Are you
cloud ready?

Contents

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Introduction: Are you cloud ready?

In just over a decade cloud has established itself as a primary driving force behind the global move towards digital business.

It has become the foundation platform for digital giants such as Alibaba, Amazon, Google, Netflix and Tencent, and represents now over a quarter of the revenues of all IT and business services – and will reach 50% by the mid-2020s. Amazon Web Services (AWS) alone has a potential IPO value of over $200B which would rank it as one of the most valuable companies on the S&P500.

Cloud has had transformative effects across many sectors such as media, retail and financial services. But perhaps of most significance to our readers is the impact it is having on the IT industry itself where customers, large and small, are adopting commodity cloud services in preference to restrictive and costly outsourcing and on-premise arrangements.

In response to this success, many traditional incumbent companies have adopted a 'cloud-first' strategy. However, in our 2019 survey of CIOs and business executives across the CIONET community of 7,000 digital leaders, we found that their ambitions were beset by legacy, resourcing and structural issues which limits their prospects of becoming a viable competitor in the digital era.

In this white paper, we describe the business and technical factors that encourage a move to cloud as well as the barriers and challenges that might impede it. To conclude, we offer practical advice on how to accelerate a 'cloud-first' strategy.

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The changing business context

Speaking to executives in a wide range of sectors, from charities and housing associations to utilities, retailers, tech companies and financial services, the clear message is that the 'ways of doing business' for the future is to respond to changes including increasing customer expectations, technical advancements and the emergence of new competitors born out of the digital revolution. This 'digital' way of working conflicts in a radical manner with current business operating models born of a by-gone 'analogue' age.

Table 1 (opposite) shows the tectonic shifts that began during the dot.com revolution which are gaining momentum as cloud, mobility, data analytics and social media mature.

The most important focus is the life-time value for the customer which requires better use of data to yield valuable insights into usage patterns and future needs. The second biggest factor is the speed and agility required to respond to rapid external changes in market demand and the competitive landscape.

These requite new ways of testing and configuring products and services in hours or days rather than weeks or months.

Cloud has proven to be a powerful enabler to such new ways of working.To conclude, we offer practical advice on how to accelerate a 'cloud-first' strategy.

Organisations of all types – public and private, recognise that traditional business models are in urgent need of reform. Many have chosen a hybrid approach to such changes, focusing concurrently on improving efficiency of operations within the 'core' of the business, whilst creating entirely new business entities.

In such 'start-up' environments, organisations can exploit cloud and related modern business methods such as design thinking, agile development, micro-services and continuous innovation. We understand from our discussions that such a hybrid approach is a practical necessity but requires a clear road map towards the ultimate digital destination. Cloud appears to be the common factor that can help deliver the desired digital outcome (see page 5).

Table 1: Tectonic shifts in business practice: before and after digital

	Before digital	After digital
Competitive mega-trends	• Hardware • Products • Transactions	• Software • Services • Lifetime customer value
Performance optimisation	• Operational excellence • Consistenct and reliability low cost	• Adaptability at scale • Continuous experimentation • Speed and agility
Organisational structures	• Monolithic • Hierachical management intuition	• Matrixed service teams • Data driven decision making
Innovation	• Projects • Stage gates	• Continuous improvement • Automated testing

Source: MAXOS.AI Group

A leading stationary retailer recently commented that it had achieved new software releases in weeks rather than months. This compares to just minutes or hours in the case of Amazon based on its exclusive use of the AWS platform.

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SCOPE becomes the UK's first Digital Charity

The journey to digital has taken over three years and has included a migration of infrastructure and applications to the public cloud.

SCOPE adopted Azure and AWS as its development platforms to spin up new applications quickly and scale where required.

It has also achieved a "single vIew" of customer and supporter data having cleaned up and standardised legacy data stores.

Cloud has enabled experimentation with new techniques such as sensors, voice and image recognition and assistive technology to support its customers in their day-to-day lives. Altogether, the move to public cloud has enabled a rapid and successful transition to digital working.

"In our move to digital we were seeking to achieve a high degree of business integration and agility that would serve our customers and supporters in a radically better way, making room for continuous innovation enabled by new technologies"

Mark Foulsham, CDO of Scope

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Business catalysts promoting cloud adoption

In this section we summarise some of the key business catalysts from our interviewees across different sectors promoting the use of cloud.

Improving the customer experience

Nearly all companies today – public and private, provide web-based interfaces and mobile apps via the cloud to their customers to encourage online transactions and payments. This has been in response to digital natives who have simplified shopping habits, dating back to EasyJet and its exclusive use of the web for airline bookings.

Midland Heart, a housing association, has used the web to simplify customer interactions to ensure long term loyalty. Metro Bank believes that a combination of high street branches and 24/7 online presence gives customers the best possible number of options for their financial needs (see page 7).

While supporting customers effectively at every stage of a typical product lifecycle, companies are extending their means of ongoing interaction by supplementing call centres with the extensive use of BOTs and natural language recognition to eliminate waiting times encouraging frequent exchanges. Again, such technologies are best deployed through cloud platforms.

In the case of Digital Workforce, a Finnish company specialising in workflow efficiencies, Robotic Process Automation (RPA) solutions can be implemented via the cloud in minutes rather than weeks or months. Such an approach has enabled the company to differentiate against its competitors by providing superior performance to its customers.

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Metro Bank: putting our customers first

"We were very impressed with how Rackspace's culture aligned with our own. Putting the customer first is intrinsic to how we operate, and we got a very similar feeling from Rackspace. They bought into the dream."

David Gould, Metro Bank's Head of Architecture and Solutions.

The first new high street bank in 100 years chose Rackspace to support its rapid growth. The organisation needed a managed cloud partner that could scale as Metro Bank expanded.

Rackspace worked with Metro Bank's IT team to evaluate architecture, pain points, goals and future requirements, and then built a roadmap for seamless migration to a bespoke, highly secure hybrid architecture.

The work started with an initial 12-month migration project. This was delivered on time, on budget and without any costly downtime, with applications starting to go online within six weeks.

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Gaining valuable customer insights

The success of digital natives such as Amazon and Netflix in gaining valuable customer insight has encouraged incumbents to exploit the vast quantity of data they have built up over decades. Using cloud to assemble, clean and standardise data from multiple internal and external sources has become an effective solution.

By virtualising assets within the cloud platform, modern tools can be applied to gain detailed knowledge of customer preferences. Harvey Nichols, a premier retailer of fashion items, is deploying such tools to both its loyalty card and online customers with much success.

A secondary benefit of operating in a cloud environment is that all staff have access to powerful tools. Platforms such as AWS maintain a wide selection of data analytic tools, and are constantly refreshing them with machine learning and artificial intelligence capabilities. This helps organisations stay ahead of their digital competitors.

Streamlining corporate functions

Despite attempts in the nineties to automate (via ERP) or externalise repetitive tasks embedded in corporate functions (via e-marketplaces), the modern era of Software as a Service (or SaaS) operating over cloud has taken centre stage in helping companies to standardise and streamline many of the key features required to operate. For example, Salesforce now leads in CRM, and Workday in HR. Cloud has simplified such functional tasks and has enabled every member of staff to access valuable corporate data through web browsers.

The trend to devolve the majority of non-core, repetitive tasks to SaaS services is likely to accelerate as new players come to market. Our recent research on 'Escaping Legacy' suggests that around 70-80% of monolithic ERP systems located on-premise, such as Oracle and SAP, can be migrated to SaaS services resident in the cloud with all the benefits of 24/7 accessibility and ease of maintenance. Few IT organisations wish to hang on to such low value tasks when they can be undertaken externally by specialist organisations with global coverage.

Enabling a digital workforce

Most medium to large scale organisations consist of multiple units, be they functions or businesses. These may undergo change through mergers and acquisitions (M&A) and restructuring events. For example, the Natural History Museum has a wide range of departments responsible for visitors, museum assets, scientific research and building facilities.

Ensuring universal connectivity is a key part of being a single integrated organisation, especially during M&A. Cloud based tools ranging from email to social media can help unify an organisation and improve workforce productivity.

Professional service firms such as EY and Arup are well advanced in equipping their staff with 24/7 access to knowledge assets that can support bids and ongoing projects. Today such information can require peta-bytes of storage. The cloud enables staff to work anywhere in the world, with concurrent information being shared across large and dispersed teams. In the future, machine learning and artificial intelligence will automate many of the tasks undertaken by teams, saving human effort and reducing client fees.

Invotra helps government improve internal communications and collaboration

"We don't provide Software as a Service, we provide software with great service, that's fundamental. Flexibility is key."

Paul Zimmerman, Invotra COO

Invotra powers over 45% of central government intranets such as the Home Office and Department of Work and Pension (DWP), as well as local authorities and membership organisations.

Collaboration is a big part of what the business offers, enabling complex, large departments to manage workflow and encourage employee engagement. In addition, Invotra retains an ongoing focus on scalability, performance and digital accessibility for its users.

With access to early architectural insights and 24x7x365 expert guidance from Rackspace, Invotra successfully implemented a scalable AWS platform across the business. This change has enabled Invotra to enhance operations and meet the needs of enterprise customers.

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Improving business agility

As identified in Table 1 (page 4), the ability to stay in business is all about adaptability at scale. Traditional businesses were designed to operate in relatively stable environments – producing many of the same products and services to serve similar customer segments over decades. Indeed, corporate strategy was based on five or ten-year plans. In the current VUCA (volatile, uncertain, complex and ambiguous) environment organisations need to operate in an agile fashion that enables rapid response to external change. Corporate strategies have been replaced by more generic visions, supported by short term plans.

According to Neil Berkett, Chair of Guardian Media, the group operates an agile organisation that refreshes itself every nine months.

One critical feature of a digital business is its ability to flex according to changing demand patterns and new opportunities. Digital Workforce has grown to 200 staff in just four years through extensive use of cloud for implementing and supporting Robotic Process Automation (RPA) solutions to major clients such as the Finnish Health Service.

A classic scenario in retail is Black Friday where peak loads on the web can exceed normal traffic by factors of ten or more. Few if any businesses can justify scaling up on-premise capacity to deal with such peak situations. Cloud is the natural partner for the VUCA world.

Protecting digital assets

As stock markets shift corporate valuations from tangible to intangible assets, and digital natives occupy an increasing slice of S&P500 capital value (now at 26%), focus is turning to corporate data as a primary asset in the information age. This implies a need to exploit and protect assets.

Cloud provides a robust solution to such a challenge, especially as the volume of data is increasing exponentially. According to IBM, 80% of all historic data was generated in the last two years. We can expect that the Internet of Things (IoT) will be responsible for an explosion of new data sources over the coming decade.

Cloud provides the only practical means of storing and protecting vast volumes of data for the future. Affinity Water has chosen cloud as the most effective way of implementing disaster recovery for its data assets that extend from customers (and associated smart metering) to sensors embedded across the entire physical supply chain. We can expect many more companies to select cloud as the preferred data repository in the coming years.

A challenge to incumbent business models

Although there are many compelling reasons for traditional businesses to migrate to cloud, the implications of such a journey are often challenging. Tech start-ups and the more mature digital natives such as Amazon have enjoyed a 'clean slate' when designing their business operating models around a cloud architecture. Incumbent organisations frequently employ a more traditional 'analogue' structure (see Table 1) that can be difficult to re-architect into a cloud environment. In our final section, we provide guidance on how such a journey can best be undertaken.

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IT is itself experiencing a profound revolution

In parallel with the above business trends, there are important changes taking place within internal IT organisations. CIOs today find themselves wedged between an IT services sector that is embroiled in its own transformation (what we refer to as the 'supply' side of IT services), and business partners (the 'demand' side of IT services) who themselves are subject to similar transformational changes, be they in retail, media, finance or public service. In nearly every case, cloud is both the disruptor and enabler that is challenging traditional methods.

Table 2 (0pposite) illustrates how IT organisations are transforming themselves to cope with change in both supply and demand for IT services. Application development is adopting continuous delivery techniques, with ever less emphasis on traditional waterfall approaches. The applications themselves are being delivered as 're-useable components' or 'micro-services' through web-based channels and mobile apps. Traditional analogue skills associated with ERP are being replaced by digital skills that favour DevOps and Sprints.
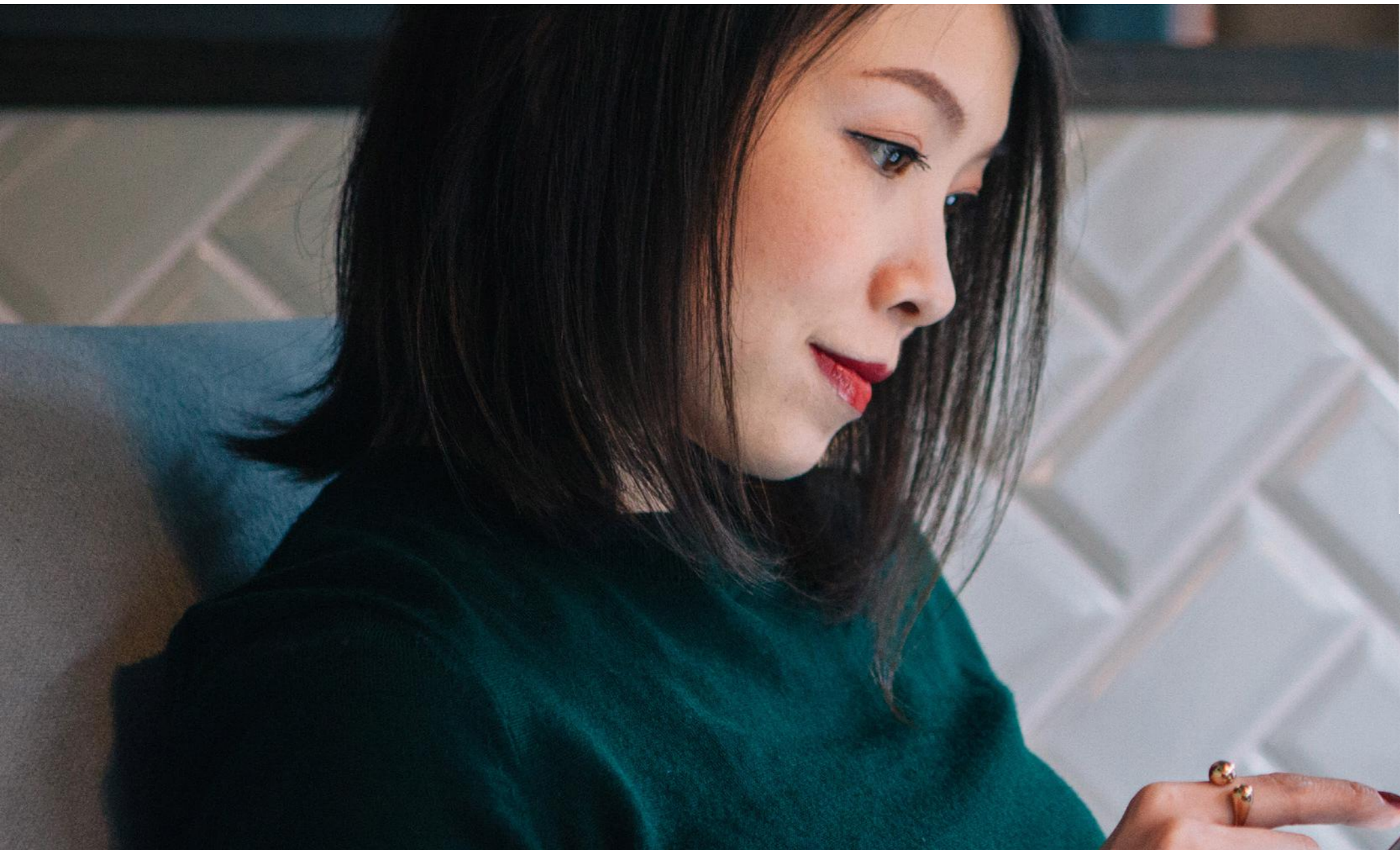
At the heart of IT transformation is the growing use of cloud both as an operations and innovation platform. Digital natives such as Amazon and Google have grown up entirely dependent on cloud as the foundation of IT service innovation and delivery. Incumbents must embrace a similar future if they wish to flourish in a digital environment. As one CIO explained 'we face an existential threat as an IT organisation' if we cannot adapt.

Table 2: IT Functional transformation, from analogue to digital

Historic state	Transformed state	Implications
Projects	• Software products	Focus on what business managers need such as reusable software components or micro-services and scaleable plaforms to support digital products and services.
Waterfall and scrum	• Continuous delivery	Small product teams that release software updates using high levels of automation for speed and quality assurance.
Monolithic applications	• Web services	Re-useable components that can contrbute to multiple products with open 'API' interfaces enabling rapid integration. Such components can be sourced on a 'build or buy' basis.
Captive IT facilities and customised services	• Hyper-scale platform services	Adoption of cloud services that have global scale and reach. Each service is intensively monitored and integrated seamlessly into the corportate environment.
Skills associated with legacy IT applications and sourcing	• Pathfinder skills associated with digital leadership	Shift away from legacy preoccupations towards data analytics and security, cognitive learning, automatic testing and new partnering skills.

Source: MAXOS.AI Group

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IT catalysts promoting Cloud adoption

In this section, we summarise the factors relating to cloud adoption that were identified by IT executives in our recent survey.

Providing reliable and secure IT operations

Much of the initial interest in cloud by the IT community focused on Infrastructure as a Service (or IaaS). Many wished to escape from inflexible, long term outsourcing contracts or ageing on-premise equipment that needed constant attention and upgrades.

Public cloud provided a robust and scalable environment for processing and the storage eliminated first and second line support and patching. With increasing volatility in demand, public cloud also offers greater flexibility than private alternatives. However, most organisations continue to operate a hybrid approach due to the complexity of shifting core applications over to a public cloud environment.

As mentioned, most companies we interviewed have adopted public cloud as their primary platform for all their office communications

such as email, file sharing and social media. This helps to maintain a standard set of workplace tools and services that can be accessed through multiple devices such as PCs, tablets and smart phones. The added benefit here is the opportunity to amass corporate knowledge in one place as is the case for many professional service organisations.

Interestingly, despite initial concerns about security and privacy, public cloud has been recognised by mid-sized companies over the last two years as superior to private facilities. This is due to the shortage of necessary cyber skills within such organisations compared to those that companies such as Amazon Web Services (AWS) can deploy. Boards now recognise public cloud as a safe venue for their corporate data assets if deployed with best practices and aligned to existing corporate governance standards.

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Orwell Group uses AWS cloud platform to automate product development

Orwell Group is a London based financial services company delivering 'white label' cash management and payment services to other banks so that they can expand into new markets whilst operating in a cost-effective and timely manner.

Many of Orwell's banking partners face increasing competition from digital natives and tech start-ups who use cloud platforms and associated tooling to innovate and scale customer orientated products in days and weeks rather than months and years. This has proven a major obstacle for incumbents who depend on legacy environments.

By transitioning from on-premise systems to the AWS public cloud platform, Orwell can now exploit a wide range of automation tools to accelerate product development and testing – giving its banking partners the ability to compete effectively with digital natives and retain customer loyalty.

"Rackspace were a fundamental part of our recent product release and ongoing cloud strategy. They helped us to transition to AWS quickly and effectively, giving us time to deploy and test our product functionality. Their subsequent AWS managed service gives us peace of mind."

Group CIO of Orwell Group

Developing new applications

Public cloud has long offered an economic solution to development and testing of new applications due to its ability to provide short term capacity that may not exist within over-subscribed private facilities. The use of DevOps and Agile development approaches is particularly well suited to public cloud, especially as such services now provide a wide range of tools to help 'spin-up' and 'spin down' applications in days rather than weeks or months.

As many new applications are undertaken as a partnership between internal and external parties such as digital agencies, public cloud provides a common platform for such developments. This is particularly true when organisations off-shore such tasks to companies in Eastern Europe and Asia. All development staff are familiar with public cloud environments and work to common standards and approaches. This simplifies the migration of completed applications into the 'run' environment.

Introducing continuous innovation

IT is seen by its peers as a vital source of 'new think' in the organisations we spoke to during the survey. Many CIOs sit on executive committees and are responsible for setting digital strategies for the entire organisation – not just their own function. Their task divides into two key areas: improving the efficiency of core operations; and establishing 'greenfield' business models that might ultimately replace the core.

In this respect utilities such as Affinity Group are testing IoT sensors to detect leakages in underground water pipes. The charity SCOPE have digitally connected their vehicle fleet to dramatically increase efficiency and through this "track and trace" are able to optimise their transport logistics. Wincanton, a leading logistics group, is pioneering a 'digital thread' to accelerate fulfilment of goods across the entire supply chain. The Natural History Museum has introduced a 'digital twin' that links physical exhibits to a vast data bank of digital records including images as well as data.

Cloud is the de-facto standard for digital natives, providing both the reliable and cost-effective facilities to support the 'run' environment, and a versatile test-lab for new products and services. Increasingly 'test' and 'run' begin to merge as companies such as Amazon.com and Netflix apply continuous innovation at the point of customer interaction – refreshing and testing applications every minute to prove or refine new software releases.

The biggest challenge today for CIOs of incumbent organisations is to clean and standardise data from a variety of internal and external sources. Typically, such organisations have hundreds of different applications, often developed over many years by different parties.

Accessing, cleansing and storing such vital data in a single repository (physical or virtual) is the most effective way of analysing and predicting commercial patterns that lead to improved performance. Public cloud is frequently the preferred option as is the case for Harvey Nichols, Ted Baker and other leading fashion retailers.

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Challenges in cloud migration

Although there are many proven business and technical benefits of migrating to a public cloud environment, as described above, we learnt of several barriers to such a transition. In nearly all the interviews CIOs admitted that a hybrid approach – combining on-premise with public cloud services, was the only realistic solution today despite a 'cloud-first' policy.

Escaping legacy

For many organisations such as banks, retailers, government departments and utilities, business critical applications that include customer records reside in transaction systems that were purpose-built many decades ago. HMRC and DWP still operate core applications based on operating systems that were designed in the early seventies.

This dependency was a key finding of our recent 'Escaping Legacy' report. Manufacturers are often locked in to their own legacy applications having frequently customised ERP systems such as SAP to suit their individual needs. Our recent survey uncovered further evidence of this, including a retail organisation whose applications still run on an IBM AS400 that dates back to the nineties.

"Our core systems were designed in the eighties and still run in batch mode. Due to tight capital constraints, our bank does not have sufficient investment funds to address this problem any time soon."

Former COO of a UK high street bank

Many companies rely on outsourcing partners or software vendors to maintain and modify their core transaction systems. Restrictive outsourcing contracts and outdated technology platforms often prohibit a move to public cloud other than a crude 'lift and shift' approach.

Some vendors have developed new SaaS styled services, but this requires users to adopt entirely different cloud architectures which could take years to implement. This is the experience of one of UK's leading wealth management companies.

An electrical utility has taken a radical approach to solving its legacy problems. Beset with near 'out-of-life' applications and disparate data sets, it has adopted an integrated public cloud solution to rebuild its fifty core applications. This will enable the utility to standardise and consolidate all data sets into a single data lake. Modern software development approaches on the cloud and open 'APIs' also enable full interworking between applications. This should eliminate much of the 'grey IT' activity that reduces staff productivity at present by up to 30%.

"Until we crack the legacy problem, our move to cloud will be symbolic rather than comprehensive."

An anonymous CIO that we interviewed

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Putting cloud governance and controls in place

Public cloud is transforming the entire IT and business services sector by replacing on-premise solutions with Infrastructure (IaaS) and Software as a Service (SaaS). Most of the CIOs that we interviewed are dispensing with traditional 'service tower' contracts (e.g. applications, data centre, network and desktop support) in favour of a more fluid mix of commodity cloud services. This has highlighted the need for a new layer of internal management, processes and support tools to monitor commercial, security and operational performance of multi-cloud arrangements.

Although this sounds like a sensible approach, few organisations have yet been successful in implementing such a 'Service Integration and Management' (or SIAM) approach. Reality suggests that the skills to do this are in very short supply and that many vendors have failed entirely to support such transitions. Companies such as Service Now are partially filling this gap, but only represent a small fraction of the capability needed.

Add to this, the complexity of responding to recent changes in regulation such as GDPR and the potential fall out of Brexit, organisations need enhanced governance procedures to cope with the increasing task of compliance and control. Most organisations register technology as a key component of the corporate risk register, but few have adequate means of assessing the numeric impact of factors such as privacy, security and cyber vulnerability in their risk calculations.

From Capex to Opex

One popular motive amongst CFOs for a wholescale move to public cloud is the possibility of replacing capital investment in software and hardware with a pay-as-you-go philosophy. In the case of the charity SCOPE, the migration of hardware into the public cloud enabled a quantum improvement in efficiency (from 200 to 40 servers), and an ability to scale on demand. This offset the need to replace internal hardware and thereby reduced IT costs by nearly 50%.

However, other companies such as a leading construction firm pointed out that pay-as-you-go could lead to large fluctuations in monthly bills that would be unacceptable to senior management. This was born out by the CIO of a trading company who mentioned that bills could vary by 100% or more, month by month, according to market activity.

Mitigation approaches have included agreeing a baseline monthly cost with cloud providers. Others are implementing specialist processes and tools to ensure ongoing cost controls. One CIO has imposed a daily close of the development and testing of new applications to contain spend on cloud capacity.

Working towards new business and IT operating models

As organisations encounter the limitations of traditional ways of working when faced with digital disruptors, many have resorted to building and testing new operating models set apart from the core business. Such structural limitations often include siloed departments and associated systems as well as fragmented processes that inhibit performance and productivity improvements.

Most of the companies we spoke to were in transition from traditional 'analogue' to new 'digital' businesses (see Table 1, page 4). However, most recognise that short term pressures place real limits on a radical solution. Many now believe that they are doing too little to defend themselves against radical attack from start-ups and digital natives.

One organisation, SCOPE, has made this challenging transition to be shortlisted as the UK's first digital charity. It has reduced cost by selecting the AWS platform for all applications development. It is using SaaS services to streamline all corporate functions. The technical infrastructure now resides entirely in the public cloud. The combination of a multi-cloud approach enables the organisation to run at a reduced cost but be more responsive to both its sponsors and customers.

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Preparing for a cloud-first future

This recent survey of executive opinion underlies the gap that now exists between 'cloud-first' ambitions and on-the-ground realities. Most interviewees admit to being stuck in a hybrid business and technical world that is being held back by legacy and cannot deliver an effective digital strategy for future survival against aggressive competitors.

This implies different thinking that is best achieved through external partnerships with qualified organisations such as Rackspace and AWS who have helped multiple clients through the transition. See Table 3 below for the six most commonly adopted migration strategies that are recommended by AWS.

Table 3: The Six most common Application Migration Strategies

1. **Re-Hosting:** commonly referred to as 'lift and shift' which can now be partially automated using AWS tools.

2. **Re-Platforming:** some level of optimisation introduced along with a 'lift and shift' approach e.g. consolidation of server farms.

3. **Re-Purchasing:** substituting on-premise applications with Software as a Service (SaaS) products such as Salesforce or Workday.

4. **Re-Architecting:** moving from a traditional structure such as monolithic systems to modern, service orientated architectures to boost productivity and efficiency.

5. **Retiring:** identifying those applications that are no longer required by the business and dispensing with them prior to a move to cloud.

6. **Retaining:** leaving alone those applications that might be uneconomic to move, for example, those nearing the end of their depreciation cycle or that are recently upgraded.

Source: AWS

Selecting the appropriate priorities for a cloud-first policy

As described earlier, cloud offers a wide range of benefits, from operational efficiency and customer intimacy to business agility and operational performance. However, cloud is purely the means. It is a powerful tool to achieve goals. Organisations should focus on desired outcomes when considering the next steps towards cloud.

In this respect, it would be unwise for any organisation to believe that a cloud-first policy can cover all bases – especially in the first few years of adoption. Taking a concrete step forward from today's hybrid situation requires management to determine exactly what are their key priorities – and these may differ from organisation to organisation.

Our advice is to develop a table that matches these four outcomes with the benefits described in our white paper. This will set the context for the following recommendations.

At the highest level, cloud can deliver benefits at all four different levels of the 'value stack':

- Improving core infrastructure (technology, people and organisation) by implementing IaaS services such as AWS.

- Streamlining and standardising operational processes through introduction of SaaS services such as Salesforce and Workday.

- Increasing customer impact by speeding up and simplifying interactions over multiple online channels as well as introducing BOTs and natural language.

- Transforming financial returns such as revenues and profits by enabling rapid scaling and increased business agility.

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Taking the next step forward in cloud-first implementation

We recommend five areas where support might be needed to affect a successful transition to a cloud-first digital organisation:

1. Develop a business architecture that is based on digital principles. This will help define the supporting IT architecture that enables digital working, such a technical architecture is likely to be based on a multi-cloud platform with open 'APIs' between applications

2. Place data at the centre of this new architecture, recognising the key value of such assets in the new competitive landscape. This implies a wholescale cleansing and standardisation of current data embedded in many disparate applications. This is likely to take the form of a data lake based in the cloud.

3. Identify and solve legacy issues associated with the desired migration, considering the cost of, and time to transition to the desired digital architecture. This may well include discussions with current vendors as to how best to terminate existing arrangements in favour of SaaS style services delivered through the cloud.

4. Produce a realistic migration plan containing a step-by-step roadmap that enables technical and commercial validation along the way. This will include both optimisation and transformation. Transition teams are best advised to adopt a series of Sprints to test and refine approaches at each stage of the journey. Cloud is a perfect test environment for such an approach

5. Engage external parties during and post migration to help define and implement new business models, operating procedures and fill in any skills and resourcing gaps. Given the complexity and profile of the task – perhaps as significant as anything in a corporate's history, it is wise to work with partners who bring recent experience to the party and help to underwrite risk.

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About Rackspace

At Rackspace, we accelerate the value of the cloud during every phase of digital transformation. By managing apps, data, security and multiple clouds, we are the best choice to help customers get to the cloud, innovate with new technologies and maximise their IT investments.

As a recognised Gartner Magic Quadrant leader, we are uniquely positioned to close the gap between the complex reality of today and the promise of tomorrow. Passionate about customer success, we provide unbiased expertise, based on proven results, across all the leading technologies. And across every interaction worldwide, we deliver Fanatical Experience™ — the best customer service experience in the industry. Rackspace has been honoured within the top 100 Great Places to Work for more than a decade. Visit **www.rackspace.com**

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About the Author

Roger Camrass was a pioneer of today's Internet whilst at MIT in the seventies. Through subsequent decades he has helped companies large and small take advantage of successive waves of technology, from speech recognition and e-commerce to public cloud and 5G mobile communications. He is a director of CIONET UK. He is also a visiting professor at the University of Surrey and a partner with the MAXOS.AI Group in the USA. He has a Master of Arts from Cambridge University and a Master of Science from MIT. For further information visit **www.rogercamrass.com**

About CIONET

Founded in 2005, CIONET operates in 18 countries throughout Europe, Asia and the Americas. It has 7,000 CIO members and holds educational and business events each year at local levels as well as CIO of the Year every June. Visit **www.cionet.com**

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