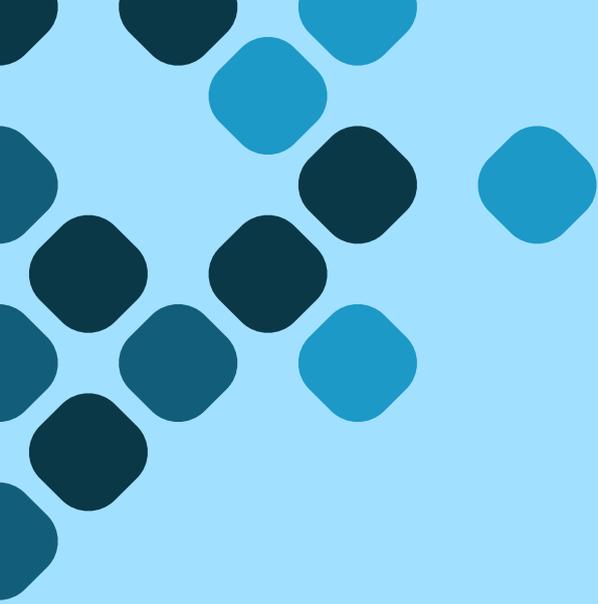# THE INCREASING IMPORTANCE OF
PLATFORM ENGINEERING

Klarrio
STREAMING AHEAD

# TABLE OF CONTENTS

INTRODUCTION

Over the past decades, we have seen significant technological developments, from the rise of broadband internet and a hyperconnected society, to cloud computing, unparalleled data volumes, and the introduction of generative AI.

The IT industry has scrambled to keep pace with these challenges, resulting in numerous frameworks and methodologies. While these offer solutions, they also introduce new operational and organizational challenges in managing all the pieces of the puzzle.

Gaining the upper hand in this digital jungle is one of the many compelling reasons why platform engineering is trending. Gartner predicts that by 2026, 80% of large software engineering organizations will have established platform engineering teams.

Non-technical stakeholders also benefit from platform engineering. A well-implemented platform leads to faster time-to-market, improved cost-effectiveness, increased efficiency and security, happier employees, and better team collaboration.

In this article, we'll explore what platform engineering is, why it's needed, the different forms it can take, the challenges it presents, and how to implement it correctly to empower businesses and maintain control.
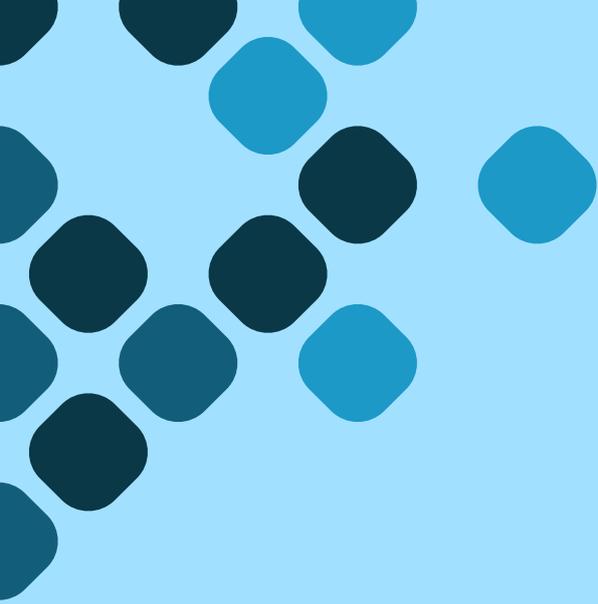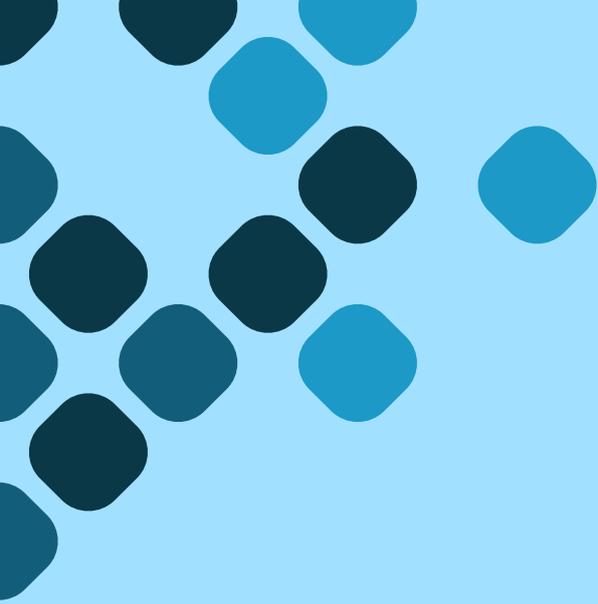
WHAT IS PLATFORM ENGINEERING?

Platform engineering focuses on creating tailor-made, centralized environments with frictionless workflows, empowering IT professionals to focus on their core activities without being distracted by secondary, time-consuming tasks.

For software developers and DevOps this could mean simplifying the increasing complexities of modern software development by providing reusable tools and automated self-service actions that deal with all the moving parts of cloud computing, various architectures, and container orchestration like Kubernetes.

Data engineers also benefit from this platform approach, as it allows them to focus on higher-value tasks instead of time-consuming ones like manually provisioning infrastructure, setting up environments, extracting data from various sources, and configuring access management and observability tools.

Other stakeholders in the data ecosystem will have more autonomy and self-service capabilities in managing data products—securely and compliantly—without endlessly needing to submit tickets to get access, and being reliant on centralized data teams.

WHY YOU NEED PLATFORM ENGINEERING

AN ANTIDOTE TO THE INCREASING COMPLEXITY OF SOFTWARE ARCHITECTURES

Long gone are the days when software development was a relatively straightforward process. Engineers focused on writing code, compiling programs, and running them on simple, hardware setups.

However, as technology has evolved, so too has the complexity of the digital environment and the infrastructure supporting modern applications. It hinders software developers' ability to focus on their core activities.

Platform engineering intends to unify all the pieces of the technology puzzle:

MICROSERVICES ARCHITECTURE:

The shift from monolithic to microservices architecture has increased complexity by introducing smaller, independently deployable components. Each microservice may use different technology stacks and protocols, requiring more intricate orchestration and management.

CLOUD COMPUTING:

The adoption of cloud services adds layers of complexity, including managing multicloud, hybrid cloud in combination with on-premises environments, scaling resources dynamically, and ensuring data consistency across distributed systems.

CONTINUOUS INTEGRATION/CONTINUOUS DEPLOYMENT (CI/CD):

With the adoption of CI/CD to accelerate software delivery, there's a need to manage multiple pipelines, automate testing, and ensure seamless deployment across different environments.

CONTAINERIZATION AND ORCHESTRATION:

Technologies like Docker and Kubernetes facilitate scaling, management of applications, developing an application once and deploying it in multiple environments. These technologies introduce complexity in container orchestration, service discovery, and network configuration.

COMPLEX SCALABILITY DEMANDS:

Modern applications need to scale seamlessly to handle varying loads, requiring complex strategies for load balancing, horizontal and vertical scaling, and resource optimization.

DRIVING BUSINESS VALUE AND KEEPING A COMPETITIVE EDGE

When done right, platforms are powerhouses that bring many advantages to the table:

FASTER TIME-TO-MARKET

Consider Internal Developer Platforms (IDPs). They automate and streamline development, testing, and deployment processes, reducing the time it takes to release software. This speed means businesses can quickly respond to market changes and customer needs, keeping them ahead of the game.

COST EFFICIENCY

Platforms help cut costs in a big way. By automating repetitive tasks and providing reusable components, they reduce the need for manual work, which means lower labor costs and fewer mistakes. Plus, multitenancy implementations with shared resources and services mean companies can make the most of their infrastructure, saving even more money.

ENHANCED COLLABORATION

Platforms bring development, operations, and business teams together by offering a unified environment with common tools and centralized information resources, such as best practices, API guides, and coding standards. This unified portal breaks down silos, so everyone has visibility into the process and can work together effectively. Better collaboration means quicker problem-solving and more innovative ideas.

SCALABILITY AND FLEXIBILITY

A good platform can easily scale to meet growing business demands. Whether it's handling more user traffic, integrating new services, or expanding into new markets, platforms offer the flexibility and scalability needed to support business growth. This adaptability ensures companies can seize new opportunities without major delays or overhauls.

IMPROVED QUALITY AND CONSISTENCY

Platforms enforce standardized practices across teams, ensuring best practices are consistently followed. This leads to higher quality software and more reliable deployments. Automated testing and continuous integration/continuous deployment (CI/CD) pipelines catch issues early in the development cycle, enhancing quality even further.

BETTER SECURITY AND COMPLIANCE

Security and compliance are crucial for any business. Platforms come with built-in security features, multitenancy capabilities, compliance and policy enforcement frameworks that help protect sensitive data and meet regulatory requirements. Centralized management of security policies and automated compliance checks reduce the risk of breaches and ensure standards are met consistently.

EMPLOYEE SATISFACTION

Platforms improve employee satisfaction by reducing the burden of repetitive tasks and enabling developers to focus on more creative and meaningful work. With streamlined processes and automated workflows, employees can achieve more in less time, leading to a greater sense of accomplishment and reduced burnout.

LONG-TERM STRATEGIC VALUE

Investing in platforms isn't just about immediate benefits; it's also about long-term strategic value. Platforms create a strong foundation for future innovation and growth. They allow organizations to build on their existing capabilities, integrate new technologies, and quickly adapt to changing market dynamics. This long-term perspective ensures sustained competitiveness and relevance.
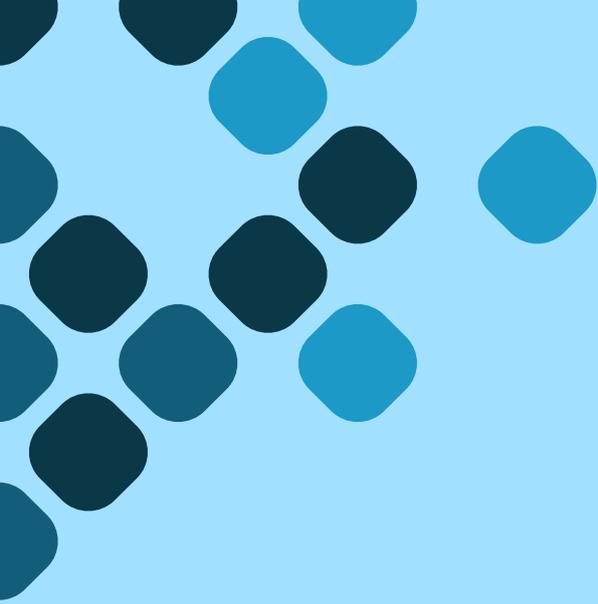
PLATFORMS COME IN MANY FORMS AND SHAPES

04

Platform engineers build unique platforms based on businesses' or organizations' needs. It could be an internal developer platform, a data platform, a mix of both or something entirely different.

While it might seem that platform types are standalone entities, they are often closely intertwined. Think of them as layers or building blocks that can be stacked to create your custom solution.

STREAMLINING SOFTWARE DEVELOPMENT WITH INTERNAL DEVELOPER PLATFORMS (IDPS)

Luckily for software developers, many cumbersome, manual steps in the new digital era can be automated, drastically reducing endless configuration file edits and "it works on my machine" syndromes.

However, smart automation and observability tools, combined with DevOps magic, are not sufficient amidst the increasing complexities of modern software architectures, dozens of frameworks and methodologies.

That's where IDPs come to the rescue. Simply put: you write code, push a button, and your application is deployed, complete with dashboards to monitor performance.

Imagine you're a developer tasked with building a new feature for your company's application.

Without an IDP, you'd need to start with typical preparations like properly setting up the initial infrastructure, software integration and developer pipelines, security services, data storage, logging, and monitoring services.

Now, consider working in a company that has an IDP. As a developer, you can:

START CODING IMMEDIATELY:
You are free to choose pre-configured "golden paths" that best fit your project. They automatically provide all requirements, such as dependencies, libraries, frameworks, and Git repositories. It's an instant solution that ensures everything you need is ready to use.

ENSURE SIMPLIFIED SECURITY:
Rely on pre-configured security protocols and multitenancy configurations that ensure perimeter security and provide tools for maintaining secure coding practices, minimizing the risk of data breaches.

ACCESS RESOURCES:
Easily: Quickly use pre-existing shared services or spin up new instances of databases and other resources with the click of a button, reducing the overhead of managing infrastructure.

UTILIZE INTEGRATED TOOLS:
Benefit from out-of-the-box logging, tracing, and monitoring tools that are already integrated into the platform, providing real-time insights into your application's performance and health.

MAINTAIN CONSISTENCY AND BEST PRACTICES:
Follow standardized tools and workflows enforced by the IDP, ensuring consistency in how applications are developed, tested, and deployed, reducing errors and improving maintainability.

DATA PLATFORMS: THE BEATING HEART OF YOUR DATA ECOSYSTEM

Data platforms are foundational components in the data management ecosystem. They provide a unified framework to collect, store, process, and analyze data. These platforms are designed to handle large volumes of data from diverse sources, ensuring that the data is discoverable, accessible, reliable, and secure.

Compared to developer platforms, data platforms prioritize data and focus on secure data exchanges. In line with industry trends, data is increasingly treated as a product rather than a byproduct. This means data is ready for consumption with formal definitions around ownership, schema, and quality, thus elevating its status within the ecosystem.

DATA PLATFORM CHARACTERISTICS

Key elements of data platforms include:

SECURITY:
Multitenancy allows multiple users or client organizations (tenants) to share a single instance of a shared platform service, with each tenant's data and configurations isolated and secure. The platform enforces and validates security policies and compliance ensuring applications meet requirements.

DATA INGESTION:
The process of importing data from various external sources such as databases, APIs, and real-time streams. Effective data ingestion ensures that data is collected continuously and efficiently.

DATA STORAGE:
Data platforms utilize various scalable storage solutions such as data lakes, data warehouses, and object storage to store vast amounts of structured and unstructured data.

DATA PROCESSING:
This involves offering tools for data transformation, cleansing, and enrichment pipelines. This may involve ETL (Extract, Transform, Load) processes, stream processing, and periodic or event triggered batch processing.

DATA ANALYTICS:
Providing tools and interfaces for analyzing data, ranging from basic reporting and visualization tools to advanced analytics, machine learning, and artificial intelligence.

DATA GOVERNANCE:
Ensuring data quality, security, and compliance through policies, procedures, and technologies that manage data throughout its lifecycle.

DATA ACCESS MANAGEMENT:
Implementing authentication and authorization mechanisms, ensuring data security, and enabling data sharing in a controlled manner.

SCALABILITY AND PERFORMANCE:
They are designed to handle growing volumes of data and increasing numbers of users without performance degradation.

SELF-SERVICE CAPABILITIES:
Democratizing data access and giving autonomy in relevant domains to all experts and relevant stakeholders, not just the technically-skilled IT teams.
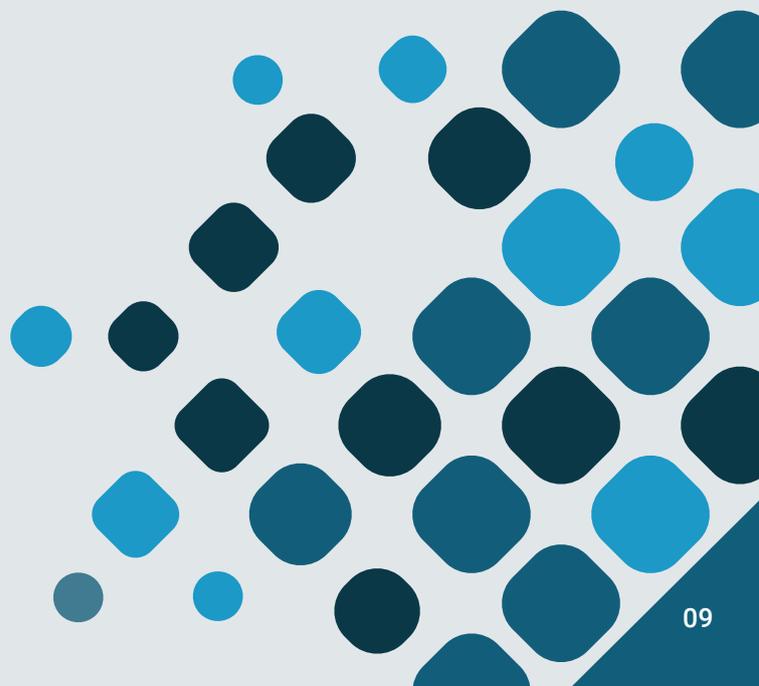
DEMOCRATIZING DATA MANAGEMENT: LEVELING THE PLAYING FIELD WITH SELF-SERVICE CAPABILITIES

Many data platforms offer self-service capabilities, embracing the "data mesh" principle. This approach decentralizes data ownership and management, empowering domain-specific teams within an organization, contrasting with traditional, centralized data architectures.

The data mesh methodology shifts the responsibility for data to the teams that generate and use it. These teams become data product owners and autonomously handle data ingestion, processing, and sharing with other stakeholders.

Because the domain-specific teams no longer rely on a central IT department, this approach enables faster and more responsive data operations, reducing bottlenecks and enhancing overall efficiency.

Robust governance tools are in place to regulate who can view or manipulate data, ensuring enhanced security, data governance, and compliance with both internal policies and external regulations.
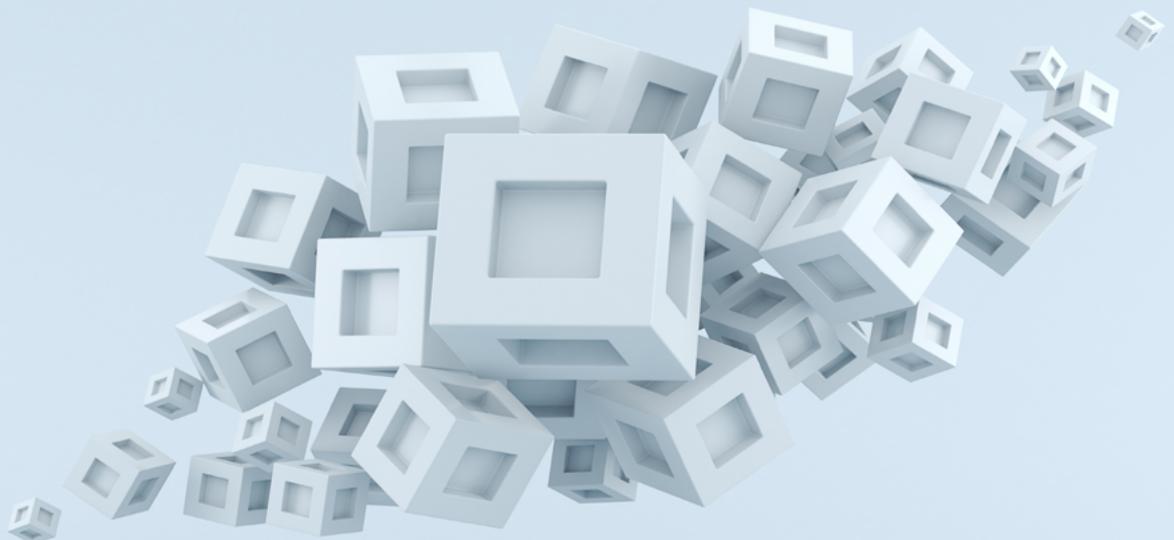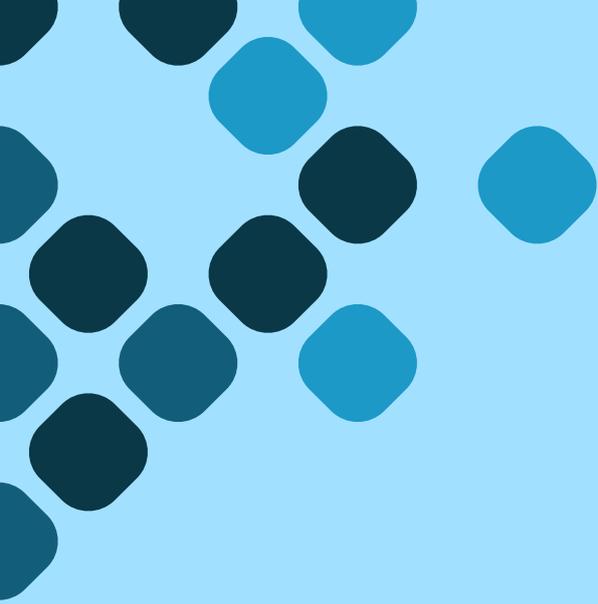
THE CHALLENGES OF PLATFORM ENGINEERING

While platform engineering brings numerous opportunities, it also introduces several challenges:

INTEGRATION

Platform engineering involves integrating a wide range of technologies, data sources, frameworks, and tools. It can be a headache to integrate legacy systems, take care of data transfer and storage across different environments, Ensure data security and compliance with regulations, API compatibility, middleware integration, ...

SOLUTION

Ensure robust architectural planning, effective project management, skilled strategic partners, and continuous improvement practices.

OPEN SOURCE LICENSING

Open source frameworks are highly recommended for cost-efficiency, transparency, optimized performance, and full control over critical components. Open source licensing should also be carefully navigated. Some licensing models prohibit commercial use, while others require you to share enhancements with the community if used commercially. This could affect your intellectual property.

SOLUTION

Make sure to carefully review the license terms and compatibility with other open source licenses and with your project. Some licenses, like the GPL, have strict requirements that might not be compatible with all projects. Use automated tools to scan your codebase for open source components and their licenses.

FINDING THE RIGHT BALANCE BETWEEN FLEXIBILITY AND CONTROL

The concept of streamlined "golden path" workflows is the preferred way of working, providing a standardized and efficient approach. However, this should not prevent developers from using other tools or processes when necessary, allowing for flexibility and innovation within the established framework.

Over-engineering the platform to streamline every process may restrict innovative approaches that deviate from established patterns, potentially stifling creativity and adaptation.

SOLUTION

Create a flexible governance model that defines the core "golden path" while allowing exceptions for innovation. Encourage a culture of experimentation and provide a feedback loop for continuous improvement. Tools like feature flags and sandbox environments can enable safe experimentation without disrupting the main platform.

CULTURAL SHIFT

Moving to platform engineering often requires a cultural shift within an organization. Teams need to embrace new tools and ways of working, which can encounter resistance. In case of self-service platforms, new stakeholders will have more responsibilities and need to gain the necessary knowledge and skills. Therefore, it's essential to provide training and support along the way.

SOLUTION

include training, workshops, and continuous learning opportunities. Foster a culture of collaboration and support. Clear communication about the benefits and support mechanisms in place can help ease the transition and reduce resistance.
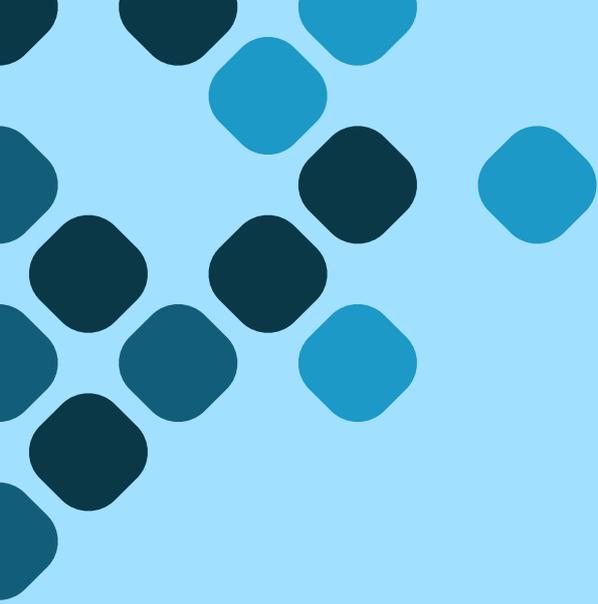
06

HOW TO IMPLEMENT PLATFORMS THE RIGHT WAY:
EMPOWERING BUSINESSES TO STAY IN CONTROL

Platforms come with a significant price tag and will be the foundation of your data-driven operations for many years to come. It's crucial to get it right from the start.

A well-designed platform should ensure not only scalability and performance but also facilitate independence from proprietary services. This empowers businesses to navigate complexities while maintaining control over their critical components.

Businesses that want to control their destinies, should keep the following key elements in mind:

IMPLEMENT SECURITY BY DESIGN

Integrate advanced security measures at every level of your platform architecture. This approach facilitates compliance with stringent data protection regulations, resilience against ever-increasing cyber-attacks, minimized downtime, and guaranteed business continuity. Addressing security issues early in the development process is also more cost-effective than fixing them post-deployment.

GO FOR MULTITENANCY

Multitenancy–where multiple customers (tenants) share the same infrastructure and resources– offers significant cost efficiency, scalability, and simplified maintenance. By sharing infrastructure, companies reduce operational costs and improve resource utilization. It allows for centralized management, streamlined support, and rapid deployment of updates, further enhancing security and compliance.

CONSIDER OPEN SOURCE COMPONENTS

Open source software offers numerous benefits, including transparency, security, avoiding vendor lock-in, maintaining control, cost-efficiency, and ensuring long-term sustainability and flexibility. Open source is the cornerstone of a cloud agnostic approach, ensuring minimal dependence on underlying cloud infrastructure and full customizability.

CHOOSE STRATEGIC PARTNERS WHO EMPOWER YOU

A strategic partner should offer an unbiased approach, prioritizing your business objectives over pushing proprietary products. Equally important is empowerment of your business through knowledge transfer, co-development, and ongoing support. Look for partners with a strong commitment to ensuring your autonomy and a proven track record of building custom, scalable solutions.

ENSURE CLOUD AGNOSTICISM

Cloud agnostic platforms can run seamlessly on any public cloud or private infrastructure, offering flexibility in deployment and cost management. This approach mitigates the risks of vendor lock-in and ensures that your business can leverage the best services available across multiple clouds. It allows businesses to avoid the pitfalls of proprietary cloud services, such as unexpected price hikes or service outages that could disrupt operations.

COMBINE WITH ON-PREMISES SOLUTIONS

While cloud technology offers numerous advantages, combining it with on-premises solutions can create a robust, hybrid infrastructure. This hybrid approach ensures that critical data and applications remain within the control of the business, enhancing security and compliance. It also allows businesses to leverage existing investments in on-premises infrastructure while taking advantage of the scalability and flexibility of the cloud.

PRIORITIZE SCALABILITY

Scalability is a key consideration in platform implementation. As businesses grow and data demands increase, the platform must be able to scale efficiently without compromising performance. Open source solutions and cloud native, cloud agnostic architectures are inherently designed to be scalable, capable of handling large volumes of data and high traffic loads.

A scalable platform ensures that businesses can respond to changing market conditions and customer needs without significant reengineering. It supports the seamless addition of new features and functionalities.

ABOUT KLARRIO

At Klarrio, we design cloud native, cloud agnostic software solutions to empower our customers to control their data, limit cloud costs, and optimize performance. We ensure flexibility for scalable platform building across various cloud and on-premises infrastructures, prioritizing privacy, security, and resilience by design.

We are platform pioneers at heart, with a proven track record in building self-service data platforms, Internal Developer Platforms, log aggregation platforms, and other innovative software solutions in various domains: from Telecom,Transportation & Logistics, Manufacturing, Public Sector, Healthcare to Entertainment.

Beyond technology, we actively collaborate and share knowledge, both in-house and together with our customers. True impact is achieved together.

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Klarrio is specializing in large scale and real-time data processing implementations.
Not only expertise, but more importantly, experience.

We go beyond being a mere software solutions provider for enterprises, embracing openness to let you control your destiny: no vendor lock-in, all open-source, with proactive and sustainable solutions.

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