Cloud-native Application Development For Delivering Customer Centricity

CONTENTS:

Introduction

As technology evolves, companies are using newer approaches than ever before to stay competitive. Hyper personalization of products or services to suit an individual's needs, analyzing customer behavior and buying patterns, and providing seamless experiences across multiple platforms are popular ways that most businesses have adopted. Using cloud-native as an approach to speed up application development & deployment is another.

For IT leaders, the priority is to keep up and adopt constantly evolving technologies available in the market. They are under pressure to think differently and invest in agile capabilities that help them meet the business demand, go to market faster, and get the work done for less.

The purpose of this white paper is to emphasize how cloud-native development is not just an approach to migrate or develop applications on the cloud, but can also help companies deliver business value and improve customer experience in a changing environment.

> **The white paper describes how cloud-native development can improve CX, enhance adaptability, foster innovation, deliver business value, and build trust with end-customers. It provides the approach that is recommended for cloud-native application development and an example of how a leading online recruitment services provider used Amzur's cloud-native solution to enhance speed to market and overcome hiring challenges.**

This white paper is meant for the Chief Information Officer, Chief Technology Officer, Director of Application Development, Director of IT, Vice President of IT, Vice President of Application Development who have an active IT transformation strategy or are working towards putting one in place for software modernization projects.

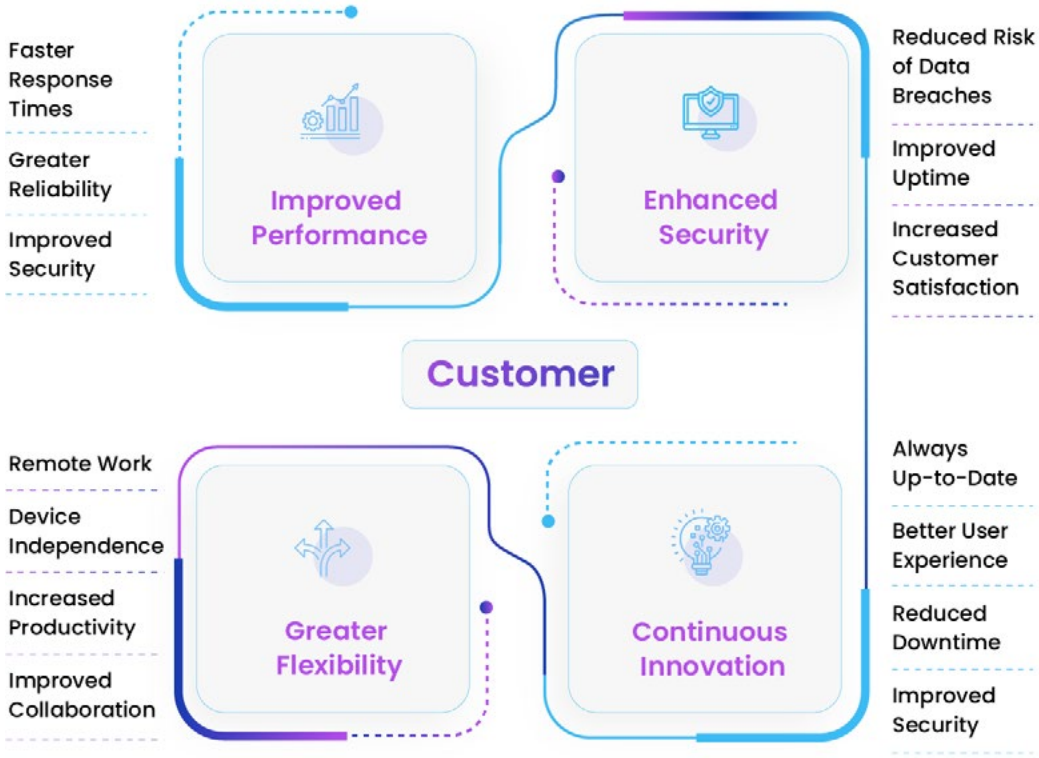
What Is Cloud-Native And What It Is Not

Building and deploying applications on the cloud can be done in three different ways: **cloud-native, cloud-based, and cloud-enabled**. Cloud-native applications are built from the ground up to run in a public cloud, using cloud-based technologies such as Containers, Service Mesh, Kubernetes, APIs, and Continuous Integration (CI) and Continuous Delivery (CD) tools.

Applications that use some of the features of the cloud but aren't entirely redesigned to use cloud services are known as cloud-based applications. Cloud-enabled applications are traditionally built applications that have been migrated to the cloud. While refactored to use virtual resources, the underlying architecture remains the same, limiting the application's scalability and resilience.

	Cloud-Native	Cloud-Based	Cloud-Enabled
DEFINITION	Applications built from scratch to run in a public cloud using cloud-based technologies.	Applications that leverage some cloud capabilities but not completely redesigned to use cloud services.	Traditional applications migrated to the cloud, refactored to use virtual resources.
ARCHITECTURE	Designed from the ground up with microservices, containers, and orchestration to take advantage of the cloud's flexibility and scalability.	Architecture remains mostly the same as on-premise systems, but with some cloud components and services added to enhance scalability and availability.	Refactored to use virtual resources, but the underlying architecture remains mostly the same, limiting scalability and resilience.
SCALABILITY	Highly scalable and elastic, with automated scaling capabilities and distributed infrastructure.	Scalability is limited by the original application architecture and the extent of cloud services used.	Scalability is limited by the original application architecture, making it difficult to take full advantage of the cloud's scalability.
RESILIENCY	Resilient and fault-tolerant, with automated recovery capabilities.	Resiliency is improved by leveraging cloud services, but not as resilient as cloud-native applications.	Resiliency is limited by the original application architecture, making it difficult to take full advantage of cloud resiliency.
MAINTENANCE	Low maintenance, with automated operations and self-healing capabilities.	Less maintenance than on-premise systems, with cloud service providers handling the infrastructure.	Requires more maintenance and refactoring effort than cloud-based or cloud-native applications.
FLEXIBILITY	Highly flexible and adaptable, with the ability to rapidly deploy new features and services.	Some flexibility, but limited by the original application architecture and the extent of cloud services used.	Limited flexibility due to the limitations of the original application architecture.
COST	Pay-as-you-go pricing, with no upfront capital expenditure and reduced operational costs.	Reduced infrastructure costs, but may require additional licensing costs for cloud services.	Reduced infrastructure costs, but may require additional licensing costs for cloud services.

Benefits That Customers Get From Cloud-Native Applications



IMPROVED PERFORMANCE:
Cloud-native applications are typically more scalable and performant than traditional on-premises applications. This is because cloud-native applications can easily be scaled up or down to meet demand, and they can take advantage of the latest cloud computing technologies. This can lead to a better user experience for customers.

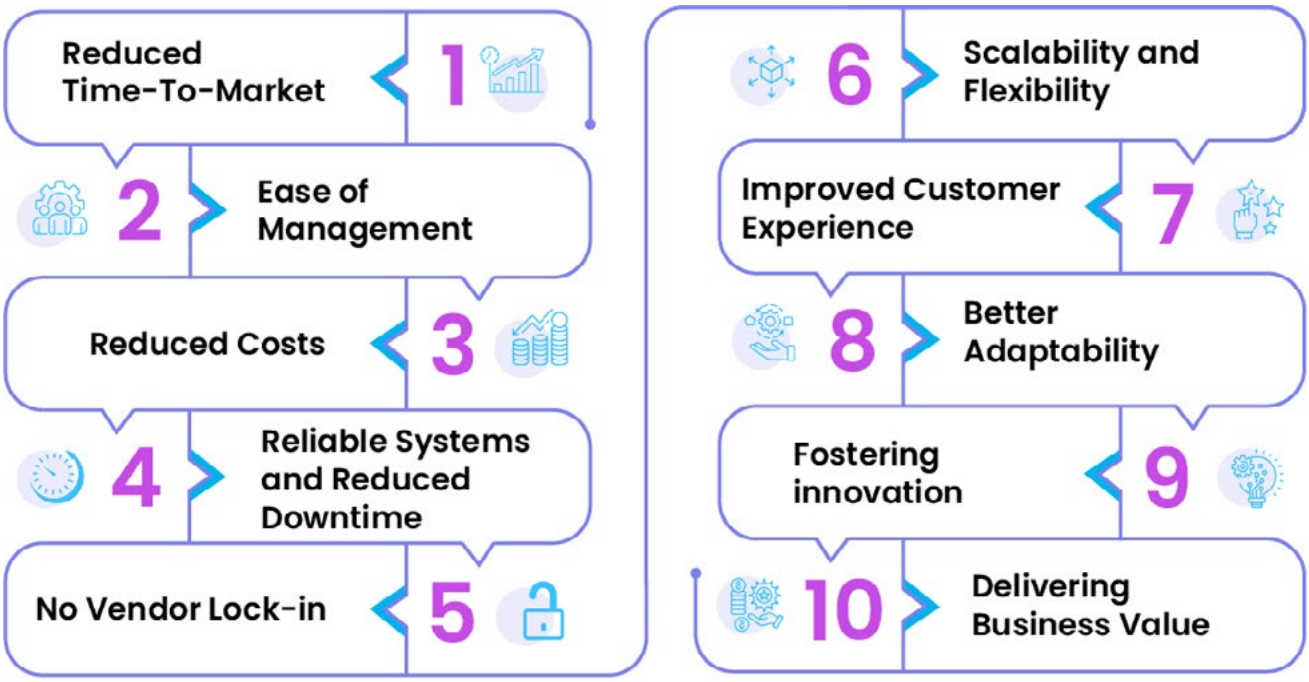
ENHANCED SECURITY:
Cloud-native applications can be more secure than traditional on-premises applications. This is because cloud-native applications are built using security-by-design principles. They are also typically hosted in secure cloud environments, which are monitored 24/7 by security professionals. This can help businesses protect their data and applications from cyber attacks.

GREATER FLEXIBILITY:
Cloud-native applications can be accessed from anywhere, on any device. This gives end users the flexibility to work from anywhere, at any time.

CONTINUOUS INNOVATION:
Cloud-native applications can be updated and improved more frequently than traditional on-premises applications. This means that end users can always have access to the latest features and functionality.

Business Advantages Of Using Cloud-Native Development

Most IT leaders today recognize cloud-native application development as means to build and update error-free applications in a scalable environment—be it in public, private, or hybrid clouds.



01 Reduced Time to Market:

In today's fast-paced, ever-changing business world, getting products to market quickly is essential for success. By reducing the time to market, businesses can gain a competitive edge and capture a larger share of the market. According to a recent study by IBM, more than **70% of development managers, IT executives, and developers believe that cloud-native principles can help to achieve faster development and launch times**.

EXAMPLE:
Using Kubernetes, the U.S. Department of Defense reduced the time of its releases from 3-8 months to a week. The department ripped the benefits of cloud-native security and system velocity after the upgrade. With total time savings of 100+ years across 37 programs, the project powered DevSecOps on F-16s and large armored warships.

02 Ease of Management:

Cloud-native services make infrastructure management simpler. Serverless platforms do not require configuring on-premises networking, planning for storage, or provisioning cloud instances. As cloud-native platforms and their infrastructure became more popular, the concept of Infrastructure as Code (IaC) gained traction. This allowed companies to reduce the time it takes to set up infrastructure and better utilize their existing human resources, which would have otherwise been spent on manual IT infrastructure management.

EXAMPLE:
Cloud-native solution transformed the way of doing business for an online video streaming service Mux, whose workflows had many moving components. To juggle such a setting, the company utilized Docker containers at the start, using the Rancher stack for orchestration. However, it experienced stability issues related to networking. Thus, it switched to Kubernetes to fuel productivity in management and version deployments.

03 Reduced Costs:

The majority of businesses spend **80%** of their IT budget on maintaining existing infrastructure, leaving little room for innovation. At the same time, **30%** of data center capacity goes unused. Cloud-native computing can help businesses free up resources by automating infrastructure management and scaling resources up or down as needed. This frees up budget for innovation and new initiatives.

EXAMPLE:
Smart Cards decided to implement a reliable cloud solution as a part of its digital transition journey. Using DevOps best practices, extensive knowledge of Docker containers and Kubernetes, Infopulse created a custom-built cloud solution, helping the client with automated software delivery and speed up time to market. The project brought a French software and hi-tech production company 80,000 EUR of savings.

04 Reliable Systems and Reduced Downtime:

Cloud-native applications are designed with security in mind, making them more resilient to cyber attacks. In the event of a breach, businesses can more easily isolate and contain the damage to a single container, while the rest of the application remains unaffected. This is due in part to the use of container orchestrators, which allow for centralized management and control of containers.

Additionally, the portability of cloud-native software makes it easy for developers to migrate applications to different environments within the cloud, which can help to mitigate the impact of outages or other disruptions.

EXAMPLE:
HubSpot scaled tremendously after it doubled production load and number of databases without any changes made to team headcount. Willing to build upon existing MySQL operational knowledge, a top-tier CRM platform opted for Kubernetes adoption that allowed it to quickly update databases that used to take days before. After automation, the downtime due to system crashes only lasts seconds.

05 No Vendor Lock-in:

Third-party service providers often make changes to their policies or upgrade their services without giving customers a say in the matter. This can be a problem for businesses that rely on these services, as they may be forced to accept new terms or pay higher prices. However, businesses that use cloud-native software are not at the mercy of third-party providers. They can switch to a different support vendor if they are unhappy with the service they are receiving. Additionally, cloud-native software is designed to be interoperable with other community software, so businesses can choose the tools that best meet their needs.

EXAMPLE:
A Czech FinTech company serving Forex brokers and their global clients had to migrate all of their microservices from the PaaS provider solution to Docker containers and Kubernetes (EKS) after their provider announced that it would be changing its service prices within a quarter. The software vendor they chose to help with the changes integrated CI/CD to their new Kubernetes-powered platform on AWS, utilizing their CircleCI pipeline and GitHub. The transformation lasted less than 3 months, helping the FinTech business to avoid a vendor lock-in.

06 Scalability and Flexibility:

A survey by IBM found that **75% of respondents believe that cloud-native computing gives them the flexibility to make improvements to their applications in real time.** This ability to make ad-hoc changes to performance allows businesses to better meet the changing demands of their customers.

EXAMPLE:
Slack solved the problem of manually dealing with its hosts, operating the legacy configuration that was no longer coping with the growing number of MySQL queries per second. The company chose Vitess clustering system that allowed it to keep working with MySQL and hosting its own instances using AWS. The project enabled the company to handle about 500,000 queries per second at peak and lower the connection latency to 1 millisecond in general.

07 Improved Customer Experience:

Companies that can quickly adapt their solutions to meet the evolving needs of their customers are more likely to succeed. These businesses will attract and retain the most valuable customers, who appreciate a customer-centric experience. Cloud-native tools make continuous delivery possible, which allows engineers to release software and app updates in short, frequent cycles.

08 Better Adaptability:

Modern technology is built on composable architecture, which enables efficient and agile development. As new tools and features are constantly being created, composable architecture allows businesses to adapt to the cloud-native world. For example, a feature-rich conversational AI bot for supporting banking customers can be enabled using the cloud-native approach in weeks.

09 Fostering Innovation:

Innovation is key to staying ahead of the competition. Cloud-native applications encourage innovation because they are easier and faster to develop, which allows businesses to experiment with new business approaches and respond quickly to changing market demands.

10 Delivering Business Value:

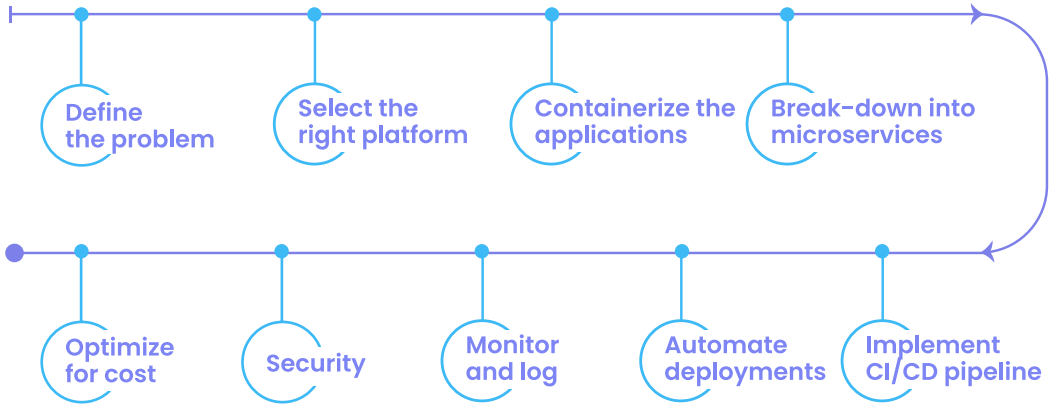
Cloud-native application development can deliver higher business value by reducing costs, improving performance, and increasing agility. Cloud-based solutions can help businesses to reduce costs by eliminating the need to invest in and maintain their own infrastructure. They can also help to improve performance by providing access to scalable and reliable infrastructure. Additionally, cloud-based solutions can help businesses to increase agility by making it easier to develop, deploy, and update applications.

Recommended Approach For Cloud-Native Application Development

Not all companies are able to get the right approach and strategy to cloud-native application development. They often struggle to implement, scale, and realize the full potential of their investment.

Amzur's cloud-native application development addresses the challenges faced by companies using tried and tested methods. We have articulated a high-level delivery journey enabled by cloud-native application development mentioned below.

Cloud-Native Application Development Approach



DEFINE THE PROBLEM:
Amzur recommends that IT leaders start by defining the scope and goals of their project by identifying the business requirements and the problem that they want to solve.

SELECT THE RIGHT PLATFORM:
IT leaders should then choose the platform that best suits their needs. They should evaluate their decision based on factors such as performance, cost, scalability, and security.

CONTAINERIZE THE APPLICATIONS:
Amzur recommends that IT leaders containerize their applications for easier deployment and management. Containers provide consistency and portability across different environments.

BREAK-DOWN INTO MICROSERVICES:
For easier deployment and management, Amzur recommends that applications are broken down into small, independent, and scalable services. This also improves resilience and fault tolerance.

IMPLEMENT CONTINUOUS INTEGRATION AND CONTINUOUS DEPLOYMENT (CI/CD):

Using CI/CD pipelines, IT leaders should automate the build, testing, and deployment of their code. This helps in reducing errors and improving the speed of delivery.

AUTOMATE DEPLOYMENTS:

Using tools such as Kubernetes, Terraform, or Ansible, IT leaders should automate the deployment of their containers to the cloud. Automating deployments helps to reduce errors and improves the speed of delivery.

MONITOR AND LOG:

Amzur recommends that applications be monitored for performance, errors, and security issues, using tools such as Prometheus, Grafana, and ELK. Logging and monitoring help with faster identification and resolution of issues.

SECURITY:

Amzur recommends that security best practices be implemented throughout the development process, including secure coding practices, access controls, and encryption.

OPTIMIZE FOR COST:

IT leaders should consider optimizing the use of cloud resources to minimize cost while ensuring that performance and availability meet their requirements.

AWS As A Hyperscaler Platform For Better Application Performance, Wider Reach, And More

AWS as a ready-to-use and scalable cloud infrastructure allows companies to experiment, build, innovate, and run applications, with agility while helping manage costs. Amzur has leveraged the platform for quickly building, deploying, and scaling applications.

Here's an example of how Amzur's client benefited by using AWS including increased operational efficiency and wider reach.

Case Study:

THE NEED:

Time is invaluable. Database management and enhanced candidate experience are equally important in the recruitment industry. Delayed hiring can impact project development and business growth.

eTeki - a leading online recruitment services provider, wanted to develop a video-based recruitment-as-a-service platform that can considerably save time and cost for employers and candidates.

eTeki struggled with numerous challenges, including:

- A poor data modeling and storage system
- Expensive & time-consuming data backup solutions
- Instances running at higher capacity resulted in increased operational costs
- Issues with security for managing databases & instances

eTeki was looking for a strategic partner to help build and manage their recruitment platform with customized BI reports.

THE SOLUTION:

Amzur has wide experience in developing HRTech, application development, and offering Cloud solutions. For an effective virtual candidate assessment and skills evaluation, Amzur developed an AWS cloud-based video interviewing platform backed by a Product Information Management (PIM) system for eTeki. The cloud solution ensures an optimized environment with better cost management and allows eTeki to revisit a candidate's profile later, thus promising them the best talent evaluation and acquisition.

The PIM environment acts as the mainstay for any interview and Amzur was successful in helping eTeki build the PIM environment on AWS enabling fast end-to-end product onboarding and simpler asset management. Our operations include provisioning, upgrading, and managing the infrastructure for PIM AWS Accounts in all environments (TST, QA, and PROD).

Features of the Solution:

- Infrastructure built using Infrastructure as Code (IaC) templates
- Adherence to IT Service Management (ITSM) practices, Security standards, and AWS best practices
- Automated Deployment
- Agile standards followed for Infrastructure development
- AWS Secrets Manager to enhance the security of the keys/secrets stored while eliminating manual effort for password management
- Automated Monitoring Reports for Resource Utilization and Elastic Load Balancer (ELB) Alarms
- Introduced Virtual Private Cloud (VPC) endpoints to secure the data transfer between Amazon Elastic

THE BENEFITS:

We built a solution that can benefit eTeki in numerous ways including,

- Reduced Product-to-Market time from **10 days to 10 minutes**.
- Backup duration reduced from **48 hours to 2 hours** with AWS backup service.
- Improved performance of the PIM due to migrating to Nitro-based Instances and **50% cost savings** due to the reserved instance purchase.
- Overall solution has given at least **85% savings per month**.

Amzur's AWS cloud development helped eTeki overcome hiring challenges with a customized and scalable video interviewing platform. Our solution is helping them through live video streaming, customization, and automation of promotional as well as transaction-related emails to customers.

Afterword

Cloud-native application development is an approach that will be extensively used to build the next generation of applications. Developing applications using this approach increases agility (faster build and deployment), thereby reducing time to market.

Whether the requirement is the development of new applications, or the modernization of existing/ legacy applications, adopting the approach of cloud-native development holds significant benefits as compared to other methodologies.

In order to succeed in a rapidly evolving software-driven market, Amzur believes companies must change the way they design, build, and use applications. They should also consider a new platform to enable improvements and deliver higher-quality apps with greater agility.

Why Amzur

- Strong Experience in designing, architecting, developing, and managing hyper-scale cloud applications.
- Diverse expertise in e-commerce, Healthcare, HR-Tech, IoT, Clean-Tech, and Energy.
- Metrics-driven and focused on improvement with measurements.
- Delivers enhanced business value through continued focus on improvements.

ABOUT US

Amzur Technologies, a pioneer in digital and technological transformation, is committed to bridging the gap between emerging technological advancements and their practical business applications. As an ISO 9001:2015, ISO 27001:2013, SOC 2 Type II certified, GDPR and HIPAA-compliant company, we are at the forefront of delivering on transformation objectives for businesses across various sectors. Our core mission is to accelerate the productivity, efficiency, and competitive edge of our clients in the dynamic digital landscape. By harnessing innovative IT solutions and sourcing elite global talent, we enable businesses of all sizes to leverage digital innovation for sustained progress and success. Amzur democratizes access to state-of-the-art technologies, enabling seamless integration and growth at scale.

Address: 2807 W Busch Blvd, Suite 110, Tampa, FL 33618

www.amzur.com

Contact: +1(813) 600 4060 | marketing@amzur.com

AMZUR TECHNOLOGIES

© 2023 Amzur Technologies, Inc. All Rights Reserved.