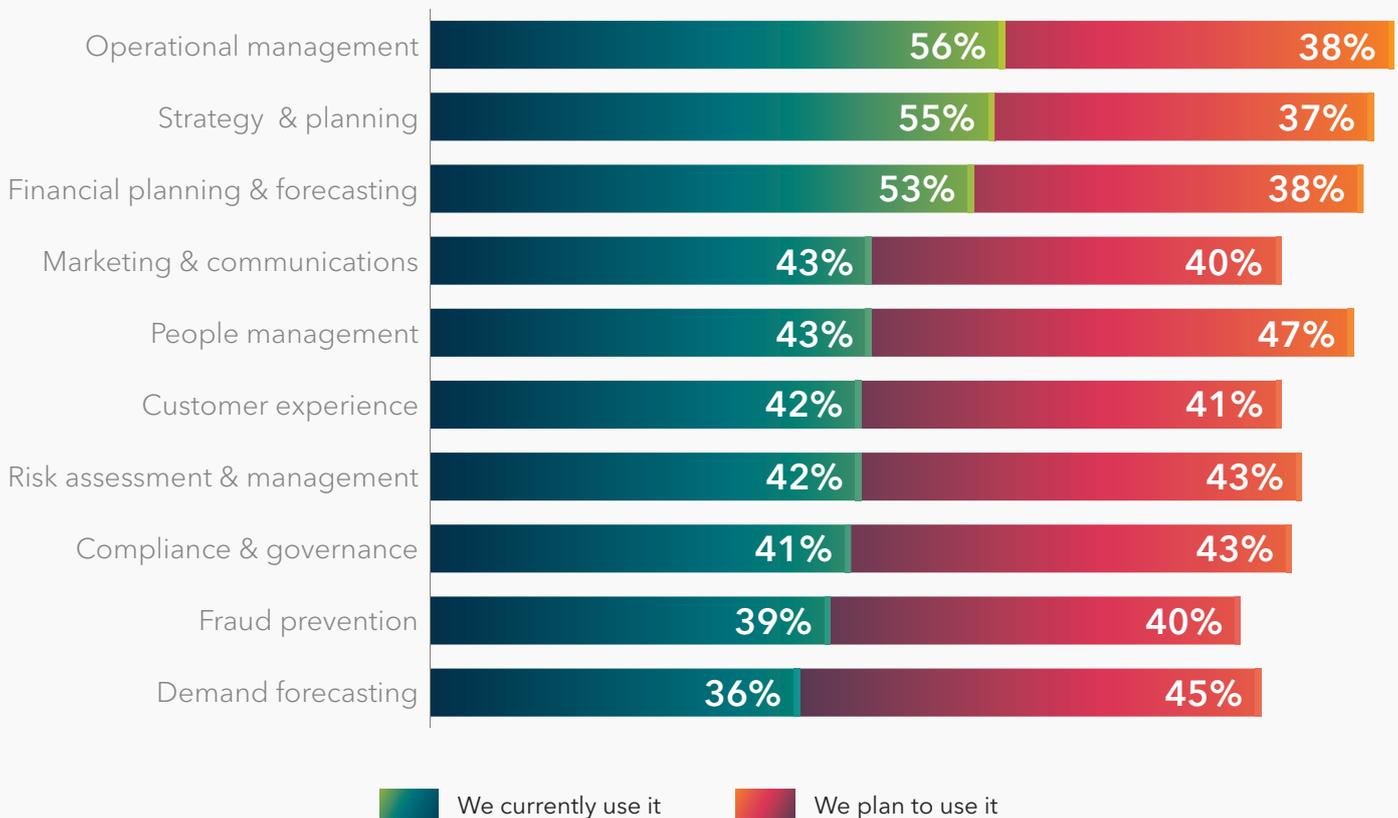
This is important given that organisations also reported security

as the main organisational IT priority for 2017, so will need to carefully assess plans to increase open source adoption in light of their overall objectives.

Almost all (94%) believe that there are hidden vulnerabilities. Many are concerned about a lack of control (45%) and have some mistrust in

the open source community (39%). Around three in 10 worry about an over-reliance on a small number of experts (32%), and employees with knowledge of the technology leaving the company (28%).

## Current and planned use of data analytics



**Fig 6:** Analysis of respondents whose organisation currently or plans to use data analytics in the above areas

### Open source for data analytics

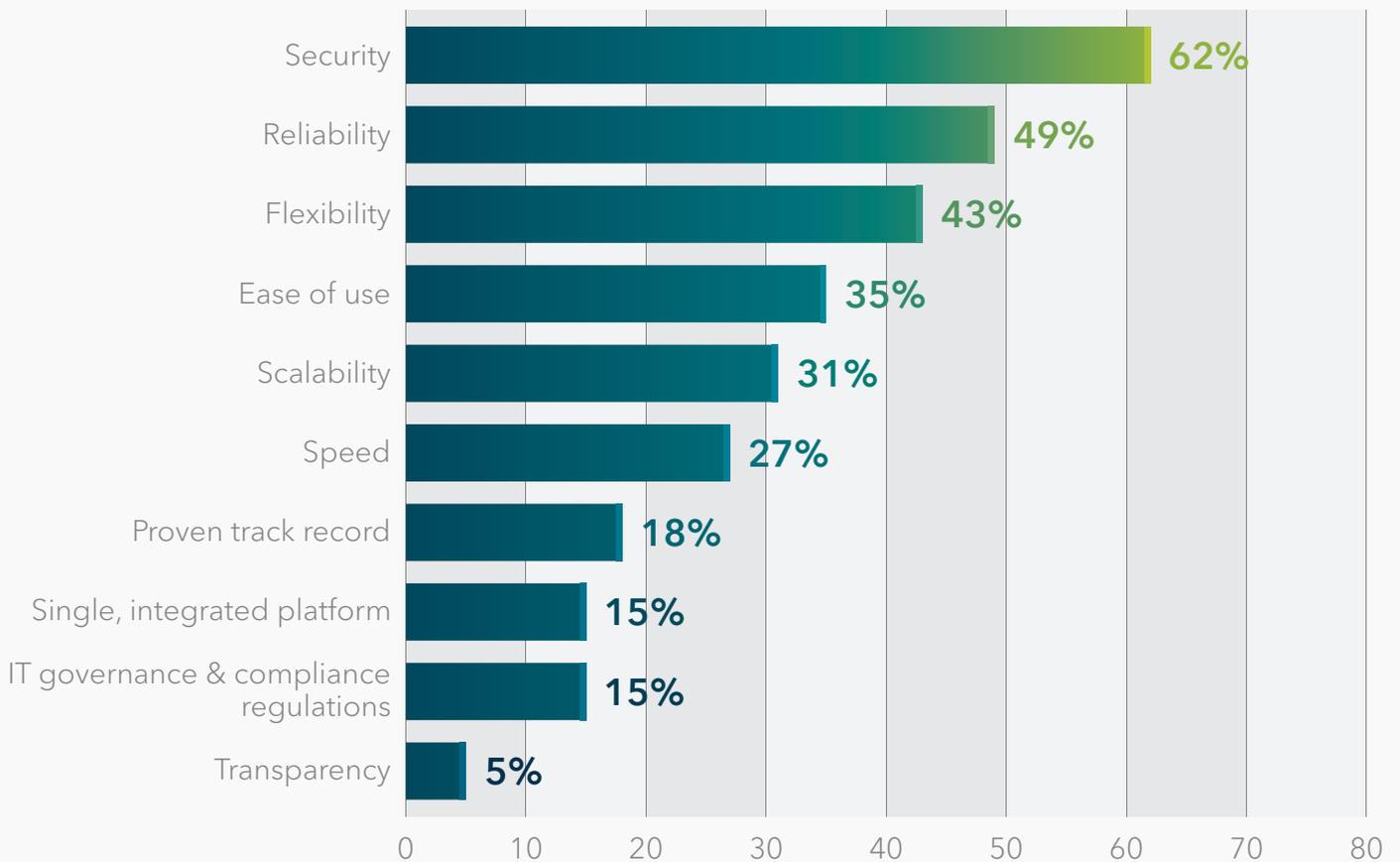
Just over three-quarters of respondents are likely to some extent to consider using an open source platform for data analytics, however only around a fifth would be extremely likely.

Respondents' relative willingness to using open source for data analytics reflects their views on the further uptake of open source as a whole (figure 6), however, many perhaps lack a full enough understanding of the technology to be definitive in their plans.

When it comes to considering an open source platform for data analytics, a small proportion of the respondents who have 'improve security' as their number one priority would be 'extremely likely' to do so (13%).

They are also more likely to list security concerns (57%) as a potential challenge in using open source for this purpose.

## Key requirements of an open source data analytics platform



**Fig 7:** 'What are your organisation's key requirements when choosing an open source versus a proprietary data analytics solution?'; asked only to respondents whose organisation is at least somewhat likely to use an open source platform for analytics (284)

### What key requirements do organisations have when it comes to an open source platform for analytics?

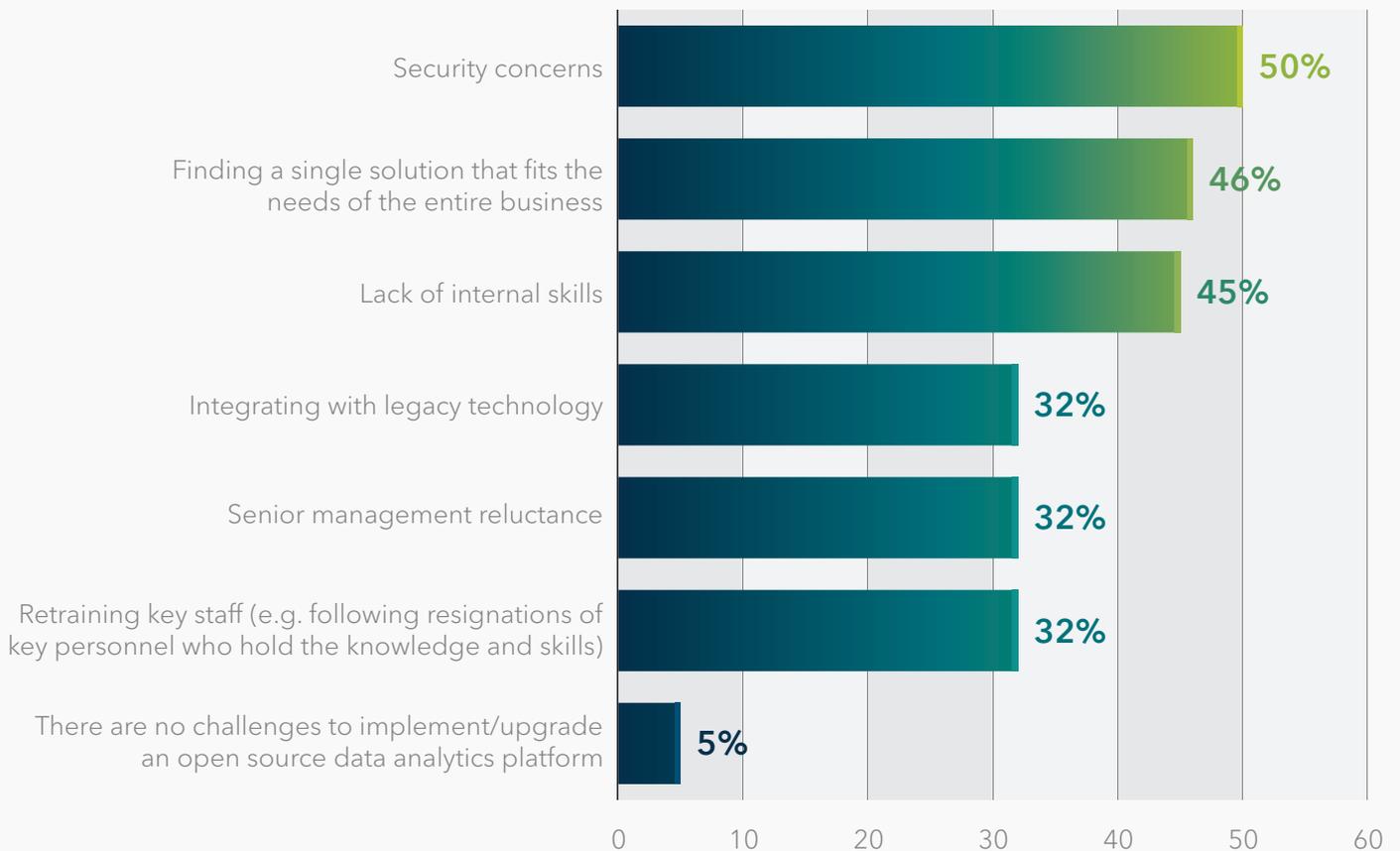
Of those likely to consider it, around six in 10 respondents say security is a key requirement when choosing an open source data analytics platform.

Reliability (49%) and flexibility (43%) are also commonly reported as important to respondents' organisations. Around a third say the same for ease of use and scalability.

An open source data analytics platform must prove itself in many aspects for organisations when

comparing it to a proprietary alternative - this perhaps highlights why only one in five are 'extremely likely' to consider it.

## Key challenges to an open source data analytics platform



**Fig 8:** 'What are the key potential challenges when implementing or upgrading an open source data analytics platform?'

### What challenges do organisations foresee in implementing an open source data analytics platform?

In addition to security concerns, almost half anticipate a struggle in finding a solution that fits the needs of the entire business - an

open source challenge already demonstrated by the low numbers of organisations that have deployed such technology throughout the business. A similar proportion also face a lack of internal skills.

Given the breadth of areas that data analytics is either used or planned to be used (figure 6), concerns about

an open source solution that can meet the needs of the entire business may limit the potential for further adoption.



## Perceptions of proprietary technology

Almost all respondents (97%) still see benefits of proprietary technology and recognise areas where it delivers over open source.

Security (54%) is the most common benefit reported, followed by control (51%). Significant numbers also believe that proprietary technologies offer a proven/trusted solution

(37%) and are easy to use (35%) and implement (31%).

Respondents retain significant faith in proprietary solutions, believing it to offer many benefits. In addition to the potential vulnerabilities of open source (figure 5), this is a clear indication as to why organisations plan to ensure that proprietary continues to make up the majority part of their technology infrastructure (figure 2).

- Those aiming to improve security are more likely to see the ease (40%) and speed of implementation (33%) as key advantages of proprietary technology
- When it comes to the key benefits of proprietary over open source, respondents who list 'lack of skills' as a key restriction to open source are also more likely to regard control (62%) and ease of use (41%) as being an advantage of proprietary software

## Top IT priorities for 2017

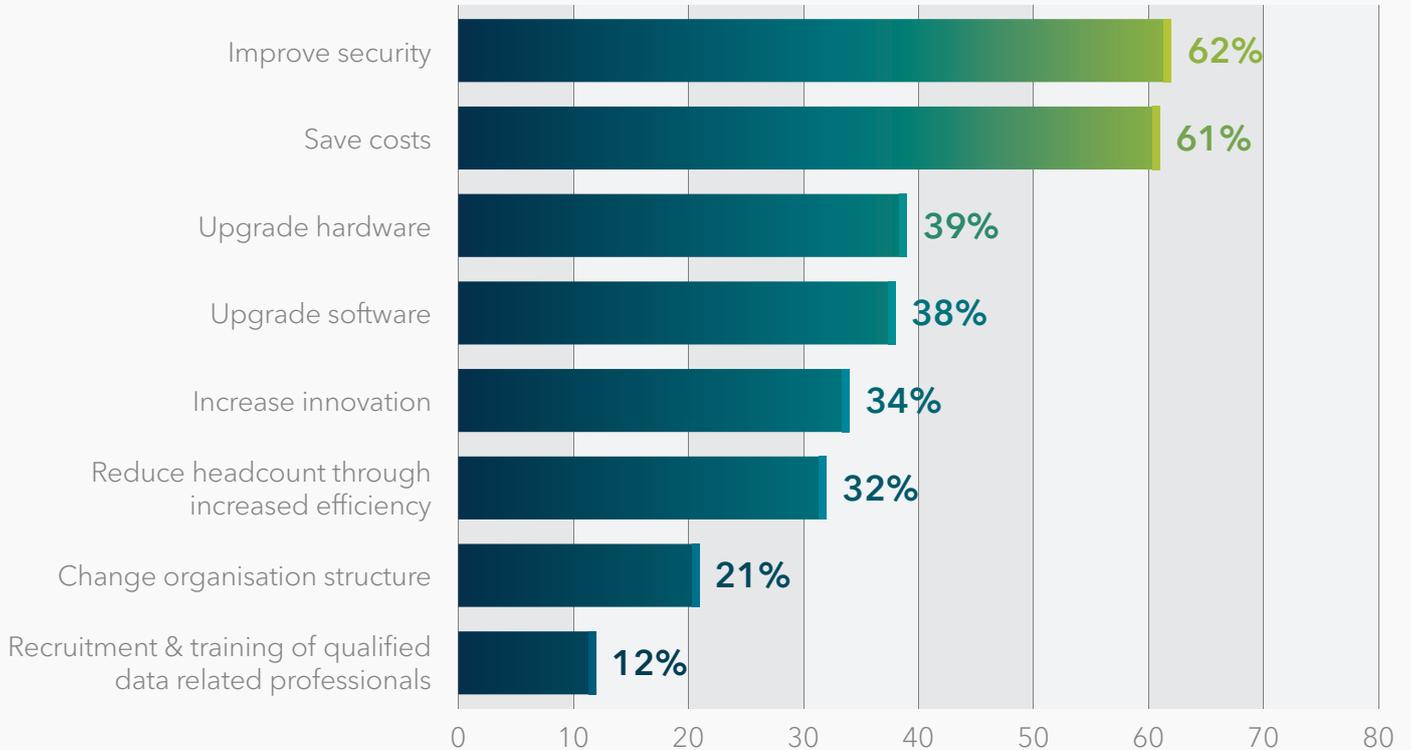


Fig 9: 'Looking at 2017, what are the top three IT priorities for your organisation?'

### IT priorities

Organisational IT priorities for the coming year reflect both a desire to protect the business, but also to move it forward through modernisation and innovation.

The most common (62%) IT priority for respondents' organisations in 2017 is to improve security. Just over six in 10 respondents place saving

costs in their top three IT priorities but beyond that, a range of priorities is apparent. Around two-fifths say upgrading software will be a key focus while just over a third say the same for increasing innovation.

Almost all organisations (95%) face challenges in meeting their 2017 IT priorities, with around half facing budget restrictions and a third facing a lack of internal skills.

### Security conflict

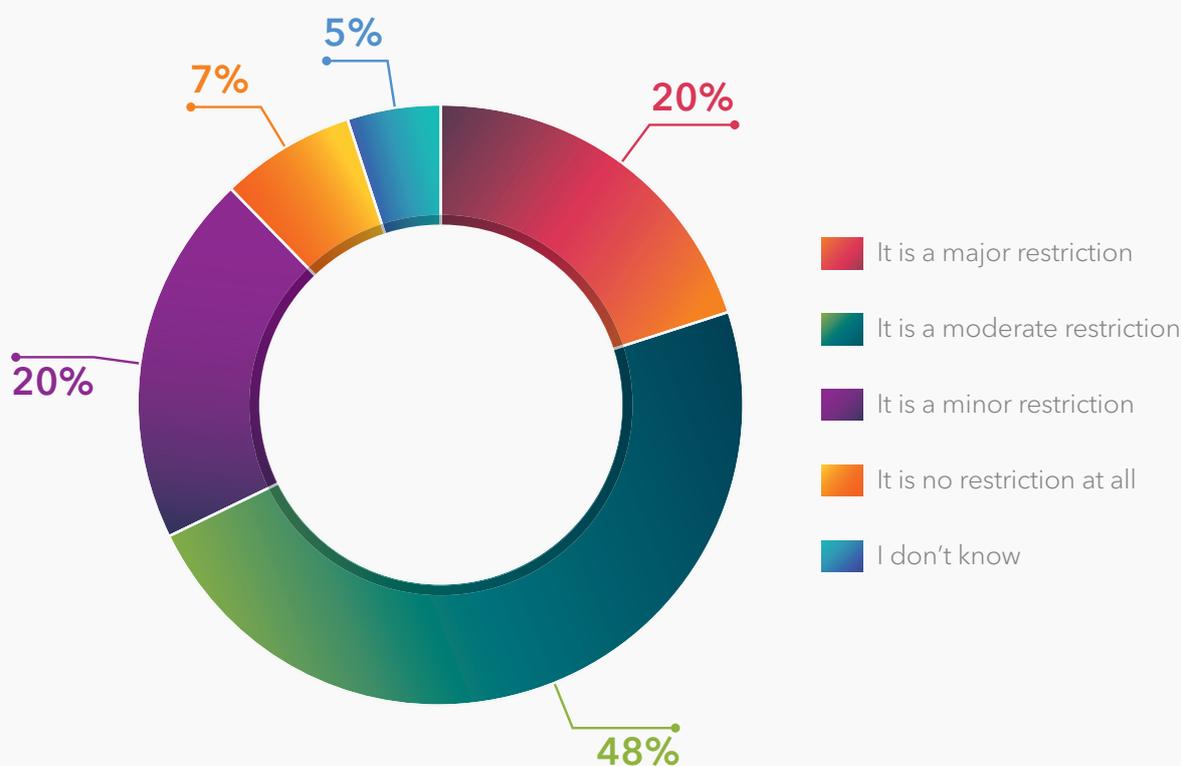
Almost all respondents (94%) believe that there are hidden vulnerabilities within open source. When considering proprietary technology, the security and control offered by proven/trusted solutions are seen to be the most common benefits together with ease of use and implementation.



Respondents with 'improving security' as their number one IT priority for 2017 would ideally increase the proportion of open source technology. However, this is despite more than four in 10 reporting that security is a hidden vulnerability of open source.

This implies organisations are not aligning their IT priorities with plans for open source adoption.

## Impact of 'technical debt'



**Fig 10:** 'To what extent would you say that 'technical debt' in terms of data analytics is restricting business innovation in your organisation?'

### Skills considerations

The key skills required of new graduates joining organisations, are technical skills (64%) and communication (63%). However, most respondents (89%) do recognise that a different skill set is needed with open source versus proprietary technologies.

More technical skills, such as implementation (50%) and coding (45%), dominate the key differences required in skills between the two in the eyes of those that use both.

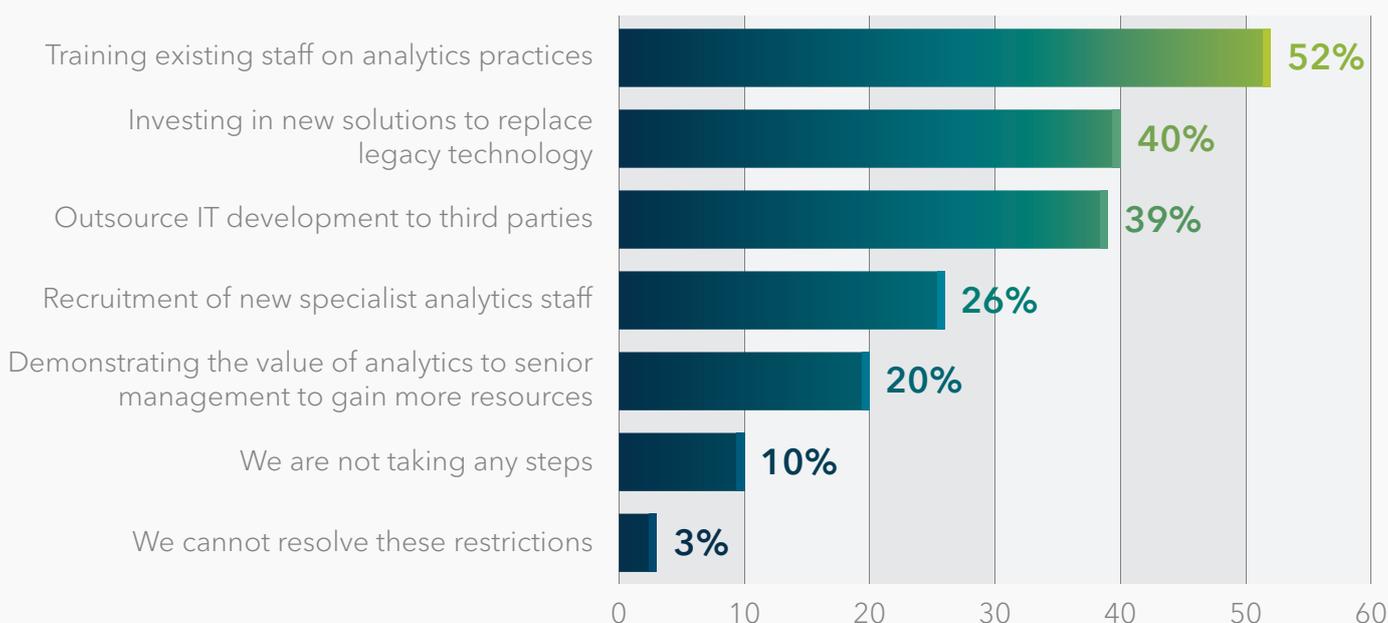
With respondents claiming that the ideal split between proprietary

technologies and open source technologies would be slightly more balanced - 60 per cent and 40 per cent respectively - organisations need to consider the additional costs of training and recruitment when considering more investment in open source. Nearly six in 10 organisations are not currently thinking about replacing open source expertise if employees leave, yet around three in 10 worry about an over-reliance on a small number of experts and employees with knowledge of the technology leaving the company.

Similarly, the majority (94%) that are familiar with machine learning face limitations in deploying or upgrading

it, with a lack of skills an issue for many. To resolve this challenge, training employees (55%) and investing in new technology (52%) are two of the most common actions planned. Around four in 10 plan to bring in new specialised employees and use external consultancy. However, with budget restrictions also highlighted as the main barrier to achieving IT priorities, some readjustment of resources may need to be made.

## Impact of 'technical debt' (cont.)



**Fig 11:** 'What steps are being taken to resolve 'technical debt' in terms of data analytics restrictions?', asked only to respondents who say that 'technical debt' is a restriction (265)

### Technical debt restricts innovation

Most organisations are considering a range of ways to overcome restrictions, including bringing in external help to fill knowledge and skills gaps.

The majority (88%) of respondents say that 'technical debt' in terms of data analytics is restricting business innovation. For a fifth, it is a major restriction. Of those facing restrictions, the most common

approach in terms of tackling the problem is training staff in analytics (52%). Around four in 10 are investing to replace legacy technology and outsourcing IT development to third parties. Around a quarter are recruiting new specialist staff.

In seeking to balance the risk of embracing new technologies and an operational focus, over four in 10 of respondents' organisations make their principal focus operational while occasionally investigating new technologies. A similar proportion

take an increasingly progressive approach, with investigation of new technologies seen as a primary focus. This split opinion is apparent in organisations' consideration of IT investment. While almost half (49%) of respondents say they are strategically focused, around four in 10 say they are both strategically and operationally focused.



## Comparing speed of implementation

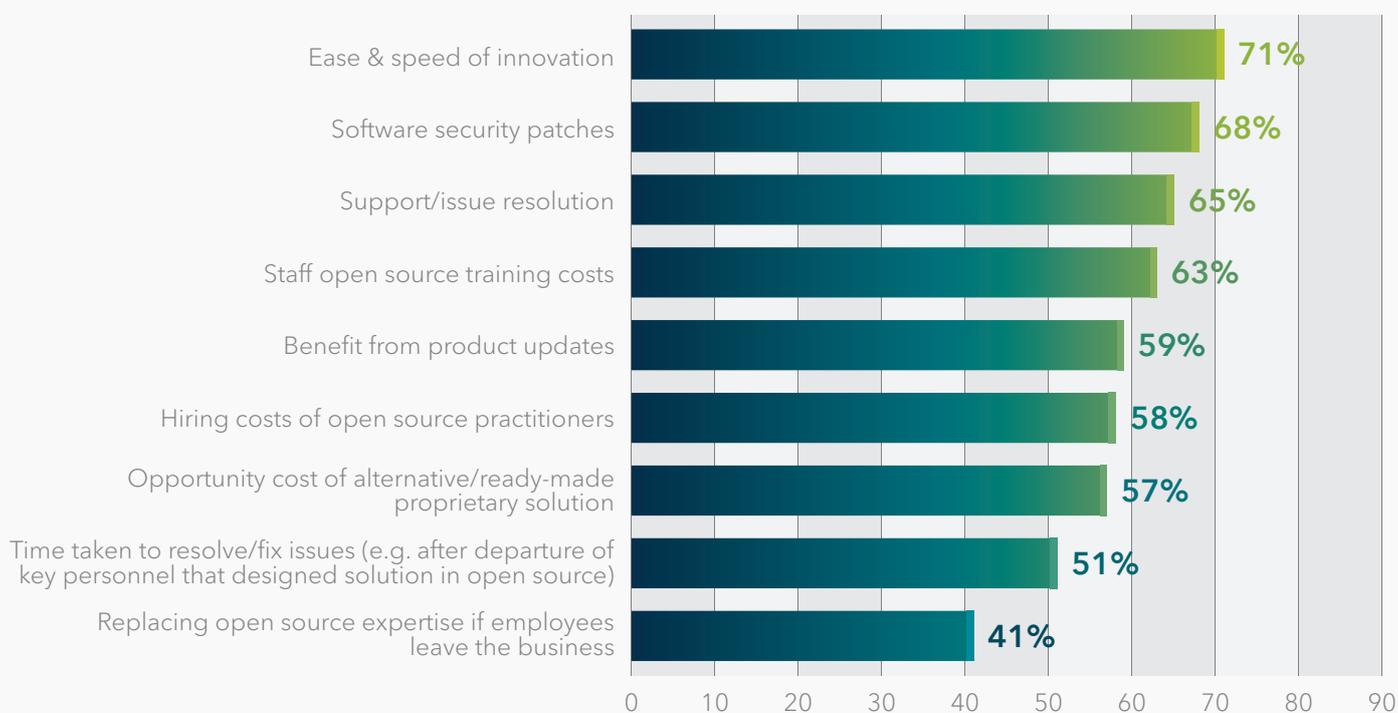
Just over half of respondents believe that open source is faster to implement than proprietary, however around a third believe them to be about the same.

When it comes to the perceived speed of implementation between the two streams of technology, there

appears to be a difference of opinion among respondents. This is perhaps driven by a lack of understanding about what open source use means and involves for their organisation. The objective is to get solutions into production and ensure they can scale without significant engineering and integration effort. For many it will make sense to explore open source analytics when there is a clear route to publish, execute and

manage open source and proprietary models together. Tried and tested platforms like SAS enable solutions to be operationalised with minimal integration effort.

## Key requirements of an open source data analytics platform



**Fig 12:** Analysis of respondents whose organisation currently takes into account the above elements when it comes to the true cost of open source

### Measuring true costs

Despite the widely accepted difference in skills required for open source, the majority (59%) of respondents' organisations are not currently taking into account replacing open source expertise if employees leave.

Only around six in 10 are currently taking into account open source training costs for employees or hiring

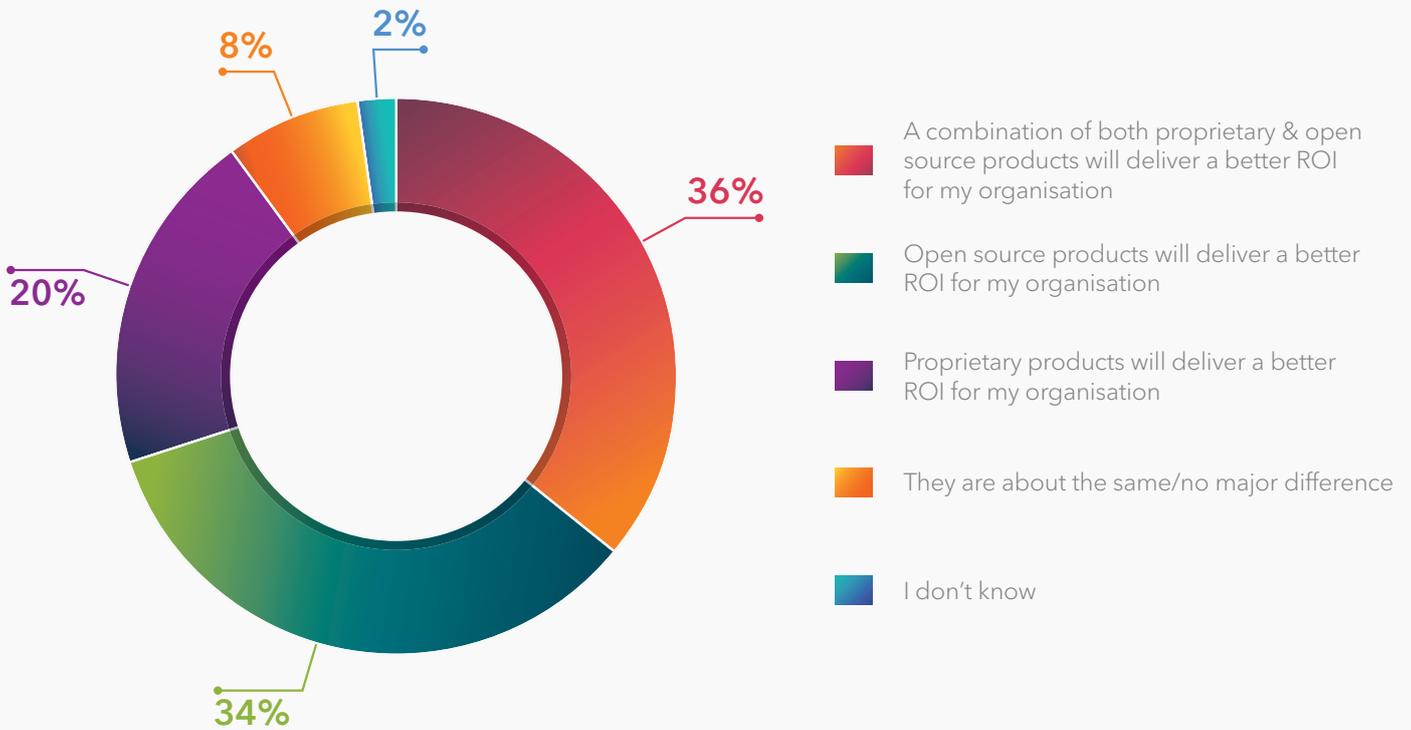
costs for open source practitioners. And only just over half are taking into account the time taken to resolve/fix issues.

Despite many organisations' plans to expand their use of open source (figure 2), many are leaving themselves exposed to additional costs by not considering everything that they potentially should.

Respondents who report a 'lack of skills' as a key restriction are more likely to regard an over-reliance on a small number of experts (42%) and employees with knowledge of the technology leaving the organisation (35%), as key hidden vulnerabilities of working with open source.

Despite this however, less than half say that their organisation currently considers replacing open source expertise as a key element in the true cost of open source adoption.

## Delivering the best ROI



**Fig 13:** 'In your opinion, which technology can deliver a better ROI for your organisation: open source solutions or proprietary software solutions?'

### Delivering the best return

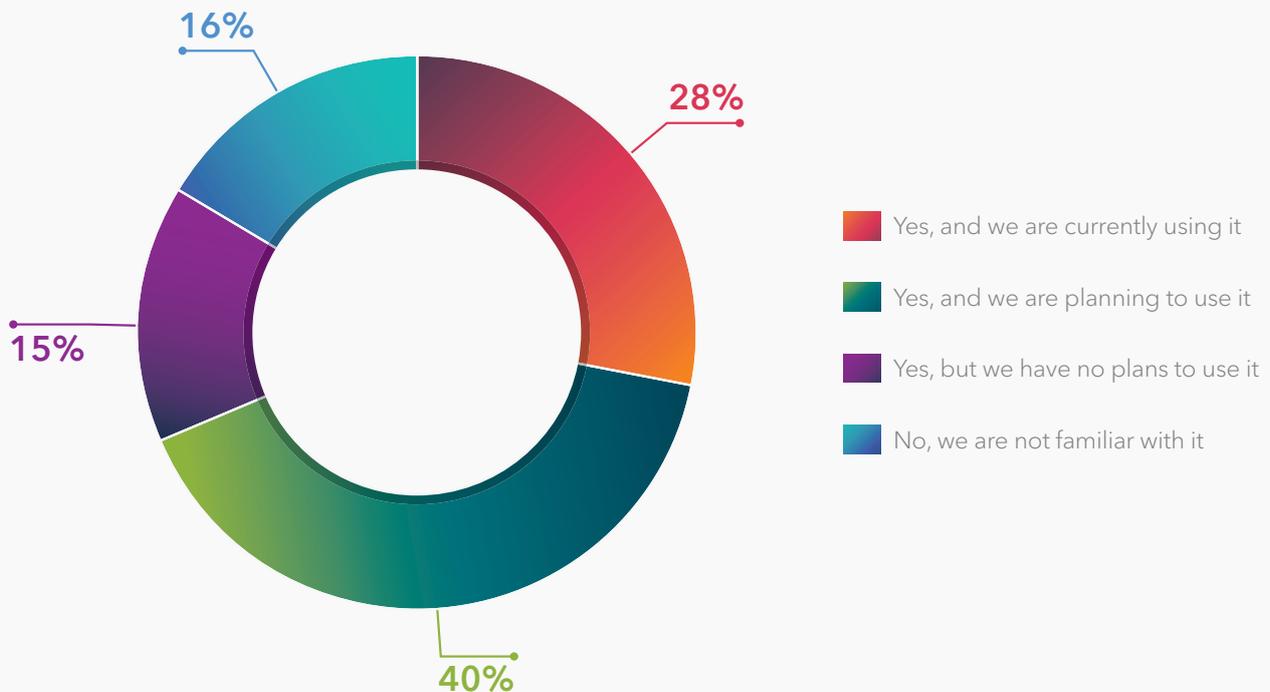
A combination of both proprietary and open source products is most commonly believed to deliver the best ROI for respondents' organisations (36%).

Slightly fewer (34%) believe that open source products will deliver a better ROI and just two in 10 believe that proprietary products will do so.

The lack of common consensus around what will deliver the best ROI again points towards confusion among many respondents about

exactly how open source can benefit them, and how the observed benefits of both open source and proprietary can be harnessed to create further synergies.

## Adopting machine learning as a new technology



**Fig 14:** 'Is your organisation familiar with the concept of machine learning (e.g. advanced analytics, pattern recognition, programme-free learning)?'

### Machine Learning

Machine Learning is an area of computer science and statistical modelling that allows a computer programme to predict an outcome or make a decision without being explicitly programmed to do so.

Machine learning, which forms the basis for artificial intelligence (AI), is closely tied to data analytics and data mining programming. Both machine learning and data mining applications use mathematical algorithms to search through data and look for patterns. However, instead of extracting data for

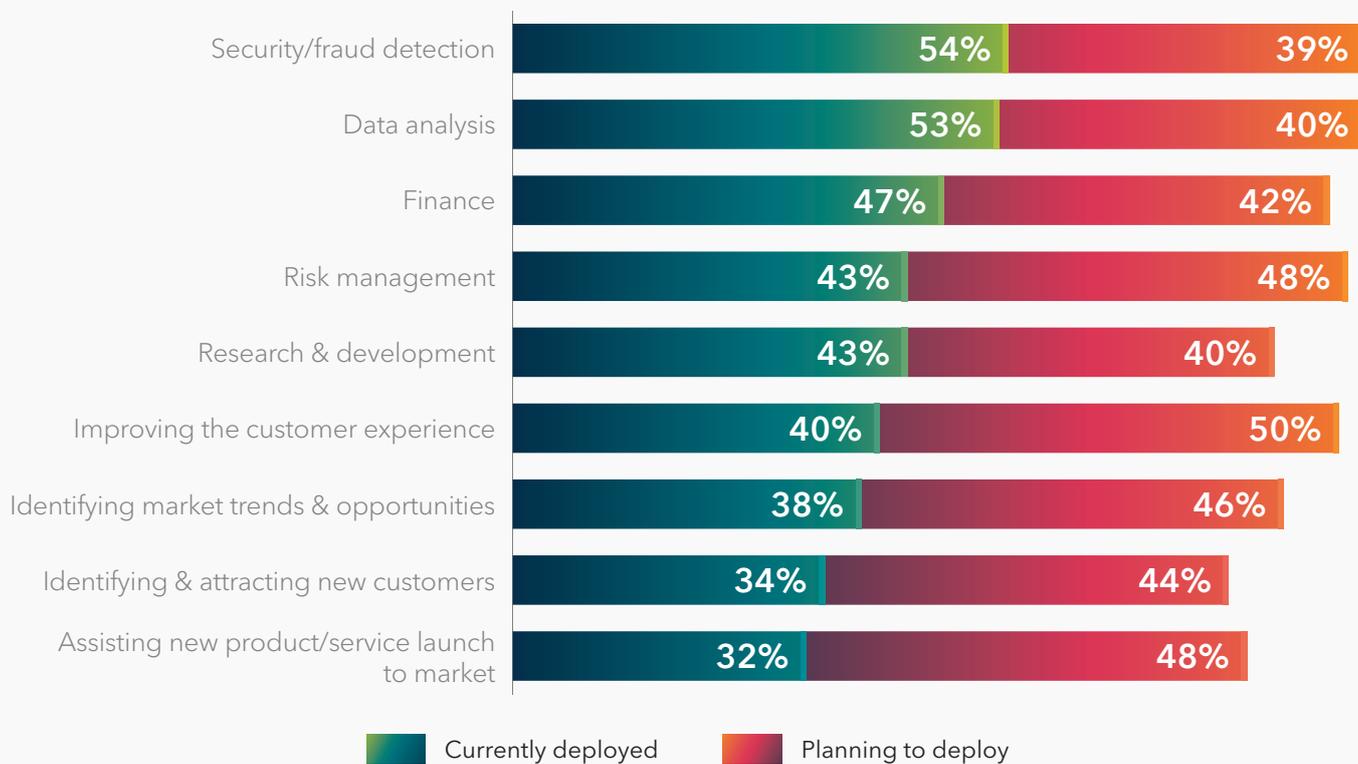
human comprehension, as is the case in data mining applications, machine learning uses algorithms to detect patterns in data and adjusts programme actions accordingly.

The most common areas for machine learning to be currently deployed are security/fraud detection (54%), with a similar proportion also listing data analysis and finance. Looking ahead, for those not currently doing so, the most likely areas that organisations are planning to deploy machine learning are improving the customer experience (50%) and assisting new product/service launch to market (48%).

As observed with plans for data analytics (figure 6), the use of machine learning is expected to broaden across the business and, in particular for many organisations, to shift from operational purposes to more forward-thinking commercial areas.

As organisations look to adopt machine learning there is a feeling among many that a way of achieving this is through more open source adoption. Data scientists hired to adopt open source solutions are also being asked to create machine learning algorithms. Many of the

## Deployment plans for machine learning



**Fig 15:** Analysis of respondents whose organisation has currently deployed or is planning to deploy machine learning in the above areas, only respondents whose organisation currently uses or plans to use machine learning (205)

barriers to adoption apply to both - in particular a lack of skills.

There is a tendency to confuse the benefits of machine learning with the advantages and disadvantages of open source. In reality, machine learning and open source are not dependent upon each other at all. However, using open source as part of the analytics lifecycle can certainly assist in the development of machine learning algorithms. Problems may arise when it comes to operationalising them at an enterprise level.

The full value of analytics is only realised if you can connect the analytical insight to action. This is true whether you are using machine learning or not. Automation, governance and deployment are the key factors for success. Open source can help with innovation in the machine learning arena, but might not be the best approach for taking ideas into production unless you are willing to undertake significant integration effort. For some organisations, this will be a price worth paying, but for many it is not an option. It could be a costly mistake to focus on the latest algorithms at the

expense of a learning system actually achieving its desired business outcomes.

# SAS and Open Source



SAS recognises that organisations are already using or plan to use open source. SAS has created an open analytics platform - SAS® Viya™ - where the benefits of SAS' proprietary systems can be combined with open source technology.

As the research demonstrates, most organisations believe the best returns can be achieved by combining the best of open source and proprietary technology - remembering always that the ideal solution in each case depends on the business problems the organisation is trying to resolve.

SAS® Viya™ is defined with one code base that can be accessed from other

languages. Designed as an open development platform, SAS® Viya™ includes public REST APIs that can be used to add proven SAS Analytics to existing applications. Analytical teams can work in the language of their choice - and all analytical assets are united within a common platform to provide a single, managed inventory across the organisation.



SAS brings three key strengths when it comes to making the best of both worlds:



### Stability

Open source doesn't always consider backward and forward compatibility. For most organisations, investments made in analytics today need to be future proof. SAS® Viya™ works with open source to ensure compatibility in a rapidly changing landscape.



### Deployment

An analytical model that experts develop with their technological background (usually on a desktop) is one thing. But it is something else entirely to carry this model over into production and then scale it using large quantities of data and on another architecture (in the cloud, in Hadoop, in stream). As a runtime environment, SAS is available on all popular platforms.



### Governance

This is a dry topic for many data enthusiasts, but for most companies, there's no way around it: data processing needs to remain transparent and reproducible not least because it is required by regulatory agencies. SAS has the knowledge from hundreds of thousands of analytics projects and knows what it takes to make analytics as sustainable and efficient as possible when questions arise regarding its administration, metadata, documentation of usage scenarios and much more.

# Conclusion

The research shows that organisations see benefits in using open source and proprietary solutions and, for most, a hybrid approach combining the best of both worlds will deliver optimal ROI.

The key decisions facing organisations are what to use open source for and what to use proprietary solutions for. The best answers will depend on a number of factors such as the type of business problems being addressed, and the skills available.

Using open source is rather like designing a bespoke wheel to address a specific problem with a particular road. However, if that wheel needs to be used on a different road, it might not function properly - it is not fully adaptable. A ready-made wheel that has already been fully road-tested in multiple different ways is more likely to perform well in a range of environments - the proprietary equivalent. A hybrid approach enables the ready-made wheel to be tweaked and adapted to perform even better in a particular situation, saving time and effort.

Companies that learn to leverage the right combination of open source and open proprietary will make the best of the value that machine learning can bring. Open source provides the catalyst for creative experimentation in solving complex challenges. Open proprietary (i.e. proprietary solutions that work alongside open source) provides the mechanism to test that creativity reliably, at scale and in a



well governed way, to help protect revenue from fines and lower the risks of relying solely on the open source creative process.

Organisations need to think about these situations and consider the time to value - in particular where use of proprietary software can provide some of the building blocks needed immediately. It is also important to consider how to incorporate open source and, in particular, make a fair cost comparison (and that includes risk assessment) when it comes to open source versus proprietary. Many organisations admit they are not taking into account all the costs and risks of open source adoption.

SAS recognises that many companies are using open source technology and many plan to continue doing so, and in some cases, increase their usage. That is why SAS analytics platforms are 'open' - that is, they are

accessible and inclusive. It means being open to:

- All analytics problems
- All users
- All skill sets
- All types and size of data
- All IT environments.

While organisations can programme in a language of their choice (e.g. Python) it is still possible to benefit from an integrated platform providing the best in analytics and governance. Otherwise the result may be the challenge of stitching together best-of-breed open source solutions.

The ability to embed and innovate with SAS analytics, and create applications to address specific business problems, means a new world where customers have all the necessary capabilities available to them to build the ideal solution.

# Summary of results



Improving security (62%) is the most commonly reported organisational IT priority for 2017 by respondents.



But almost all (95%) respondents' organisations face challenges in meeting their 2017 IT priorities with a third (35%) facing a lack of internal skills.



The average proportion of proprietary technology to open source technology in respondents' organisations is 67% to 33%.



Ideally, according to respondents, open source would increase to 40% but proprietary would still form the bulk of the total technology in use at 60%.



Open source is expected to bring new opportunities to the organisation (95%) and to customers (89%) according to respondents.



But only just over half (52%) of respondents believe that open source is faster to implement than proprietary - around a third (32%) feel that the two are the same speed.



The vast majority (94%) see hidden vulnerabilities in using open source and even more (97%) still see benefits in proprietary technology over open source.



Many respondents' organisations are not fully taking into account the full true cost of open source - only 41% currently take into account replacing expertise if employees leave and just 51% the time to fix/resolve issues.



A combination of proprietary and open source is most commonly (36%) believed by respondents to deliver the best ROI.



Around three-quarters (76%) of respondents would consider the use of an open source platform for data analytics but most (95%) face challenges in doing so.



Security (50%) and finding a single solution (46%) are the most commonly reported challenges, reflecting the perceived vulnerabilities of using open source as a whole.

# Key differences...

## ...by organisation size

- According to respondents, smaller organisations of 500 -1,000 employees are more likely (45%) to face a lack of skills restricting them from meeting IT priorities compared to larger organisations of more than 5,000 employees (30%)
- Larger organisations of more than 5,000 employees are likely to have a higher proportion of open source technology in use (36%) than smaller organisations of 500-1,000 employees (31%)
- However, respondents in these smaller organisations are more likely to report the use of open source throughout the organisation (32% to 18%)
- A combination of proprietary and open source technologies is believed more likely to deliver the best ROI by respondents in larger organisations of more than 5,000 employees (43%) than by those in smaller organisations of 500 -1,000 employees (28%)
- The likelihood of considering an open source platform for data analytics is higher in smaller organisations of 500-1,000 employees (84%) than larger organisations of more than 5,000 employees (71%)
- However, respondents from both are highly likely to report facing challenges to doing so (96% and 95% respectively)

## ...by organisation sector

- Respondents from organisations in the public sector report the highest proportion of open source technology in use currently (36%) compared to those from financial services organisations who have the highest proportion of proprietary technology (70%)
- Respondents from retail organisations are most likely to believe that open source is faster to implement than proprietary solutions (60%)
- When it comes to being more likely to take into account the multiple factors that make up the true cost of open source, retail organisations are most likely to currently do so (47% to 77% report currently doing so across all areas) compared to public sector who are least likely (27% to 68%)
- Respondents from financial services organisations are most likely to believe security (63%) is a key benefit of proprietary solutions over open source while those from public sector organisations are more likely to feel that they are a proven/trusted solution (51%)
- Public sector organisations are most likely to believe a combination of proprietary and open source products will deliver the best ROI (48%)
- Those most likely to consider using an open source platform for data analytics are respondents from organisations in the financial services (87%) and retail (85%) sectors
- However, in considering doing so, respondents from financial services organisations are most likely to report challenges with a lack of skills (53%) while public sector organisations are most likely to face difficulties in finding a single solution that fits the needs of the business (51%)

# References

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- <sup>2</sup> 5 Ways to Be Successful With Open Source Software - Doug Cutting, Information Week:  
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