

FUTURE OF DATA MANAGEMENT

REAL-TIME PROCESSING,
CLOUD-NATIVE DATABASES,
AND AUTOMATION

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INTRODUCTION

- The digital landscape is rapidly evolving.
- Data is becoming larger, faster, and more complex.
- Modern businesses must manage **real-time, distributed, and intelligent** data systems.
- This presentation explores **future trends** that define the next era of data management.



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LEARNING OBJECTIVES



By the end of this presentation, you should be able to:

1. Evaluate challenges of managing data in a modern digital environment.
2. Explain how real-time data processing works.
3. Identify features of cloud-native databases.
4. Describe how automation and AI transform data management.
5. Recognize future trends such as AI, blockchain, and analytics.



CHALLENGES IN MODERN DATA MANAGEMENT

- Increasing **data volume and velocity** (Big Data).
- Maintaining **data quality and governance**.
- Ensuring **security and compliance** with regulations.
- Integrating multiple data sources and **cloud systems**.
- Handling **real-time insights** and **low-latency processing**.



REAL-TIME DATA PROCESSING



Processing and analyzing data as soon as it's generated - no waiting for batch updates.

Importance:

- Supports **instant decision-making**.
- Powers **IoT, banking transactions, and live monitoring systems**.

Key technologies:

- **Apache Kafka** - Distributed streaming platform for handling real-time data feeds.
- **Apache Flink** - Framework for real-time computation and stream analytics.



REAL-TIME DATA PROCESSING KEY TECHNOLOGIES

Apache Kafka Overview

- Handles high-throughput, low-latency data streams.
- Enables communication between data producers and consumers.
- **Common uses:**
 - Log aggregation
 - Real-time monitoring
 - Even streaming in apps and services



REAL-TIME DATA PROCESSING KEY TECHNOLOGIES

Apache Flink Overview

- Open-source stream processing framework.
- Allows Stateful computation over unbound data streams.
- **Works well for:**
 - Real-time analytics
 - Fraud detection
 - IoT event processing



CLOUD-NATIVE DATABASES

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Definition

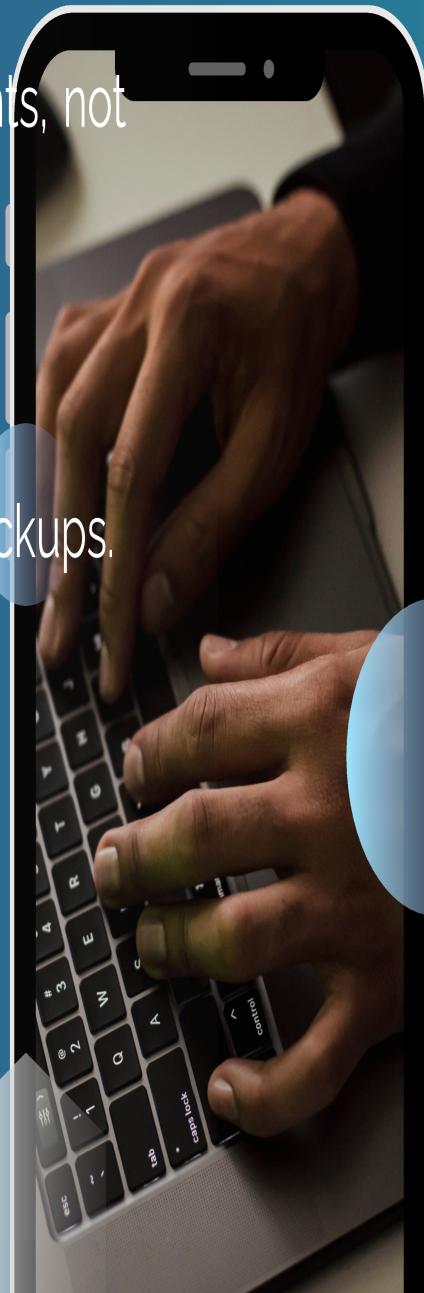
Databases designed to run in cloud environments, not just on-premises.

Advantages:

- **Scalability** - Expand resources easily.
- **High availability** - Automatic failover and backups.
- **Cost efficiency** - Pay only for what you use.

Challenges:

- **Data security** and **compliance** issues.
- **Complex migrations** from legacy systems.
- **Vendor lock-in** risks.



AUTOMATION IN DATA MANAGEMENT

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Automation involves:

- Streamlining repetitive data tasks.
- Using **AI tools** for:
 - Data pipeline automation
 - Real-time performance monitoring
 - AI-driven decision support

Benefits:

- Reduces manual errors
- Improves processing speed
- Enables predictive and proactive maintenance



FUTURE TRENDS



1. **Artificial Intelligence (AI)** – Predictive analytics, smart data cleanup, autonomous systems.
2. **Blockchain** – Secure, tamper-proof data sharing and verification.
3. **Real-Time analytics** – Immediate insights from live data.
4. **Edge Computing** – Processing data closer to where it's generated.
5. **Data Mesh Architecture** – Decentralized data ownership for large organizations.



SUMMARY

- The future of data management is **real-time, automated, and intelligent**.
- Organizations must adapt to **cloud-native and AI-driven** approaches.
- Technologies like **Kafka, Flink, and blockchain** shape this future.
- Data managers must evolve from **storage focus** to **insight and innovation** focus.





**THANK
YOU!**

