TRANSFORMING YOUR BUSINESS THROUGH DATA

Creating a virtuous cycle for your high-value data

IRON MOUNTAIN®

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SECURING THE WORLD'S MOST VALUABLE ASSETS

Iron Mountain Incorporated is the world leader in storage and information management services. With over 70 years of experience, a real estate network of more than 85 million square feet across more than 1,400 facilities in over 50 countries, we store and protect billions of valued assets, including critical business information, highly sensitive data, and cultural and historical artefacts. We look after the information of some 225,000 customers, including 95% of the Fortune 1000.

In recent years we have rounded out our portfolio and processes for the digital age, building a leading role in the data center and colocation market and partnering with cloud leaders like Google. We believe that a good portion of the digital economy will be founded on the hyper-connected data center, so we have invested over $2 billion in cutting-edge global data center infrastructure: Iron Mountain Data Centers now offers connectivity-rich colocation across the USA, Europe and Asia.

MOVING WITH THE TIMES

1951
Iron Mountain Atomic Storage Corporation opens its first underground vault.

1980
Iron Mountain becomes first records management company to use bar codes for real-time access; colocation business begins.

1997
Iron Mountain Inc launches on NYSE (IRM) and becomes a leading software escrow business.

2004
Iron Mountain Digital launches online backup and e-discovery solutions.

2009
Iron Mountain Digital Record Center for Images named 'Product of the Year' by the Massachusetts Network Communications Council in the "Cloud Computing, Virtualization and Data Warehousing/ Storage" category.

2019
Iron Mountain named Google Cloud Technology Partner of the Year for AI & Machine Learning.

2018
Data center infrastructure expanded in Europe and Asia via acquisition and build-out.

2017
Acquisition of the US division of IO Data Centers.

2016
Fortune magazine lists Iron Mountain as 729th of the largest 1000 public US companies.

2010
Content archiving solutions rolled out following the acquisition of Mimosa Systems.

05

SECURING THE WORLD'S MOST VALUABLE ASSETS

Our Data Center services are an extension of a well-established group portfolio that enables customers to exploit the value of their digital assets. These include cloud storage, workflow automation, imaging and data restoration, AI-powered SaaS and migration services. All are designed so that customers can focus on core business processes while generating greater value from their assets and accelerating their digital transformation.
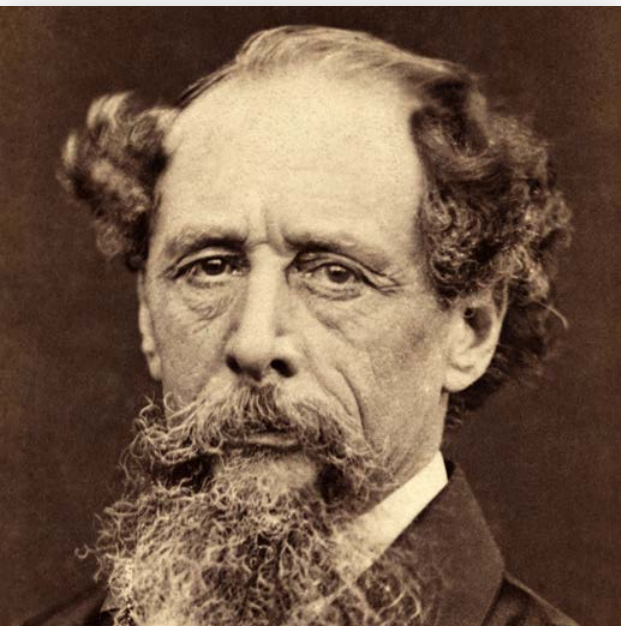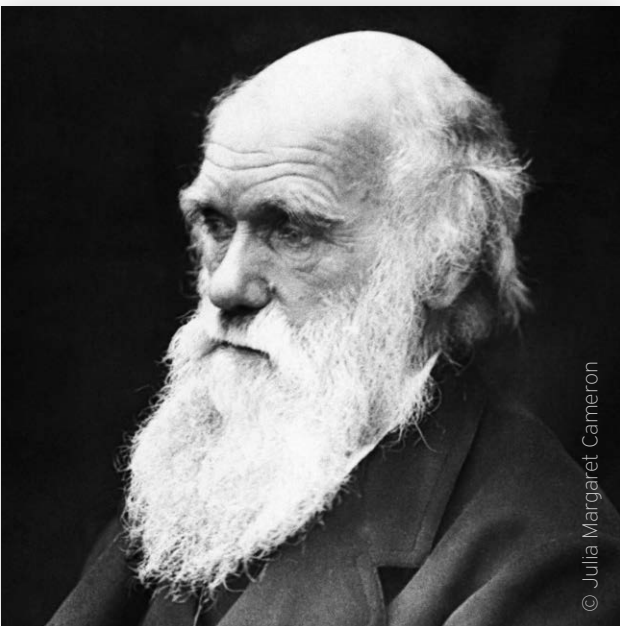

Famous Faces
Iron Mountain stores the wills of Princess Diana, Charles Dickens, and Charles Darwin, as well as the original recordings of Frank Sinatra and Prince.

Princess Diana

Charles Dickens

Charles Darwin

+ Frank Sinatra

+ Prince

HELPING CUSTOMERS ALONG THE DIGITAL TRANSFORMATION PATH

Change is always hard, because it demands that people move out of their comfort zones. Even with the commitment to see it through, the precise nature and requirements can be elusive. This has never been more true than with digital transformation.

For many people there is no readily visible path, and companies are not only grappling with how to handle their digital data, they also face the challenge of taking physical documents and moving them to a digital platform. The volumes involved can be daunting. Also, in larger organizations, teams can be very siloed, so it can be a challenge to align the whole business.

The whole landscape is shifting, and I think our challenge as a company is, how do we help our clients not only design the best solution for their company, but also move within their own organization so that they can cross silos and deliver a full solution. In the past things were simpler. We dealt with questions like managing the growing costs of real estate or remaining compliant. But today we're answering questions like, "How can I get more value from my data?"

I hope that this short paper on Data Transformation gives you some useful insights. We know there is no single solution for such a complex challenge, and in order to guide our customers in the right direction, we have to listen carefully to individual needs and priorities. Please don't hesitate to get in touch with us if you think we can help you in any way.

William L Meaney
President and CEO,
Iron Mountain

DATA LANDSCAPE

THE DATA EXPLOSION

The collective sum of the world's data is forecast to grow from 40 Zettabytes in 2020 to 175 Zettabytes by 2025.

The amount of data stored in large data centers in the core will be more than double the amount stored in the endpoint, reversing earlier trends, where data storage was growing fastest at the edge or with the end-user. According to IDC, 49% of data will be stored in public cloud environments by 2025 and nearly 30% will be consumed in real-time.

Every business has unstructured data – the key is knowing how to use and process it to the greatest business advantage, which data to store and which to discard. It is very expensive to store and maintain unstructured data because of its size, the processing power it requires, and the fact that not all of it is useful. According to a recent survey by the Economist Intelligence Unit, employees spend over 25 percent of their time simply tracking down data. In most companies, data is created and accessed ad hoc, and it is not organized to encourage accessibility. Without clearly defined pathways for the vast majority of the data companies are generating, end users cannot massage it, visualize it, secure it or manipulate it in any meaningful way.

The growth in data and the growing need to automate management of this data is driving both reactive (compliance and security-driven) and proactive (competitive advantage, transactional) business cases for the deployment of Machine Learning.

Total data levels are set to rise by around 300% over the next five years, with 95% of this generated by IoT. Around 15% of data will need to be stored, a similar percentage to today.

BYTE SHIPMENT SHARE BY STORAGE MEDIA TYPE

■ DRAM ■ Optical ■ Tape ■ Flash ■ HDD
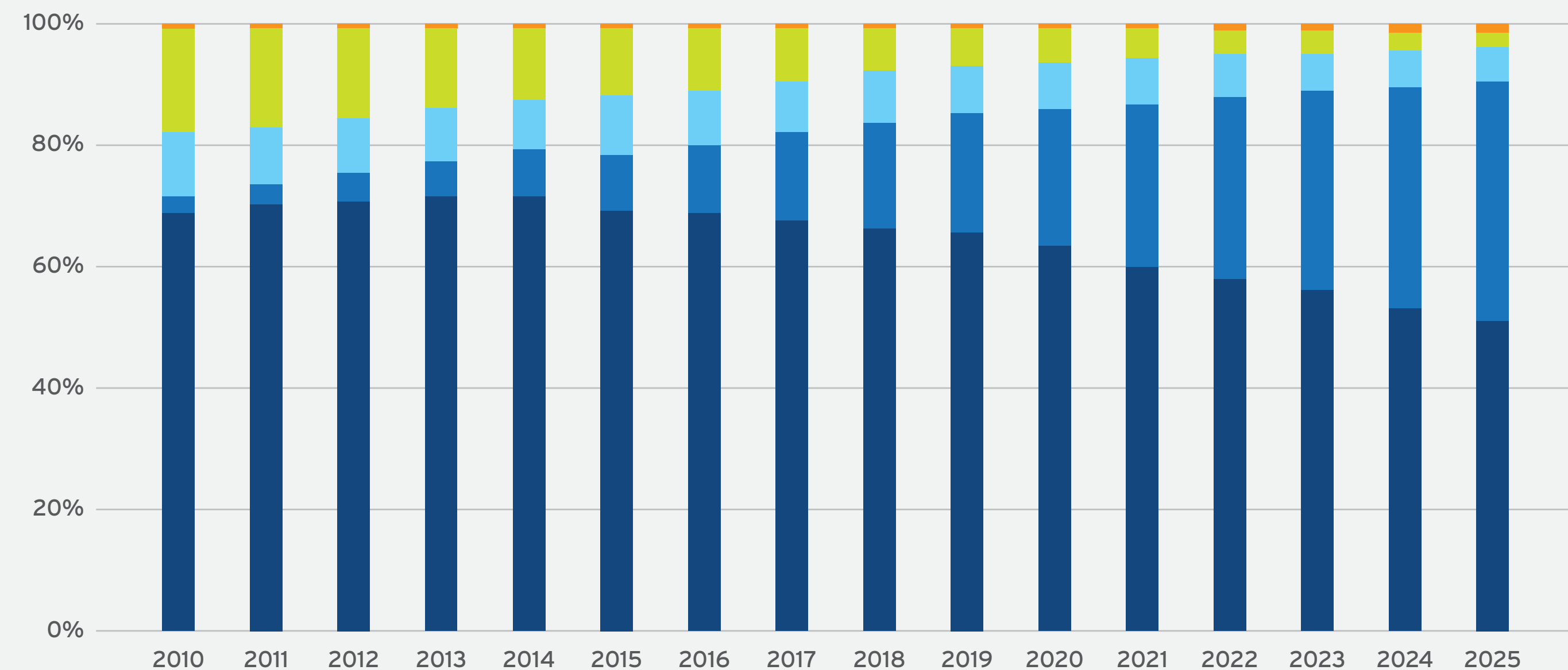
SOURCE: IDC's Data Age 2025 study, sponsored by Seagate, March 2017

THE DATA EXPLOSION

Despite the hype, the majority of businesses have yet to embark on a full digital transformation strategy. For these enterprises the challenges posed by the data explosion are stark, as data on this scale cannot be managed effectively without automated analytical tools.

DIGITAL TRANSFORMATION
% of respondents (n=651)

9%

27%

21%

42%

■ **Execution** We have a formal strategy and are actively digitizing our business processes and/or assets

■ **Consideration** We are considering it, but have no formal plans

■ **Evaluation** We are planning and researching to develop a digital transformation strategy

■ **No strategy** We currently have no digital transformation strategy

SOURCE: 451 Group 'Voice of the Enterprise: Datacenters 2019' report.

DATA LANDSCAPE

ROLE OF
MACHINE LEARNING

A subset of the overall field of Artificial Intelligence, Machine Learning is a foundational process for digital transformation. It uses algorithms to learn and improve on a process without the need for explicit programming.

Machine Learning relies heavily on the combination of large volumes of data with high levels of processing power. The spread of cloud computing has made Machine Learning accessible for most businesses, with a growing number of practical applications and measurable return on investment.

Machine Learning can be applied across the following data types:

- **Structured data** (databases, records, security logs etc.)

- **Semi-structured data** (email, XML etc.)

- **Unstructured text data** (documents, files etc.)

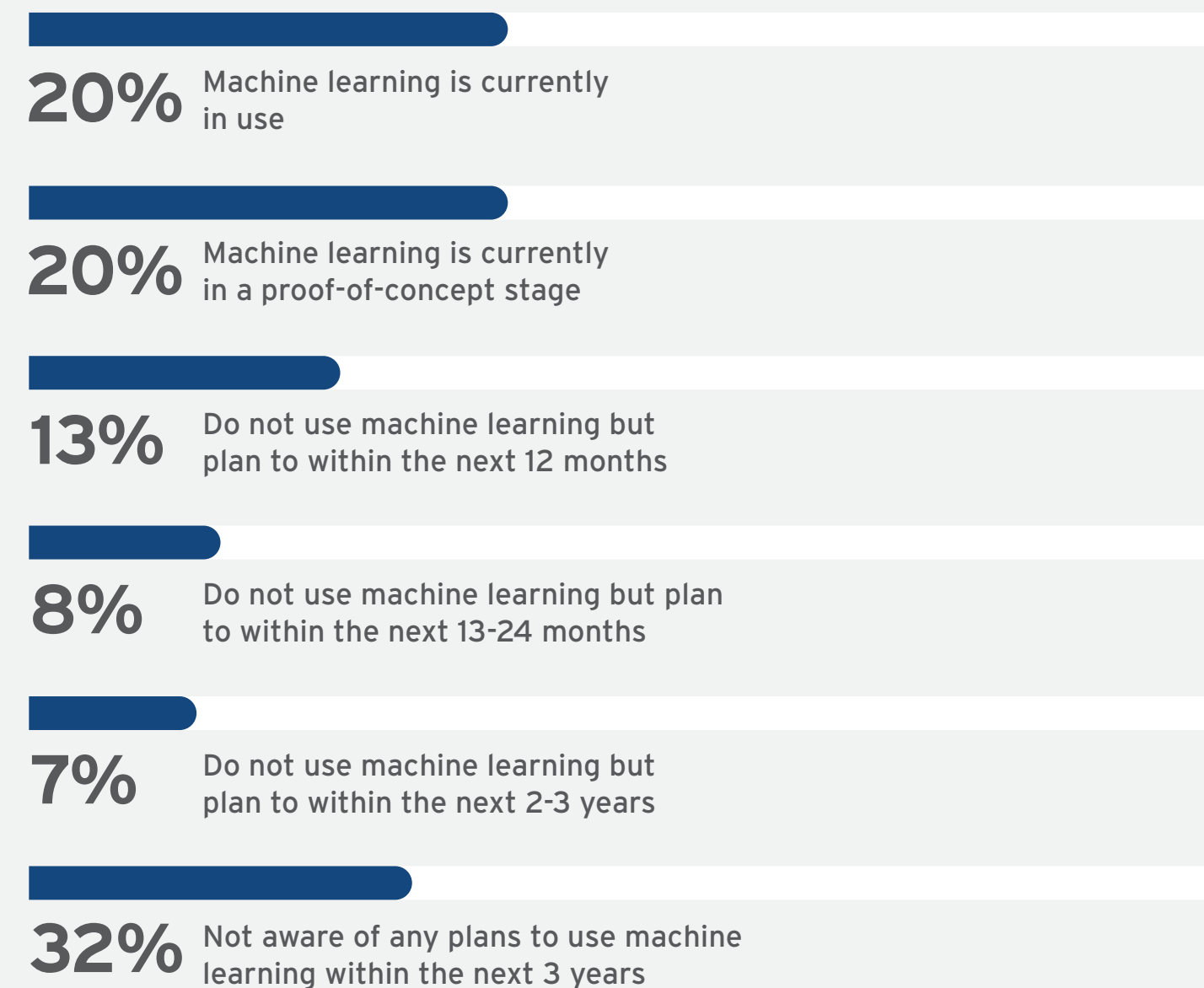- **Unstructured rich media** (images, audio, video etc.)

PACE OF CHANGE

According to a recent report from 451 Research, commissioned by Iron Mountain, active engagement in Machine Learning is growing fast. It is currently being used by 20% of the 1540 survey respondents. It is at proof-of-concept stage with an additional 20%. And a further 21% plan to adopt it within the next two years.

Feedback to date is encouraging. 92% of those using Machine Learning regard the investment as a success. The trend appears to be to start with more structured data, with 61% of respondents using structured data to feed their projects, and 51% using semi-structured data. 42% are using unstructured data such as documents and 40% are using unstructured rich audio-visual media data. Over 90% of those engaged in Machine Learning projects plan to increase their scope across the business.

MACHINE LEARNING IN-USE
% of respondents (n=1,540)

20% Machine learning is currently in use

20% Machine learning is currently in a proof-of-concept stage

13% Do not use machine learning but plan to within the next 12 months

8% Do not use machine learning but plan to within the next 13-24 months

7% Do not use machine learning but plan to within the next 2-3 years
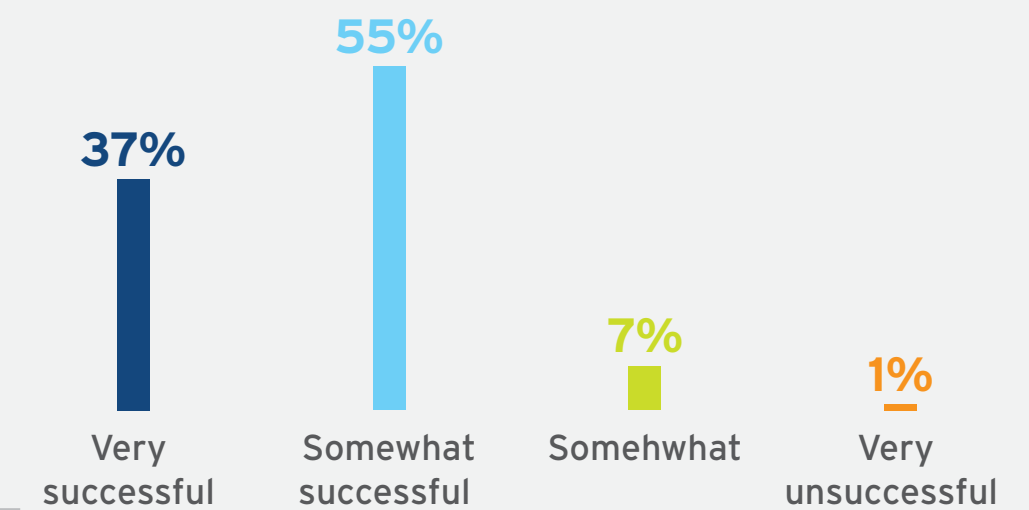
32% Not aware of any plans to use machine learning within the next 3 years

92% of users have positive opinions about the performance of their machine learning projects.
n=518

37% Very successful

55% Somewhat successful

7% Somewhat

1% Very unsuccessful

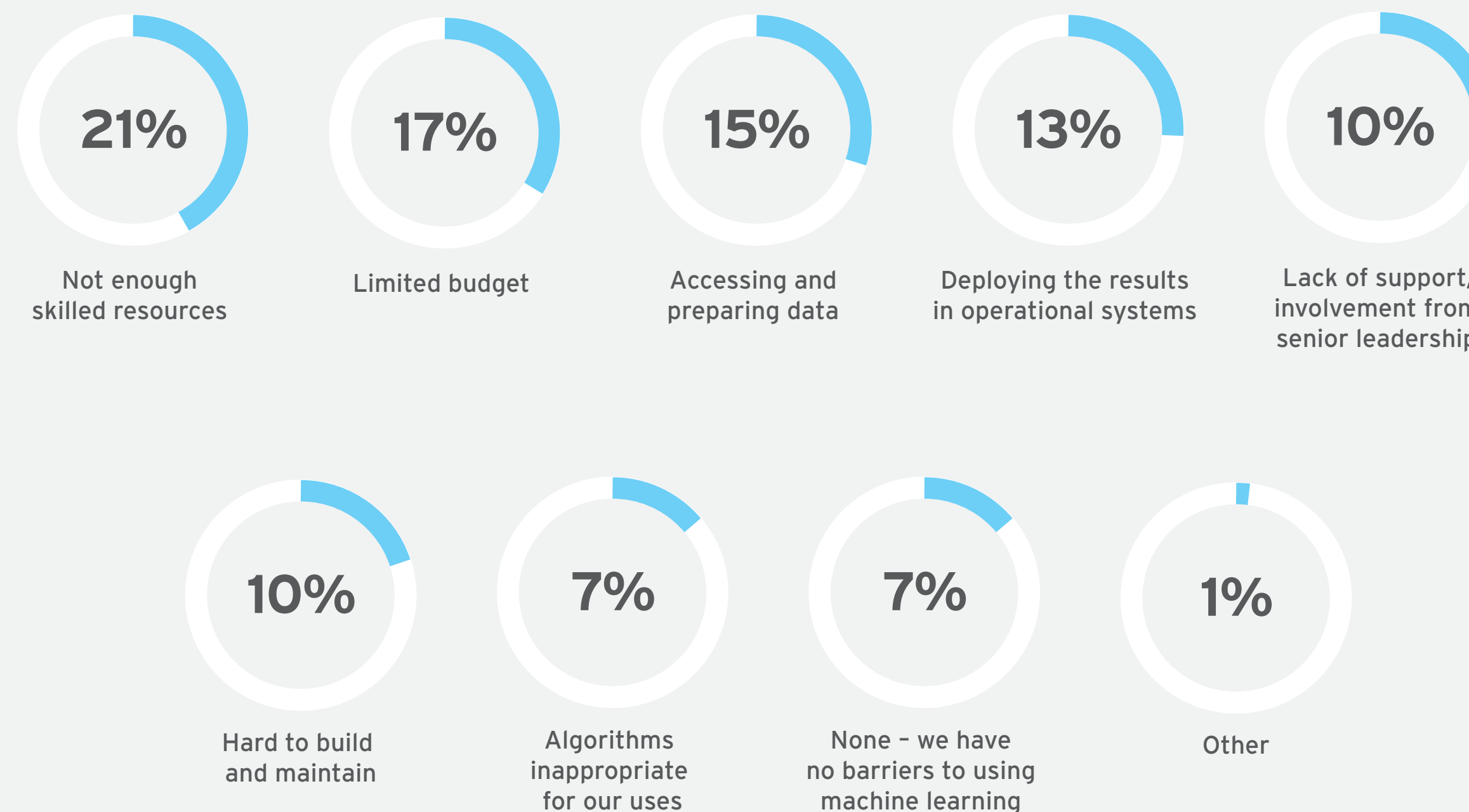# CHALLENGES

DIGITAL TRANSFORMATION

Digital transformation is high reward, but it is also high risk. Research shows that risk is the number one concern for CEOs and senior executives, but well over half of all initiatives fail to achieve their goals. That represents a spend of almost $1 trillion on failed or partial projects.

There are clearly many barriers to overcome. Skills can be lacking, IT environments can be extremely complex, and data that is potentially sensitive can end up in siloes. Cost is a significant factor too. And culture. The pace of implementation is also critical. If a business moves too slowly it falls victim to competitor disruption. If it moves too fast or in an uncontrolled manner there is a real risk of regulatory, legal, and reputational problems.

451 Research, commissioned by Iron Mountain, found that lack of skilled resources is seen as the most common barrier, followed by lack of budget. These are followed by data access/preparation and effective integration with operational systems. At the planning and strategic level, key company stakeholders do not always have aligned business objectives.

BARRIERS TO MACHINE LEARNING

n=738

21% Not enough skilled resources

17% Limited budget

15% Accessing and preparing data

13% Deploying the results in operational systems

10% Lack of support/ involvement from senior leadership

10% Hard to build and maintain

7% Algorithms inappropriate for our uses

7% None – we have no barriers to using machine learning

1% Other

SOURCE: 451 Research's Voice of the Enterprise: AI and Machine Learning, Adoption and Use Cases 2H 2018

PEOPLE & SKILLS

SECURITY & COMPLIANCE

Between lack of skills and resistance to digitization, people are the biggest challenge.

Tata found that 8 of the top 10 challenges preventing businesses from capitalizing on Big Data were cultural, not technical. This is primarily because most digital technologies provide possibilities for efficiency gains and customer intimacy, but if people lack the right mindset to change and current organizational practices are flawed, transformation will simply magnify those flaws.

An injection of external specialist time is generally necessary for accessing and preparing data (the third most common barrier) and this comes with significant cost. New in-house skills and roles will also be needed along with broader team education around new technology and terminology.

A Chief Data Officer may well be appointed for regulatory compliance, e.g. to meet the terms of GDPR.

The Chief Data Officer should play a crucial role in teaching everyone in the company how to work with data, helping them regard it as a strategic asset like people or money. This can address and hopefully overcome the mentality that compliance, privacy and risk management is in opposition to data leverage and insight, a view that wholly undermines digital transformation.

The majority of enterprise data tends to be unstructured, and this includes sensitive information subject to regulation, like personal data. To protect and work with this data in the long term the business needs to be able to assess, classify and apply policy to it on a large scale. There is no way this can be done manually, so AI and machine learning techniques need to be used to track it for logical security and regulatory reasons. This presents its own challenges. Data analysts need to groom the unstructured data so it can work hand-in-hand with other types of data. Adequate storage processing power and connectivity for this data must also be provisioned.

CHALLENGES

INADEQUATE INFRASTRUCTURE

This leads to the issue of infrastructure. A surprising number of businesses think that they need to build and maintain their own data infrastructure. This can be a huge and costly headache, with slow design processes making transformation projects a faraway reality, and rigid legacy IT systems making updates, scaling or overhauls complicated.

Deploying your critical data to next generation colocation infrastructure turns CapEx to OpEx and shifts a huge workload from your company to a specialist supplier during a busy time for the enterprise. In terms of compliance, for instance, Iron Mountain Data Centers maintains a standardised set of global safety, physical security and operational standards including ISOs 50001, 27001, 9001, 14001, and 45001. But they also go a step further, complying with and offering guidance on specific operational and security standards that vary from one region to the next, such as NIST reports, FISMA and FedRAMP in the States, the OSPAR report in Asia or GDPR in Europe.

Most critically, carrier-neutral colocation providers like Iron Mountain make data both assessable and accessible, providing a platform for hybrid and multi cloud deployments with the on-ramps and market proximity needed to reach clouds and customers. In-house direct connects to key PaaS providers like Google, Microsoft and Amazon, and rich levels of connectivity which include world-leading exchanges and a raft of carrier options all drive performance up and keep costs down.

PARTNERSHIPS & OUTSOURCING

Digital transformation cannot be achieved in isolation. As data volumes grow, barriers to success like lack of skills and the complexity of accessing and preparing data will make the deployment of managed services increasingly attractive.

A lot of these services live in the cloud. A survey by Forrester on behalf of Virtustream found that 86% of businesses characterised their organisational cloud strategy as 'multi cloud'. This generally means working with a mix of the leading public cloud providers (like AWS), as well as private cloud solutions (like VMware), as well as a broad range of Cloud Service Providers, often deployed on an unmonitored ad hoc basis.

The ongoing challenge will be to impose data policy in this area, orchestrate and tag data across these multiple services and harness and harmonise the data for the benefits of the business and its customers.
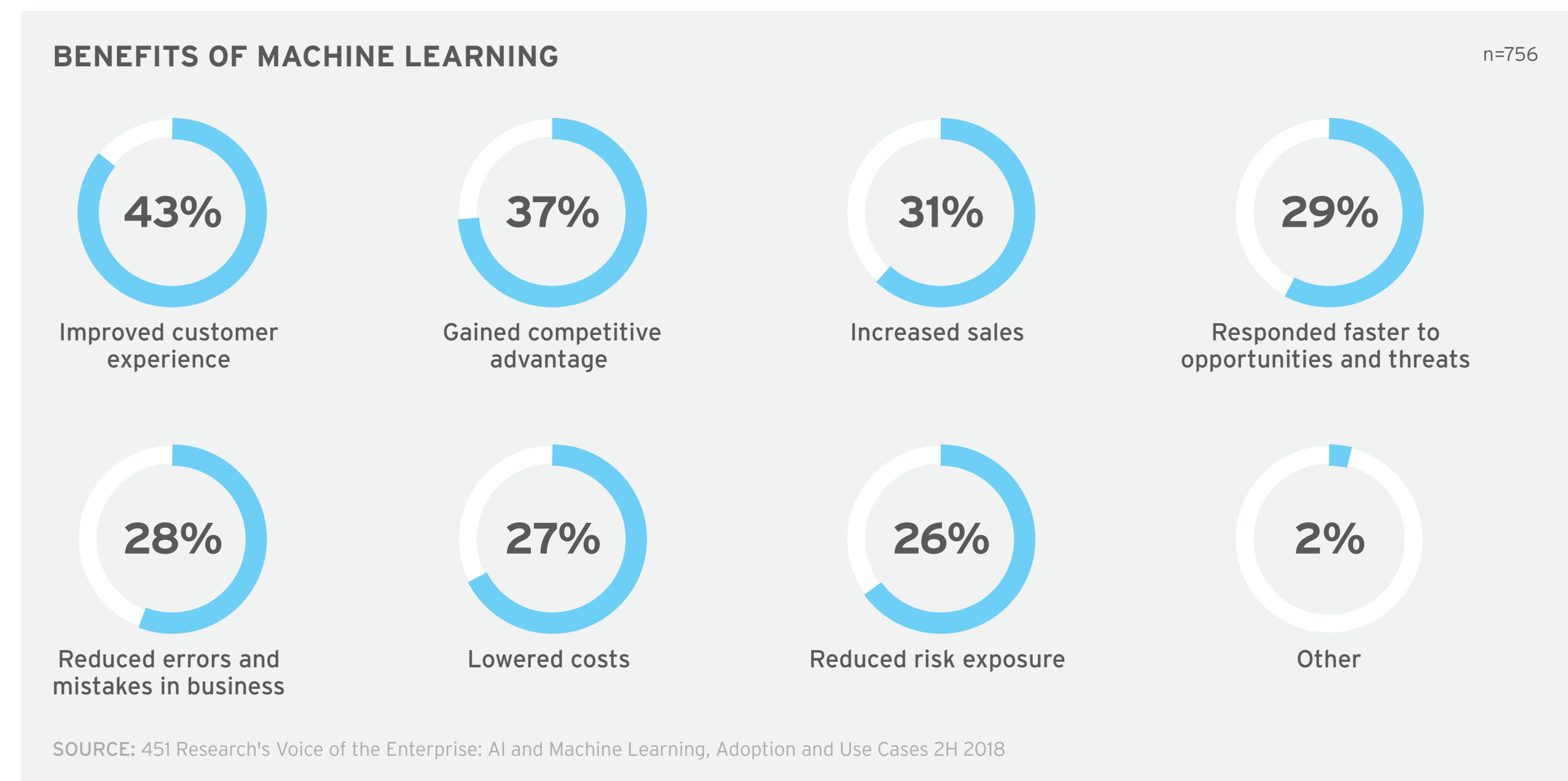
OPPORTUNITIES

PRIMARY BENEFITS

AI is at the heart of digital transformation, and Machine Learning is the foundation for the initial transformation of enterprise data.

Migrating unstructured hard data into a hybrid or cloud data center environment via Machine Learning can achieve several important objectives, such as improving customer experience, increasing competitive advantage, accelerating sales and enhancing data security and regulatory compliance.

However, further progress means optimizing data management practices and establishing workflows that operationalize the ongoing, responsible and compliant use of this information. Digitization should be regarded as part of an iterative process to generate additional valuable data and derive meaningful insight. Data management and governance practices are the foundation of successful data leveraging initiatives as well as data risk mitigation efforts.

In the chart below, based on 451 research commissioned by Iron Mountain, 43% of ML projects delivered an improved customer experience; 37% increased competitive advantage and 31% increased sales. Business agility and data accuracy also increased and, despite the fact that these projects generally took place in the early stages of digital transformation over a quarter of respondents observed a reduction in costs and risk exposure.

BENEFITS OF MACHINE LEARNING

n=756

43%
Improved customer experience

37%
Gained competitive advantage

31%
Increased sales

29%
Responded faster to opportunities and threats

28%
Reduced errors and mistakes in business

27%
Lowered costs

26%
Reduced risk exposure

2%
Other

SOURCE: 451 Research's Voice of the Enterprise: AI and Machine Learning, Adoption and Use Cases 2H 2018

CONTINUOUS IMPROVEMENT

The benefits of data transformation increase over time. When analog processes are digitized, they gain the ability to generate data that was not available before.

These include additional insights into business health, performance, productivity, and so on. Once error-prone elements of data management and digitization are automated, data value – and quality of insight – greatly increase. Better data quality, fresher data,

better data access and reduced risk exposure create an additional virtuous cycle of improvement. This in turn helps the organization to innovate further.
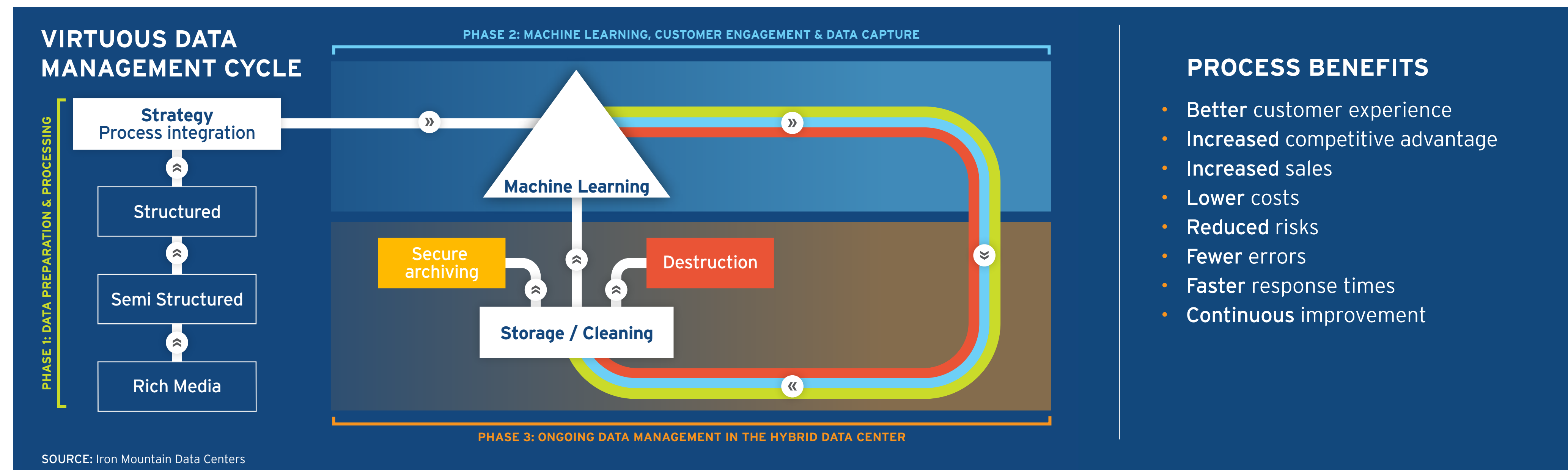
A typical Machine Learning program enables a virtuous data management cycle.

Phase 1 Structured data is digitized and integrated with selected operational processes. Semi-structured

and rich media data can be fed into the program along with additional processes in future phases.

Phase 2 Data is deployed in the customer-facing environment and new data captured for phase 3.

Phase 3 Cleaning and reuse, secure storage or destruction in a hybrid data center environment with low latency cloud connectivity.

VIRTUOUS DATA MANAGEMENT CYCLE

PHASE 2: MACHINE LEARNING, CUSTOMER ENGAGEMENT & DATA CAPTURE

PHASE 1: DATA PREPARATION & PROCESSING

Strategy
Process integration

Structured

Semi Structured

Rich Media

Machine Learning

Secure archiving

Destruction

Storage / Cleaning

PHASE 3: ONGOING DATA MANAGEMENT IN THE HYBRID DATA CENTER

SOURCE: Iron Mountain Data Centers

PROCESS BENEFITS

- **Better** customer experience
- **Increased** competitive advantage
- **Increased** sales
- **Lower** costs
- **Reduced** risks
- **Fewer** errors
- **Faster** response times
- **Continuous** improvement

IRON MOUNTAIN INSIGHT™

Iron Mountain Insight™ combines Iron Mountain's content analytics, data management and information governance expertise with Google Cloud's Machine Learning (ML) and Artificial Intelligence (AI) capabilities, allowing customers to capture, classify, index, enrich and visualise both physical and digital data, uncovering new revenue stream opportunities and cost savings.

It is a cloud-native Services Platform that uses Machine Learning and Deep Learning – the full range of Google's AI capabilities – on a subscription basis.

Alternative or similar solutions to IM Insight include leading services like RapidMiner, Halo, Dash, BigML, and PrediCX or PaaS-based services from other hyperscalers like Amazon AWS, Microsoft Azure, and IBM Cloud. Any of these providers can be directly-connected from Iron Mountain data centers for speed, security and storage scalability.
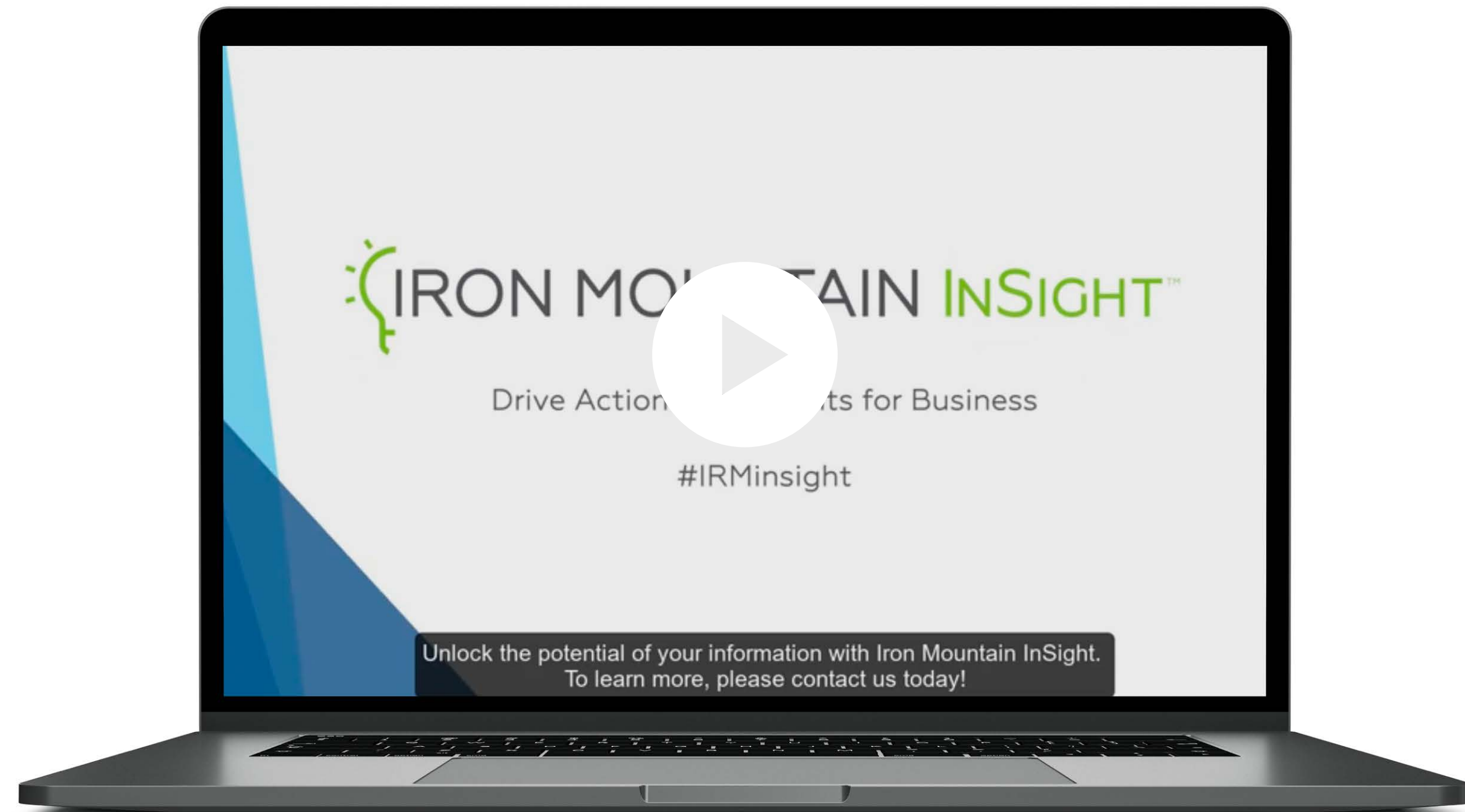
→ YOU CAN WATCH A VIDEO SNAPSHOT OF THE IM INSIGHT SOLUTION HERE

CONCLUSION

BUILDING YOUR DIGITAL VISION

The primary challenges are cultural rather than technical. The following six steps below give a reliable starter framework for making a success of your data transformation.

At the outset it is unlikely you will have all of the answers in-house. Some specialist areas such as specific compliance regulations, interconnection requirements or data architecture, processing and tagging may require external support. There are an increasingly reliable range of resources and use cases now available for data transformation projects, and several are listed below.

Perhaps you have an existing relationship with one of the leading IT or change management consultancies, in which case they will be eager and well placed to help.

If you have questions on colocation, data, machine learning, or security then we will be pleased to offer impartial advice. Whoever you choose to work with on your road to transformation, please remember that while the stakes are high, the benefits are well worth the risk and effort, and they increase over time.

MAKING A SUCCESS OF YOUR DATA TRANSFORMATION

1 Do a full and frank assessment of your long-term business strategy before you invest in anything.

2 Make the most of the assets you have – external consultants and integrators are great but costly and temporary.

3 Map out your infrastructure needs – what needs to be in the cloud and what in-house.

4 Research: build your program around real customer experience and needs.

5 Don't ignore employee anxieties; address them and forge a clear link between employee and digital value.

6 Build, test, improvise and adjust as you go – this is a cultural leap but it's worth it.

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IRON MOUNTAIN: WHERE DATA THRIVES

For me, Iron Mountain is Where Data Thrives, and our hyper-connected colocation and data and assets portfolios allow us to bring customer data to life like never before. The data center is where business begins and ends today, the place of commerce and exchange where people's data lives, where their applications and business processes live. Structuring your business to take advantage of this has to be at the heart of any successful digital transformation.

Inside any Iron Mountain facility, whether it is a center for data or a colocation data center, we offer a secure place to both store and access data. We have the practical capabilities to take data and move it into whatever business process or set of analytics is needed. That could be moving it between sites and into a dedicated cloud environment, or from a shared cloud environment to a private backup elsewhere, or it could be extracting data and shipping it completely offline.

We have built a global infrastructure and portfolio which is second to none to support you as you make these choices. We pride ourselves on our security, our single-minded customer focus, and our neutrality. And we look forward to listening to the challenges you face and becoming a constructive and trusted part of a solution that accelerates and sustains the success of your business.

Mark Kidd
Executive VP and GM, Iron Mountain Data Centers

WHO TO CONTACT

To discuss your plans and requirement please contact us via:

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Or visit our website for more contact details:
www.ironmountain.com/in

SOURCES & RESOURCES

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Video CXO Talk
Video insights from PwC, Google, Adobe, Siemens, Nokia, Lenovo, SAP and many others
https://www.cxotalk.com/digital-transformation

Book Digital Transformation Playbook a popular
publication by David Rogers of Columbia Business School;
stress on strategy – full of practical examples
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PDF Getting Started with Digital Transformation
Download form: Iron Mountain guide to digitization, automation and types of storage
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https://blog.userlane.com/

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Good sectoral and technical focus
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Up-to-date news, views and reviews from the CIO perspective
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