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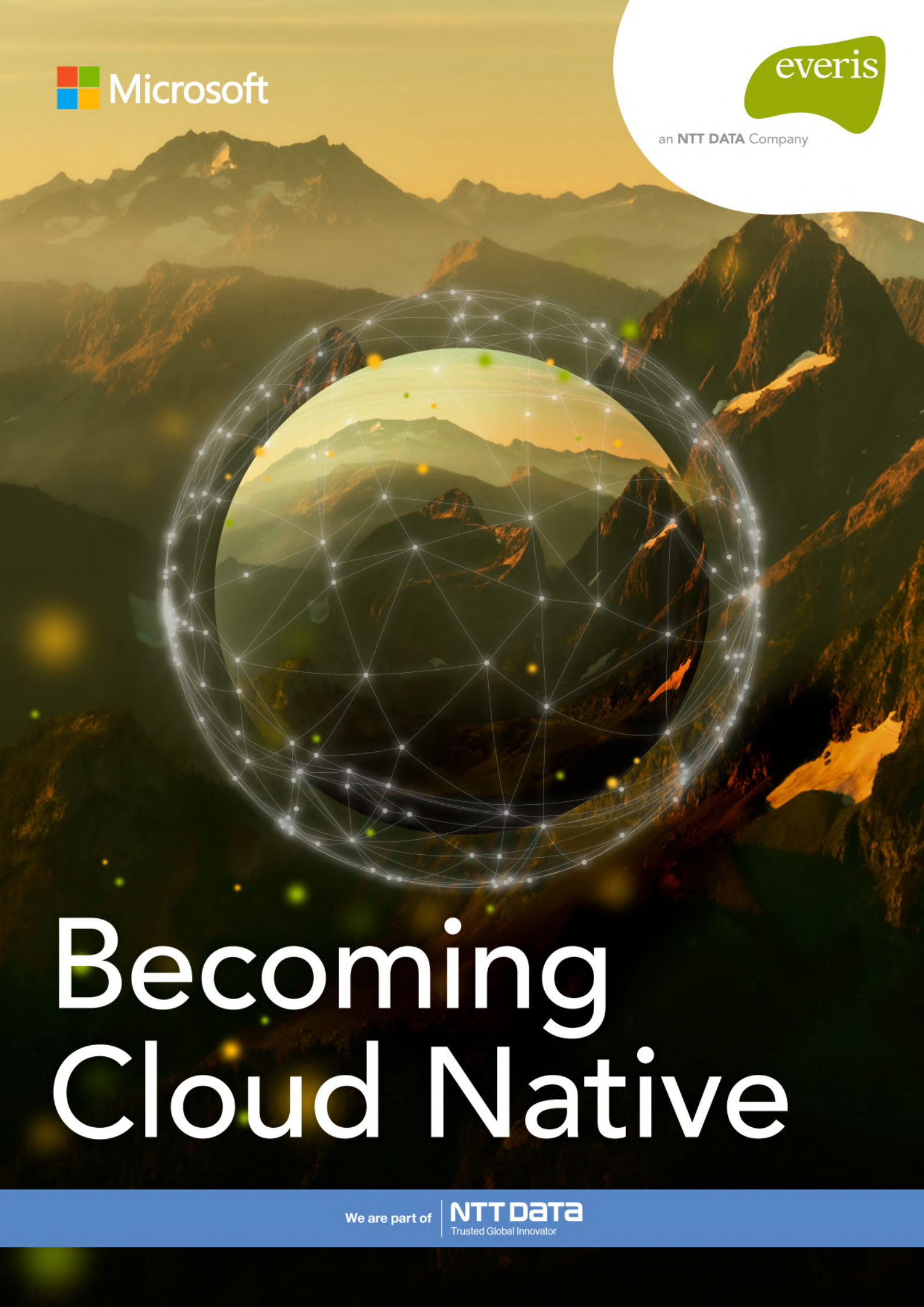

Becoming Cloud Native

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01 Think Cloud

The Cloud revolution is well-established now. The rise of hyperscale providers has led to a market shift, in which corporations, large and small, are ceasing to own or even directly manage their own physical ICT infrastructures and instead use space within a specialist cloud provider's own environment.

The Cloud concept has evolved from being an attractive potential source of cost advantage to being quite simply the way that businesses- virtually all businesses- need to operate.

Initially, corporations moved to the cloud to avoid *being disadvantaged* by carrying unnecessarily heavy overhead fixed costs. Now they are taking the opportunity to build higher levels of flexibility into their own processes and organizations.

In this short paper, **we look at what happens next in the Cloud revolution** and, in particular, how a business moves from being Cloud-enabled to becoming *Cloud Native.* Where is the right place to start? And what is the most rational process to follow?

We are already seeing a series of evolutionary developments, which are likely to have a transformational impact on most market sectors, and which are directly driven by large-scale adoption of cloud-related technologies. These include:

Hybrid & Multi-cloud approach

Large corporations are building strategic partnerships with hyperscale providers, such as Microsoft Azure, to create hybrid IT solutions. The move to Cloud is not only related to cost but reflects the need for consistency across complex, distributed IT environments.

In some sectors, such as banking, the growing need to ensure full compliance with evolving regulatory requirements is driving the move to cloud native environments, in which rules can be applied consistently and full audit data provided for all relevant territories and legal jurisdictions. To benefit from the advanced capabilities offered by different cloud vendors, enterprises are therefore progressively developing their application landscapes to make them cloud native. That is the key both to competitive advantage and to full control over distributed environments.

Azure ARC is the hybrid and multi cloud platform from Microsoft, which has already established itself as a leading player in this developing field. Azure enables enterprises to manage resources both within and outside of Azure with the same control plane. This provides enterprises with central management of capabilities such as security and provisioning, while monitoring usage and unifying unify automation processes across all the environments.

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IOT and Edge enablement

The increase in sensor usage (often defined as IoT devices) is extending the scope of cloud from being simply *scalable, virtualized datacenters* to becoming something larger and more strategically significant: *programmable intelligent networks.*

We are now seeing the integration of Edge devices, Software Defined Networks and Cloud to provide services that have much wider geographical reach and permit agile collaboration of a kind that was never possible in the past. The spread of 5G technology will accelerate this process of change during the next decade.

The rise of cloud, together with its transformation to embrace global networks as well as individual compute environments, is also affecting the type of services and solutions that the market can offer. So, for example, IoT and Edge devices can be used in greatly extended networks of connected environments to combine automated responses to low-latency requirements (in power plants, oil and gas installations, for home-use medical devices or smart city requirements) while enabling centralized control of the extended network as a whole.

From scalability to hyperautomation

Hyperautomation is a concept based on distributed AI, which creates an interdependent network for decision-making at all levels and all stages of the value chain, leaving human direction at the strategic level only, with little or no influence on minute-by-minute operations. Due to the new reality imposed by COVID-19 restrictions, most enterprises are urgently aiming to reduce OpEx and CapEx faster than ever, and this makes increased automation a very high priority.

Their aim is to reduce dependence on IT Operations to deliver IT services through self-service, increasingly automating process stages, applications configuration and management of the infrastructure ecosystem. this approach uses technologies like artificial intelligence and machine learning, driving through a NoOps paradigm.

This is the key to understanding what Cloud really means for all of us in the near to mid-term future. It has moved from being an externally available set of services to being *the environment in which we operate and do all our business.* It is no longer feasible simply to transfer certain assets and capabilities into the Cloud: we must learn to *live within it.* That is the key to becoming a Cloud Native organization.

The success of any organization in the future will be largely defined by how fast and how completely they can inhabit the cloud and make themselves fully at home there as real Cloud Native businesses. That is not just about technology but a major challenge to people and process management, as well.

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02 The Transformation Challenge

Business transformation is normally market-driven, but markets, themselves, are greatly influenced by technology change. Despite the increased complexity in the marketplace and in societies, we believe there are two main drivers for change that are of the highest importance. These are *Customization* and *Automation.*

Customization

This is the term we use to describe increased targeting of products and services in all market sectors to fit the very specific needs of individual customers, consumers, groups and businesses. Though the individual offer components are likely to be standardized, products and services will be tailored to fit individual needs.

The move towards a *market of one* approach is accelerating across sectors as different as banking and retail. By adding services (a process known as *Servitization*) to individual products we open up the potential for rethinking the very nature of the products, and that will drive the need for new collaborative partnership, new alliances and new ways of delivering into the market.

Sector focus

Banks

are focused on using breakthroughs in technologies such as cloud data platforms with analytical capabilities to create deeper levels of both customer engagement and operational efficiency. This improves targeting, enables fast response with better customized services, and achieves competitive advantage in the B2C and B2B segments. Another relevant challenge in this sector is how to use a cloud native approach to define open banking platforms that offer an open standard connection API, opening a potential future of distributed, hyper-efficient core banking services.

Retailers

can adapt faster than before, and this is a key requirement for surviving and prospering in the dramatically changed market conditions caused by the pandemic. They can adopt cloud native architectures to build a robust foundation that can capitalize on microservices, APIs and cloud to deliver innovative features, respond to changes and provide more agile and responsive end user experiences.

These are simply indicative examples. Other sectors also include emerging options for the kind of highly targeted, customizable solutions that are only possible because of the technology convergence made possible by cloud.

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IT automation

This is a highly familiar term that is gaining new meaning in the world of converged (programmable) cloud/SDN, in which scalable, almost limitless processing and storage capacity is combined with geography-agnostic, secure and low-latency connectivity.

The proliferation of IoT and Edge devices means that a growing proportion of interactions will be automated, based on algorithms and, increasingly, Artificial Intelligence. The growth of automation, not just in closed systems (such as manufacturing plants) but in widely shared systems (transportation management, smart power grids and many other critical systems) is accelerating.

In this context, we will need to rethink, not only the products and services we deliver, but how we develop, test and deliver them *from the cloud.*

Technology

tools will be largely those used by hyperscale partners and will be highly standardized in nature. Developers inside individual corporations and partner ecosystems need to master the art of using standard toolsets to drive custom-developments, capturing the potential efficiency benefits this approach offers.

Processes

are being streamlined continuously across most businesses, but working *in* the cloud, rather than *with* the cloud, requires a serious rethink of how processes should be designed and managed. We are likely to see a continued increase in collaborative working across extended ecosystems, so security management will be critically important, as will removal of silos to increase flexibility and operational efficiency.

Becoming Cloud Native

In summary, it is not possible to develop the highly customized, service-enabled products that the marketplace increasingly demands, and to do this in the context of increasingly automated systems, by working in the same ways as before. We need transformation that affects Technology, Process, Organization and People.

In this context, we will need to rethink, not only the products and services we deliver, but how we develop, test and deliver them from the cloud.

Organization

is at the heart of all the changes driven by moving to a Cloud Native model, as we will see monolithic, horizontally integrated corporations disadvantaged in competition with “born in the cloud” businesses, which typically have low legacy debt and very lean business models. The test for successful cloud-based businesses will be to remove silos (enabling agile, end to end processes) while fostering a community approach (empowered groups focused on delivering a defined solution).

People

are the key to everything, of course, as they always are. Businesses that are committed to becoming Cloud Native need to ensure they have the right people, the right skills, and are able to mobilize resources within a strong and constantly evolving ecosystem of partners. At this stage it is effectively impossible to predict exactly what capabilities will be needed 5 or 10 years into the future. Corporate agility is not possible without human flexibility. That may be the greatest of all challenges.

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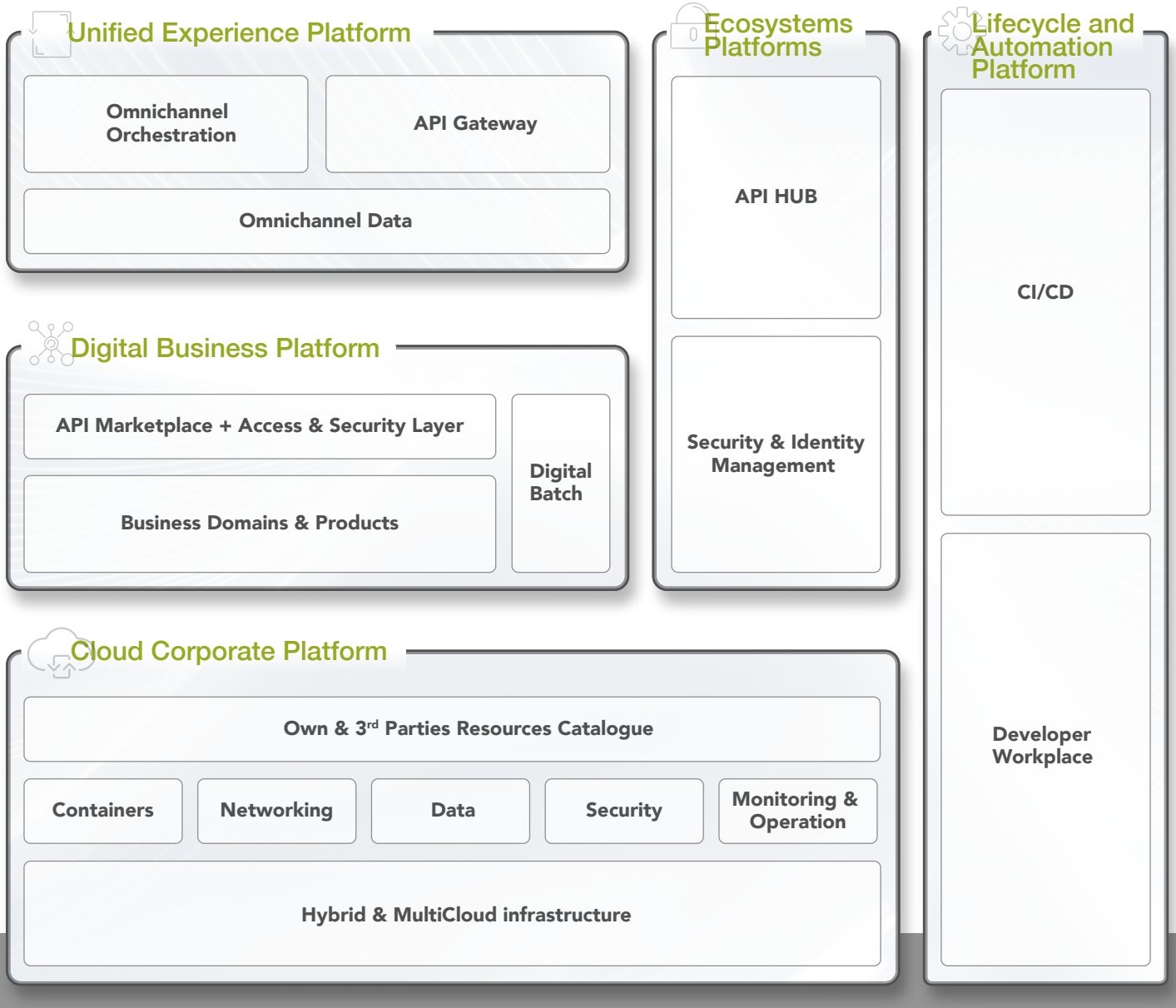
03 Cloud Native Vision

A Cloud Native organization has five key defining characteristics. *everis* has worked with Microsoft Azure Managed Services to build robust and easy to execute solutions at all five of these, which are shown in high level form in the diagram below.

Let's look at these in some detail.



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Lifecycle and Automation Platform

Cloud Native operations deliver competitive advantage by rapid develop and test, across an ecosystem environment, using DevOps techniques, enabled by agile processes, leading to the move from test to production without unnecessary barriers and at high speed.

Use of DevOps, Agile and Lean are long-established development methods, of course, and it is wrong to suggest that Cloud Native operations lead to a major conceptual change. What is different now, and this is a very important change, is the development environment, itself, and the tools we have available to us.

In a Cloud Native approach, the development lifecycle will happen mostly in the cloud, without the need to establish a full development platform in local environments for every development process connected to deployment.

Cloud Native development does not work in exactly the same way. Of course, security requirements remain as tough (or tougher) than ever and governance principles must be agreed and managed in advance, but the development process, itself, will be more open and fluid, once every part of it happens in the same, shared environment.

To achieve this, both effective change management and a new mindset for developers are essential for successful adoption of cloud native development.

Developer workplace is a solution created and provided by *everis*, and is designed to drive these capabilities in cloud native ecosystems. It is based on Github Codespaces and is available to all partners as a basic function of joint DevOps in a Cloud Native environment. This approach enables collaborative teams to capture Cloud Native benefits more completely and at higher speed than before.

Cloud Corporate Platform

As we saw earlier, one of the most interesting developments within hyperscale cloud provision is the shared environment, in which a provider (such as Azure) delivers a best in breed, always current infrastructure and a large corporate customer builds its own private environment within this infrastructure.

This hybrid approach contributes to lower fixed costs and improved scalability for corporate IT, but it is not a true Cloud Native environment.

The extra component that permits truly agile collaborative working, with absolute security, in a shared cloud environment is *containerization.*

Containers permit joint working within private spaces at OS level, which can be shared between authorized partners, according to agreed business and security rules. Containers within the Azure environment are managed by Azure Kubernetes Service, which provides a production ready, open source, highly flexible platform for joint development and testing.

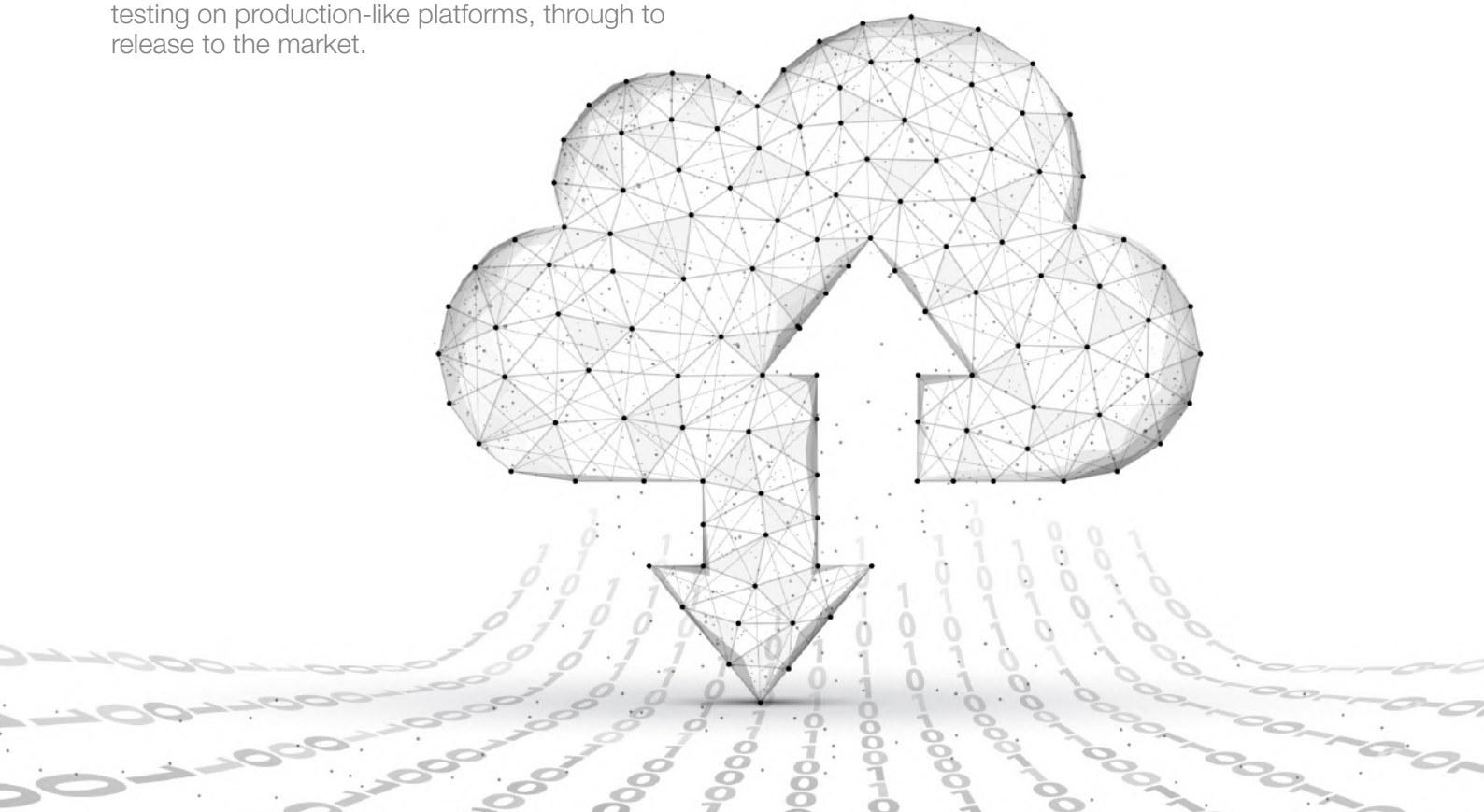
To be Cloud Native, therefore, it is not enough to inhabit and commit to the cloud: it is necessary to provide an environment which is custom-designed for ecosystem and partner-based collaboration, securely and efficiently. Azure containers Service, enabled by Azure Kubernetes, establishes an infrastructure specifically designed for rapid DevOps, from initial concept through to extensive testing on production-like platforms, through to release to the market.

everis **is a pioneer in helping enterprises to adopt this hybrid approach, enabling them to benefit from the best that both private and public cloud can offer.**

Working closely with Microsoft in implementing Azure ARC, we have a clear edge in standardizing cloud architectures, enabling faster innovation, reducing cost and simplifying the path to cloud native status.

All these process stages take place within the same environment, using the same platforms, and on the same infrastructure. The savings in time and cost are significant, leading to much faster time to market. The real difference, however, lies in the quality improvements that can be achieved.

Cloud Native development of this kind makes it easier to build sophisticated customized and highly targeted products or services and do this at speed.



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Ecosystem platforms

A defining characteristic of Cloud Native businesses is the ability to interact smoothly and easily, not just at development level but in building complex service offers by adding contributions from a range of other partners in the market. This is also the key to accurate targeting and high-quality customer experience.

Virtually all businesses use Open APIs to enable rapid and as near seamless as possible integration between applications, and APIs are a fundamental part of the Azure Cloud Native environment.A range of API management tools are built-into the Azure environment and this enables easier collaborative working during the development and testing processes. Partners connecting within the same Cloud platform are able to interact as easily as if they were in the same physical department in a traditional business set-up.

The greatest benefit for applications development, however, lies in the way APIs, managed within the Azure toolset, accelerate release to the market, make customer interaction simpler and more satisfying, and foster targeting through rapidly-actioned feedback loops.

everis **has experience in this concept within the insurance sector, enabling a digital ecosystem platform to expose core capabilities to reach digital products (API First) through Azure IPaaS implementation.**

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Digital Business Platform

Cloud Native applications development requires a major change in attitude and mindset from all team members. It means moving from a classic production to a service-focused approach.

This same attitude will also make it easier to work with customers and external partners to target needs more accurately, turn feedback into insights and create “virtuous circles” in which feedback drives improvement, leading to higher speed and greater satisfaction.

In a traditional development cycle, different corporate teams and departments interact according to set rules and within a strict governance framework. In simple (perhaps simplistic) terms, each process stage hands over to the next in a linear fashion. The focus for every player in the team is to do their job and hand over to the next person on the production line.

In Cloud Native development a service mindset is essential. Teams will be integrated and focused around shared goals, no matter where the different members come from. Their aim is, or must be, to deliver the best possible outcomes to each other, to the team, itself, and to the ultimate end users of their application.

The service mindset replaces strict adherence to corporate discipline and subordinates all other factors to a service-focused drive to deliver the best outcome in the shortest time. This attitude enables Cloud Native teams to unlock the full potential benefits from their shared environment. It also helps ensure that a service-based mindset informs the applications and offers that they deliver into the market.

These topics are included in the concept of Digital Business Platform as a modular and extensible global platform with a set of functional modules built on top of an exponential technologies. The mission is to enable an accelerated creation and launch of new digital products facilitating the best in-class customer experience.

everis **has worked with a real estate company to create a digital platform based on Azure cloud native service, designed to improve the appraisal process through enhanced communication between bank entities, real state agencies and end users.**

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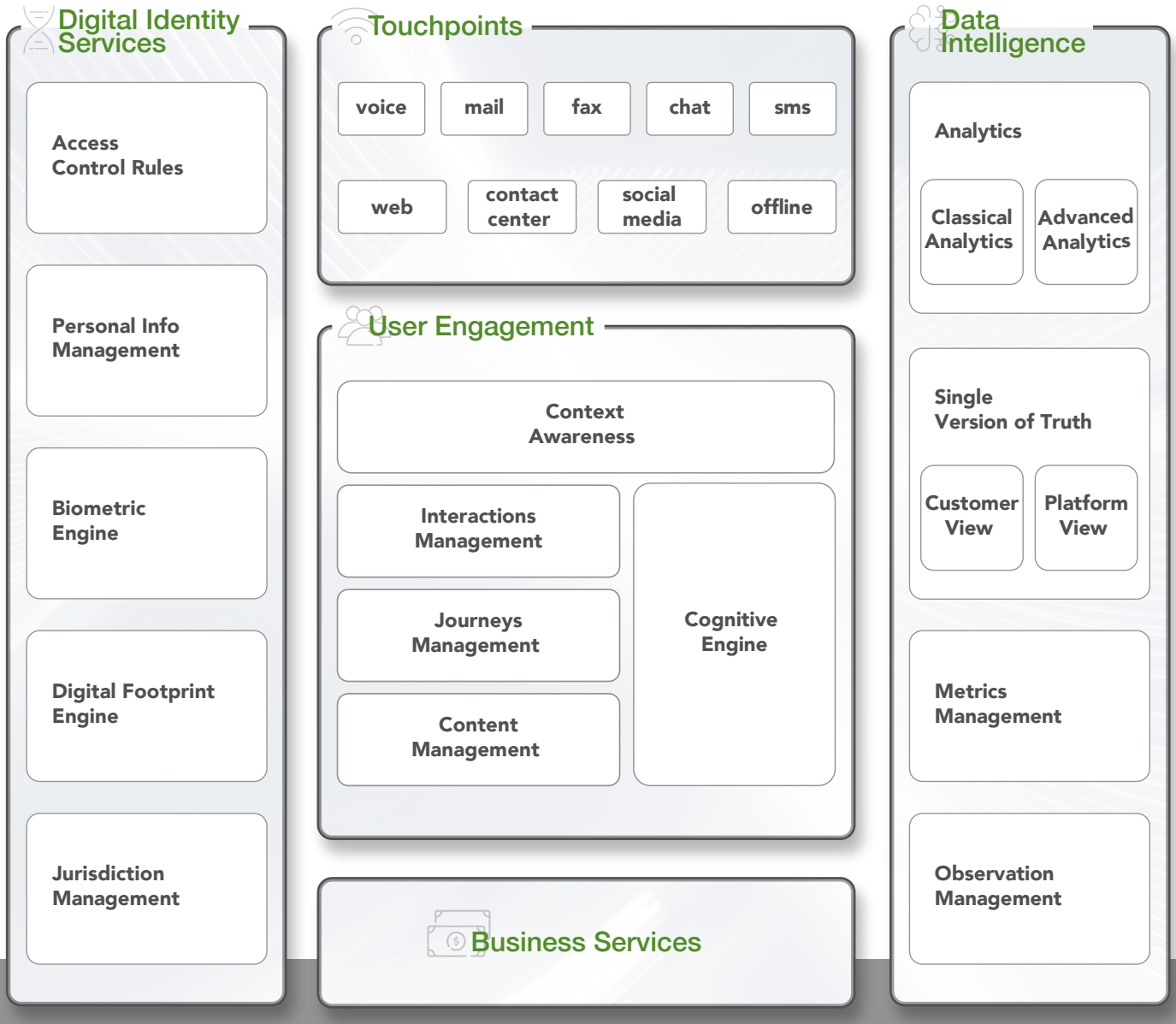
Unified Experience

Customers now have an unprecedented number of ways to engage with companies, from traditional channels to an ever-growing array of digital modes. Unified experience is the ability to create and manage experiences in a way that is cohesive and seamless, providing consistent, personalized access all digital channels to engage its users.

everis combines the Azure platform and managed services to develop a specialized approach that builds a set of collection and orchestration services from the ground up to create frictionless, context-aware experiences for customers. The essential key point of this approach is the integration of the front-end and back-end layers to consolidate running events and interactions into a single repository that can be drilled down into.



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04 From Vision to Reality

To summarize this story so far, Cloud is now an indispensable reality for most enterprises in most market sectors. Cloud native operations, however, remain hard to achieve for many organizations right now. Moving to Cloud Native status is a major undertaking and requires expert, active support at all stages.

NTT DATA strongly believes that Cloud Native development offers exceptional competitive advantage to early movers, but there are risks attached. We have built on our strong, long-term relationship with Microsoft to ensure that risks are reduced, benefits are maximized and rewards are delivered as fast as possible. We recommend a four-stage approach to Cloud Native, covering Strategy, Platform, Solutions and Migration.

STRATEGIC PATH

The natural starting point and one that requires in-depth planning, scenario testing and clear understanding of the risk-reward equation. This is not primarily a technology discussion but requires a detailed analysis of business priorities, future ambitions, competitor comparisons and transformation options.

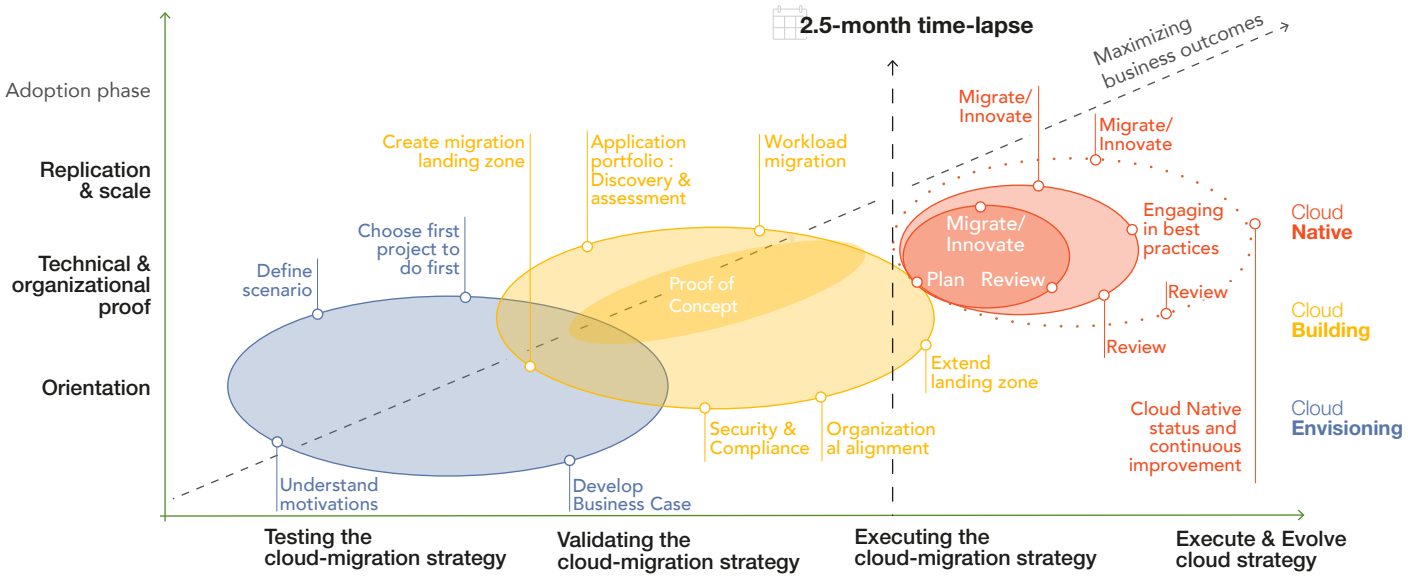
everis brings skills and proven track record in consulting, Microsoft Azure relationships and technology leadership, placing us in a good position to foster understanding and develop a rational, practical and ambitious strategy for Cloud Native Through its Azure CoE Cloud.

Azure CoE Cloud has the main objective to create and boost capabilities in Microsoft Azure across all industry sectors, providing relevant skills and knowledge about Azure platform services, promoting talent and being one of the main reference integrators in Azure Technologies.

An incremental, iterative and adaptive approach in cloud strategy is more likely to deliver successful outcomes faster than traditional project management methods. This approach is extremely aligned with Azure Cloud Adoption Framework and forms the starting point for a successful cloud native adoption strategy.

everis provides a toolset to speed up this advisory process, providing references models, cloud maturity models and Cloud Value Tool to ensure best decisions at this stage.

everis, working with Microsoft Azure, takes you through a logical, stage-by-stage approach to trialing, planning validating and then executing a proven migration strategy



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Platform Foundations

There is no single “right solution” for platform development in the Cloud Native world. We recognize this may need to be a step-by-step journey, in which capabilities for Cloud Native development are first established in a hybrid cloud environment, potentially using a number of different providers, before evolving further.

In the long term, platforms are all subject to permanent evolutionary change: the most important requirement at this early stage is to establish a platform that enables early entry to Cloud Native development, and that does not close off any potential paths to the future.

Aligned with the concept of Azure Landing Zone, *everis* builds on and strengthens this approach by providing a pre-configured environment, provisioned through code, while also deploying Azure Managed Services blueprints and archetypes to simplify the initial stage of cloud native development.

Automation is an essential basis for cloud native approach and the next level is to orchestrate these curated models in architecture blueprints.

everis has collaborated with Microsoft in delivering services to a multinational financial services company, building Cloud platform foundations and driving cloud adoption internationally to ensure a fast start to their cloud native journey.

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Migration and modernization

This is the last of the three steps towards Cloud Native status. All agreed assets, processes and capabilities will be moved to the pre-prepared target cloud environment, following a proven migration procedure and methodology. *everis* will ensure that all corporate components have been optimized for running in the host platform, following the correct patterns and procedures:

1. Identify cloud migration strategy, based on business and technical information gathered in the strategy path.
2. Define the right strategy and workloads prioritization, based on migration and cost savings.
3. Ensure a realistic migration planning for the different workloads, considering dependences and business impact
4. Follow up and measure the migration planning and set the KPIs for technology and business cloud adoption.

SUMMARY AND NEXT STEPS

Becoming Cloud Native is a necessary step for any business in the process of developing, testing, releasing and managing applications or service offers built from multiple applications into virtually any market sector.

As traditional barriers between companies, departments and even industry sectors blur, so the need for a radically new approach to development grows more urgent. Being Cloud Native enables a business to reduce its risks and costs, while at the same time adopting more fluid and agile collaborative methods for end-to-end development in shared environments.

Moving to the desired future state is going to be a complex business and requires careful preparation, backed by expert partnership. Microsoft Azure and *everis,* working together, can make the path to the future more secure, less risky and far more rewarding than any alternative option.

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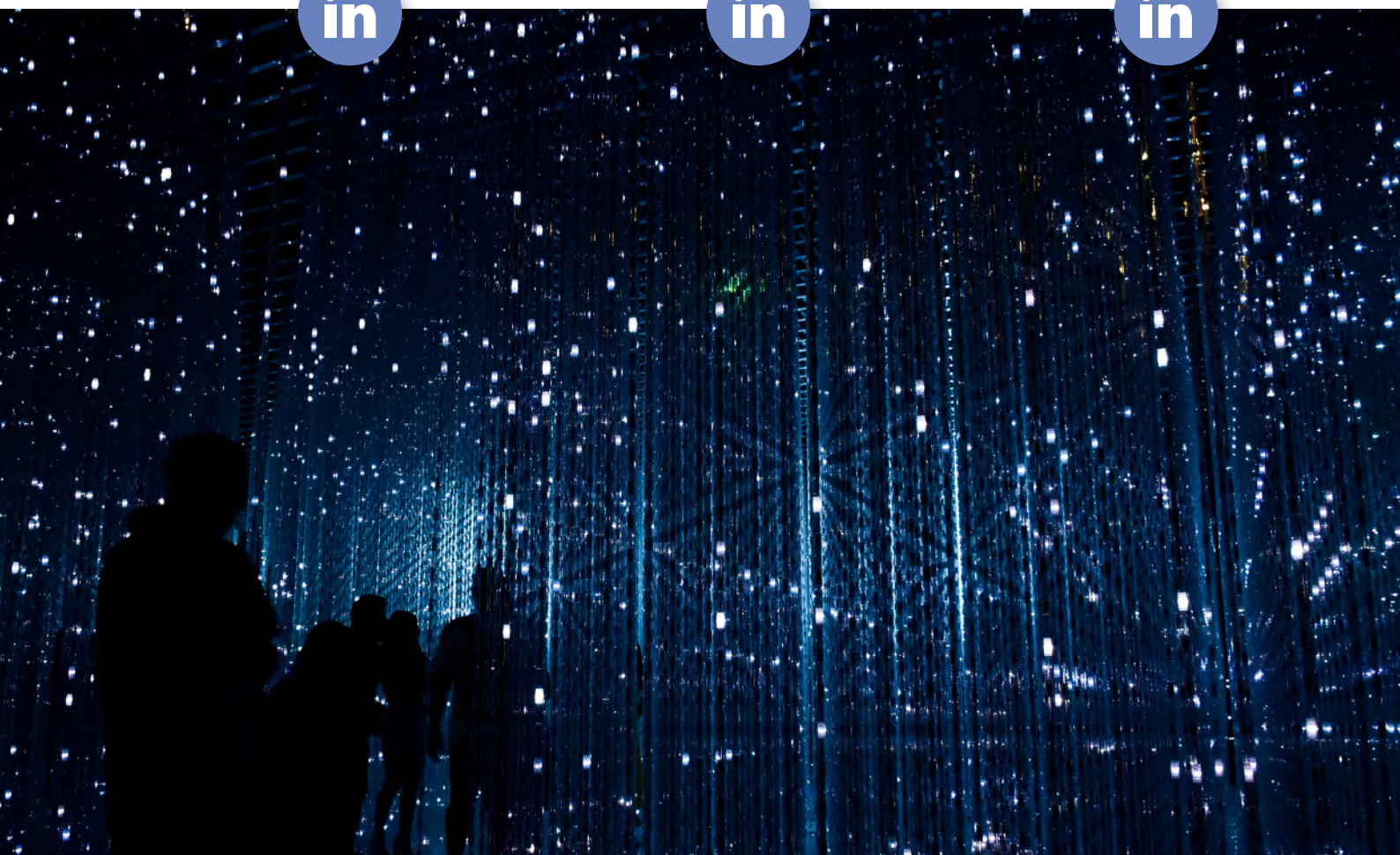

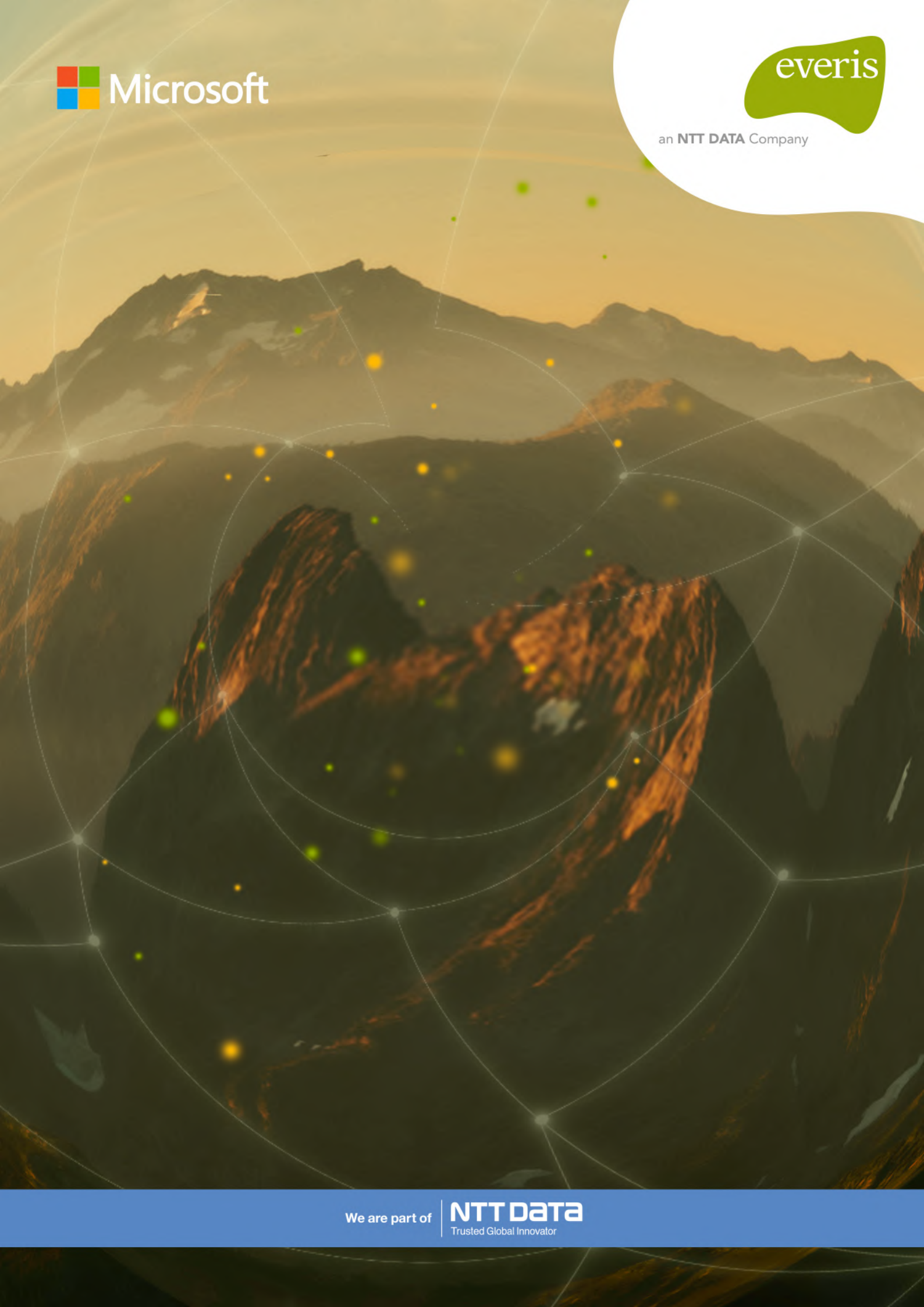
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