

Data Literacy: The Upskilling Evolution

Build a workforce ready for the data-driven enterprise

Find out how ►



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Foreword

Data and digital transformation have a symbiotic relationship; digital advances were the catalyst for an explosion in data that now underpins the continuous evolution of the enterprise. Yet despite their interconnectedness, there is a stark difference in recognition for the respective skills requirements.

The immediate need for digital upskilling has been recognized, and enterprises, governments and schools around the world are working to close the gap. But there is far less appreciation of the need for data literacy – the ability to read, analyze, work and communicate with data.

In 2017, Qlik® undertook a mission to raise awareness of the data literacy skills gap and help organizations to close it. In the years since, we have shown business leaders the [impact it is having on their employees](#), and quantified its potential to increase both [enterprise value](#) and [productivity](#).

Today, the importance of data literacy has never been more critical as the role of data in the enterprise continues to evolve at speed. Many data leaders are now moving away from the passive consumption of data and analytics and are instead moving toward a state of [Active Intelligence](#), where data is continuously integrated into working practices to allow organizations to gain access to context-rich, real-time insights that help people to make immediate decisions and informed action in the moment. This is something we will talk about further in the report.

But not unlike other trends seen during the pandemic, Active Intelligence isn't just a response to the uncertain environment in which businesses needed to operate. Its value during this critical period accelerated its adoption, and companies now recognize it as key to competitiveness for the foreseeable future.

From [Novartis](#) making six-figure savings by improving budget allocation in R&D to [Vancouver International Airport](#) shortening complex queries from over a day to less than a minute, thereby reducing passenger connection time, Active Intelligence is completely changing our expectations of data.

What more could we achieve if everyone had the data and the skills to use it – to understand a situation and act in the moment? How could we streamline, simplify and empower our organization with a data-driven culture? What more could we do for our customers if we could better anticipate their needs?

But perhaps most importantly, what more could we do if we as individuals, colleagues and leaders had a better grasp of data and how to use it to take informed action?

With the opportunity from data now greater than ever before, there is an immediate need to consider what upskilling and cultural changes should be made to seize it.

To help uncover the potential barriers and opportunities many organizations face, we commissioned futures consultancy, The Future Laboratory, to develop this report based on interviews with a series of experts in the fields of data, technology and human behavior, as well as industry leaders that are working to close the gap between their aspirations for, and the reality of, data in their businesses.

Supported with the opinions of more than 1,200 C-level executives and 6,000 employees from the US, the UK, France, Germany, Japan, Australia and New Zealand, the **Data Literacy: The Upskilling Evolution Report** examines what tangible shifts are appearing in the workplace as it becomes more digital and data-driven. This global report gives business leaders an understanding of the upskilling requirements needed to take full advantage of data – now and in the future.

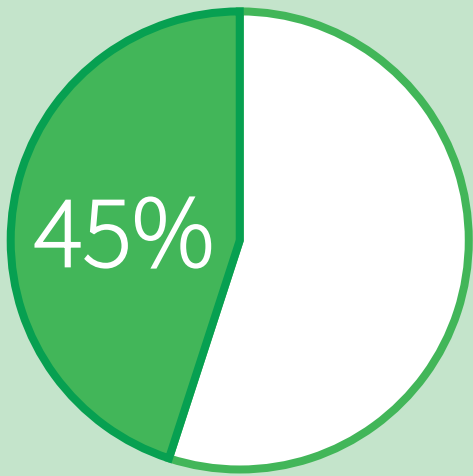


Paul Barth,
Global Head of
Data Literacy,
Qlik

Key Findings

The C-suite still act on their gut over data insights.

45% say they frequently make decisions based on gut feeling rather than data-led insights



Leaders have high expectations for employees' data decision-making.

89% of C-level executives expect their team members to be able to explain how data has informed their decisions



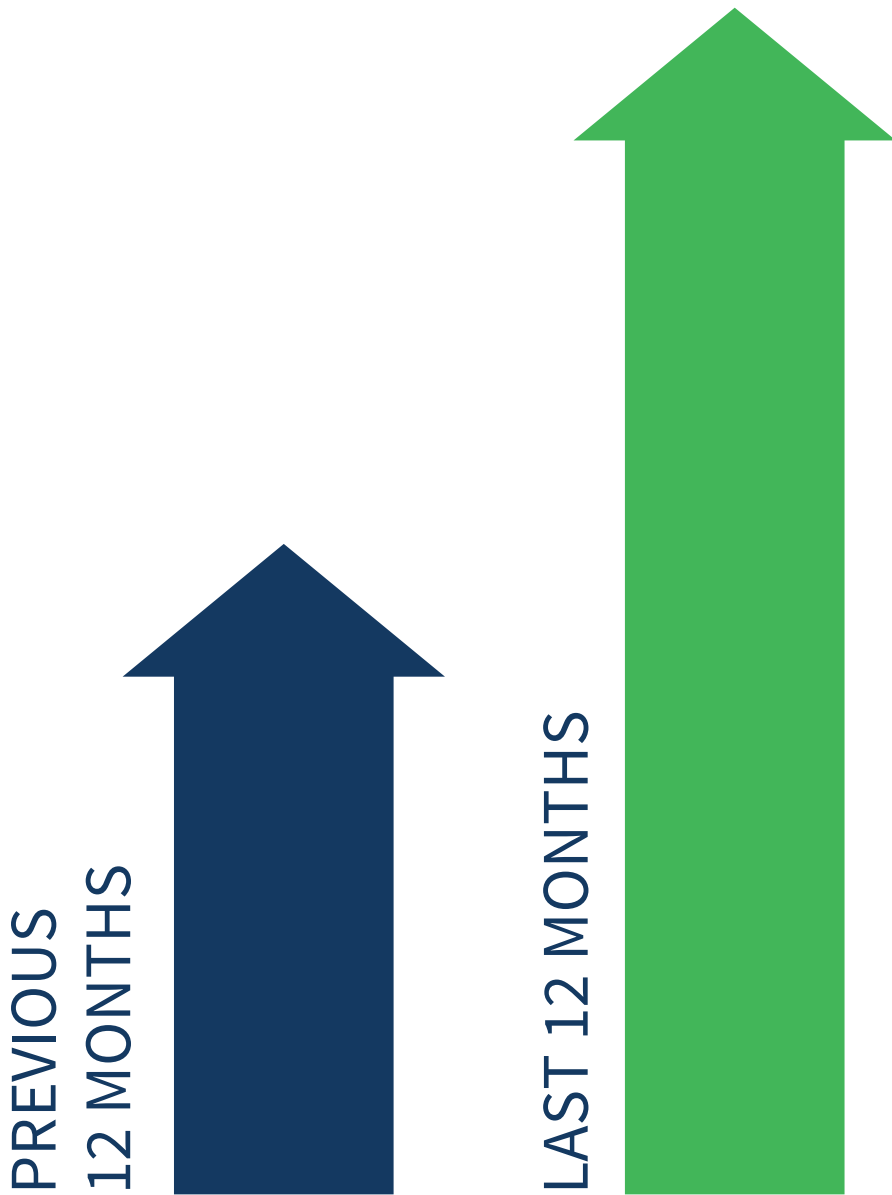
Low data literacy levels plague global workforces.

Only 11% of employees are fully confident in their ability to read, analyze, work with and communicate with data



Data use is accelerating. Fast.

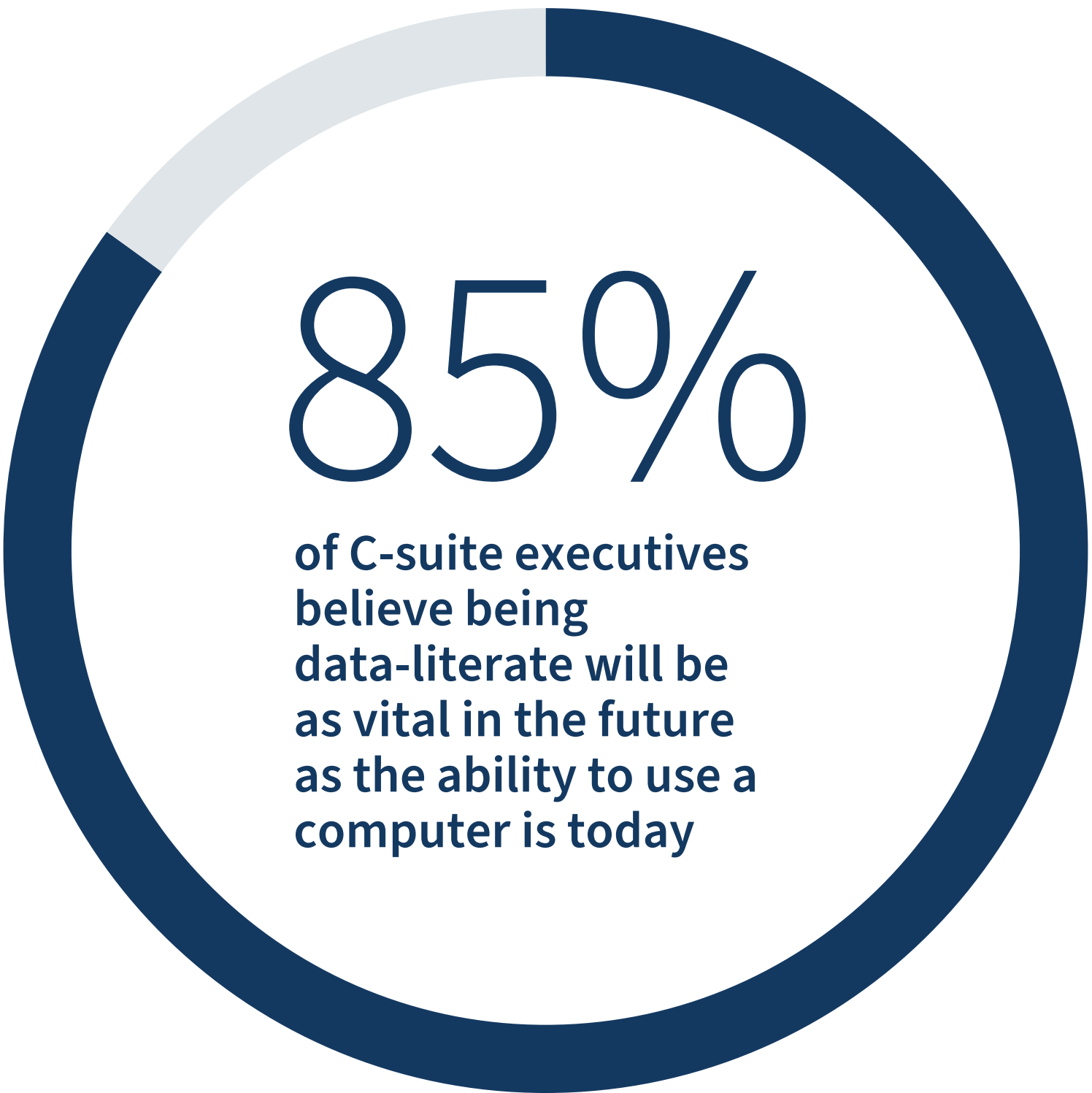
In the past year, the amount of data that employees have read, interpreted and made decisions with **has doubled**



Data literacy is essential to the future of work.

85%

of C-suite executives believe being data-literate will be as vital in the future as the ability to use a computer is today

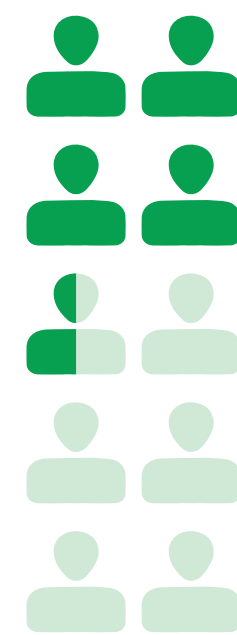
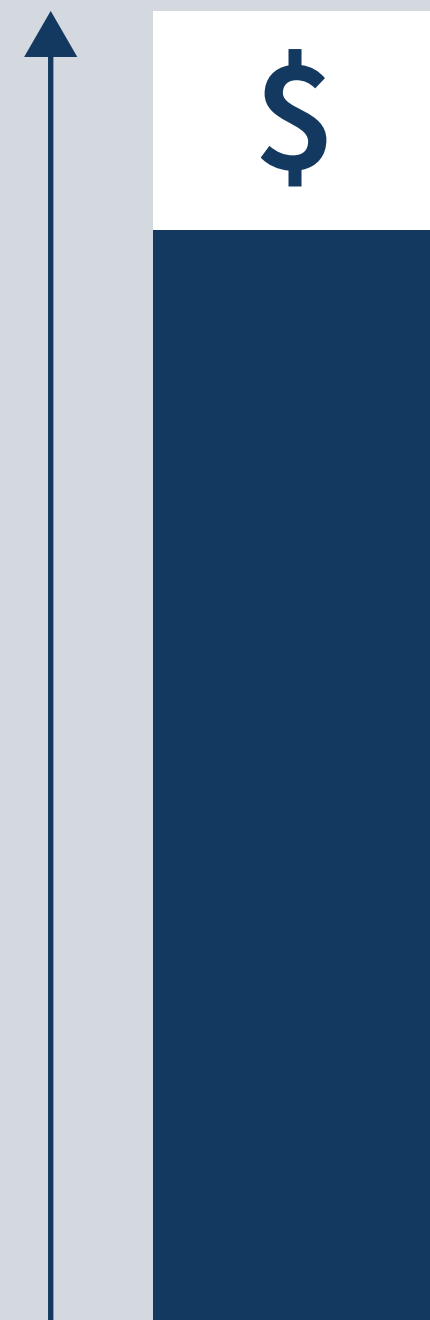


Data-literate employees will make more money.

US workers who can demonstrate their data literacy skills can expect a 20% salary increase

20%

salary increase US executives prepared to offer to data literate employees



Employees are leaving jobs for better upskilling opportunities.

45% of global employees would change jobs if they felt they could get better preparation and training for the future workplace elsewhere – and 35% have done so in the past 12 months

All companies will hire a Chief Metaverse Officer as data transforms how we operate.



Over 99% of C-suite executives believe they will hire new roles – such as Chief Automation Officer, Chief Metaverse Officer, Head of Gamification and Immersion Counsellor – in the next 10 years

Employees demand firms use data to operate more responsibly.





1 Fueling Enterprise Growth Through Data Literacy

Fueling Enterprise Growth Through Data Literacy

The future of data, the enterprise and leadership are bound together. All three must be diverse and dynamic to thrive. Data must be trusted, interactive and intelligent, compelling for workforces to take informed action, proactively and not just passively or reactively. Enterprise leaders must drive their organizations toward this paradigm by creating an active data culture defined by data literacy and democratized insights.



To do so, leaders must first embrace data-powered actions themselves. **Despite over half of C-suite executives (52%) being fully confident in their data literacy skills, a concerning 45% say they frequently make decisions based on gut feeling rather than data-led insights.** Meanwhile, 42% don't always trust that the data available to inform their decisions is up to date and accurate.

The aim of this report is to explore how leaders can champion the value of an active data culture and boost adoption of data literacy and usage across organizations. We'll look at the current state of data and how this will evolve over the next decade, and how leaders can prepare for the exciting new opportunities on the horizon.

Based on research with over 1,200 C-level executives and 6,000 employees across the US, the UK, France, Germany, Japan, Australia and New Zealand, this report sets out how leaders will transform and differentiate their organizations with data capabilities and technological advances that fuel growth and build resilience.

Establishing systems that deliver [Active Intelligence](#) will be key to this. Based around the development of an end-to-end analytics data pipeline that offers real-time, hyper-contextual analytics insights, these systems are heterogeneous, constantly evolving and augmenting the humans that form part of the decision-making process. The availability of context-rich data in the business moment not only translates into smarter decisions, but also compels action to create real impact.

Perpetual learning to keep pace with change

But to seize this opportunity where workforces can deliver unprecedented productivity and results, employees and leaders alike need to be data-literate and adopt a perpetual learning approach to keep pace.

Data literacy directly translates into more proactive and better uses of data. **While only 11% of employees feel fully confident in their data literacy skills** – the ability to read, work with, analyze and communicate with data – those who are confident are much more likely to make informed decisions than those who aren't.

In fact, 95% of these data-literate respondents regularly review and use data to inform their decisions and 89% say that their actions are often triggered by data insights. This is an increase of 58% and 59%, respectively, over employees who are not fully confident in their data literacy skills.

The first step toward future success is to build confidence through data literacy. Leaders must create an active culture that encourages the democratized use of data and demonstrates its necessity in boosting the performance and prosperity of individuals, teams and the entire enterprise. In this way, they will not only ensure commercial growth, but empower people with the skills to progress into new roles created by an increasingly digital-first, data-driven world.

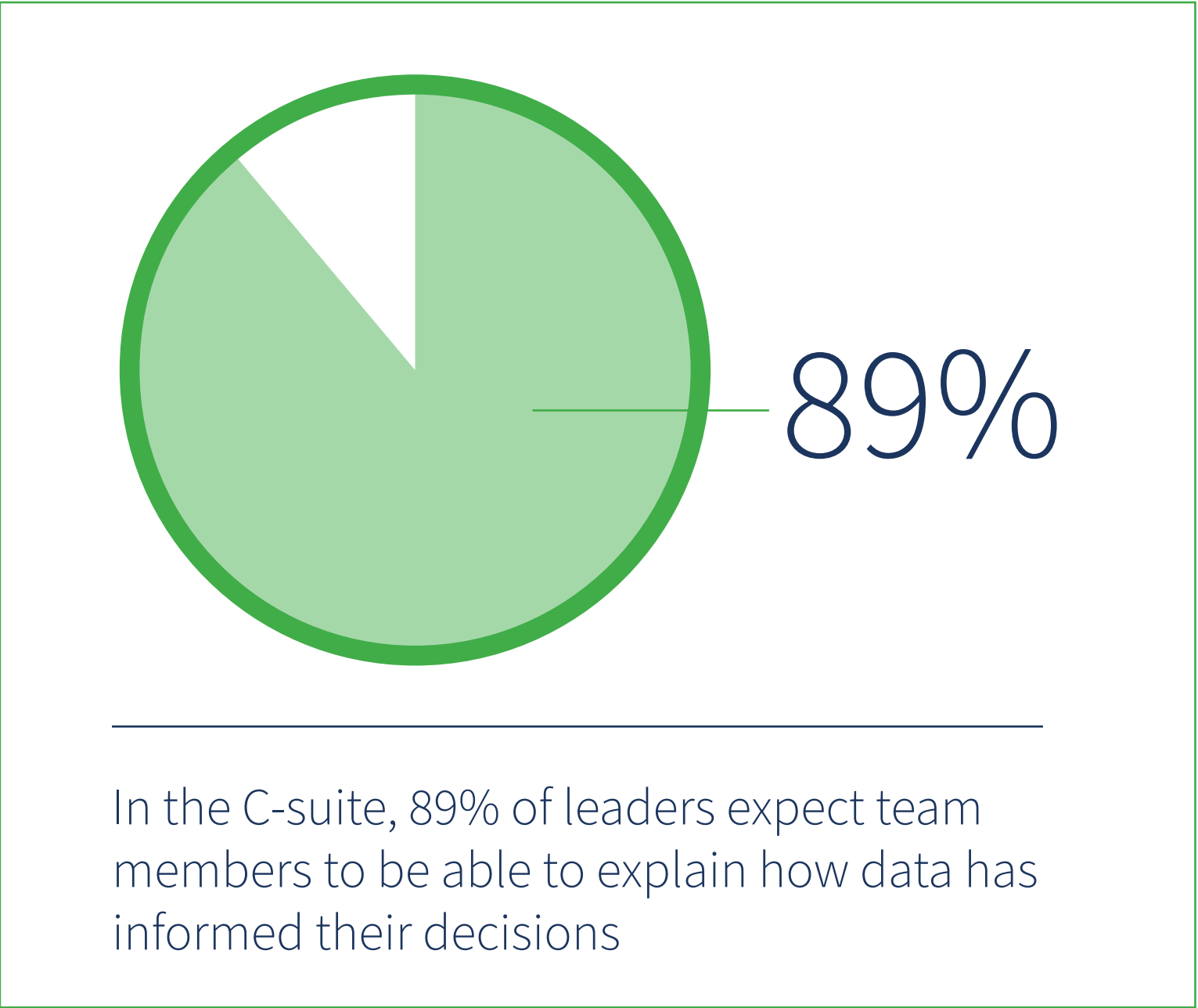
Keeping up with the potential of data

In the past year alone, employees’ use of data and its importance in decision-making has doubled. Of those employees who reported an increase in data use, 55% said this included reading data and making decisions using data; 54% said it involved interpreting data; and 59% reported overseeing and managing the outputs of automated systems.

Looking ahead, our working lives and environments will become truly hybrid. New technologies will automate some jobs while creating others. People will increasingly balance remote and office working, but in new ways that blur the boundaries between physical and digital worlds. And **87% of C-suite executives expect to introduce robots and physical machines in the office in future to encourage collaboration between intelligent systems and human employees. The right balance between human intuition and machine insights will be vital in this future as employees interpret data and translate it into meaningful impact;** for example, by proactively uncovering and solving problems that might otherwise have gone undetected until much later.

‘Ultimately, data literacy will mean using the intelligence from analytic data pipelines to make decisions that only humans can make,’ says Gerd Leonhard, Futurist and Author. ‘It will be understanding the context, using judgment and doing a reality check on what the data actually means.’

In this hybrid, collaborative future, data will become more interactive, intuitive and intelligent. Data literacy will become an essential skill, not just something nice to have. Enterprise leaders must act now to prepare their workforces for the shifts of the coming decade. They must propel their teams forward using data literacy, democratization of data and cultural change as fuel.



2

Data Now: Leading with Literacy



Data Now: Leading with Literacy

Harnessing and acting on data is the future of successful enterprises. Organizations that thrive will not only embrace advanced technologies that enable the collection and analysis of data, but will also upskill their workforces in data literacy for better, smarter decisions and behaviors.

Just as using typewriters and typing evolved from a specialist skill to an organization-wide necessity with personal computers, data literacy proficiency is a skill that every employee needs to inform action in real time. And **85% of C-level executives believe being data-literate will be as vital in the future as the ability to use a computer is today.**

‘It’s not that data takes over everyone’s job and it’s not that old skillsets have no value,’ says Daniel Castro, Director of the Center for Data Innovation and Vice-President of the Information Technology and Innovation Foundation. ‘It’s that there’s this new skillset that pretty much everyone needs, moving to a data-literate world where understanding how to use and interpret data will be essential across the board.’

What is Active Intelligence™?

Active Intelligence represents a new state for data and analytics where organizations can take action from their data in real time, as events happen.

This is in contrast to the traditional passive approach that relies on preconfigured, historical and often siloed data which offers no ability to drive in-the-moment decisions and action. Instead, Active Intelligence is made possible with an end-to-end analytics pipeline that embeds AI-powered, real-time analytics directly into business operations. This empowers people by providing context-rich, continuous intelligence based on a complete and current view of their data.

In turn, this compels action in the business moment by delivering timely and relevant insights when and where users need them. With in-context, personalized alerts for users, and by automatically triggering processes and actions in downstream systems and applications, organizations can be confident that the right decisions are being made at the right time with certainty.



The C-suite overestimate their workforces' data literacy

At present, the C-suite significantly overestimates the level of data literacy across their workforce. C-level respondents estimate that over half (55%) of their workforce are confident in their data literacy skills. This contrasts with the lower level reported by employees; just 11% are fully confident in all data literacy skills – the ability to read, analyze, work with and communicate with data – and 31% are somewhat confident and working toward developing this skillset. This is despite **62% of employees recognizing that data literacy is necessary to fulfill their current job role.**

11%

Just 11% of employees globally are fully confident in all data literacy skills

Employee Data Literacy confidence levels globally



% of employees who report to be fully confident in all data literacy skills

Leaders – who have inevitably been engaging with data for longer – must support employees with the tools and skills they need to improve their confidence and literacy. In doing so, they will ensure better decision-making and empower employees to take informed action at every level.

Castro emphasizes the importance of bringing three elements together: culture, direction and skillset. Led by data, he believes enterprise leaders must take a top-down approach to literacy and flatten hierarchies when it comes to decision-making.

‘In the wrong organizational culture, you would still be going with the opinion of the highest-paid person in the room instead of going where the evidence truly leads or questioning assumptions and challenging interpretations about what the data actually means. But if a business is going to be a data-driven enterprise, you can’t have leaders that don’t understand how it works.’

Daniel Castro,
Director of the Center for Data Innovation and Vice-President of the Information Technology and Innovation Foundation

The Data Literacy Gap

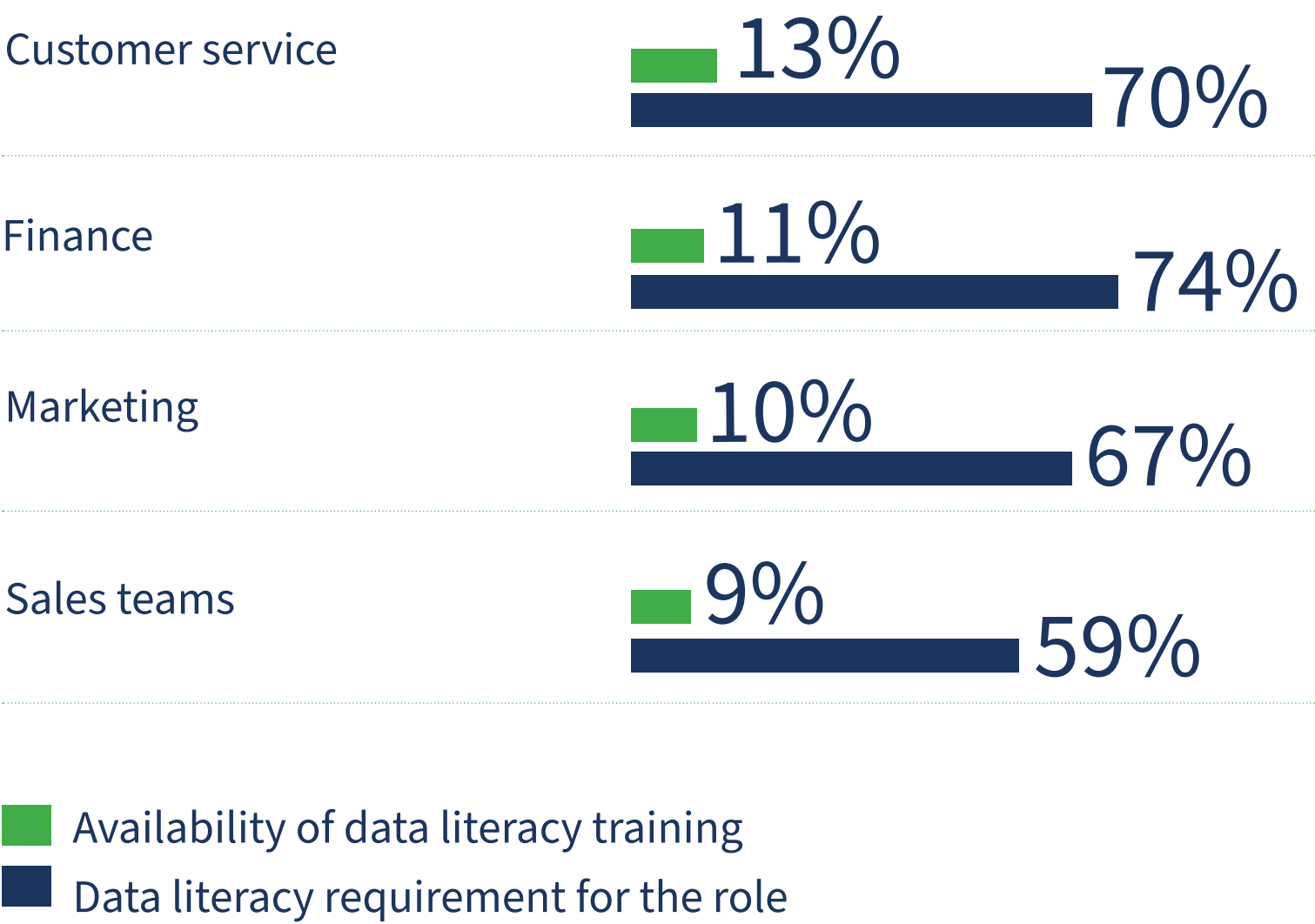
The appetite for improving data literacy is strong among employees globally, with 59% wanting to become more data-literate. But only just over one quarter (27%) say they have had formal data literacy training with hands-on exercises, while just one in five employees believe their employer is preparing them for a more data-orientated and automated workplace (21%). Almost half (45%) report that they feel anxious that their employer is not taking responsibility for nurturing their skills to succeed in this future workplace.

45% of employees are anxious that their employer isn't taking responsibility for nurturing the skills needed to succeed in this future workplace

There are signs that we are reaching a tipping point at which business leaders are starting to shift focus. Our research found that leaders are increasing their investment in data literacy training and upskilling by 49% over the next 12 months. The main drivers of investments in data literacy upskilling are to enable the organization to move faster by identifying opportunities and potential problems with (near) real-time data (36%), followed by increasing the number of decisions made by employees that are informed by data (30%).

But this investment appears to be largely focused on those working in data-orientated roles and those in leadership. **C-level executives currently prioritize data literacy training for those working in specific data-related roles** – such as data analysts or data scientists (58%), followed by product development and research and development teams (34%), and directors (32%). At the lower end of the investment priority spectrum are HR and people teams (12%), customer service teams (13%), finance teams (11%), marketing (10%) and sales teams (9%). This is despite about two-thirds of employees working in these functions stating that data literacy is already necessary to fulfill their current role.

Two-thirds of employees working in these functions state that data literacy is already necessary to fulfill their role.



Lines of business at risk of being left behind

Enterprise leaders clearly recognize the value of data literacy, but the business opportunity of data is being lost with some lines of business at risk of being left behind. Take HR, for example, where Chief People Officers might conduct attrition analysis to improve employee satisfaction and continuity. Or take procurement teams, where the ability to analyze and compare data from contractors and suppliers to evaluate benefits and risks can improve negotiation power – something that drove multi-million-pound savings at [Nationwide Building Society](#). It is when data literacy skills are democratized across the entire business that the greatest enterprise value is achieved.

‘The role that business leaders play in inspiring change cannot be underestimated – particularly when it comes to something as integral as decision-making. Creating a culture of informed action means shedding ages old practices, such as the most senior person in the room taking the final decision. Leaders need to inspire their employees with the humility to put the insights first.’

Kevin Hanegan,

Chief Learning Officer at Qlik and Chair of the Advisory Board for the Data Literacy Project

‘When you’re making a big investment like this, it’s quality over speed,’ says **Louise Brownhill, Chief HR Officer and Chief Learning Officer at PwC UK.** **‘We want our people to be data-literate, so they embrace automation to change the way they go about their work and release value and time. We want them to be able to have more informed conversations with clients. Leadership’s role is absolutely critical. We need to participate in [data literacy programs] to give others permission that this is an important investment.’**

Learning and development initiatives must be sponsored by C-suite leaders who become figureheads for impactful data use and work across the entire business to emphasize the value of upskilling programs. **According to Qlik’s Data Literacy Index, based on the average organization size in the study (\$10.7bn enterprise value), those with higher data literacy scores can achieve \$320–534m in higher enterprise value.**

PwC UK has trained 17,000 of its 24,000 UK employees in data literacy to date. Speaking about the program, Brownhill says:

‘We treat this not as an upskilling program, but as a change program. It’s important to create a mindset shift in all of our people from the very top to the very bottom, to help people to get confident with data and digitalization.’

Louise Brownhill,

Chief HR Officer and Chief Learning Officer at PwC UK

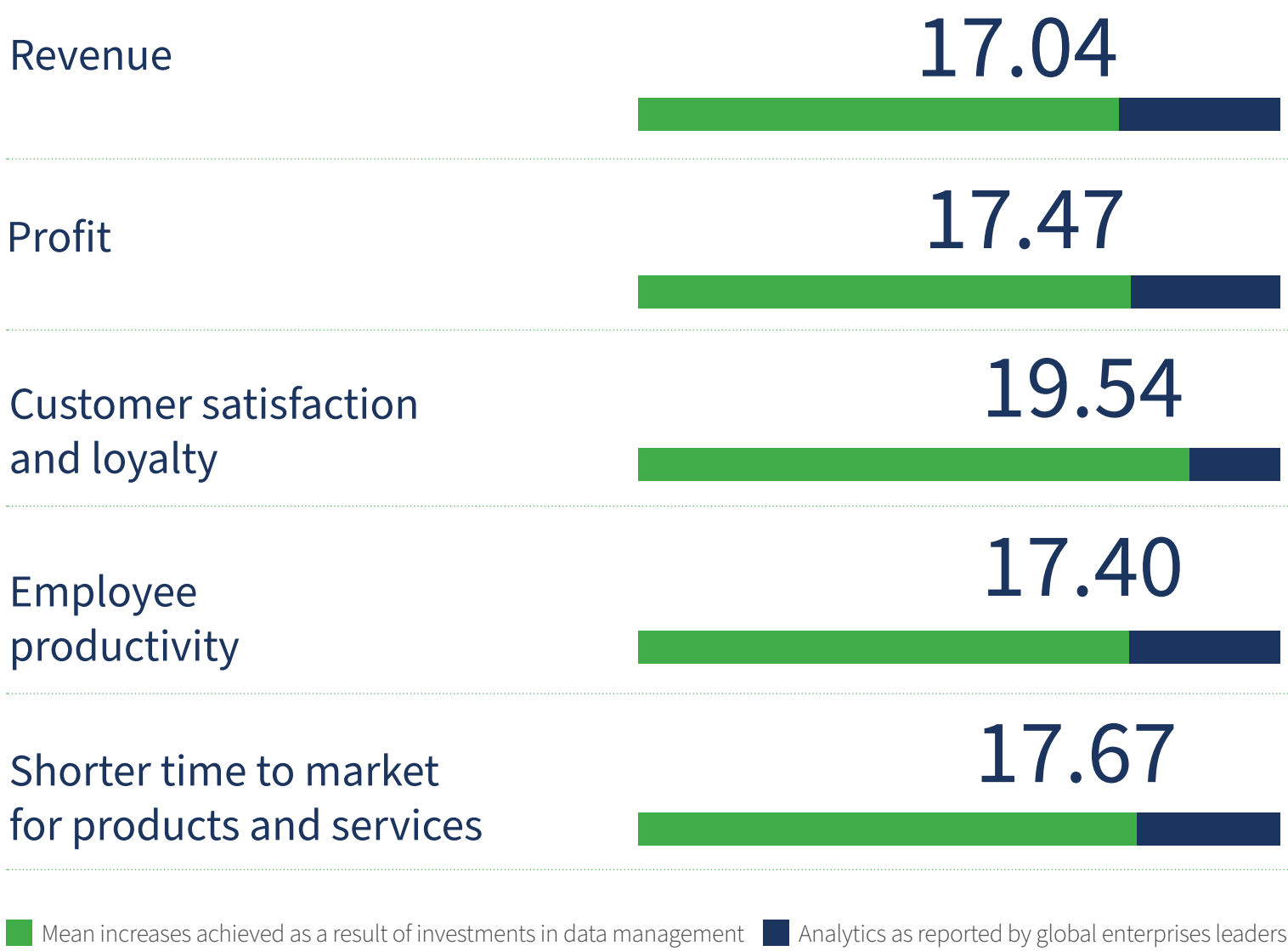
Realizing the Potential of Active Intelligence

Since the beginning of the Covid-19 outbreak, there has been a heightened need for Active Intelligence systems, where data isn't passively consumed, but real-time analytics compel and trigger smart actions. Almost all (90%) of C-suite executives say that data enables them to better navigate the uncertain business environment created during the pandemic, and that it was critical to the success of their organization (80%). In fact, **93% became more reliant on data when making decisions as a result of Covid-19 and 92% increased their investment in data technologies.**



Unfortunately, 41% of employees say that they struggle to find the data they need to perform their job role to the highest possible standard

Improvement as a result of investments in data management and analytics:



The ROI for those enterprises already investing in data management and analytics is clear, with [a study from Qlik and IDC](#) revealing an average 75% increase in profits, revenue and customer satisfaction and loyalty.

Meanwhile, **just 22% strongly agree that they have access to tools that help them better read and understand data.** Accelerating growth of data will only compound the problem. IDC figures show that global data creation and replication will increase by 23% between 2020 and 2025, with much of this growth coming from data collected by [IoT devices](#). And [Qlik and IDC](#) revealed that 96% of global organizations already find it challenging to identify data sources that are potentially valuable. As data becomes more complex, cleansing and integration to make it analysis-ready will be a major issue. But data-literate enterprises will have tools such as data catalogs – and employees who can use them – in place to streamline the process of finding and sharing valuable, ready data.

‘We’re very quickly running into having too much data. For a long time, the focus has been on big data: ‘Get more data, we’ll record everything’ when it should be on sifting out irrelevant data, asking: ‘Is the data you’re collecting representative of the problem that you’re looking at?’

Erik Rasmussen,
Head of Data Analytics at Harrods

Better Insights, Better Outcomes

Investing in data democratization through tools and education will help organizations navigate through future turbulence. It will help ensure that they anticipate and are compelled to act quickly as situations require it, rather than responding well after the event occurs. And seizing such opportunities in the business moment will transform the outcomes and impact of data on the business.

‘We talk about breaking the silos and getting access to the data, but it’s really about driving the right use cases with the right access, and also with the right transparency and consent.’

Meri Rosich,
Professor of Data Strategy for the Globis University Japan MBA

Importantly, enterprises need to reframe data as fuel for better actions, better attitudes and better business outcomes. **The transparency that data provides is already being realized by the C-suite, with 84% saying that they frequently find new insights to help solve problems, and are more agile (85%) and confident (86%) when making business decisions.**

C-level leaders also see the benefits it offers to workforce management, with 86% saying that data helps them measure their workforce’s performance, better understand their training needs (85%) and understand how their workforce is engaging with customers (85%). That transparency extends to their company’s wider eco-system, with better visibility of the supply chain (85%) and the behavior of customers (85%). It also helps them identify new product innovations (84%).

Where do C-level leaders see value from data?



Executives must lead from the front

A tool is only as effective as the user, however, and it’s important for leaders to help all employees realize the diverse benefits of reading, working with and communicating with data. At the moment, while C-level executives extol the benefits that they experience from more data-driven decision-making, they appear not to appreciate the full potential for data literacy in the enterprise. Every enterprise needs people across the entire organization who know how to input data, challenge data, generate better insights and are empowered to use it to inform decision-making. It is this skills gap that critically needs to be closed.

‘Without doubt, accessing and using information will be critical in the future. It is not about ‘data’ per se, but about using data to make better decisions.’

Dave Ulrich,
Rensis Likert Professor at the Ross School of Business

3

**Data Evolution:
Interactive,
Proactive,
Active**



Data Evolution: Interactive, Proactive, Active



We’re now at the dawn of the data-driven enterprise – one that incorporates a combination of physical, digital and virtual experiences and environments, an optimized fusion of human and machine workforces, the best data and analytics for real-time impact. **Enterprises that want to lead in their markets must invest in the talent and technologies to propel this transformation.**

Employees globally believe that data literacy will be the most in-demand skill by the end of the decade (38%), followed by working with AI and machine learning (29%) and data science (24%). Over half (58%) believe that data literacy will help them stay relevant in their role with the growing use of artificial intelligence. Meanwhile, 81% of C-suite executives recognize that if they don’t upskill themselves, their own jobs will be at risk from those with a better understanding of data. Now is the time to start the journey or risk disruption.

‘You need a new paradigm in which a literate workforce asks for more data, and your data and analytics capabilities are in place to deliver it.’
Elif Tutuk,
Vice-President of Innovation and Design at Qlik

‘If you wait until that perfect model is built, by the time you deliver it, the business will have already changed,’ says Elif Tutuk, Vice-President of Innovation and Design at Qlik. ‘You need a new paradigm in which a literate workforce asks for more data, and your data and analytics capabilities are in place to deliver it, and then training for the people to use them. And you’re building that into every business decision you make.’



Analytics Evolution: Interactive Insights

C-level executives recognize that a more data-orientated and automated workplace will change the ways in which they operate in the future. Most (85%) expect to spend more time focused on fostering company culture and organizational culture, and 84% believe they will be able to make significant business decisions more quickly.

Many organizations are now using real-time analytics to help them streamline, strategize and take action. Going one step further, the most innovative enterprises use AI-powered analytics to deliver business-ready data and predictive insights to employees so they can make future-facing decisions.

[University Hospitals of Morecambe Bay NHS Foundation Trust](#) is using predictive analytics and AI to help its employees prepare for future eventualities using real-time data. Working in partnership with Qlik, Snowflake and DataRobot, the Trust now has a system that predicts daily patient numbers in the Accident and Emergency department, as well as assessing potential requirements to estimate resource needs. It predicts length of patient stay and helps doctors understand those at high risk of re-admittance so they can make

different clinical pathways to better treat individuals. There is also potential to identify hypertensive patients before they are admitted to hospital.

Data in the future enterprise

In the next-generation enterprise, data will be instantly visualized and customized to the needs of teams and individuals. We're on a journey from passively consuming data to interacting with it and instantly acting on it.

‘[As an employee] I won't be in a 2D world where I'm just receiving data, I'll actually be in a 3D world where I'm surrounded by this data and I can ask questions of it and I can interact with it,’ predicts Rupinder Mann, Managing Director of people and culture consultancy UnNamed Ventures. ‘And because I can do that, I can generate and use insights for different things. It will be intrinsic to everything.’

‘[As an employee] I won't be in a 2D world where I'm just receiving data, I'll actually be in a 3D world where I'm surrounded by this data and I can ask questions of it and I can interact with it.’

Rupinder Mann,
Managing Director of UnNamed Ventures

Data will become more intuitive and almost playful to use. ‘It's creating a language that a lot of people have pushed back against because it sat in the realm of mathematics, rather than in the realm of opportunity, and I think that's where it's now shifting to,’ says Martin Raymond, Co-founder and Editor-in-Chief of futures consultancy, The Future Laboratory. ‘The next generation of visualization will show us data in a way that will really make it easier to understand the impact of making decision X versus decision Y.’

In this interactive and intuitive future, data is democratized to the point that it is at all employees' fingertips. But to truly empower people, data, analytics and insights need to be intrinsically trustworthy.

46%

46% of employees don't always trust the data available and frequently make decisions based on gut feeling

Almost half (46%) of employees frequently make decisions based on gut feeling, rather than data-led insight, and the same percentage (46%) don't always trust that the data available to inform their decisions is up to date and accurate. To overcome this lack of trust, Explainable BI (Business Intelligence) offers visibility into the data's lineage, including the source, as well as governance and business logic applied to the data to reach an insight.

'This is only going to grow in importance as we move closer toward more widespread adoption of the Active Intelligence model, where we're not only using the data to inform our own decisions, but it is proactively served to compel us to take actions and trigger automated responses. That is only possible through trust,' says [James Fisher, Chief Product Officer at Qlik](#).

Dawn of the Metaprise

Future enterprises will be transformed into 'metaprises' as we enter the dawn of the metaverse – a reality that straddles physical, digital and virtual realms all at once so that each becomes blended with each other. Many companies are already working toward this vision. Facebook has notably rebranded itself under the umbrella company of Meta; Microsoft is repositioning itself with new metaverse-orientated products and apps; and Hyundai already equips its designers with VR headsets that allow them to meet across different geographies and design new car models together, yet remotely.

‘Over the next 10 years, we’re going to develop tools that are absolutely mind-boggling for virtuality. Virtualization is what I call a mega-shift; systems are getting smart and eventually there’ll be no difference whether I’m here or there, in the office or a virtual meeting room.’

Gerd Leonhard,
Futurist and Author

During the pandemic millions of employees switched to digital-only modes of communication. Platforms such as Microsoft Teams and Zoom continue to empower employees to communicate and collaborate across physical and digital boundaries in a precursor to the metaverse.

The vision of the metaverse strips current limitations of working remotely versus in person through the creation of immersive virtual workplaces where employees can meet and collaborate in new ways. Accenture has collaborated with Microsoft and Altspace VR to Create the Nth Floor, a mixed-reality workplace where avatars interact as much as they would in a physical office.

This 3D modeling will support better decision-making in architecture, construction, manufacturing, healthcare and other industries as it enables individuals to be ‘in the room’ remotely. And whether it’s fixing machinery from another continent or creating immersive design prototypes of new products, data will form the fabric of our daily environments in these 3D worlds and, in turn, create a wealth of new data sources.

To prepare for a metaverse-enabled future, organizations need to think about how they can adapt and transform operations, culture and workforces. Leaders must embrace the evolution from hybrid to borderless and find new, creative ways to engage employees and customers.

Metaprise workforce:

C-suite respondents predict several new job roles will appear in just the next five years to take advantage of these new opportunities, created as we move from a physical-first enterprise to a metaprise.

- 85% believe that it will be important to have a **Chief Metaverse Officer** in charge of employee and customer experiences that straddle digital and virtual realms
- 86% believe that having a **Metaverse Experience Designer**, responsible for employee and customer experiences that straddle virtual and physical realms, and who ensures data transfer is seamless, will be important
- 86% believe a **Workplace Environmental Architect**, responsible for ensuring all workspaces – physical or in the metaverse – are designed to maximize employee productivity and wellbeing, will be important
- 87% believe that it will be important to have an **Immersion Counsellor** who uses virtual and augmented reality to boost mental resilience and wellbeing through guided immersive therapies
- Over 99% believe the above roles will be hired into their organization in the next 10 years

Workforce Evolution: Proactive Productivity

The future workforce will be made up of proactive, perennial learners. With mundane and repetitive tasks automated, these workers will spend more time on value-adding tasks, and prosper from their ability to make better, quicker decisions informed by real-time data and AI-powered analytics. Employees will not only collaborate with each other, but also with customers and with machines.

Active Intelligence is already being embraced by the most forward-thinking enterprises. Take [UK communications group BT](#), which partnered with Qlik to put data directly into the hands of more than 1,200 consumer team members. Employees now have access to market insights that enable them to personalize and optimize the customer experience. **Through customized analytics dashboards and real-time data feeds, employees can now answer any business question in six clicks or fewer – a task that would have previously taken a data analyst weeks to find, prepare and analyze.**

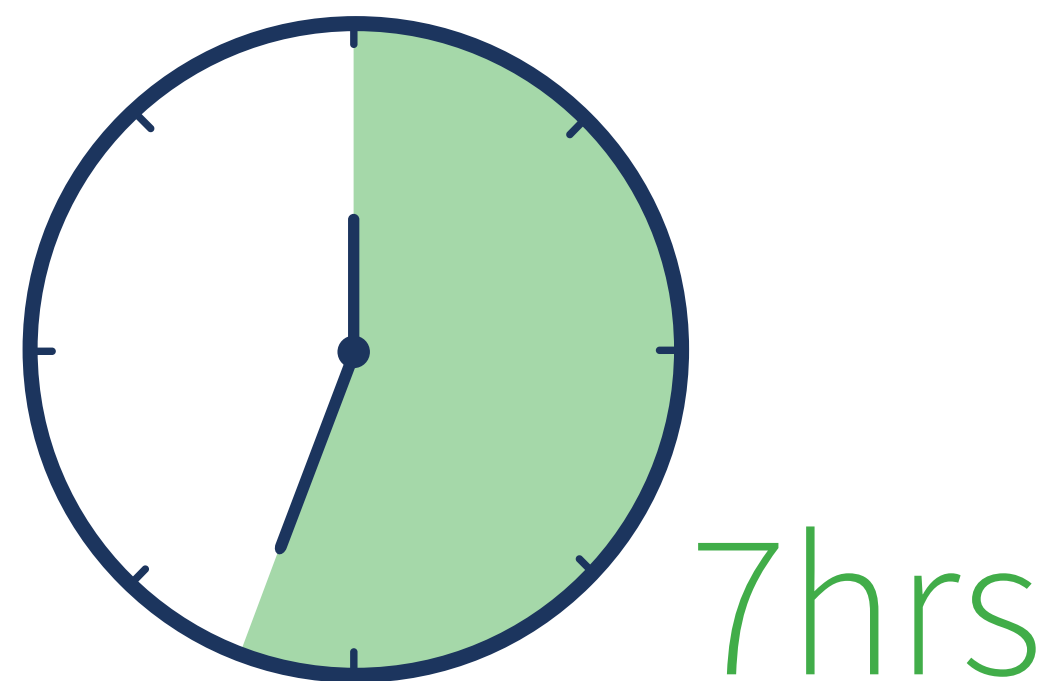
As we move further toward the end of the decade, this acceleration of tasks will be commonplace, with many jobs and roles being automated. **Eighty-three percent of C-level executives expect their organization to reduce staff head count because of the automation of some manual and operational tasks.** This reflects [estimates from McKinsey & Co](#) that 375m will need to adapt their roles to automation by 2030.

Most C-level executives predict employees' working practices will change and become more collaborative, with intelligent tools helping them to make better decisions (84%) and become more productive (83%). Employees share this outlook, and have both negative and positive feelings about it. Over two-fifths of global employees (42%) fear the growing use of intelligent automation in the workplace will lead to them being made redundant due to the automation of manual tasks. **But 53% believe it will give them more time to spend on value-adding work and decision-making rather than operational tasks.**

Technology, combined with data literacy, will help employees to save time, be more productive, and have more confidence to take action through enhanced accessibility to, and interpretation of, data. A third of employees say that having a virtual assistant to guide them through the analytical process would help them when making decisions with data. This reflects [predictions from IDC](#) that by 2024, 50% of knowledge workers will regularly interact with their own AI-enhanced robot assistant. The assistant will help collect information, identify and prioritize tasks, and automate repetitive work to free up more time.

Embracing and augmenting human intelligence

Even – and perhaps especially – as technology evolves and data is democratized, human intuition and acumen will continue to be valued and key to success. Enterprises that invest in learning programs that embrace human intelligence, augmented by technology, will thrive.



Employees invest nearly seven hours per month on personal upskilling

‘My advice is to invest as much in humanity as we invest in technology. So good people, great training, human skills, empathy, not investing 90% in technology and then basically cutting people out. Keep the human in the loop.’

Gerd Leonhard,
Futurist and Author

Data literacy should form a major part of this investment with the understanding that it is a set of competencies that encompass workplace skills beyond what machines are capable of. These include what are often described as ‘soft skills’, such as emotional intelligence, empathy, creativity, complex problem-solving, multi-disciplinary thinking and cognitive flexibility.

According to the [World Economic Forum’s Future of Jobs report](#), critical thinking and problem-solving top the list of skills that employers believe will grow in prominence by 2025, with skills in self-management, such as active learning, resilience, stress tolerance and flexibility also appearing in the top 10. In addition, [Accenture’s report, Harnessing Revolution: Creating the Future Workforce](#), argues that training in soft skills will significantly reduce the number of jobs lost to automation.

Employees are taking matters into their own hands

Future workers will be life-long learners who embrace an iterative, perpetual approach to digitalization and upskilling. They’ll invest more in themselves, and they’ll be rewarded. Today, over three quarters (78%) of global employees are spending time every month investing in their own personal development – and these employees spend an average of nearly seven hours (6 hours 50 minutes) on personal upskilling each month. Over the past 12 months, they’ve spent an average \$2,800 on professional development.

\$2,800

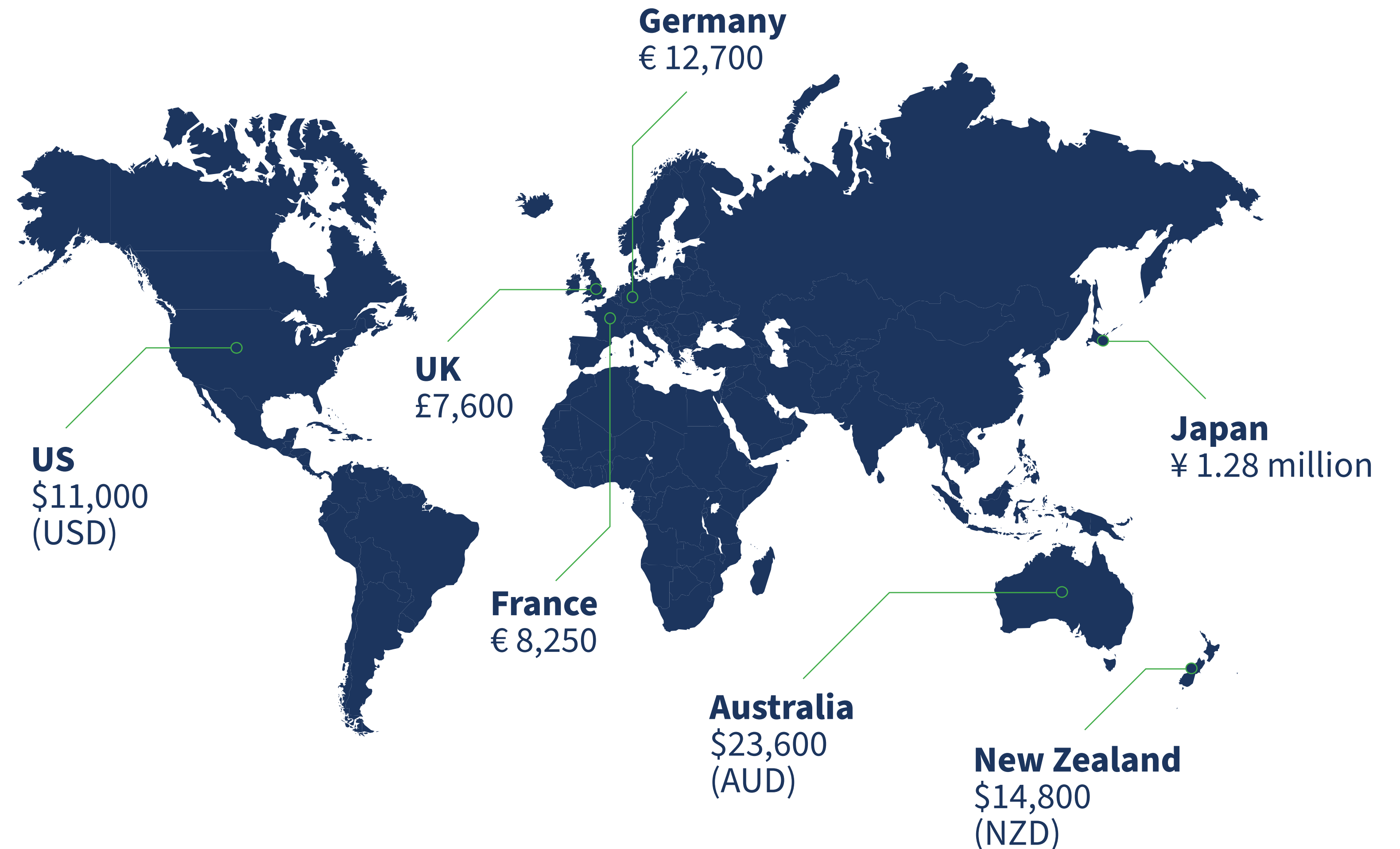
has been spent, on average, on professional development by employees

‘Until we get to a technology where information from someone’s brain is parsed out in a database, you still have to do human-to-human collaboration, and we’ve moved away from that over the past decade. I see us coming back to that full circle where we look at the three Cs – Creative, Collaborative and Critical – thinking.’

Elif Tutuk,
Vice-President of Innovation and Design at Qlik

In the future, more of the burden will be on employers to help their workforces learn necessary skills. Either way, for those who improve their data literacy, rewards are on the horizon. All C-level executives report that they would offer a salary increase for candidates that could demonstrate their data literacy. **In the US, the average salary increase for demonstrable data literacy (19.53%) could put up to \$11,000 extra into employees’ pockets every year, based on the average yearly salary of \$56,310 as recorded by the [Bureau of Labor Statistics](#).**

Potential salary increases for employees with data literacy skills



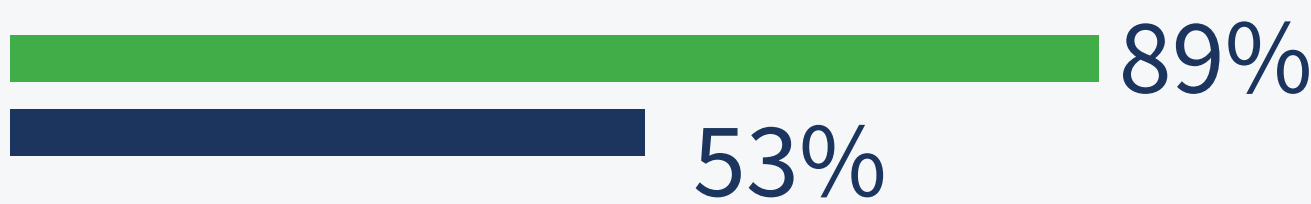
Leadership 2030: New Roles

The growing adoption of automation in the workplace, as well as societal and technological progression, will transform many job roles, while others will disappear. Entirely new roles will also be realized as businesses strive to navigate new paradigms and evolving customer, employee and commercial needs.

Below are the top new leadership roles that will be commonplace in boardrooms by 2030:

Chief Customer Experience Officer

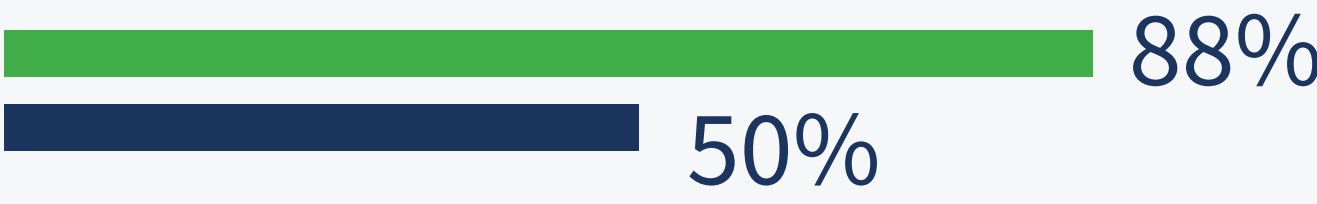
The Customer Experience Officer will be responsible for ensuring that every touchpoint in a customer’s journey with the organization is optimized, including product design, sales, customer service, the web and mobile UX.



CXOs believe they will hire this position
Employee aspiration to work in the role

Chief Automation Officer

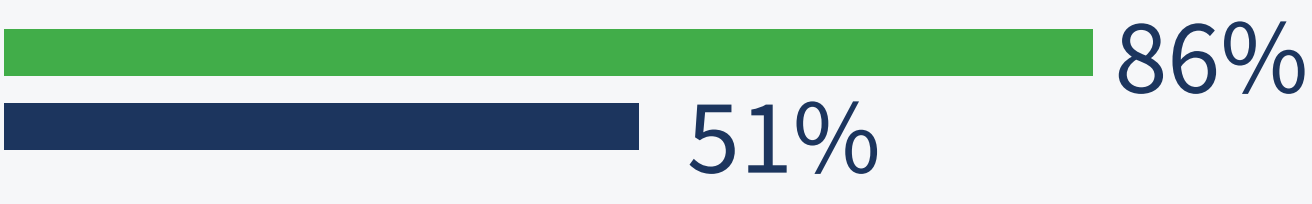
The Chief Automation Officer will oversee the implementation and management of automated working practices and machines in the organization.



CXOs believe they will hire this position
Employee aspiration to work in the role

Chief Trust Officer

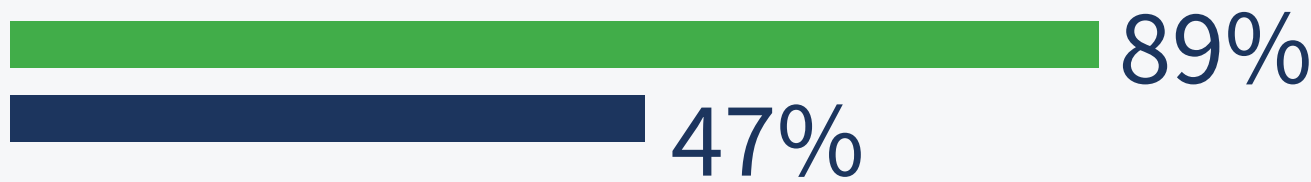
The Chief Trust Officer will be responsible for enhancing consumer and employee trust in the business. They will ensure that the organization maintains its ethical values for everything from data privacy and product development to organizational communications.



CXOs believe they will hire this position
Employee aspiration to work in the role

Head of Gamification

The Head of Gamification will monitor the ways in which people interact with internal and external digital processes, and identify opportunities to increase engagement.



CXOs believe they will hire this position
Employee aspiration to work in the role

Head of Collaboration

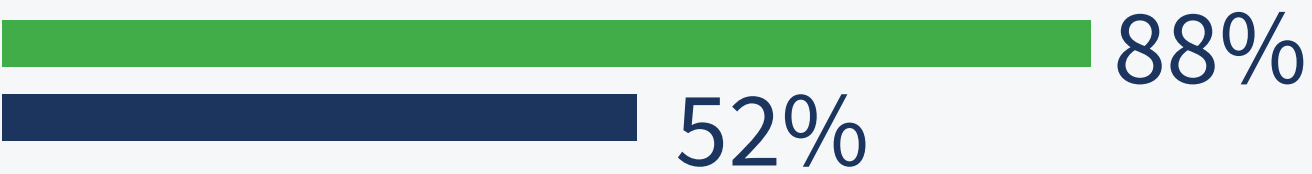
The Head of Collaboration will be in charge of eliminating departmental silos. They will be responsible for ensuring that data and insights are shared across the organization, and even outside it, to boost competitive advantage and opportunities for innovation.



CXOs believe they will hire this position
Employee aspiration to work in the role

Head of Betterment

The Head of Betterment will work to ensure continual improvement across the enterprise. This will include identifying areas for employee development and learning, opportunities for ongoing improvement of processes and operations, and generally helping their organization do better. The role includes ESG with the KPI to put purpose at the core of the business, from data use to supply chain, diversity and employee wellness.



CXOs believe they will hire this position
Employee aspiration to work in the role

Enterprise Evolution: Active Culture

As well as boosting the bottom line for future enterprises, data will form the lifeblood of alternative means of growth and transformation. It will provide metrics of progress that lead to individual, collective and global betterment, such as reducing carbon emissions and increasing workplace diversity and equality. The future enterprise will be active in every sense, embracing the proactive model enabled by systems that leverage Active Intelligence to make decisions that enhance lives and businesses.

There is a growing awareness of the role that data can play in improving society, especially since the start of the pandemic.

‘There is a definite difference in how businesses talk about driving growth and business efficiencies. At the very heart of this is data, and how we look at it, and how it’s going to transform our businesses, societies and communities.’

Rupinder Mann,
Managing Director of UnNamed Ventures

Covid-19 saw unprecedented collaboration between industry, institutions and researchers in the hunt for an effective vaccine to the novel virus. It was the speed, scale and distribution of action that was so unusual. Data was the driving force that made this possible. Take, for example, Operation Warp Speed (OWS) – the US project behind the development, manufacture and authorization of two Covid-19 vaccines in nine months. Built on a data-led culture, [OWS was the largest global development program for vaccines](#), and encouraged private and public collaboration to accelerate approvals and production while ensuring safety and security.

Putting data at the heart of the solution

In the coming decade, we’ll see this data-driven approach applied to solving many of the world’s biggest challenges. **It will not only require collaboration and data-sharing, but also the ability to read and translate data into progress through literacy.**

‘The problems that we’re going to face in the future are going to require collaboration. It’s going to be very difficult to solve climate change from a single angle, a single person, a single team or a single company or country. Multi-disciplinary collaboration and data literacy are going to be very important for the critical thinking skills of the future.’

Meri Rosich,
Professor of Data Strategy for the Globis University Japan MBA

The UN has partnered with Qlik for advanced data analytics to enhance tracking and collaboration with member countries toward achieving its Sustainable Development Goals. Most recently, Qlik partnered with the UN Framework Convention on Climate Change (UNFCCC) to develop an innovative IT tool – the Negotiations Status Snapshot – which collected and processed up-to-the-minute information on the positions of different parties during the very complex and intricate negotiations at the COP26 climate conference.



Employees also expect data to positively inform the evolution of the enterprise. Many believe that better use of data would enable leaders of their organizations to achieve more by understanding the upskilling requirements of employees (39%), improving employee engagement and understanding employee sentiment (37%). A further 27% believe data could be better used to measure and reduce an organization's carbon footprint, with the same percentage agreeing it would improve diversity and inclusion.

Data-sharing was recognized as an important tactic



More than 90% of global employees believe that openly sharing data would make their organization fairer and more responsible

The following uses were called out as the most impactful: sharing salary bands (35%); gender pay gap reporting (31%); inclusive hiring data (26%).

Data fueling organizational transformation

Better use of data will prove both purposeful and profitable for organizations that embrace it. Data-driven enterprises will have metrics of continual improvement as KPIs for their workforce, with leadership setting an example and championing use of data to achieve goals beyond – but not necessarily exclusive of – the bottom line. In fact, we'll see new C-suite roles being developed toward sustainable goals.

'We've got new roles which have come in the last three months or so,' says PwC UK's Brownhill.

‘Chief Data Officer, Chief Sustainability Officer and Head of Purpose. All these people will need high levels of data literacy. The creation of these roles reflects the revolutionary shift in data and digital. It reflects COP26 and everything that’s happening around sustainability and climate change, and around ethics and governance. ESG [environmental and social governance] is a top emerging skill.’

Louise Brownhill,
Chief HR Officer and Chief Learning Officer at PwC UK

Yet, despite the benefits of sharing data, there are still barriers to overcome on the road to betterment and continual improvement. **While 93% of C-suite executives agree that it is beneficial for enterprises to share data to solve global issues, only one-third would be prepared to share proprietary organizational data to help solve climate change (35%), overcome misinformation (34%), and improve inclusion and diversity (33%).**

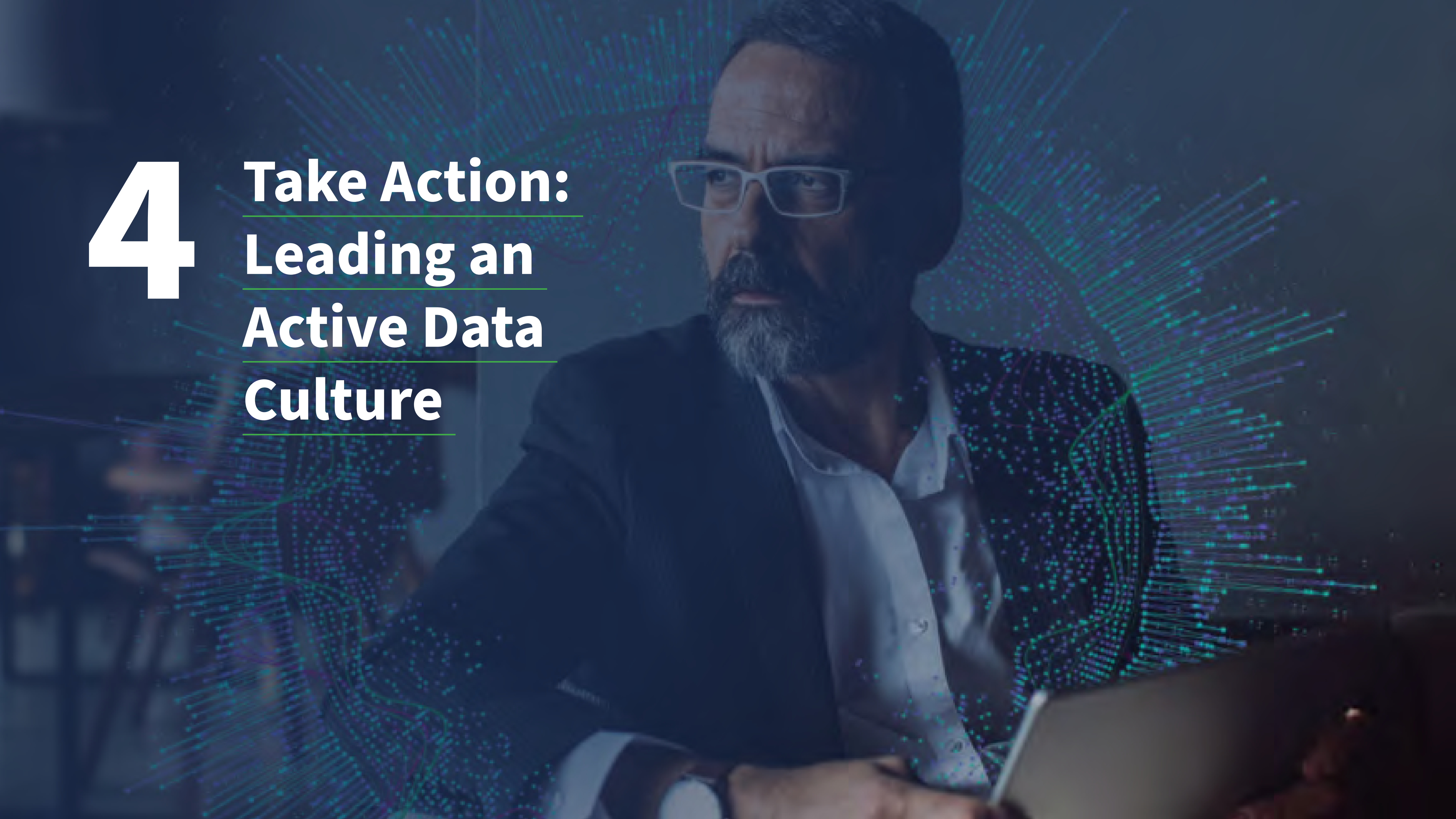
Leaders are more likely to share data where a precedent or legal imperative has already been set. Fifty-nine percent of C-suite executives are willing to share data related to cyber-attacks and data breaches, for example, and in some cases, this is less of a choice than a requirement. British organizations must report data breaches of personal information to the Information Commissioner’s Office, and Japanese organizations to the Personal Information Protection Commission. This willingness to share data in these incidences shows how greater regulation can encourage wider collaboration.

‘We need to emphasize the importance of readiness for data exploitation across society.’

Hiromichi Amagai,
Executive Officer, Strategic Business Planning
at Dynamic Map Platform

‘Scenarios for data use vary industry by industry,’ says Hiromichi Amagai, Executive Officer, Strategic Business Planning at Dynamic Map Platform, a Japan-based planning company. ‘We need to collaborate with government agencies to establish services and regulation in some cases, and we’ll also need to participate in activities to enlighten society about data literacy so that services enabled by data can be accepted.’



A man with a beard and glasses is shown from the chest up, looking at a laptop. The background is dark with a complex, glowing digital network overlay in shades of blue and green, suggesting data or technology. The text is overlaid on the left side of the image.

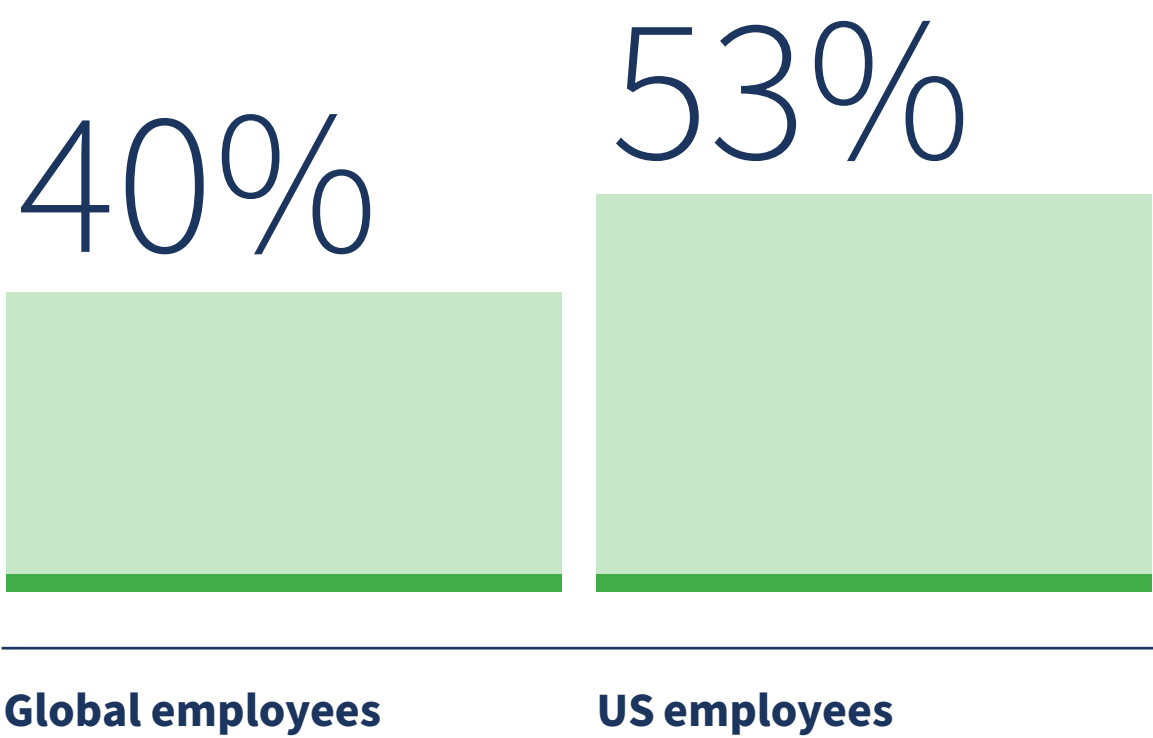
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Take Action: Leading an Active Data Culture

Take Action: Leading an Active Data Culture

We’re at the dawn of a new era for enterprise data cultures. Over the next 10 years, we’ll witness huge leaps in data and advanced technologies, such as AI and machine learning. The resulting analytics present an enormous opportunity for leaders to empower their employees with the tools and skills to make better decisions and to take informed action based on Active Intelligence.

Employees are actively looking for a new role that will provide them with better upskilling and training opportunities



There is work to be done, however. There is currently a major disparity between employees’ and enterprise leaders’ beliefs about whose responsibility it is to prepare workforces with skills for the future workplace. **Among employees, 59% want their employer to offer training to improve their data literacy.** In direct contrast to the employee survey, the most commonly held belief by the C-suite about whose responsibility it is to prepare individuals with the skills for the future workplace is that it falls to the individual. This was true of all regions except France where most executives believe the onus sits firmly with the employer.

The reality is that it might take a more collective approach to achieve the results necessary to ensure future success. As Brownhill says: **‘We’re on a treadmill that isn’t going to stop, so we need to constantly be asking: what is the next suite of emerging technologies and skills, and armor our people up with those? It is the responsibility of employers to do that. And there’s a responsibility for the individual, as well. They’ve got to have the curiosity to want to grab this, and participate and engage in it.’**



Building the Right Data Culture for Active Intelligence

The rewards for leaders who do implement data literacy upskilling and training are compelling, especially when it comes to talent retention. **Some 45% of global employees would change jobs if they felt they could get better preparation for the future workplace elsewhere. In fact, 35% have done this in just the past 12 months.**

2/5

Two-fifths of global employees (40%) are actively looking for a new role that will provide them with better upskilling and training opportunities – rising to 53% of US employees

Expectations must be met by enterprise leaders, who will need to drive the change toward a more data-literate workforce. Indeed, 90% of the C-suite agree that those without data literacy and the skills to work with AI and machine learning face the greatest risk of being left behind in the future workplace.

With the changes to data, analytics and our working practices, investment in data upskilling need not be as significant – both in terms of cost and time. Virtual training offerings, alongside traditional live and in-person instructor-led curriculums, allow for hybrid approaches that have a lower barrier to entry. The acquired skills can then be consolidated with guided analytics and AI bots providing real-time support to employees using data tools.

Leaders need strong data strategies in place, and to create an active data culture through investments in their people, policies and technologies. Learning initiatives and new roles will be crucial to thriving in this new age of data.

‘To succeed in the marketplace requires insights and innovations in HR outcomes of talent, leadership and organization that deliver value to employees, customers, investors and communities.’

Dave Ulrich,

Rensis Likert Professor at the Ross School of Business



To maximize the ROI of Active Intelligence across the organization and to thrive in the marketplace, business leaders should work toward the following five goals:

1

Champion a data-literate culture supported by Active Intelligence systems

Start by thinking about your own skills and mindset. Consider how they could be enhanced or shared, and then initiate a learning program from the top down. Create an active data culture that embraces the best of human and machine for better decision-making and outcomes. Let employees see the benefits of data literacy and use it, not only in their current role but for their future progress and success.

2

Democratize the right data through tools and literacy

Empower employees to make better decisions and compel them to take informed action by democratizing data usage through training and upskilling, as well as intuitive, interactive tools and customizable interfaces. Don't just offer these tools and skills to technical teams – further champion an organization-wide data culture by putting data in the hands of those who need it to do their jobs well; that is, the vast majority of an organization.

3

Embrace perpetual learning to keep pace

Remember that data literacy is a never-ending journey, not a destination. New insights lead to more questions and deeper understanding; we're never going to be at a point when we don't have something new to learn. Just as data creation is accelerating, so are the skills to use it in the right way. To succeed, employees and leaders should become perennial students with initiatives in place to evolve alongside technological advances.

4

Promote trust in data

Embrace transparency and responsible governance to enhance trust around ethical use of data, but also to assure employees that the data they are seeing is the data they need. Harnessing the power of AI and machine learning, alongside human experience and skills, will provide insights and analytics that people feel confident in using and explaining.

5

Harness data for continual improvement and positive change

Work toward sustainable goals and new metrics of progress using systems that deliver Active Intelligence that involve, support and produce better insights, decisions and actions for individuals, organizations, communities and the planet. As priorities shift to a more even balance between ESG and commercial growth, leaders will need to think about KPIs and other ways in which they can encourage more conscious and conscientious data use.

Contributor Biographies

Gerd Leonhard

Futurist, a leading voice on exponential technological progress, and author of *Technology vs Humanity: The Coming Clash Between Man and Machine*, Leonhard specializes in the connection between technology and humanity and making sure that we gather the right data, and unlock new insights, without losing what makes us human.

Daniel Castro

VP of the Information Technology and Innovation Foundation (ITIF) and Director of the Center for Data Innovation. Castro writes and speaks on a variety of issues related to information technology and internet policy, including privacy, security, intellectual property, Internet governance, e-government, and accessibility for people with disabilities.

Rupinder Mann

Founder and MD of UnNamed Ventures, a strategic people and culture consultancy. Combining business intelligence and cultural anthropology to help organizations realize their hidden potential. Mann focuses on helping build environments and ecosystems that enable and nurture the people within them by using data and science to inform, empower, facilitate and reimagine the workplace.

Hiromichi Amagai

Executive Officer, Strategic Business Planning at Dynamic Map Platform. The company brings together Japanese technology and autonomous driving expertise to offer a high-precision 3D data platform that replicates the real world in digital space.

Dave Ulrich

The Rensis Likert Professor at the Ross School of Business, University of Michigan and a partner at consulting firm the RBL Group. Ulrich has published over 30 books on leadership, organization, and human resources, which have shaped how people and organizations deliver value to customers, investors, and communities.

Louise Brownhill

Chief Learning Officer and Chief HR Officer at PwC UK. She is responsible for developing and executing a holistic talent, performance and development strategy that optimizes people’s potential and business performance. Within this, Brownhill focuses on maximizing a learning culture through traditional L&D design and delivery, modern technological interventions and leadership development.

Erik Rasmussen

Head of Data Analytics at Harrods, the world’s leading luxury department store.

Meri Rosich

Professor of Data Strategy for the Globis University Japan MBA, Rosich focuses on driving digital transformation with the strategic use of data and AI. She had the privilege of leading the data teams for global organizations as CDO, transforming organizations’ data cultures, and creating business value with data by using innovative data solutions.

James Fisher

Chief Product Officer at Qlik, Fisher leads the product management and product marketing organizations that help drive Qlik’s vision, product and innovation strategy, messaging, thought leadership and go-to-market strategies. He has two decades of experience in global software and consulting businesses focusing on analytics, performance management, finance and mobile solutions.

Kevin Hanegan

Chief Learning Officer at Qlik, Hanegan’s passion is the intersection of business, technology, learning, and psychology. He promotes diversity and inclusion within company processes and brings a human approach to working with data. He authored *Turning Data Into Wisdom: How We Can Collaborate with Data to Change Ourselves, Our Organizations, and Even the World*.

Paul Barth

Global Head of Data Literacy at Qlik. Barth is the former CEO of Podium Data, which developed advanced data and analytics solutions for Fortune 100 companies. And through his leadership roles at Schlumberger, Thinking Machines, Epsilon, Tessera, and iXL, Barth led the discovery and development of parallel processing and AI technologies that dramatically accelerate and simplify data management and analytics.

Elif Tutuk

VP of Innovation and Design at Qlik, Tutuk is responsible for managing a global team of UX designers, product designers and engineers in planning and executing design, UX and innovation strategies for Qlik’s end-to-end cloud data integration and analytics products.

Further reading

For more information on how to equip your workforce on the journey to becoming a data-driven business, check out these useful resources:

- [Qlik Continuous Classroom: Several free and paid-for data literacy learning resources](#)
- [Data Literacy Index: A study that identifies the enterprise value opportunity of a data literate workforce](#)
- [The Human Impact of Data Literacy: Research that highlights how the data literacy gap is impacting organizations, and how to best overcome these challenges](#)

About the research

The Data Literacy: The Upskilling Evolution report is based on research conducted by Censuswide of 1,209 C-level executives and 6,197 global full-time employees in organizations of 50+ employees in the UK, USA, Germany, France, Japan, Australia and New Zealand in October and November 2021. This research was combined with expert interviews with industry specialists by Futures Consultancy, The Future Laboratory.

About The Future Laboratory

The Future Laboratory is one of the world's leading strategic foresight consultancies. It exists to help companies make a better future by giving them the confidence to take the decisions today that will create economic, environmental, technological and social growth tomorrow. From its offices in London, Antwerp, São Paulo and Melbourne, The Future Laboratory offers a range of strategic foresight products and services to help its clients harness market trends, adapt to emerging consumer needs, and keep them ahead of their competitors. Stay on top of the latest consumer trends and market shifts by visiting its trends intelligence platform, [lsnglobal.com](#), and find out more about its client work at [thefuturelaboratory.com](#).

About Qlik

Qlik's vision is a data-literate world, where everyone can use data and analytics to improve decision-making and solve their most challenging problems. Our cloud-based Qlik Active Intelligence Platform delivers end-to-end, real-time data integration and analytics cloud solutions to close the gaps between data, insights and action. By transforming data into Active Intelligence, businesses can drive better decisions, improve revenue and profitability, and optimize customer relationships. Qlik does business in more than 100 countries and serves over 38,000 active customers around the world.

[qlik.com](#)