



UNLOCKING BUSINESS POTENTIAL THROUGH SOFTWARE INNOVATION

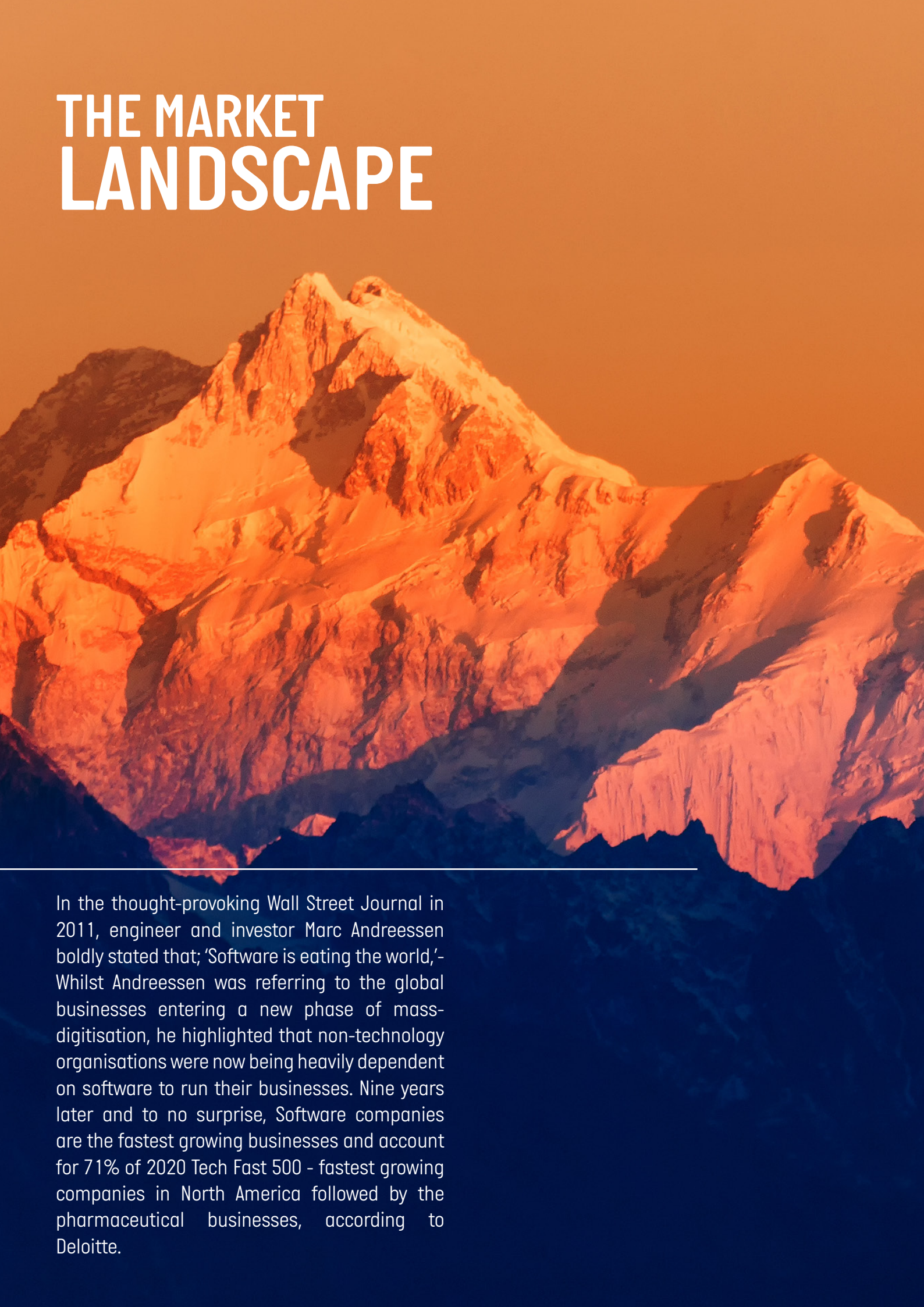
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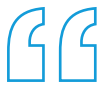
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THE MARKET LANDSCAPE



In the thought-provoking Wall Street Journal in 2011, engineer and investor Marc Andreessen boldly stated that; 'Software is eating the world,'- Whilst Andreessen was referring to the global businesses entering a new phase of mass-digitisation, he highlighted that non-technology organisations were now being heavily dependent on software to run their businesses. Nine years later and to no surprise, Software companies are the fastest growing businesses and account for 71% of 2020 Tech Fast 500 - fastest growing companies in North America followed by the pharmaceutical businesses, according to Deloitte.



Uncertainty could be the new normal; therefore, creating repeatable processes to continually reevaluate business strategies and innovation portfolios, at rapid pace, could support your organisation, not only in a time of crisis and disruption, but also in the readiness for any disruption or change.



Gartner, "Don't Survive, Thrive! Leverage Crises and Scarcities to Accelerate Business Innovation", Nicholas Evans, et al, Published 18 May 2020.

As the world deals with the economic recession triggered by the global pandemic, businesses of all sizes find themselves in havoc. Buzz phrases like 'the new normal', 'the end of commuting,' and 'the demise of retail,' made global headlines in the news, and for many executives it is now the realisation that the market landscape has been changing for years, and now with COVID-19 this has without a doubt accelerated the shift, with the recipe for survival being a thorough transformation of their entire business model. This has rocketed the demand for software products and services, consequently propelling the fastest growing enterprises toward deeper investment and innovation within this field.

As we move into 2021 and beyond, more organisations are facing increased pressure to deliver efficiencies and cost savings due to the ongoing scrutiny of budgets at all levels. This is due to evolving market trends, rapid increase of demand for products and services, and the emergence of novel competitive threats. Finding innovative solutions to deliver value back to the business whilst gaining the competitive edge requires effective use of existing IT assets, optimised procurement processes, and investment in innovation to support growth.

To do so effectively, it is important to close the gap between existing IT assets and the organisation's strategic growth objectives. As gathering reliable data is becoming more challenging, and budgets continuously tightening, early groundwork and discovery activities can help alleviate many sticking points during the procurement and negotiation stage. This can be achieved by engaging with the key IT, Procurement and Line of Business (LOB) stakeholders to gather the overall operational, legal and commercial requirements and map those against all relevant groups and objectives.

What was on top of the agenda yesterday, may not be there tomorrow: the global pandemic has stressed the importance of adaptability and innovation at pace. In addition, it welcomed Independent Software Vendor (ISV) engagement through cloud investment introducing more routes to market such as Amazon Marketplace. This has facilitated an environment for accelerated transformations and provided new platforms to innovate from.



The challenges are very real. More vendors, more products, less money to invest, struggling to find the skills to manage it, and need to remain relevant and competitive. Not having suitable answers to these questions will severely inhibit many organisations in their plans for digital transformation.



Pete Groushko
Director of Technology Sourcing Sales



UNICORN BUSINESS

With more eyes than ever before on an organisation's application estate, use of software, and IT assets in general, there is an ever-growing pressure on IT departments to innovate at speed in order to remain a serious contender in the marketplace. All too often we see examples of those companies that fail to move forward allowing competition to move in swiftly. There is no time to stand still, especially with the rise of the 'unicorn businesses' disrupting industries.

Typically, these 'unicorn businesses' are privately-owned start-ups valued at over £1 billion. The technology democratisation has come a long way since 2013 when 'Unicorns' were first mentioned, for they are now represented by over 500 unicorn businesses around the world. Thanks to the unparalleled speed of technological advancement and mass business digitalisation, start-ups are now able to reach unicorn status in less time than ever before, posing a real challenge to traditional businesses. All you need to disrupt a well-established market is a sound innovative idea and a credit card to access flexible development environments that can bring it to life. This, no doubt, makes large enterprises uncomfortable. It is a common practice not only for the investment firms to keep an eye on the emerging business's trends. These traditional enterprises need to hold on to their market share whilst exploring avenues of expansion, often via acquisitions.

At Computacenter, we partner with an array of diverse customers representing various verticals and see the unicorn companies entering a broad range of industries: Monzo and N26 threaten traditional banking, Zoopla and Purple Bricks disrupt property marketing, BrewDog, and Deliveroo challenge the food and drink industry, OvoEnergy – Energy market, the list goes on. All these businesses have one thing in common, they're using scalable technology to their advantage and implementing it within the centre of their business model.

In these market conditions, innovation is imperative to the business survival. We all heard the tales of corporations that failed to innovate and ceased to exist; However, being innovative once is not enough, and the unicorn companies are not safe either.

As the battle for survival continues, and the competition gets tougher, tech giants like Amazon and Apple are entering new sectors and challenging digital pioneers like Netflix with their own streaming services. Being disruptive is no longer enough to stay afloat, but keeping up with continuous innovation, harvesting of data, investing into analytics, creative content and customer experience is vital to remain competitive.

Whilst technology innovation creates competition and rivalry across all the industries, it also provides opportunities for collaboration and co-creation of business value. The stand-out sectors include financial services, and the heroes of 2020 - healthcare and pharmaceuticals. The latter operate within demanding regulatory and compliance environment; however, financial services face these too and pioneer innovative approaches by using agile methodologies to balance the legal and commercial demands to gain a competitive edge.

DIGITAL BANKING

As with other industries over recent years, the financial services sector has experienced a rapid shift towards online operating models with FinTechs disrupting the traditional banking sector.

The central value for FinTechs like N26 and Revolut is automated money and data analytics, that applications use to anticipate their consumers' financial needs, notifying them when it's time to restructure a mortgage, consider more saving for retirement or when clients are overspending on their utility bills.





The world is going even more digital due to the global pandemic: distributed microservices and data driven operating models are prevailing. These trends shift conversations from challenging 'buts' to promising 'what ifs' whilst ensuring agility and business continuity.



Olya Scekaturova

Head of Sales, Workplace Services



Whilst initially, FinTech lured customers away from traditional high street banks, financial sustainability and investment requirements created an opportunity for partnership combining the benefits of both worlds. This allowed more FinTechs to work in collaboration with traditional banks in helping to diversify their portfolio of products and further monetise their rapidly expanding client base. This collaboration has been spurred by the onset of open banking. We are still at the dawn of the open banking revolution which invites the use of open APIs and enable third-party developers to build applications and services for financial institutions, their customers, and connected parties.

This financial services evolution comes down to two things; driving down the cost of customer acquisition for banks, but more importantly, meeting the requirements of the consumer with products and solutions to the problems they face. Strategic partnerships allow both parties to achieve greater scale and improve customer reach.

PHARMACEUTICAL

In today's fast-paced world, the critical factor of any successful business is speed — the faster you can deliver the product to market, the better. In 2020, with COVID-19 affecting our lives, this was particularly evident in the pharmaceutical sector where the accelerated development of a vaccine was reduced from a 5-10-year research cycle to just under one.

How did it suddenly become possible when the long product research timeline is also mirrored by a typically stretched software development lifecycle in response to the strict regulatory demands?

As highlighted this year, organisations like Pfizer, BioNTech and AstraZeneca are becoming more technology driven. Adoption of cloud allowed researchers to remove complexities from clinical trials, enhance computational power, and improve development of proprietary software. Whilst focusing on their core business of drug development, pharma companies often partner with smaller innovators that provide huge libraries of clinical data for AI platforms to analyse leading to faster experimentation and astonishing results.

To top it up, B2C consumer healthcare demand via mobile apps are calling for expedited development cycles and innovation to address the growing demand for online medical appointment bookings, virtual appointments, online prescription requests, national track and trace apps and more.

PUBLIC SECTOR

Much like the private sector, the public sector is experiencing a shift in the digitalisation of public services, where the needs and expectations of citizens and businesses are at the centre of each initiative.

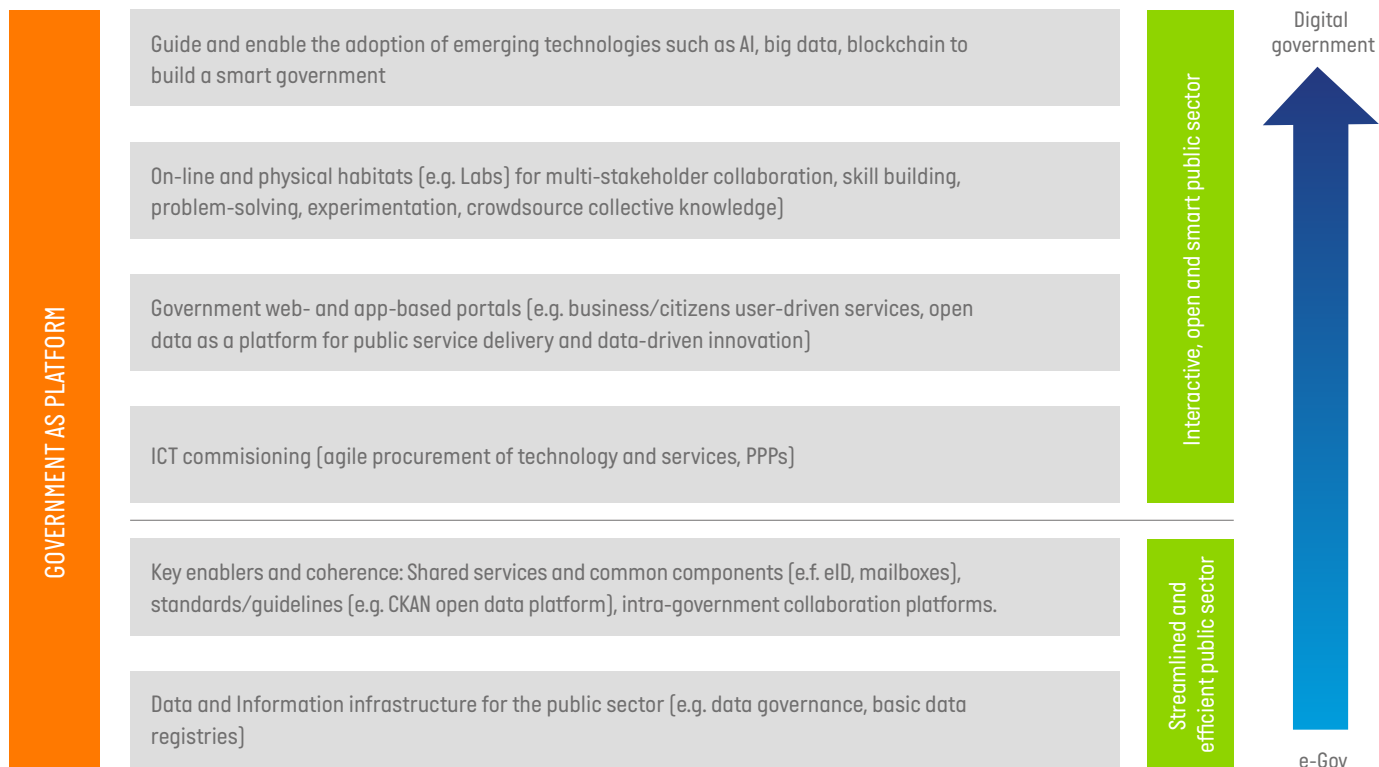
2020 has been a challenging year for the government agencies too, both with the lockdowns and quarantine, citizens have been heavily relying on online services and apps for healthcare, tax, social services, immigration and more. This has ultimately made government agencies focus even more on emerging technologies to help make public services more efficient, secure, simple and cost-effective. Many have started experimenting with AI enabled technologies, automated decision-making systems (ADMS) and distributed ledger technologies (DLT) in hope to connect to their citizens and build trust in government processes.



The role of the new agency should also focus on its strategic value as an enabler and platform for creativity, and providing digital and data-driven innovation, multi-stakeholder collaboration and value co-creation with public sector. The Agency can be pivotal to 'start building a beta version' of a smarter and agile government.



OECD, Digital Government Review of Sweden
Towards a Data-driven Public Sector



Source: OECD, Digital Government Review of Sweden 2018

Various governments use a combination of technologies to create safer societies, allocate resources and treatment for patients in a public health system, profile taxpayers, address the unemployed, and disburse welfare benefits or detect fraud. Some governments, like the Swedish, turn their digital agenda into a multi-year Digital Government strategy (Digital Agenda First) and work on robust programmes in conjunction with the Organisation for Economic Co-operation and Development. This multi-faceted approach helps build trust with citizens in order to better understand their needs and trajectories.

The Swedish government discovered early on that the success of the integration of digital services depends not only on citizens' trust, but their computer literacy and technology adoption, which is now factored in to ensure a robust communication plan and education.



Our pioneers transform innovations into applications, develop them to the series production stage, and thus safeguard the pioneering role played by Daimler products. Because they set standards and keep this goal in mind from the initial idea through to its implementation.



Daimler, Product Innovation

Source: <https://www.daimler.com/innovation/product-innovation/>

MANUFACTURING

The manufacturing industry has always been a tough sport for competition. Industry 4.0 with all its innovation and digitalisation has brought new challenges as well as opened a whole range of new opportunities and potential.

Industrial machines giant, Caterpillar, partnered with the predictive analytics firm, Uptake, to build a digital platform that analyses massive amounts of data gathered by their machines' sensors ultimately leading to new data driven services for their customers. This combination of Caterpillar's product engineering with Uptake's software developers and data analytics expertise transformed the data from the sensors into useful information which was then fed back to Caterpillar customers for real-time decisions and maintenance planning. This innovative approach also allowed the manufacturer to create an additional revenue stream by monetising the data generated by the original product. challenges as well as opened a whole range of new opportunities and potential.

You need not look hard to see other reputable royalty in the industrial world take advantage of software development and digitalisation. Daimler experiments with the blockchain technology and implements it for myriad of purposes including quick, cheap and secure data transfer without any central intermediary.

Daimler is invested in the microservices model and partners with multiple hyper-scalers to extract the most value. Daimler AG uses Microsoft Azure DevTest Labs which help reduce the developers' onboarding time from weeks to hours. At the same time, Daimler Trucks NA uses DevOps model and IBM® UrbanCode® Deploy software to manage application delivery, deployment and quality and control.

Whilst some businesses are thriving and finding new opportunities to collaborate, others are fighting for their place under the sun; however, all organisations have to deal with the rising skills gaps, employee attrition and cyber security threats – all this is when new commercial models, AI and digital technologies raise the competitive bar higher.

This whitepaper explores Computacenter's latest thought leadership on technology trends within software and the application domain. It also explores the key areas to focus on in order to unlock your business potential through software innovation:

- Software Modernisation for Efficiency - The business value of experimenting and failing fast
- Unlocking Innovation - Building adaptable and agile procurement processes
- The seven principals that lead to successful software innovation





SOFTWARE MODERNISATION FOR EFFICIENCY

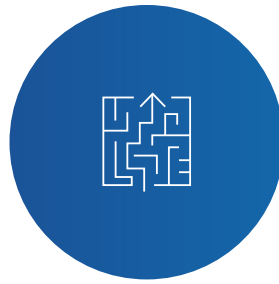
TECHNOLOGY TO PROVIDE BUSINESS VALUE

Can you name a business that does not have a website, an app or any other form of digital presence? Probably not. Going digital is an effective business strategy and form of interaction that extends customer reach and helps build brands: online visibility translates to business visibility and subsequently increases market share. But if everyone is online, then what is the differentiation? Is content king? Is customer experience the key? Is it all about the speed and convenience? Yes to all the above, but what is the driving force behind it? How do businesses combine the infrastructure, software, tools, application development and more for an ultimate consumer experience whilst providing data security and helping deliver business growth?



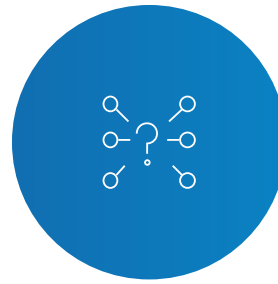
APPLICATION MIGRATION **ASSESSMENT**

Business and operational assessment of an application portfolio to decide target fate



APPLICATION MIGRATION **DISCOVERY**

Detailed automated technical discovery and dependency mapping



APPLICATION MIGRATION **PLANNING**

Migration planning and execution 'command center'



APPLICATION MIGRATION **DELIVERY**

Migration execution aligned to the target fate and cloud strategy

There are many ways to generate business value through new technologies. It provokes many questions such as: how do you simplify the ordering process for your clients? How can you make it easier for your customers to get access to the services you provide? Leveraging technology to create business value is the tricky bit. The terminology 'idea to production' is something commonly used to 'speed up' time to market, often with the use of agile methodologies to facilitate experimentation as we have seen in pharmaceutical sector.

The ability to be agile is a combination of many things, some of these are technical and some are cultural arising from legacy technology. Gaining confidence in processes and being comfortable with moving fast can only arise once you have demonstrated a level of resilience to failure that is not in the psychology of many large organisations.

The focus on business benefits often brings applications estate into the conversation. Of course, efficiency and cost reductions are priority in end-user applications, but let's first think about the infrastructure and environment required to support a successful application strategy.



The reason that you do anything in IT is to add business value. Applications exist to manipulate data and getting access to data in different ways is how we add value to the business.



Elke Papaioannou

Customer Unit Director
Consultant Principal



We believe that the cloud delivery model, will transform and grow beyond enterprise software (\$456 billion) and technology (\$3.7 trillion). The cloud has already moved beyond the enterprise software market and will continue to as we turn towards the cloud for transportation, healthcare, education, and more.



Source: Bessemer Venture Partners. State of the Cloud 2020 Report

The evolution of cloud provided access to applications anytime and anywhere; amongst many advantages of the cloud model is: flexibility, predictable costs, security, scalability, lower energy costs and more than 99% guaranteed uptime. With these benefits in mind, cloud services from the big three cloud vendors: Microsoft Azure, Amazon Web Services and Google Cloud are gaining share and monetising software. With the expectation of customisation, flexibility and business continuity, more and more businesses are choosing a multi-cloud or a hybrid approach. Whilst operationally it makes sense, the management of a multi-vendor approach can become complex quick.

Adding to this procurement of the third-party products and services by the line of businesses is a perfect recipe for creating a shadow IT, jeopardising security and causing mayhem. So, in pursuit of feasible and flexible business and IT solutions, the modernisation and transformation journeys become infinite.

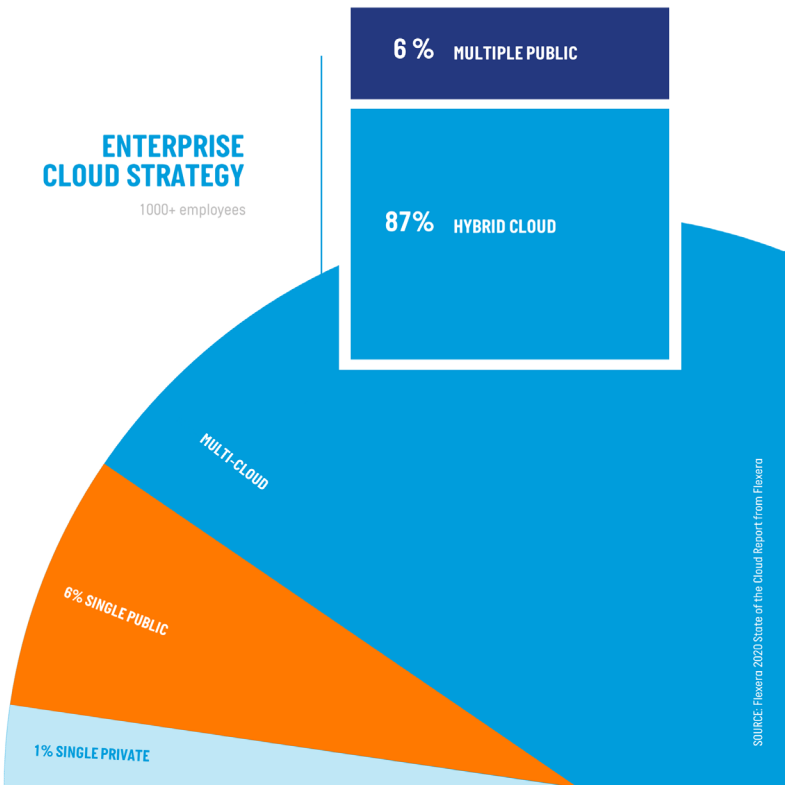
Quite often, the ‘move to cloud’ can be viewed as a direct catalyst for the change that organisations are looking to generate. This is largely because cloud providers offer many of the fundamental components and elements that are required to quickly enable the rapid development of new applications. But the key to a successful and long-lasting cloud migration is the transformation of an organisation’s application portfolio which includes application modernisation.

Application Modernisation involves analysing, migrating, modernising and redeveloping applications to facilitate cloud migration and other digitalisation strategies. The application landscape is typically characterised by the way it has grown over a long period of time; legacy applications and their migration are typically described as being complex, difficult to oversee and evaluate.

Companies are often faced with the challenge of reviewing their applications and adapting them to the current state of technology. To do this, it is a good idea for organisations to gain an overview of the landscape, analyse it and decide whether the applications can be migrated 1:1 into the cloud, whether extensive adjustments are necessary, or whether the applications must be completely redeveloped.

MULTI-CLOUD STRATEGIES ARE NOW THE NORM

It’s no surprise that cloud adoption among enterprises has been growing rapidly, especially as everyone moves to increase both their agility and efficiency. Most enterprises are now using a mix of private clouds, public clouds and on-premises infrastructure.






EVOLUTION OF CLOUD SERVICES

Public cloud brings the greatest benefit when you are able to leverage a wider portfolio of services for example: containers, functions as a service (often called serverless), data services, messaging, AI, the list is extensive. The common element is that if you want to do this, you need to think about splitting your existing 'monolithic' applications and start thinking about microservices. This is just a fancy term for breaking your application up into lots of little pieces so that each individual element can be developed, changed, scaled, monitored, and executed separately from everything else. When you do things this way, the potential 'blast radius' of any issue effecting the whole of your application is dramatically reduced.

As the cloud services market matures, the customers' expectations around the ease of use and doing business continue to rise. There are typically three models to compare: Software as a Services (SaaS), Platform as a Services (PaaS) and Infrastructure as a Service (IaaS). With this comes the variety of choices of how to approach people, processes and technology to achieve a lean operating model yet to remain agile and compliant.

Whichever is the right choice of technology for your organisation – successful digital business is a combination of factors. However, your strategy to take advantage of new technology should focus on what matters the most – your customers, and to do so, a strong data-driven operating model is a must.

UNLOCKING INNOVATION

A full-page background image featuring two hands cupped together, holding a bright, glowing sun. The scene is set against a warm, orange-hued sunset sky with soft, out-of-focus clouds. The hands are silhouetted against the bright light of the sun, creating a sense of holding or nurturing something precious. The overall mood is hopeful and visionary.

Most organisations are heavily reliant on technology and software to drive their businesses. We're frequently seeing that applications are now part of the 'engine room', that is enabling the business to function efficiently. These utility applications that 'keep the lights on' generally don't differentiate one organisation from its competitors. They may be vital system of record applications, integral to the organisation doing business but they are just part of the cost of doing business – the table stakes.

Customer loyalty is an increasingly rare commodity. The expectation of the buyer to be able to easily interact with the seller through a digital platform is almost universal. It works in our personal transactions, so it begs the question; does it work in our business transactions? Customers increasingly expect the applications to be available across multiple platforms and provide the customer with a rich user experience that simplifies the interaction and contributes towards building customer brand loyalty.

A digital application that differentiates one organisation from its competitors, by its very nature needs to be bespoke. These applications may rely on Commercial-Off-The-Shelf (COTS) applications at the back end but having a flexible platform that you control and unlocks the ability to innovate at the front.

Creating digital services is mostly undertaken within the lines of business where the niche expertise can be found, rather than using a centralised pool of developers. This decentralisation lends itself to the product management approach where a team is responsible for the full lifecycle of the application. Removing these barriers between development, testing, operations, and the line of business subject matter experts enables a strength and cohesion that the traditional approaches cannot achieve. Coupling the product approach with agile development practices and the rich suite of tools that eliminate manual activities and handoffs allows organisations to react quicker to customer demands.

Within the product team, experimentation and the willingness to try things and throw them away if they don't work is key. Failure is part of innovation. It should be expected and embraced if it's contained within a small blast radius and we can take something new away from the experience.

Public cloud provides a great platform for innovation, as it allows for fast iterations and the ability to fail or succeed – quickly. The wealth of native services available, often richly featured and usable with only a minimal amount of coding experience, make developing rapid prototypes quick, straight-forward, and cost effective.



Application leaders are overwhelmed by the sheer number of applications to inventory and assess at the start of a rationalization process. Prioritizing application areas based on business-fitness, change, known problems and costs splits the work into manageable pieces.



Gartner, "How to Prioritize Application Inventory and Rationalization", Bill Swanton, Published 24 October 2018



You don't add innovation to an organisation, you get out of its way.



Adrian Cockcroft

VP Cloud Architecture Strategy at AWS

WHAT IS CLOUD-NATIVE APPLICATION DEVELOPMENT?

When you hear 'Cloud Native' what do you think? Perhaps you think it's another industry buzzword used to market more 'stuff'? Fortunately, it's far different and in this chapter, we'll explore what it means to you and to your business and how it helps unlock innovation.

Within a short time, cloud-native has become a driving trend in the software industry. It's a new way to think about building large, complex applications. It's an approach that takes full advantage of modern software development practices, and the unparalleled power and flexibility of the public cloud infrastructure.

The speed and agility that comes from developing a cloud-native application is underpinned by the idea that time-to-value is the fundamental metric for innovation. There is no economy of scale in software. Therefore, enhancing the application development to release lots of small changes regularly is the optimum approach. If you change one small thing at a time, then it's easier to detect problems and resolve them, it will take less time and risk to integrate the changes, it's easier to measure time-to-value – which ultimately leads to happier developers and satisfied customers.

THE 7 PRINCIPLES THAT LEAD TO SUCCESSFUL SOFTWARE INNOVATION

The concept behind Cloud-Native application development are deeply engrained into seven key principles that we will explore further and how they can lead to successful software innovation for organisations:



Stop trying to centralise everything:
Provide autonomy and accountability
throughout the organisation.



Smarter With Gartner, "[Why Now Is the Time to Accelerate Digital](#)",
Chris Howard, Published, 10 September 2020

1. ADOPT A MICROSERVICES ARCHITECTURE

A Microservice architecture is the orchestration of an application as a cluster of services as well as enabling the rapid and dependable delivery of sustainable and intricate applications. By adopting a Microservice architecture approach it will help enable successful software innovation. Unlike traditional approaches to architectures, the Microservices of today are absolving the need for developers to use monolithic systems, but instead it allows them to free up their time to develop purpose-built database solutions that amplify the application performance and reduce an organisation's overheads.

2. TAKE FULL ADVANTAGE OF THE CLOUD

Cloud-Native applications are intended to grow in a dynamic cloud environment, these applications make extensive use of serverless infrastructure to reduce organisations' overheads.

More importantly the Pay-as-you-go (PAYG) pricing model for the public cloud cleverly allows developers the freedom to experiment and try out their ideas without the fear of running up huge costs. By taking full advantage of (PAYG) developers are in confident that there are no wasted resource and they are reducing the overall risk of the cost of failure and enabling successful software innovation.

3. EMBRACE MODERN DEVELOPMENT FRAMEWORKS AND TOOLS

There is no denying it - modern cloud-native applications can become complex business. Therefore, it is a good idea to be clear from the start on each step in the journey - from virtualisation to deployment (and everything in between). As well as the added pressure to ensure that nothing interferes with the overall performance, it is useful to plan for every eventuality in the development of these applications, especially software-as-a-service applications.



As customers look for increased
innovation, responsiveness and
new options, providers strive to
accommodate them.



Source: The Impact of Public Cloud on Operating Budgets.
March 2020



Sustainable application delivery requires application platforms and architectures that are not just snapshots of current trends. Architectures should continuously adapt and evolve to meet new and evolving business requirements



Gartner, "2021 Planning Guide for Application Platforms, Architecture and Integration", Brad Dayley, Gary Olliffe, Published 9 October 2020.

An example of this is the famous 12-factor application methodology that details a set of 'best practices' that developers can observe when they are building applications that need to be fully optimised for modern cloud environments.

Whilst the 12-Factor Application methodology doesn't eradicate the complexity that developers are faced with, it does however give a clear overview of the structure for organising development environments. It is a good idea that if a company is to adopt these principles, they are fully aware of the structured steps for the developers to manage their project from start to finish. This is an essential step for companies to follow - not only for developing software applications in a coherent and cost-effective way, but also paving the way for true innovation in the application when completed to time and in an organised and structured way.

Allow developers and operations to tackle those large monolithic applications that you have tried so hard to avoid for all those years. You can be as agile as you want in new applications but if you can't make the most important applications in your business more adaptive, then at some point, your agility will be limited.

4. INSIST ON DEVOPS

DevOps needs no introduction in the methodology of how it effectively and seamlessly brings together the developers and the operations teams together, to deliver applications and services at speed. Many organisations strive to have a DevOps strategy, because quite simply it aims to accelerate the software application quality, as well as promoting agility. Noting this, it is important to appreciate what DevOps is and what it is not – and how it can help your organisation become more innovative in its approach when this methodology is adopted.

What DevOps offers an organisation is the ability to cut through the complexity that exists across different departments within an organisation – typically between developers and the operations side of business. It is crucial for any business to resolve any conflict via DevOps as it will in turn ensure that the project is moving forward at pace and with agility. It breathes an air of confidence that something crucial isn't

going to fall between the development and operations department, so organisations can move quickly to evolve their application landscape to meet the needs of the business and customers.

This is a compelling but demanding organisational requirement to change but, it is crucial to those organisations that will succeed. Historically, organisations are grouped in lines of technology but as cloud providers start to do a lot of the 'heavy lifting' this continues to drive down the significance of detailed infrastructure and becomes much more about how you take full advantage of the platform that you are using.

An organisation that can leverage this cultural and systemic change will likely be the most successful in the future. That's not to say that company will need to be developing all of their own applications, but through removing any organisational restrictions, you can encourage harmonious working environments between the two departments and accelerate the deployment of 'off-the-shelf' applications as well as in-house developed apps.

5. AUTOMATE THE DELIVERY OF SOFTWARE WITH CI/CD

Everything will be code! Or at least, everything will be expressed in code, even infrastructure. The cloud and platform providers are doing a lot to make this simpler, but nothing can get away from the fact that configuration will continue to be bespoke for every organisation based on their individual needs, governance in specific geographical locations, and their organisational preferences.

Continuous Integration and Deployment is a strategic concept that many development teams have adopted for a while now. The desire to be able to confidently add to and deploy your application code in real-time is nothing new. But, as more ideas become 'code', the significance of this cannot be underestimated.



Agile software engineers, developers and testers become trusted business partners by driving business innovation and growth. Application technical professionals must embrace continuous learning, adopt DevOps practices and adapt to new ways of working to improve business and customer outcomes



Gartner, "2021 Planning Guide for Agile Software Development and DevOps", Kevin Matheny, et al, Published 9 October 2020

The core principles of continuous integration and deployment appears to be quite straightforward – you take the process you have for building, checking, testing and releasing code and automate it. It sounds easy, but a lot is dependent on how much of that has already been automated.

A key component to success in this area is to have consistency. While your developers are writing, it is advisable that they can control the storage, management, and handling of their code. You can then provide a way for frequent tasks to be automated with quick proactive visibility for any challenges that might arise. You would then be advised to address these swiftly, so the entire process is transparent and seamless.

6. APPLICATION SECURITY AND DEVSECOPS

Probably one of the most fundamental necessities when developing any application for businesses and end users is security and compliance. This is critical for any application's success and simply cannot be ignored by developers or the businesses who are creating applications.

Whilst organisations may well be under increased pressure to develop and deliver applications that are innovative. The applications will never be trusted if there is a breach to any customer data that has resulted from not having any of the necessary security in place for end-users.

Mobile banking apps are an example of this in the financial sector– yes, they need to be at the forefront of innovation, functionality and design, but without the essential security protection, they will simply not be used by customers. The competition is high, and if you get it wrong – you might as well pack up and go home.

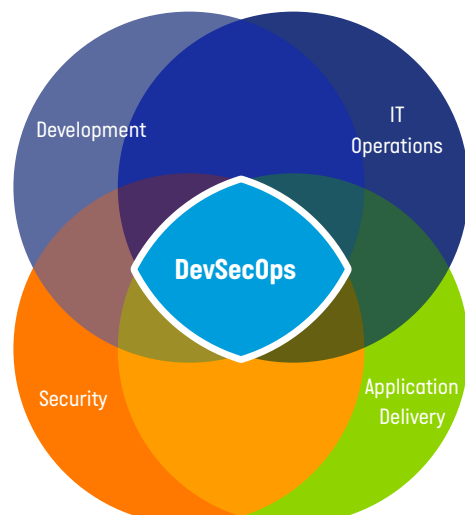
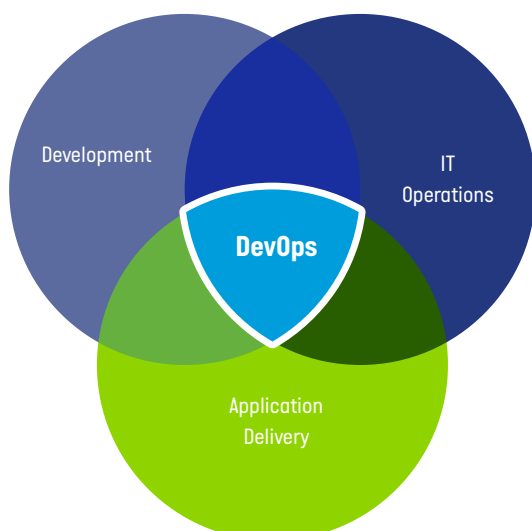
Creating applications that ignore customer protection and any country regulatory requirements are a thing of the past –and have no room in the current market. Customers will be quick to publicly report of any breach and you can expect a negative media frenzy. Once the damage is done, customers are quick to move to a competitor that can offer the security that is required, irrespective if the issue is ever rectified. This will be a PR nightmare for those companies that have got this wrong and have ignored the importance of ensuring that their applications are secure. Companies must do more to take advantage of the benefits of DevSecOps – which not only offers security within the applications, but also stability at pace through automation.



DevSecOps is not only relevant to organisations creating their own applications, but also important to organisations acquiring software. Organizations use a varying combination of acquisition, outsourcing and custom development. Production implementation also often requires creation of connecting software or custom code to make applications function as expected or required. Security and risk management technical professionals responsible for development, security and/or operations of applications must adapt practices to support modern DevSecOps trends.



Gartner, "Structuring Application Security Tools and Practices for DevOps and DevSecOps", Frank Catucci, Michael Isbitski, Published 18 June 2020



As IT infrastructure has shifted to dynamic provisioning and shared resourcing, DevSecOps adoption is continuing to increase across enterprises. The objective of DevSecOps is to build security assurances into development cycles and custom-line business applications. To improve software security and reliability, organisations are actively monitoring and analysing their end-to-end processes and tools across the development lifecycle with data analytics solutions.

Integration of security into DevOps to deliver DevSecOps is a difficult process for two different disciplines. It requires a new mindset and approach for processes to adhere to the agile and collaborative nature of DevOps. The approach requires transparency in the development cycle to make security as seamless as possible. Integrating DevSecOps strategy also means that at each stage everyone is responsible to develop a quality product that is resilient to security challenges.

7. PEOPLE & CULTURE – CHALLENGING THE STATUS QUO

Finally, and perhaps most important in any of these principles is that you must foster the 'Enabling Success' culture within your organisations to help teams stay innovative and customer centric. By doing this, you enable your workforce to collaborate on what matters the most – business result: whether it is procurement team that understands the development cycles and enables the purchase of additional storage capacity or new technology in an agile way, or Operations and Development educated on the best procurement timings to leverage vendor programmes that bring true value to the business.

This will make your competition vigilant, and ultimately lead to a better customer experience and by fostering this culture of innovation allows you to take advantage of CI/CD, DevOps, DevSecOps and other types of services.



Agile innovation methods have revolutionised information technology. Over the past 25 to 30 years they have greatly increased the success rates in software development, improved quality and speed to market, and boosted the motivation and productivity of IT teams.



Harvard Business Review: Embracing Agile
May 2016



Successfully introducing automation into your organisation will require more than just selecting tools for scripting languages. Working with your organisation's leaders, you will need to develop a conscious automation strategy that strikes a balance between over-automation and under-automation



Gartner, "Guidance Framework for Choosing What to Automate to Increase Application Delivery Agility", Bill Holz, Paul Delory, Published 4 June 2020.

A good example of this is Amazon's famous 'Working Backwards' philosophy. Working backwards is a framework for how to think about a product without lengthy roadmaps that end up being scrapped. It's a way to short-cut the traditional product development track and make sure that you build something that your customers actually want.

Educating your Workforce

Education! Education! Education! – For an organisation to be truly innovative and successful it starts with fostering a culture where you can educate your people and let them try. Failure should be expected – maybe not encouraged, but the fear of failure shouldn't be a stumbling block. By doing this you are harvesting a culture where people are not scared to draw outside of the lines, and to be innovative in their approach. It is these types of people who excel in these environments and bring true innovation and agility to a company – and ultimately to their customers.

Cascading Change from the Top

Everybody needs to understand that pace is not without its challenges and being able to work together and tackle these challenges is of the upmost importance. It is a common misconception that you are going to need a 'whole new workforce' to be successful.

The people you already have are your best people – they know your business inside and out, but they need your help to learn these new ways of working. It really is the most important thing you can do. To nurture your teams – to allow them the creativity to excel and encourage a culture where innovation, agility and challenging the status quo is the norm, not the exception.

YOU AND TECHNOLOGY INNOVATION



Navigating the right way to unlock business potential through software innovation is no easy task and there is plenty to consider, as we've demonstrated throughout this white paper. The journey is full of opportunities and challenges which have helped to drive innovation across countless sectors. The role that technology plays for businesses in this process is two-fold. On one hand, it has shown us what is capable when either we as businesses, or our competition, embrace a new platform or technology and prove the benefits in the field. On the other hand, making the right decision on which direction to take at these crossroads can be one of the biggest roadblocks, often marred with issues surrounding implementation, potential cost, or netting the wrong results.

Understanding the landscape is not about seeing your situation as a moment in time, it is about looking at how these technologies are evolving, and how they in turn, can be aligned to your business objectives.

Sound advice you can trust is paramount in taking this next step forward in unlocking your business potential. At Computacenter, we endeavour to remain at the forefront of proven and emerging technologies, continually matching the right solutions to the right business applications.



Agile software engineers, developers and testers become trusted business partners by driving business innovation and growth. Application technical professionals must embrace continuous learning, adopt DevOps practices and adapt to new ways of working to improve business and customer outcomes.



Gartner: 2021 Planning Guide for Agile Software Development and DevOps, October 2020

PREPARING FOR TECHNOLOGY INNOVATION TOGETHER

At Computacenter , we work with enterprises across all sectors to bring technological progress into business strategy; Our long-standing relationship and industry expertise span across Public Sector, Financial Services, Logistics, Telecommunications, Retail, Media, and Manufacturing.

We invest heavily in the end-user disciplines, technology procurement, infrastructure, security, application development, amongst others. We hold powerful partnerships with the top vendors and software publishers to build technology roadmaps and the processes to underpin their successful deployment.

Co-creating value and innovation with our customers to enable success is at the heart of everything we do.

CONTRIBUTORS



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Andrianna is responsible for the go-to-market and strategic marketing development for our cloud and data center portfolio. Andrianna is an experienced Marketing Manager with a background of over 15 years working in ICT marketing across various roles.



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MARTIN CLARKSON

SOLUTION LEADER – HYBRID IT AND PLATFORMS

Martin has worked for Computacenter for nearly 25 years, almost all of this as a key architect in our professional services team. Over the past couple of years, Martin has been focussed on building our propositions and assisting customers as they look to adopt the public cloud and ensuring that they deliver value to what they need from a partner like Computacenter. He has a vast amount of experience in how enterprise scale organisations deliver change successfully and it helps that he understands some of the technology too.



OLYA SCEKATUROVA

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Olya heads up the solution specialist team within the Workplace Line of Business. She has led commercial and professional technology services practices across EMEA before joining Computacenter in her current sales leadership role. Olya is an experienced Change Management practitioner with both technical and business management background.



PETE GROUSHKO

TECHNOLOGY SOURCING AND SOFTWARE SALES DIRECTOR

Pete has been at Computacenter for 22 years and has held a variety of differing roles starting with the CIP's accredited procurement division. Now as the Director of Technology Sourcing, an entire team has been industrialised to foster Pete's approach to enable simplicity for customers around their experience in supply chain. Whilst ensuring the supply of technology is treated as a service and differentiating our approach in clear and succinct way to our customers.



ROB SELBY

GROUP AWS TECHNICAL LEAD

Rob has more than 20 years IT industry experience. With a background covering a variety of roles from software development to infrastructure and solution architecture. Rob joined Computacenter 3 years ago and has been responsible for the Cloud and Data Center service development strategy. Rob is now focused on leading our AWS public cloud service development.

Computacenter is a leading independent technology partner, trusted by large corporate and Public Sector organisations. We help our customers to Source, Transform and Manage their IT infrastructure to deliver digital transformation, enabling people and their business. Computacenter is a public company quoted on the London FTSE 250 [CCC.L] and employs over 17,000 people worldwide.



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