

TRANSITIONING LEGACY SYSTEMS TO CLOUD-NATIVE ARCHITECTURES: BEST PRACTICES AND CHALLENGES

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ABSTRACT

The transition from legacy systems to cloud-native architectures is becoming a strategic priority for organizations seeking agility, scalability, and cost-efficiency. Legacy systems, although robust, often struggle with limitations such as poor scalability, high maintenance costs, and incompatibility with modern technologies. Migrating to cloud-native architectures offers benefits including improved performance, real-time data processing, and streamlined operations. However, the process is not without challenges. Key concerns include data security during migration, integration with existing systems, and potential downtime or data loss.

Best practices for a successful transition begin with a thorough assessment of the existing infrastructure, followed by identifying workloads suitable for the cloud. Adopting a phased migration strategy, such as lift-and-shift or re-architecting, helps minimize risks. Additionally, leveraging microservices, containers, and DevOps practices enables greater flexibility and operational efficiency in cloud environments.

Challenges such as legacy code incompatibility, skill gaps among the workforce, and governance issues often hinder the migration process. Addressing these challenges requires a combination of staff training, automated migration tools, and robust monitoring systems. Ensuring regulatory compliance and maintaining data integrity further adds complexity to the transition.

Ultimately, successful migration to cloud-native architectures depends on strategic planning, stakeholder alignment, and continuous performance monitoring. Organizations that effectively manage the shift can unlock new opportunities for innovation, enhance customer experience, and achieve long-term business growth. This study explores best practices and common challenges in transitioning legacy systems, aiming to provide actionable insights for organizations embarking on their cloud modernization journey.

KEYWORDS: *Legacy Systems, Cloud-Native Architectures, Migration Strategies, Microservices, Containers, DevOps Practices, Scalability, Data Security, Operational Efficiency, Regulatory Compliance, Digital Transformation*

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