



WHITEPAPER / CLOUD

Balancing the Cloud

Leveraging FinOps and AI for
Effective Cloud Cost Management

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nathan11.quadrio@nttdata.com

1. Executive Summary



20 to 30 Percent Cost Saving

Practice Shows: FinOps can effectively reduce Cloud Costs by as much as 20 to 30 percent.¹

FinOps for more Business Value

The Target: Reduce Cloud Costs. As businesses increasingly migrate to the cloud, controlling and optimizing cloud spending has become a paramount concern. Financial Operations, or FinOps, offers a strategic framework to tackle this challenge, marrying financial and operational insights to drive business value.

The Way: Get a Hold of Cloud Costs. This whitepaper provides a comprehensive yet concise guide to understanding and implementing FinOps in the context of cloud cost management. From introducing the fundamental principles of FinOps, explaining its life cycle, to the role of cloud technology, it lays out a clear path for businesses to gain control over their cloud finances.

Innovative Tools: AI and ML. Application of Artificial Intelligence (AI) and Machine Learning (ML) in FinOps are explored, providing businesses with a glimpse into the present and future of cloud cost management. These technologies offer promising potential to streamline cloud expenditure and ensure businesses extract the most value from their cloud investments.

Reading this Whitepaper – it's Worth the Effort. This whitepaper serves as a crucial resource for businesses seeking to balance the challenges and opportunities of cloud spending. It is an invitation to harness the power of FinOps and advanced technologies like AI and ML to drive cost efficiency, scalability, and financial clarity in the era of digital transformation.

¹ The FinOps way: How to avoid the pitfalls to realizing Cloud's value" – McKinsey 2023

2. FinOps and Cloud Spending – Introduction

Wanted: Efficient Model to manage Cloud Costs for Higher Value

Challenge: Cloud Cost Management. Managing cloud costs is a pressing challenge in today's rapidly evolving business environment, where 70% of enterprises exceed their budgets due to ineffective resource allocation, according to the Everest group. This can result in a 28% of the budget for cloud projects being wasted . Additionally, it highlights a disconnection between IT expenditure and business growth, emphasizing the urgent need for a more efficient management model to enhance business value through controlled cloud spending.

Cloud Financial Management: Just as Important as Technology. The transition to cloud technology should not overshadow the imperative of sound financial management. Establishing mature FinOps capabilities early on can prevent costly oversights, helping organizations keep a check on their cloud expenditures before they escalate to unsustainable levels.

The Potential of the Cloud has its Price. The transition to the cloud is more about culture than technology. The cloud provides vast potential and capabilities, but they come at a cost. Developers, previously limited by hardware constraints in traditional on-premises setups, are now empowered to initiate production-grade services. This new-found flexibility, while beneficial, also risks potential overuse and cost escalation if not managed effectively.

**28% of the
cloud project
budget
is wasted.²**

Managing and Optimizing Cloud Spend with FinOps. FinOps presents a collaborative solution, merging financial, operational, and business expertise to streamline cloud spending. Instituting robust FinOps strategies is vital to manage costs proficiently, ensuring the removal of inefficiencies and the realization of cloud investments' full potential.

FinOps – a New Mindset. Born from the necessity for detailed oversight of cloud expenditures, FinOps fosters a shared understanding and responsibility across organizations. Essential practices like spend visibility, governance, and optimization are central to leveraging cloud assets effectively.

Turning the Cloud into a Business Engine. FinOps stands as a strategic tool in navigating the complex cloud spending landscape, aiding organizations in converting every dollar spent on the cloud into a business growth engine. It transforms the perception of cloud spending from a necessary expense to a lever for gaining competitive advantage and enhancing business value.

² Flexera: 2023 State of the Cloud Report

3. The FinOps Lifecycle and Its Impact on Cloud Costs

Aligning Cloud Spend with Business Value

Successful Cloud Cost Reduction – 3 Steps.

The FinOps lifecycle is an ongoing, iterative process designed to align cloud spending with business value, with Cloud Technology serving as its cornerstone. It consists of three main phases: Inform, Optimize, and Operate, each of which plays a crucial role in controlling and optimizing cloud costs and relies heavily on the intelligent use of Cloud Technology.

1. Inform.

The initial FinOps phase focuses on enhancing cloud cost visibility across the organization, largely facilitated by Cloud Technology. It delivers precise financial reports that classify cloud spending by teams, projects, or resources, fostering accountability and cost-awareness through detailed insights.

2. Optimize.

This phase leverages Cloud Technology to optimize cloud resources for cost efficiency. FinOps teams employ various strategies and tools to refine cloud

usage, eradicate waste, and enhance efficiency. It's about ensuring optimal returns from cloud investments through rightsizing resources, detecting underutilized assets, utilizing discounts, and optimizing cloud configurations.

3. Operate.

The Operate phase, deeply rooted in Cloud Technology, translates informed decisions into actions. The organization monitors the impact of cost-optimization strategies on cloud expenditure and continuously refines these strategies in response to real-time cloud usage data and shifting business needs. This phase establishes a feedback loop, promoting adaptability in the organization's cloud spending strategy as circumstances evolve.

More than Minimize Cost Waste. The impact of the FinOps lifecycle on cloud costs is profound. By adopting the FinOps lifecycle, organizations increase transparency, encourage accountability, enable optimization, and promote continuous refinement of operations. This approach not only minimizes waste but also ensures that cloud resources are being used effectively to support business objectives.

See more detailed description of these three steps in chapter 6.



The three main phases of the FinOps Lifecycle

4. Artificial Intelligence and Machine Learning in FinOps

Integration of AI and ML into FinOps

Cloud Cost Optimization with AI and ML. AI and ML technologies facilitate the prediction of future resource utilization based on past usage patterns. Furthermore, they enable organizations to adapt their cloud infrastructure according to anticipated demand. The advancements in deep learning techniques significantly bolster the capabilities of simulation and forecasting technologies.

Not Only Saving Costs but Improving Performance. AI- and ML-driven tools also provide dynamic learning capabilities. By continuously scrutinizing cloud infrastructure, these tools identify cost inflating factors and subsequently minimize cloud spending. This automation not only leads to financial savings but also improves application performance.

AI- and ML-Based Solutions for Cloud Optimization

Hyperscaler and Third-Party Tools. Several AI- and ML-powered tools have been developed to optimize cloud spending. These solutions can be broadly categorized into two groups: those developed by the major hyperscalers (Amazon AWS, Google GCP, and Microsoft Azure) and third-party offerings.

Optimizing Specific Cloud Environment. Cloud-native tools offer a rich array of functionalities. These platforms often come equipped with features that allow for precise forecasting and intuitive dashboards that facilitate the visualization and

management of costs over time. However, they are generally more focused on optimizing costs within their specific cloud environment, potentially lacking a holistic view of multi-cloud deployments.

Unifying Various Cloud Environments. On the other hand, third-party tools such as VMware Aria Cost and IBM Turbonomic integrate seamlessly with various cloud environments to offer a unified solution, providing dynamic learning capabilities that adapt to an organization's usage patterns. Leveraging AI and ML technologies, these tools can potentially offer more effective cost optimization solutions and management capabilities for multi-cloud deployments.

Artificial Intelligence (AI)

AI-powered tools improve cloud optimization by providing insights and recommendations superior to traditional manual processes. These tools operate on a "workload-specific" basis. Consequently, IT teams and developers must adapt their cloud spending strategies using customized AI optimization models.

Machine Learning (ML)

ML plays a pivotal role in managing cloud spending. An ML model, once trained on an organization's IT system usage patterns, can predict resource usage and auto-scale them appropriately. This ensures organizations only pay for actual usage instead of a fixed rate, optimizing costs.

5. FinOps in Cloud Spending – Benefits and Challenges

Taking Advantages, Mastering Strengths

FinOps – a Special Challenge. The rapid evolution of cloud computing and the resulting expenditure has positioned FinOps at the forefront of contemporary corporate strategy. Recognizing and responding to the unique benefits and challenges of FinOps in cloud spending is essential for organizations to achieve cost control, optimize efficiency, and adapt to this transformative era. Despite these undeniable benefits, navigating FinOps in the realm of cloud spending does present distinct challenges.

Shared Cloud Services Cost Allocation

Transparent and Fair. Shared Cloud Services Cost Allocation stands as a vital cog in the FinOps machinery, orchestrating the fair distribution of cloud expenses across teams, projects, or departments that collectively utilize these resources. The objective: reflecting each party's use and benefits accurately, fueling transparency and fairness.

Attribution-Based Model versus Consumption-Based Model. At the heart of this task, two primary allocation methods vie for the spotlight. The attribution-based model allocates costs based on ownership or responsibility, simplifying the process, but potentially overlooking the intricate sharing of services between departments. In contrast, consumption-based allocation leans into fairness, tying costs to actual usage. This method, however, can stumble on the complexities of accurately tracking shared resources' consumption.

NTT DATA'S PRACTICE RECOMMENDATION

■ Tagging Strategy for Cloud Resources

A way to navigate these challenges is to devise a robust tagging strategy for cloud resources, making it possible to link usage with cost centers better. Leveraging cost allocation tools or cloud management platforms could also be beneficial. These systems can automatically track and allocate costs, generating comprehensive reports that maintain visibility and accountability, and inform cost-effective decisions.

■ The Right Model? Depending on Company-specific Needs, Structure, Culture

Periodic reviews and adjustments ensure the cost allocation strategy remains tuned to organizational changes, fostering a culture of cost-effectiveness. The choice between the rigid attribution-based model, the fluid consumption-based method, or a hybrid variant depends on an organization's unique needs, structure, and culture. By successfully navigating this choice, organizations can anchor a culture of accountability and cost awareness, setting the stage for optimal cloud spending and operational efficiency, ultimately propelling



5. FinOps in Cloud Spending – Benefits and Challenges

Multi-Cloud Environments

Lost in the Cloud Jungle. Navigating multi-cloud environments presents a unique set of challenges for FinOps. These environments comprise various cloud providers, each with its own pricing models, billing structures, and resource management tools. The complexity can lead to inefficiencies and potential overspending if not managed effectively.

Holistic View of Cloud Costs. The diversity of multi-cloud environments makes it challenging to have a unified, holistic view of cloud costs. Each provider offers a different interface and set of tools for managing and monitoring resources. This fragmentation can lead to difficulties in understanding and managing cloud costs across the entire organization, potentially resulting in oversights and missed opportunities for optimization.

NTT DATA'S PRACTICE RECOMMENDATION

■ Overview of Usage and Costs with Cloud Management Platform.

To overcome these challenges, FinOps teams need to embrace strategies and tools that can aggregate data and provide visibility across all cloud platforms. A robust cloud management platform or tool that supports multiple providers can be invaluable. It can provide a unified view of usage and costs, streamline monitoring and management tasks, and identify potential cost savings opportunities across all environments.

■ Clear Policies and Guidelines.

Moreover, organizations should establish clear policies and guidelines for using different cloud providers. Standardizing deployment, operations, and cost management processes across providers can help reduce complexity and ensure more efficient resource utilization.

■ Always Up To Date.

Also, investing in training and developing expertise within the team is crucial. Understanding the nuances of each provider's pricing model, billing structures, and management tools is necessary for effective cost control. As part of this, the team should stay up to date with the latest offerings and pricing changes from each provider, which could present new opportunities for cost savings.

■ Strategic Multi-Cloud Approach.

Finally, organizations need to be strategic about their multi-cloud approach. It's important to assess the value and costs of maintaining a multi-cloud environment and balance that against the business benefits it provides. Leveraging multi-cloud environments judiciously can help organizations tap into the strengths of different cloud providers while mitigating the risks and complexities associated with managing costs in these diverse environments.



5. FinOps in Cloud Spending – Benefits and Challenges

Decentralization & Silos

Centralized Oversight. In many organizations, different departments or teams handle their own cloud usage and spending without a centralized oversight body. While this setup can offer teams more flexibility and control over their cloud resources, it can also lead to misaligned priorities, inefficiencies, and difficulties in implementing a unified cost strategy.

Redundant Cloud Resources. Decentralization may result in overlapping or redundant cloud resources, as separate teams may unknowingly provision similar resources for similar tasks. Similarly, siloed departments may lack visibility into overall cloud usage and spending, leading to uncontrolled costs, under-utilized resources, and missed opportunities for consolidation and savings.

NTT DATA'S PRACTICE RECOMMENDATION

■ Cross-Departmental FinOps Team.

Overcoming the challenges of decentralization and silos requires promoting communication and collaboration across teams. Establishing a centralized FinOps team can provide a unified vision for

cloud cost management across the organization. This team should comprise representatives from different departments, including IT, finance, and business operations, to ensure a holistic view of the organization's cloud needs and spending.

■ Sharing Responsibility for Cloud Cost Management.

An effective FinOps team fosters a culture of shared responsibility around cloud cost management. It works to ensure that all teams understand their cloud costs, are accountable for their usage, and are aligned with the organization's cost management goals. Regular meetings and reports can help maintain open lines of communication, providing all teams with visibility into the organization's overall cloud spending and usage patterns.

■ Use of Cloud Cost Management Tools.

Additionally, organizations can leverage cloud cost management tools to gather and present data in a unified, accessible manner. These tools can provide comprehensive visibility into cloud usage and spending across all departments, breaking down silos and promoting a shared understanding of cloud costs. The visibility these tools provide can help drive informed decisions, eliminate waste, and optimize spending across the organization.

In a Nutshell

In short, overcoming the challenges of decentralization and silos in cloud cost management requires fostering a culture of communication, collaboration, and shared responsibility. With the right strategies and tools in place, organizations can unify their approach to cloud cost management, optimize their cloud spending, and realize the full potential of their cloud investments.

5. FinOps in Cloud Spending – Benefits and Challenges

Balancing Performance and Cost

Keeping Costs and Performance in the Same Perspective. Striking a balance between the cost and performance of cloud infrastructure is a significant challenge faced by organizations. The allure of high-performance cloud infrastructure often prompts teams to lean towards the 'best' options, which usually come at a high cost. However, this can lead to overprovisioning and consequently unnecessary spending, as many of these high-performance resources are underutilized or not fully optimized. On the flip side, an excessive focus on cost-cutting measures can also degrade the performance of applications and services, leading to poor user experiences and potential business impact. Thus, it is vital to strike a delicate balance between maintaining high performance and controlling costs, without compromising either.

In a Nutshell

Ultimately, the key to balancing performance and cost lies in understanding the organization's needs, continually optimizing resource usage, and fostering a culture of cost-awareness and responsibility. With these strategies, organizations can maximize the value of their cloud investments while ensuring high performance.

NTT DATA'S PRACTICE RECOMMENDATION

■ Monitoring Resource Usage.

Overcoming this challenge involves continually monitoring resource usage and adjusting as needed. Tools that leverage AI and ML can be instrumental in this process, providing predictive analytics and recommendations for rightsizing.

■ Explore Different Cloud Pricing Models.

To optimize the performance-cost balance, organizations can also explore different cloud pricing models. For instance, reserved or spot instances can provide cost savings for predictable or flexible workloads, respectively. Managed services, which abstract away some of the lower-level infrastructure management, can also be a cost-effective way to maintain performance.

■ Establishing a Culture of Cost-Awareness.

Additionally, organizations should foster a culture of cost-awareness among developers and IT teams. Regularly communicating the cost implications of different resource choices can encourage teams to make cost-effective decisions without compromising on performance. Providing these teams with the tools and visibility they need to monitor their resource usage and costs can also empower them to manage their cloud resources more effectively.

5. FinOps in Cloud Spending – Benefits and Challenges

Rapid Cloud Adoption

Speed of Transition. Rapid cloud adoption presents both opportunities and challenges for organizations. While it offers the potential for unprecedented scalability, flexibility, and business transformation, it can also lead to significant difficulties, particularly around cost governance, resource management, and monitoring. The speed of transition can mean that organizations are suddenly managing vastly expanded and complex cloud environments, without the requisite processes, tools, or skills in place.

NTT DATA'S PRACTICE RECOMMENDATION

- **A Structured and Phased Approach to Cloud Adoption.**

A clear roadmap can help balance the speed of adoption with the organization's capacity to manage the new environment. This includes careful planning of which applications or workloads to move to the cloud and when, based on their suitability and the organization's readiness.

- **Investing in Necessary Skills and Capabilities.**

This can involve hiring or training existing staff in cloud management and FinOps principles. External consultants or managed service providers can also support organizations in navigating their cloud journey.

- **Implementing Robust Governance Mechanisms.**

This includes setting up policies and procedures for cloud usage and spending, as well as frameworks for accountability and reporting. An effective cloud governance framework can help ensure that the speed of cloud adoption does not lead to uncontrolled costs or compliance risks.

- **Installing the Right Tools.**

These include cloud management platforms, cost monitoring tools, and automation tools. Such tools can help organizations keep track of their cloud usage, identify inefficiencies, automate repetitive tasks, and ultimately manage their cloud environments more effectively. AI and ML can further enhance these capabilities, offering predictive insights and recommendations for optimization.

- **Establishing a culture of cost transparency and accountability.**

This can ensure that all teams understand the implications of their cloud decisions and are committed to cost-effective practices. This is where FinOps comes in, bridging the gap between finance, IT, and business units and promoting a shared understanding and management of cloud costs.

In a Nutshell

In conclusion, while rapid cloud adoption can indeed pose challenges, with the right strategies and tools in place, organizations can manage these challenges effectively. By doing so, they can take full advantage of the opportunities presented by the cloud, driving innovation, agility, and business growth.

6. Implementing and Optimizing FinOps for Cloud Spending

Step-by-Step Approach. Implementing and optimizing FinOps for cloud spending is not a one-time event, but rather a continuous cycle of learning, adapting, and improving. The process involves three interconnected phases: Inform, Optimize, and Operate, each characterized by specific actions and goals.

1. Inform.

The first step in the FinOps journey is enhancing visibility into cloud costs and fostering a shared understanding across the organization.

This phase involves:

- **Assembling a Cross-Functional Team.**

This team should comprise members from finance, IT, and business units to ensure diverse perspectives and skills. This cross-collaboration is fundamental to promoting a culture of shared responsibility and alignment around cost management goals.

- **Implementing a Cost Allocation Strategy.**

An effective cost allocation strategy is vital for distributing cloud costs fairly and promoting accountability. This involves choosing an allocation method, setting up consistent tagging practices, and using tools to automate cost allocation and reporting.

- **Establishing Cost Visibility & Reporting Practices.**

Regular reporting of cloud costs and usage to all relevant stakeholders can enhance visibility and understanding. This transparency can help drive more informed decisions about cloud usage, leading to optimized spending and operational efficiency.

2. Optimize.

Once the organization has established a clear understanding of its cloud costs, the next phase is to identify opportunities for optimization.

This phase involves:

- **Analyzing Cloud Usage and Costs.**

By reviewing their cloud usage and cost data, organizations can identify inefficiencies, waste, and opportunities for improvement. Tools powered by AI and ML can help in this analysis, offering predictive insights and recommendations for optimization.

- **Implementing Cost Optimization Measures.**

These measures can include rightsizing resources, identifying and eliminating underutilized assets, taking advantage of discounts and reserved instances, and optimizing cloud configurations.

- **Creating and Implementing Budgeting and Forecasting Models.**

These models can help predict future costs based on past usage patterns and planned activities. This can inform strategic planning and decision-making, allowing the organization to align its cloud spending with its business objectives.



6. Implementing and Optimizing FinOps for Cloud Spending

3. Operate.

With the insights from the Inform and Optimize phases, the organization can now take action.

This phase involves:

■ Implementing Optimization Measures.

The cost optimization measures identified in the Optimize phase are put into action. The effect of these measures on cloud expenditure is continuously monitored and adjusted as necessary.

■ Iterative Learning and Improving.

The Operate phase involves continuously refining and adjusting the organization's cloud spending strategy based on real-time cloud usage data and evolving business needs. This creates a feedback loop, enabling the organization to adapt and evolve its cloud spending strategy as needs and conditions change.

■ Scaling FinOps Practices.

As the organization grows, so should its FinOps practices. This might involve expanding the FinOps team, implementing more advanced tools or strategies, and continuously fostering a culture of cost accountability and efficiency across the organization.

■ Continual Improvement.

The cycle of Inform, Optimize, and Operate is not linear but circular. The organization should continuously revisit each phase, incorporating new insights, learning from past experiences, and adjusting its strategies and actions as necessary.

In a Nutshell

Implementing and optimizing FinOps for cloud spending is a dynamic, iterative process. By following this step-by-step approach, organizations can make significant strides in managing their cloud costs, enhancing efficiency, and driving business value.

The journey to FinOps maturity is ongoing, but with commitment, collaboration, and continuous learning, organizations can successfully navigate it.

7. Case Study: Cloud Cost Optimization for a Tier 1 Telco Provider

The Transformation Power of FinOps – A Practice Example

The Situation: Growing Costs and a lot of Other Issues. In the rapidly evolving landscape of cloud-based solutions, a renowned Tier 1 telco provider faced a considerable predicament. Despite enjoying the multiple advantages that cloud services offered, the company grappled with escalating costs. This hefty budget wasn't the sole concern. Their existing culture was not oriented towards achieving FinOps or cloud cost savings, the architecture patterns in place weren't optimized for cloud use, and their operations echoed the complexities of a decentralized and siloed structure. These challenges were exacerbated by a palpable lack of governance and accountability. Essentially, their vast and complex multi-supplier ecosystem lacked direction, structure, and control.

The Requirement: Save Millions on Cloud Costs Annually. The customer's primary ask was two-pronged: first, an immediate reduction in their cloud expenditure, aiming for savings of \$3.5 million USD per annum, and second, to foster a change in strategy, processes, and culture across their diverse supplier ecosystem. This aligned with the broader industry challenge of bridging finance, IT, and business units of establishing a long-term FinOps framework, which would be fortified with systematic processes, policies, and measurable KPIs. Such a framework was deemed essential to gauge optimization efficiency in their public cloud and to set tangible targets for assessing the impact of proposed alterations.

The Solution

- 1. Establish a Cloud Cost Saving Culture.** Addressing the immediate and the long-term needs presented a formidable challenge. The first step was to cultivate a culture receptive to cloud cost savings. Changing the entrenched "default answer" mentality was imperative. To tackle the lack of supplier buy-in, a collaborative approach was adopted, ensuring that all stakeholders were aligned with the organization's objectives.
- 2. Make IT Architecture Ready for the Cloud.** Furthermore, a focused effort was made to re-engineer architecture patterns, making them cloud-compatible. This involved tailoring applications to function efficiently within a cloud environment.
- 3. Governance Model for Cost Control and Optimization.** But restructuring wasn't limited to architecture alone. A robust governance model was introduced, placing cost considerations at its core and ensuring that services were streamlined and optimized. This model, both tactical and strategic, provided a clear roadmap to maintain cost control while also venturing into newer avenues of optimization.

7. Case Study: Cloud Cost Optimization for a Tier 1 Telco Provider

The Main Benefit

- **Save \$3.5 million USD – Every Year.**

The results of this rigorous overhaul were both immediate and long-lasting. Remarkably, the target savings of \$3.5 million USD per annum were achieved within an initial span of two weeks.

This quick win, however, was only the tip of the iceberg. By consistently applying the principles of the newly established governance model and continually refining optimization strategies, these savings were replicated year after year.

- **Continuous Cloud Cost Optimization – Autonomous.**

As a testament to the success of the approach, the relationship with the customer extended over five years. The true hallmark of this collaboration, however, was the client's evolution. Recognizing the value of the solutions implemented, they decided to internalize these capabilities. With guidance and support, the client's internal teams matured to a level where they could independently manage and optimize their cloud expenses.

The Conclusion

This case study underscores the transformative power of adopting a holistic FinOps approach. In an age where cloud costs can spiral without oversight, it's essential to embed cost awareness, governance, and efficiency into an organization's DNA. As the customer's journey demonstrates, with the right strategies and mindset, businesses can navigate the intricate landscape of cloud spending, optimizing costs without compromising performance.



**Start your own FinOps Journey.
NTT DATA accompanies
you on the path to success.**

8. The Author



Nathan Quadrio is Cloud Managed Services Offering Lead at NTT DATA. His expertise in IT encompasses the Go-to-Market strategy for cloud services and the integration of "xOps" practices, which includes FinOps, AIOps, and MLOps. In his previous roles, he was responsible for IT solutions and cloud architectures, leading pre-sales activities and guiding cloud migration projects.

Nathan Quadrio has an educational background in Computational and Applied Mathematics from the Technical University of Denmark, the University of Texas at Austin, and the Polytechnic University of Turin. Additionally, he earned his MBA from the Quantic School of Business and Technology in Washington D.C.

nathan11.quadrio@nttdata.com

LinkedIn: <https://www.linkedin.com/in/nathan-quadrio-327089b0/>

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NTT DATA Deutschland SE
Hans-Döllgast-Straße 26
D-80807 München
Germany
Fon +49 89 9936 -0
www.nttdata.com/de

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NTT DATA Deutschland SE
Hans-Döllgast-Straße 26
D-80807 München
Germany
Fon +49 89 9936 -0
www.nttdata.com/de

