

WEEK 6: USE CASES & REAL-WORLD APPLICATIONS



WORKFORCE DEVELOPMENT



Content Usage Parameters

Content refers to material including instructor guides, student guides, lab guides, lab or hands-on activities, computer programs, etc. designed for use in a training program



1

Content is subject to
copyright protection

2

Content may only be
leveraged by students
enrolled in the training
program

3

Students agree not to
reproduce, make
derivative works of,
distribute, publicly perform
and publicly display in any
form or medium outside of
the training program

4

Content is intended as
reference material only to
supplement the instructor-
led training

RECAP: WEEK 5

Global Data Centers & Azure Architecture Center

Extensive Network: Azure operates a vast network of data centers worldwide, enabling global reach and redundancy.

High Availability: These data centers are designed to ensure high availability and reliability for Azure services.

Storage Services

Blob Storage: Unstructured data storage solution for various types of data.

File Storage: Managed file shares accessible via standard protocols.

Compute Services

Virtual Machines: Azure provides scalable virtual machines that can be adjusted based on workload demands.

App Services: Offers a platform for building, deploying, and scaling web applications efficiently.

Networking Services

Virtual Networks: Enable secure communication between Azure resources.

VPN Gateway: Connect to on-premises workloads

- Week 1-2: Introduction to Cloud Technology
- Week 3-5: Cloud Strategy and Architecture
- Week 6-7: Use Cases and Real-World Applications
- Week 8-9: Benefits and Value Proposition
- Week 10-12: Challenges and Risks
- Week 13-14: Interactive Simulations and Practical Exercises
- Week 15: Course Review and Final Assessment

WEEK 6 OVERVIEW

Use Cases:

BCDR, Big Data and Analytics, IoT and Edge Computing, AI and ML, Dev Ops, Industry-specific solutions

Objectives:

Understand strategic cloud adoption reasons, explore Azure support, learn about different use-cases.

WHAT IS BCDR

Definition of BCDR: BCDR stands for Business Continuity and Disaster Recovery—a holistic approach to ensuring operational resilience.

Business Continuity (BC): Focuses on maintaining critical business functions during unexpected disruptions.

Disaster Recovery (DR): Involves plans and processes to restore IT systems and data after a disaster.

Key Components: Includes proactive planning, risk assessment, backup solutions, and recovery protocols.

Importance for Business: Minimizes downtime, safeguards data, maintains customer trust, and ensures regulatory compliance.

BENEFITS TO BUSINESS



High Costs: Traditional on-premises BCDR involves significant capital investments in hardware, plus ongoing expenses for maintenance, power, cooling, and physical space.

Operational Complexity: Managing multiple disparate systems and manual processes increases administrative overhead and complicates coordination among teams.

Limited Scalability: Traditional setups struggle to scale quickly in response to business growth or sudden surges in demand, leading to inefficiencies.

Extended Recovery Times: Manual recovery processes often result in prolonged downtime, delaying the restoration of critical functions after a disaster.

Lack of Flexibility: These systems are less adaptable to evolving business needs and emerging technologies, making it hard to update or modify recovery plans.

HOW AZURE HELPS WITH BCDR

Cost Efficiency: Pay-as-you-go pricing with Microsoft Azure reduces capital and operational costs.

Simplified Operations: Automated backup and recovery with Azure Backup and workload replication with Azure Site Recovery.

Scalable Resources: Elastic compute, storage, and networking allow quick scaling to meet varying demands.

Reduced Recovery Time and High Availability: Automated failovers with Azure Site Recovery and use of Availability Zones for resilience.

Enhanced Flexibility: Wide range of Azure services for customization and easy integration with new technologies.

AZURE BCDR SERVICES



Azure Backup: Data protection for cloud and on-premises environments.

Azure Site Recovery: Workload replication for failovers to another region.

Availability Zones: High availability within a region through physically separated data centers.

Azure Storage GRS: Data redundancy across multiple regions for storage.

Azure Monitor: Monitoring and alerting to detect and respond to disruptions.

USE CASE: E-COMMERCE BCDR WITH AZURE

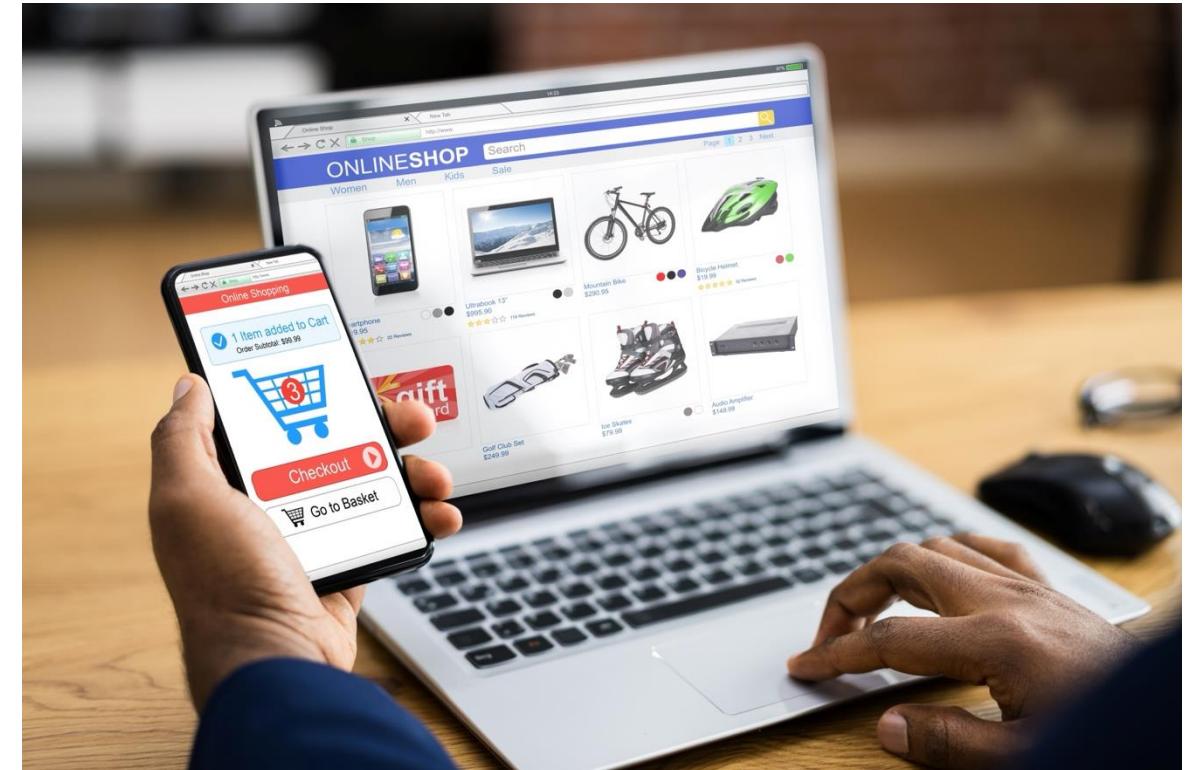
Company: A leading e-commerce platform with millions of daily users.

Problem: A regional power outage threatened to disrupt their primary data center, risking customer experience and revenue.

Solution: Implemented a comprehensive BCDR strategy using Azure Site Recovery, Azure Backup, and Azure Monitor.

Result: Failed over to the secondary region within 30 minutes, ensuring minimal disruption.

Benefits: Maintained customer trust, preserved revenue, and demonstrated the importance of cloud-based BCDR.

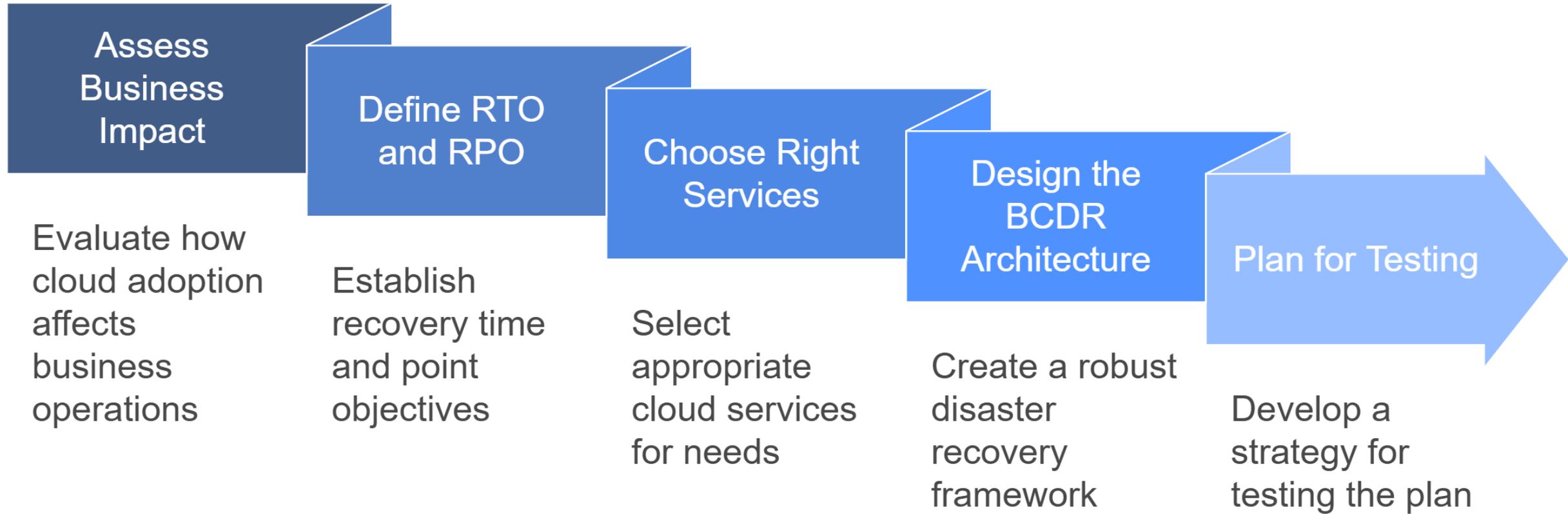


BEST PRACTICES FOR CLOUD BCDR



- Define Business Impact and Prioritization
- Set RTO and RPO
- Use Cloud-Native Services
- Implement Multi-Region Strategy
- Regular Testing and Training

PLANNING YOUR BCDR STRATEGY

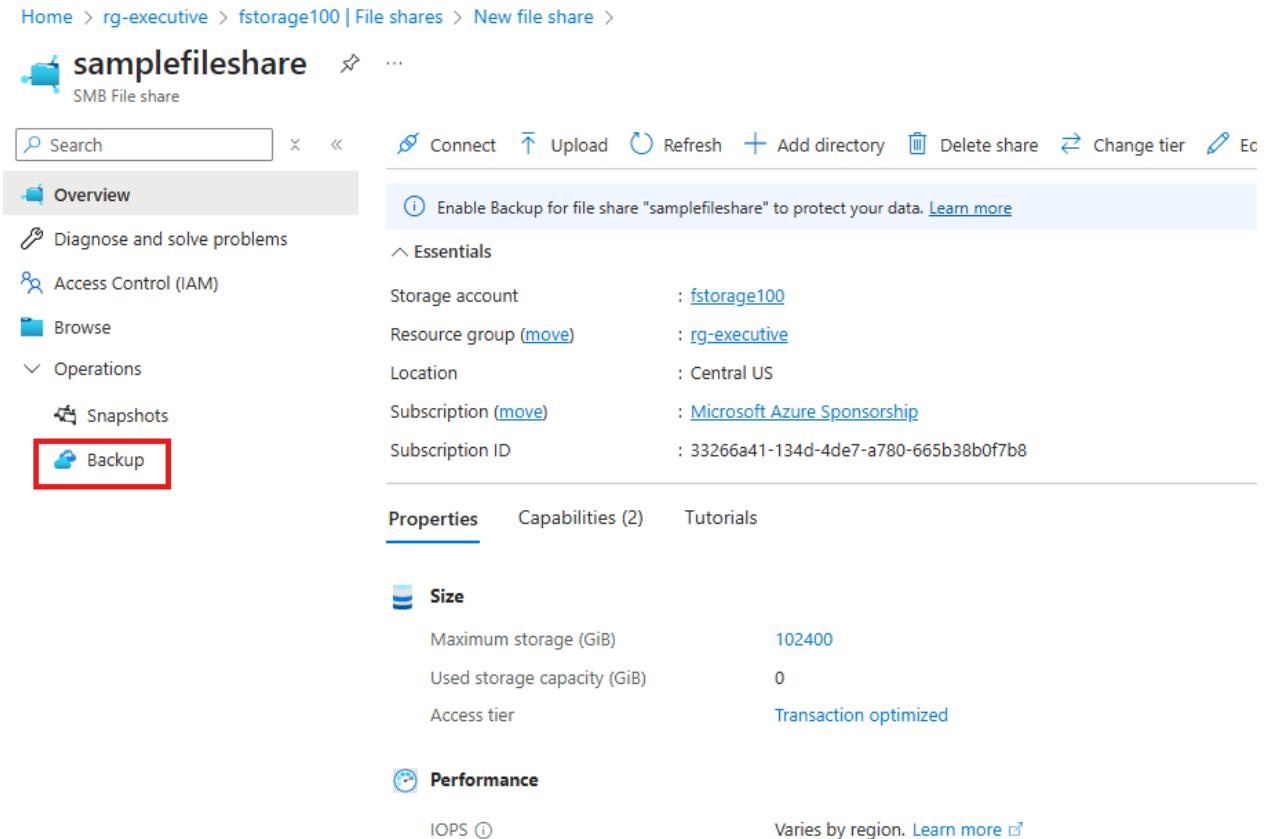


PLANNING - STRATEGIC BENEFITS TO LEADERSHIP

Planning Step	Description	Strategic Benefit for Leaders
Assess Business Impact	Identify critical applications and data	Ensures resource allocation aligns with business goals
Define RTO and RPO	Set recovery time and point objectives	Maintains operational efficiency and customer satisfaction
Choose Right Services	Select Azure services like Site Recovery, Backup	Provides cost-effective, scalable solutions
Design the BCDR Architecture	Plan regions, zones, and redundancy	Ensures global compliance and resilience
Plan for Testing	Schedule regular tests to validate the plan	Minimizes failure risk, preserves customer trust

DEMO: HOW TO BACKUP AZURE FILE SHARES

Open the file share in the Azure Portal and select Backup



The screenshot shows the Azure portal interface for managing a file share. The top navigation bar includes 'Home', 'rg-executive', 'fstorage100 | File shares', 'New file share', and a back arrow. The main title is 'samplefileshare' (SMB File share). The left sidebar has a 'Search' bar and links for 'Overview', 'Diagnose and solve problems', 'Access Control (IAM)', 'Browse', 'Operations' (with 'Snapshots' and 'Backup' sub-links), and 'Backup' (which is highlighted with a red box). The right panel displays 'Essentials' information: Storage account (fstorage100), Resource group (rg-executive), Location (Central US), Subscription (Microsoft Azure Sponsorship), and Subscription ID (33266a41-134d-4de7-a780-665b38b0f7b8). Below this are sections for 'Properties' (selected), 'Capabilities (2)', and 'Tutorials'. Under 'Properties', there are 'Size' and 'Performance' sections. The 'Size' section shows Maximum storage (102400 GiB) and Used storage capacity (0 GiB). The 'Performance' section indicates IOPS (Varies by region) and Access tier (Transaction optimized).

DEMO: HOW TO BACKUP AZURE FILE SHARES

Create or select an existing Azure Recovery Services vault

Welcome to Azure Backup for Azure file shares
Simple and reliable file share backup to the cloud. [Learn more.](#)

Review the following information and click on 'Enable backup' to start protecting your file share.

To protect file shares in another subscription, ensure to register Microsoft.RecoveryServices in the file share's subscription. Please note cross-subscription backup feature is in preview.

Recovery Services vault [\(i\)](#)

Create new Select existing

vault187

Subscription [\(i\)](#)

Microsoft Azure Sponsorship

Resource group

rg-executive

[Create new](#)

(new) DailyPolicy-m8g7c5xi [Edit this policy](#)

Choose backup policy [\(i\)](#)

Policy Details

Full backup

Backup frequency

Daily at 7:30 PM UTC

Retention of daily backup point

Retain backup taken every day at 7:30 PM for 30 Day(s)

Storage account lock [\(i\)](#)

Enabled

Configuring backup of this file share will automatically enable soft-delete for all file shares in the response.

[Enable backup](#) [Cancel](#)

DEMO: HOW TO BACKUP AZURE FILE SHARES

If required, edit the backup policy.

Create policy
Azure File Share

Policy name

Backup tier Snapshot
 Vault-Standard (Preview)

This configuration retains backups as snapshots in the same storage account as the backed-up file share. We recommend choosing 'vault standard' for enhanced protection and longer retention. [Learn more](#)

Backup schedule

Frequency * Time * Timezone *

Snapshot retention

Retention of daily backup point
At For Day(s)

Retention of weekly backup point
Not Configured

Retention of monthly backup point
Not Configured

Retention of yearly backup point
Not Configured

OK

DEMO: HOW TO BACKUP AZURE FILE SHARES

The screenshot shows the Azure Backup service interface for an Azure file share. The top navigation bar includes options like 'Backup now', 'Restore Share', 'File Recovery', 'Resume backup', 'Stop backup', 'Delete backup data', 'Restore To Secondary Region', 'Undelete', and 'Feedback'. Below this, the 'Essentials' section provides key information:

Recovery services vault : vault-m8g79hc7	Last backup status : ⚠ Warning (Initial backup pending)
Subscription (move) : Microsoft Azure Sponsorship	Item state : Active (Last sync time: 3/19/2025, 10:36:14 AM)
Subscription ID : 33266a41-134d-4de7-a780-665b38b0f7b8	Backup policy : DailyPolicy-m8g79hi
Alerts (in last 24 hours) : View alerts	Item type : Azure file share
Jobs (in last 24 hours) : View jobs	Storage account : fstorage100

Below the essentials, there's a section for 'Recovery points' which indicates 'No restore points available.'

Click on the Enable Backup button and wait for deployment to complete.

DEMO: HOW TO BACKUP AZURE FILE SHARES



Backup now Restore Share File Recovery Resume backup Stop backup Delete backup data Restore To Secondary Region

You can perform the following actions after setting up backup and recovery:

- Run a backup
- Restore a file share from a backup
- Stop or resume a backup
- Delete backup data
- Restore backups to a secondary region
- View backup jobs

ADDITIONAL RESOURCES FOR BCDR

[Business continuity and disaster recovery - Cloud Adoption Framework | Microsoft Learn](#)

[High availability and disaster recovery concepts in SharePoint Server - SharePoint Server | Microsoft Learn](#)

[Arizona Department Of Education - Veeam Customer Story](#)

[Azure to Azure disaster recovery architecture in Azure Site Recovery - Azure Site Recovery | Microsoft Learn](#)

POP QUIZ:

Which of the following is a key advantage of cloud-based BCDR solutions compared to traditional on-premises solutions?

- a) Higher upfront costs
- b) Limited scalability
- c) Reduced recovery time
- d) Increased operational complexity



POP QUIZ:

Which of the following is a key advantage of cloud-based BCDR solutions compared to traditional on-premises solutions?

- a) Higher upfront costs
- b) Limited scalability
- c) Reduced recovery time**
- d) Increased operational complexity



POP QUIZ:

What is a key challenge of traditional on-premises BCDR solutions?

- a) Lack of flexibility
- b) Low initial investment
- c) High scalability
- d) Automated recovery processes



POP QUIZ:

What is a key challenge of traditional on-premises BCDR solutions?

- a) Lack of flexibility
- b) Low initial investment
- c) High scalability
- d) Automated recovery processes**



WHAT IS BIG DATA



BIG DATA CHARACTERISTICS & STRATEGIC IMPLICATIONS

Characteristic	Description	Strategic Implication for Leaders
Definition	Large, complex datasets beyond traditional tools	Requires advanced systems like Azure for management
Volume	Massive scale of data generated daily	Enables tracking of large-scale operations
Velocity	Rapid generation and processing speed	Supports real-time decision-making
Variety	Diverse data types (structured, unstructured)	Provides comprehensive business insights
Strategic Value	Drives insights, decisions, and innovation	Enhances competitiveness and customer experience

IMPORTANCE OF BIG DATA

Data-Driven Decision Making: Transforms raw data into actionable insights, enabling informed choices.

Competitive Advantage: Provides an edge over competitors by leveraging data for strategic decisions.

Customer Insights: Allows businesses to personalize experiences and improve customer satisfaction.

CHALLENGES WITH ON-PREMISES DATA SOLUTIONS



What are the main challenges of on-premises big data solutions?



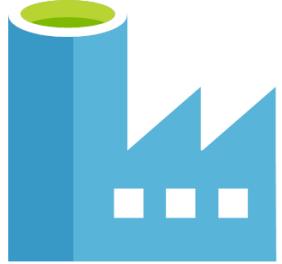
HOW CLOUD ENABLES BIG DATA ANALYTICS

Elastic Compute Resources: Ability to scale resources up or down based on demand.

Managed Services: Cloud providers handle infrastructure management, reducing operational burdens.

Cost Efficiency: Pay-as-you-go pricing models eliminate the need for large upfront investments.

OVERVIEW OF AZURE'S BIG DATA SERVICES



Azure Stream
Analytics



Azure Data Lake



Azure
Synapse
Analytics



Azure Databricks

SAMPLE USE CASE

Company: Global retailer with vast customer data

Challenge: Needed insights from sales and supply chain

Solution: Migrated to Azure Synapse and Data Lake

Outcome: Improved inventory and personalized marketing

Benefit: Boosted sales by 15% and cut costs by 10%



TRENDS IN CLOUD-BASED BIG DATA

AI Integration: Combining big data with AI—like Azure AI Foundry —enables predictive analytics, forecasting trends like customer churn or demand spikes.

Real-Time Processing: Tools like Azure Stream Analytics shift analytics to real-time, critical for applications like fraud detection or live customer support.

Edge Analytics: Processing data at the edge—using Azure IoT Edge—reduces latency, ideal for manufacturing or retail scenarios needing instant decisions.

Data Privacy Focus: With regulations like GDPR, cloud solutions are enhancing encryption and compliance features, protecting your organization legally and reputationally.

Serverless Computing: Azure Functions and similar services simplify analytics deployment, reducing overhead and letting you focus on insights, not infrastructure.

BEST PRACTICES FOR BIG DATA ON AZURE

Define Clear Goals: Start by aligning analytics projects with specific business objectives—like increasing sales or improving customer retention—to ensure ROI.

Ensure Data Quality: Cleanse and validate data before analysis; poor data—like duplicate entries—leads to flawed insights, undermining decisions.

Optimize Costs: Leverage Azure's auto-scaling and Cost Management tools to avoid overspending, balancing performance with budget constraints.

Secure Data: Implement encryption at rest and in transit, plus role-based access controls, to protect sensitive data and meet compliance needs.

Monitor Performance: Use Azure Monitor to track analytics workloads, identifying bottlenecks or overuse, ensuring efficient resource use.

POP QUIZ:

Which of the following is a key benefit of big data analytics for businesses?

- a) Increased operational complexity
- b) Data-driven decision-making
- c) Higher storage costs
- d) Reduced customer insights



POP QUIZ:

Which of the following is a key benefit of big data analytics for businesses?

- a) Increased operational complexity
- b) Data-driven decision-making**
- c) Higher storage costs
- d) Reduced customer insights



POP QUIZ:

Which Azure service is designed for unified analytics, combining data warehousing and big data?

- a) Azure Data Lake
- b) Azure Synapse
- c) Azure HDInsight
- d) Azure Stream Analytics



POP QUIZ:

Which Azure service is designed for unified analytics, combining data warehousing and big data?

- a) Azure Data Lake
- b) Azure Synapse**
- c) Azure HDInsight
- d) Azure Stream Analytics



WHAT IS IOT?

Network of connected devices sharing data

Scope: Includes smart devices, sensors, and systems

Data Generation: Produces real-time, actionable insights

Connectivity: Relies on internet and cloud integration

Strategic Role: Enhances decision-making and automation

BENEFITS OF IOT

Efficiency Gains

Automates processes and reduces costs

Revenue Growth

Enables new IoT-based products/services

Customer Insights

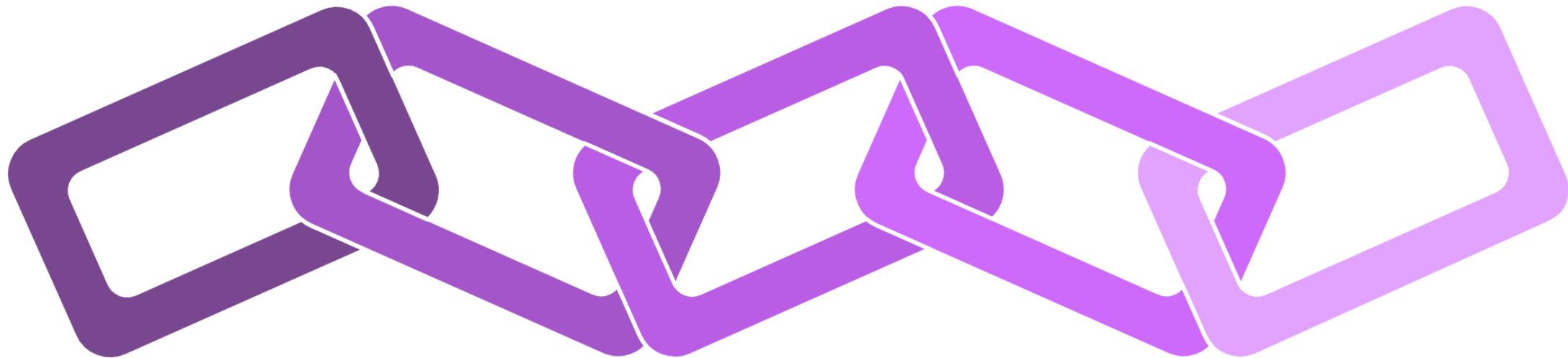
Provides data for personalized experiences

Predictive Maintenance

Reduces downtime with proactive fixes

Supply Chain Optimization

Enhances visibility and control



HOW AZURE SUPPORTS IOT

Scalable Storage: Azure expands storage dynamically, managing the flood of IoT data—like sensor logs—with no upfront costs.

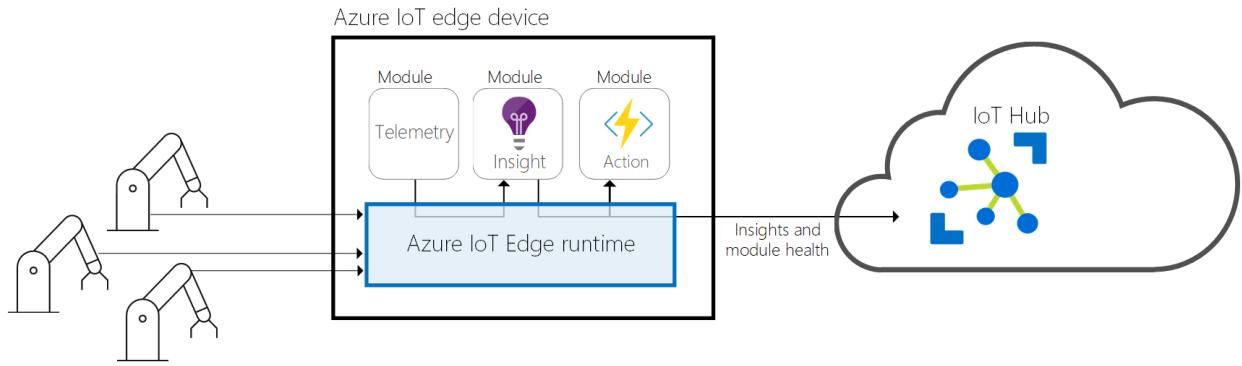
Processing Power: Azure provides compute resources for real-time analytics, critical for applications like remote patient monitoring.

Security Features: Advanced encryption and identity management—like Microsoft Entra ID & Microsoft Defender for IoT—safeguard IoT data against threats.

Integration Hub: Azure IoT Hub and Azure IoT Central act as a central platform, linking diverse IoT devices—like factory machines and smart thermostats—into one ecosystem.

Cost Flexibility: Pay-as-you-go pricing avoids large capital investments, aligning IT spending with business needs.

EDGE COMPUTING & ITS ROLE



[Learn how the Azure IoT Edge runtime manages devices | Microsoft Learn](#)

Definition: Processing data near its source

Latency Reduction: Speeds up real-time decisions

Bandwidth Savings: Minimizes data sent to the cloud

Reliability Boost: Operates offline during outages

Strategic Fit: Enhances IoT for critical applications

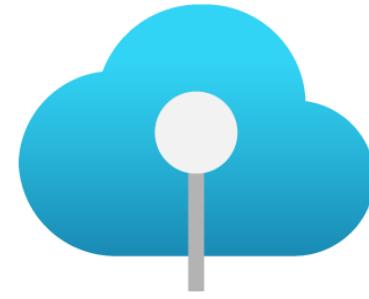
AZURE IOT SERVICES



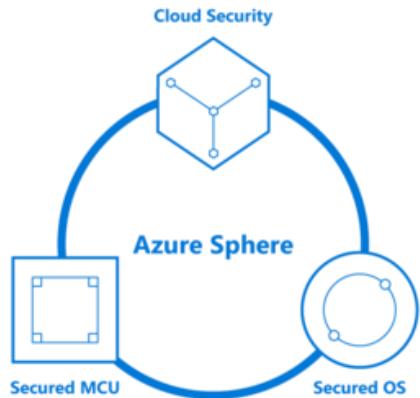
Azure IoT Central



Azure IoT Hub



Azure IoT
Edge



SAMPLE USE CASE



Company: Manufacturing firm with global plants

Challenge: Downtime from equipment failures

Solution: Used Azure IoT Hub and Edge for monitoring

Outcome: Reduced downtime with predictive fixes

Benefit: Saved millions annually, improved efficiency

BEST PRACTICES FOR IOT ON AZURE

Set Clear Objectives: Define what IoT will achieve—like reducing costs or improving customer service—to ensure strategic alignment.

Prioritize Security: Implement encryption and device authentication—like Azure Sphere—to protect against breaches, safeguarding your reputation.

Scale Smartly: Plan your architecture—like using IoT Hub—for an expanding device network, avoiding future bottlenecks.

Leverage Edge: Use Azure IoT Edge for local processing—like in remote sites—enhancing speed and reducing cloud dependency.

Monitor Continuously: Deploy Azure Monitor to track IoT performance and detect issues—like sensor failures—keeping operations smooth.

POP QUIZ:

What is the primary role of IoT in business?

- a) Reducing data generation
- b) Enhancing decision-making through real-time data
- c) Increasing manual oversight
- d) Limiting connectivity between devices



POP QUIZ:

What is the primary role of IoT in business?

- a) Reducing data generation
- b) Enhancing decision-making through real-time data**
- c) Increasing manual oversight
- d) Limiting connectivity between devices



AI & ML OVERVIEW



AI simulates human intelligence; ML learns from data

Core Concepts: Supervised, unsupervised, reinforcement learning

Applications: Automation, predictions, personalization

Azure's Role: Provides tools like Azure AI Foundry and Azure OpenAI

Strategic Importance: Drives innovation and competitive advantage

WHY AI & ML ARE IMPORTANT

Automation: AI handles repetitive tasks—like customer support—allowing your team to focus on high-value work.

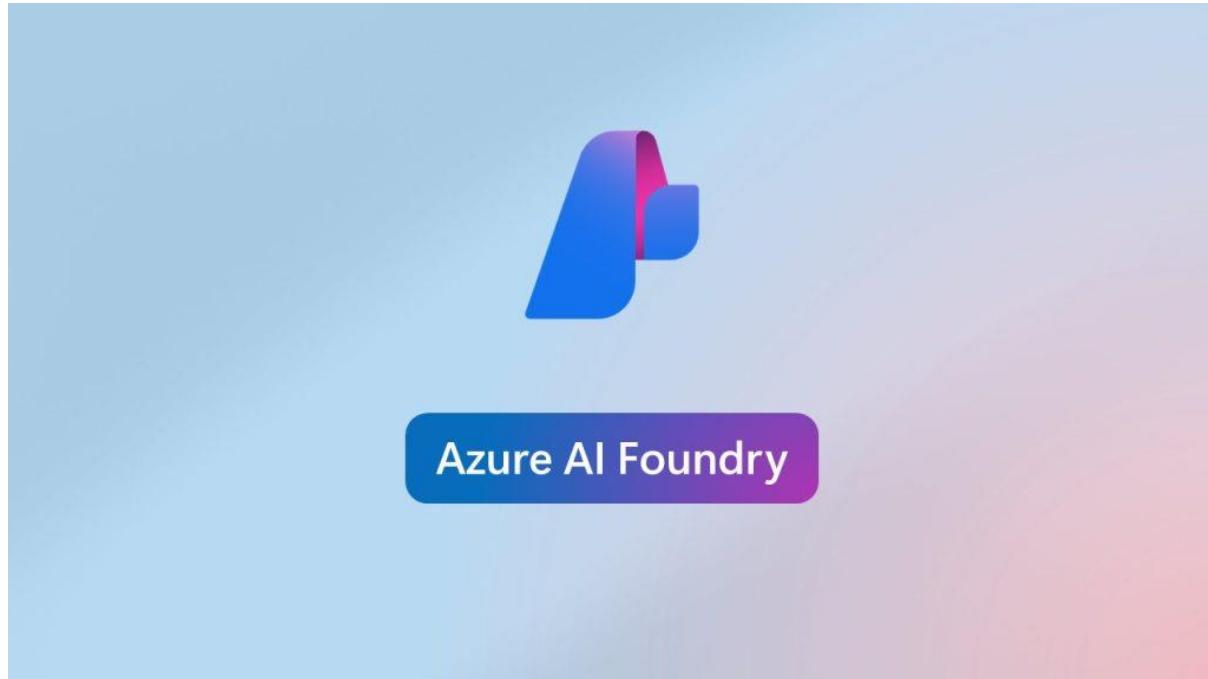
Data Insights: ML reveals patterns—like customer behavior trends—driving smarter strategies.

Personalization: AI delivers tailored experiences—like targeted marketing—boosting engagement and loyalty.

Innovation: AI powers new offerings—like predictive maintenance tools—creating revenue opportunities.

Competitive Edge: Tools like Azure OpenAI enable rapid AI deployment, helping you outpace competitors.

OVERVIEW OF AZURE AI SERVICES



Azure AI Foundry: Accelerates AI development and deployment

Azure OpenAI: Provides pre-trained large-language models for NLP and image tasks

Azure Machine Learning: End-to-end platform for custom models

Cognitive Services: Pre-built APIs for vision, speech, and more

Bot Services: Creates intelligent, conversational agents

GETTING STARTED WITH AI & ML ON AZURE

Assess Needs: Pinpoint challenges—like improving supply chain efficiency—where AI can add value.

Choose Tools: Pick Azure AI Foundry for rapid development or Azure OpenAI for pre-built solutions, based on your goals.

Build Skills: Use Microsoft Learn's AI courses to upskill your team quickly and effectively.

Start Small: Launch pilots—like an AI-driven FAQ bot—to validate concepts and measure ROI.

Scale Strategically: Roll out proven solutions across the enterprise, embedding AI into core processes.

USE CASE

Company: A hypothetical hospital network facing high patient readmission rates.

Challenge: Wanted to predict risks and personalize care but lacked scalable data tools.

Solution: Used Azure AI Foundry to develop predictive models and Azure OpenAI to craft tailored care plans.

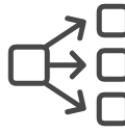
Outcome: Reduced readmissions through proactive interventions driven by AI insights.

Benefit: Saved millions yearly and improved patient satisfaction, aligning with cost and quality goals.

ETHICAL CONSIDERATIONS

Bias Mitigation

Addressing and reducing biases in AI models



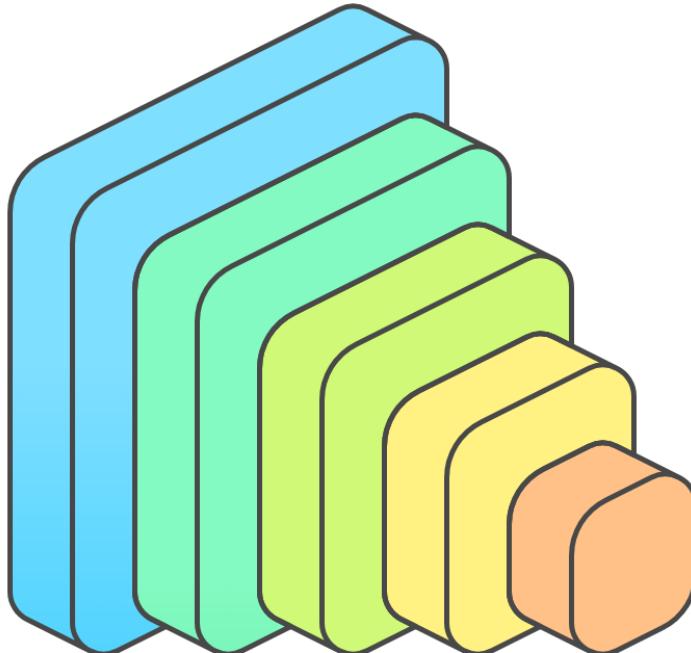
Privacy Protection

Safeguarding data and complying with regulations



Continuous Monitoring

Ongoing evaluation of AI systems



Transparency Enhancement

Making AI decisions clear to stakeholders



Accountability Assignment

Designating responsibility for AI outcomes

POP QUIZ:

Which of the following is a key ethical consideration when implementing AI solutions?

- a) Increasing model complexity
- b) Bias mitigation
- c) Reducing data privacy
- d) Limiting transparency



POP QUIZ:

Which of the following is a key ethical consideration when implementing AI solutions?

- a) Increasing model complexity
- b) Bias mitigation**
- c) Reducing data privacy
- d) Limiting transparency



DEVOPS OVERVIEW

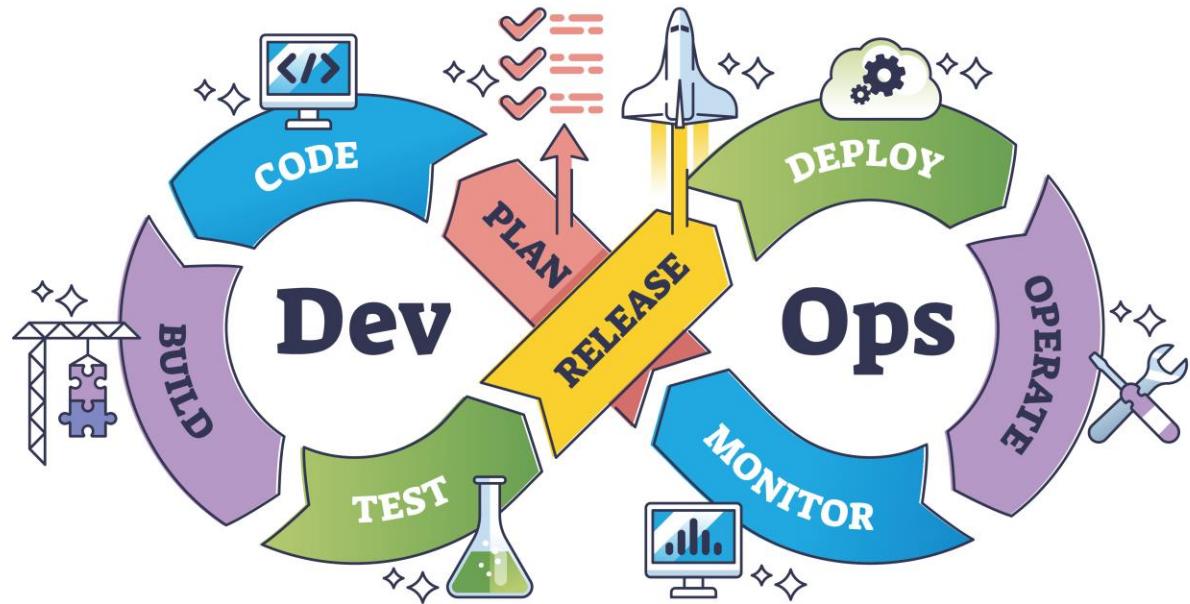
Combines development and operations for faster delivery

Core Principles: Collaboration, automation, continuous improvement

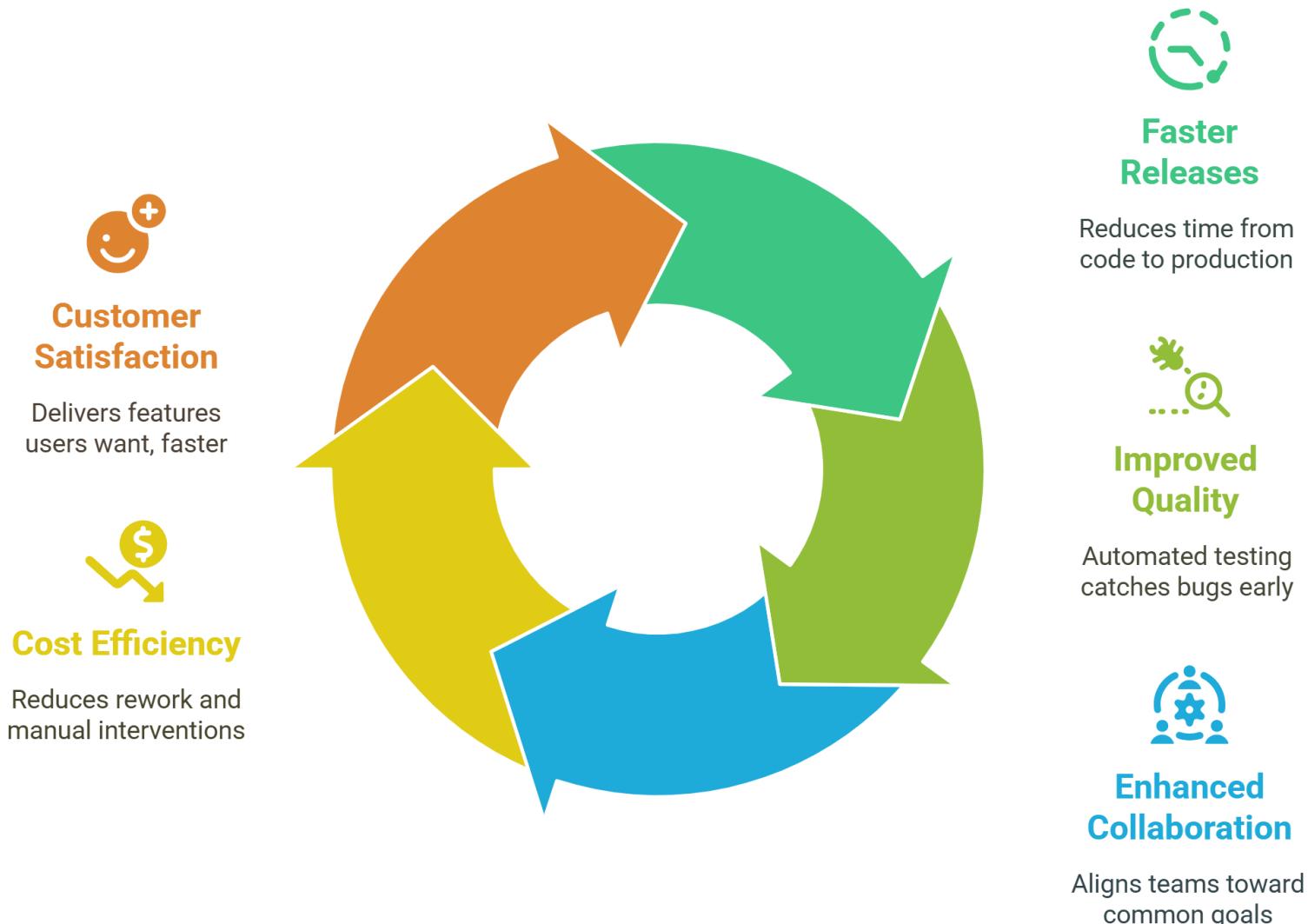
Cultural Shift: Breaks down silos between teams

Tools and Practices: CI/CD, monitoring, version control

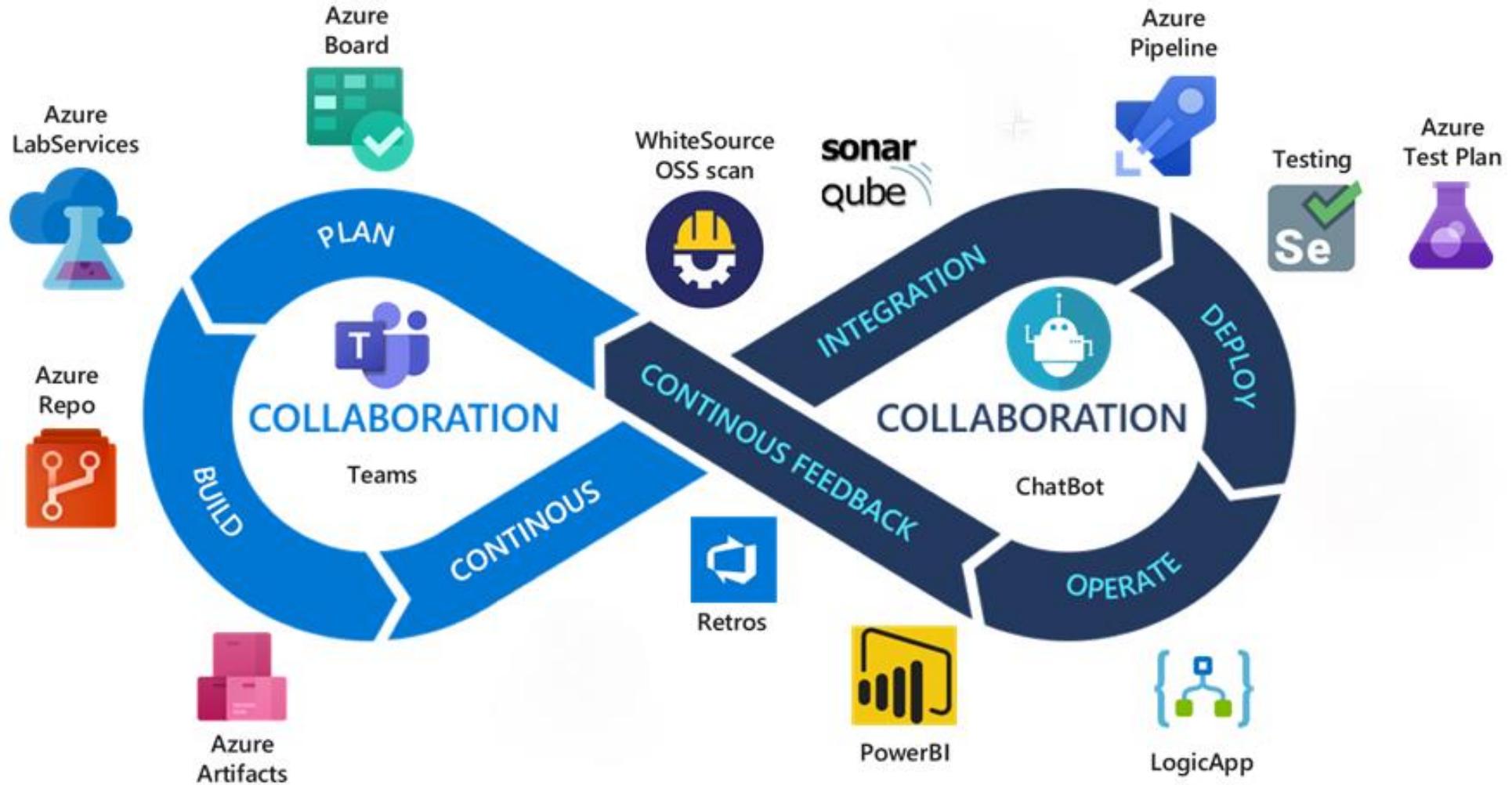
Strategic Role: Accelerates innovation and market responsiveness



BENEFITS OF DEVOPS

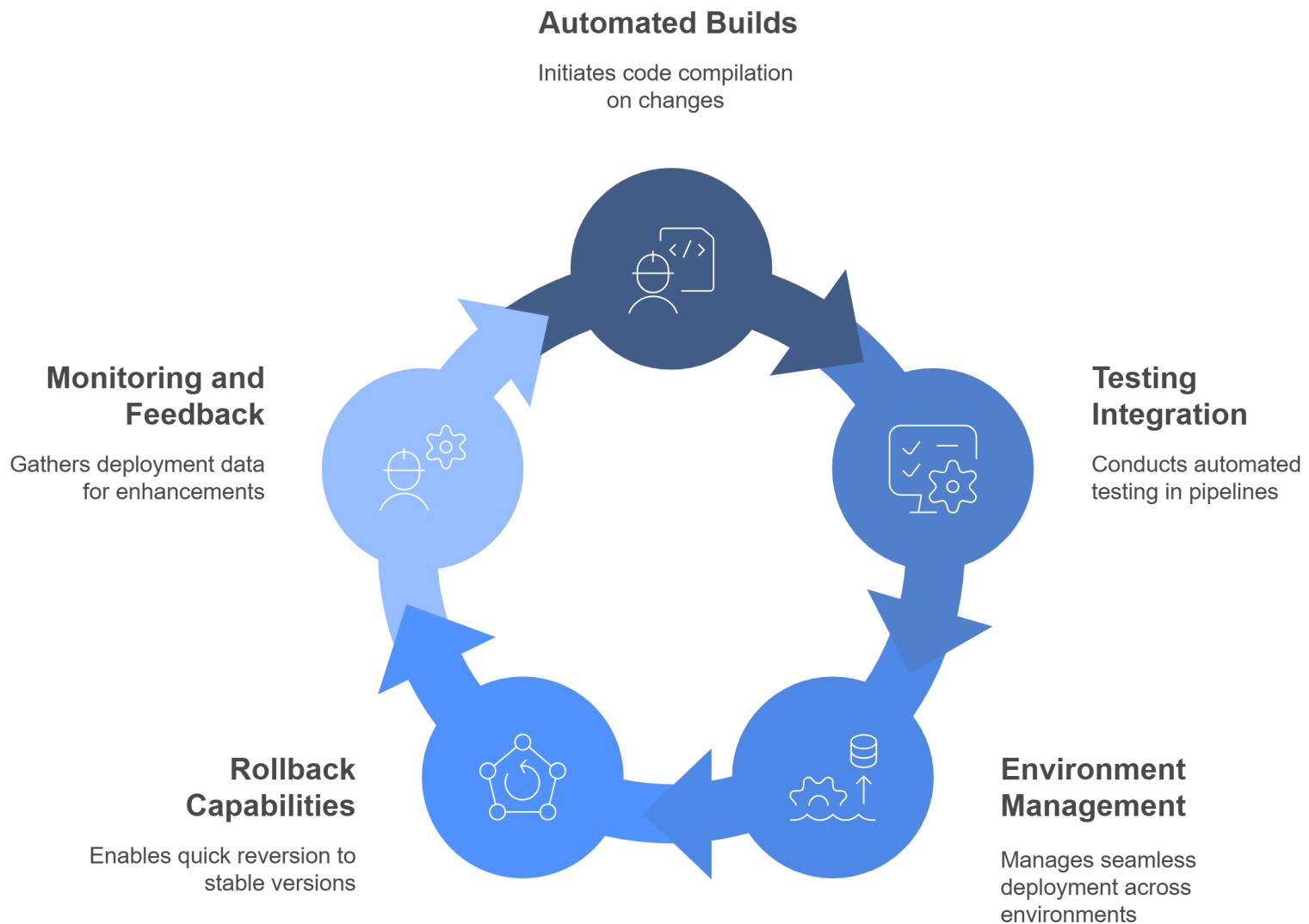


AZURE DEVOPS TOOLCHAIN



[DevOps toolchain - Cloud Adoption Framework | Microsoft Learn](#)

HOW AZURE SUPPORTS CI/CD



SAMPLE USE CASE

Company: A hypothetical software firm bogged down by slow, quarterly release cycles, losing ground to competitors.

Challenge: The firm needed to deliver new features faster to meet market demands and retain customers.

Solution: They implemented Azure Pipelines for automated CI/CD, Azure Boards for agile planning, and Azure Repos for code management.

Outcome: Release cycles dropped from 3 months to 2 weeks, enabling bi-weekly feature rollouts.

Benefit: Customer satisfaction rose by 30%, and market share grew due to rapid, reliable innovation.

BEST PRACTICES FOR DEVOPS ON AZURE

Automate Everything: From builds to deployments

Foster Collaboration: Use tools like Azure Boards for transparency

Monitor Continuously: Track performance with Azure Monitor

Secure Pipelines: Implement access controls and secrets management

Iterate and Improve: Use feedback to refine processes

POP QUIZ:

Which of the following is a best practice for DevOps on Azure?

- a) Manual builds and deployments
- b) Fostering collaboration with tools like Azure Boards
- c) Ignoring security in pipelines
- d) Avoiding continuous monitoring



POP QUIZ:

Which of the following is a best practice for DevOps on Azure?

- a) Manual builds and deployments
- b) Fostering collaboration with tools like Azure Boards**
- c) Ignoring security in pipelines
- d) Avoiding continuous monitoring



INDIVIDUAL KEY TAKEAWAYS



Write down three key insights from today's session.

Highlight how these take aways influence your work.

COURSE REVIEW

This week was divided into six key areas: Business Continuity and Disaster Recovery (BCDR), Big Data and Analytics, IoT and Edge Computing, AI and Machine Learning (ML), Azure for DevOps, and Industry-Specific Solutions.

Each section blended theoretical concepts with practical examples, providing technical managers and executive leaders with the tools to understand both the strategic importance and the operational applications of cloud technology.

Through case studies and service-specific insights, we highlighted Azure's versatility in driving efficiency, innovation, and resilience.

- Week 1-2: Introduction to Cloud Technology
- Week 3-5: Cloud Strategy and Architecture
- Week 6-7: Use Cases and Real-World Applications
- Week 8-9: Benefits and Value Proposition
- Week 10-12: Challenges and Risks
- Week 13-14: Interactive Simulations and Practical Exercises
- Week 15: Course Review and Final Assessment

NEXT WEEK: REAL-WORLD APPLICATIONS

Next week we continue the conversation and look at some real-world challenges. We'll dive deeper into how Azure resources address critical challenges in various industries. Get ready to explore practical use cases, understand industry-specific needs, and see how Azure technologies create strategic value.

- Health care
- Finance
- Retail
- Manufacturing

Q&A AND OPEN DISCUSSION



