



SNS COLLEGE OF TECHNOLOGY COIMBATORE-35

23BAE733-DATA- DRIVEN DECISION MAKING

Dr.P.Krishnaveni
Design Thinker



RECAP....

- Recap of the importance of volume, velocity, and sensitivity in data logistics.
- Effective data management requires a strategic approach to these characteristics.



Case Scenario:

Amazon, one of the world's largest e-commerce companies, handles massive amounts of data daily, including customer orders, payment information, product details, and user browsing behavior. With its vast global network, Amazon faces several challenges related to data storage, retention, and security. As Amazon expanded, the volume of data grew exponentially, with real-time data (velocity) from millions of transactions needing to be processed instantly. Additionally, the sensitivity of customer data, including personal and financial details, required the company to adhere to stringent security protocols to protect privacy. Amazon needed to balance data availability with security by ensuring the right teams had access to necessary data while safeguarding sensitive information. To tackle this, Amazon implemented various storage and security strategies, ensuring efficient data retention while keeping costs under control. With increasing volumes of data, the company had to also develop sophisticated storage solutions to meet its ongoing needs.



Introduction to Amazon's Data Management Challenges

Amazon, a global leader in e-commerce, handles vast amounts of data from customers, products, and transactions.

Key Data Challenges:

- Volume of data
- Velocity (real-time processing)
- Sensitivity (customer privacy and security)
- Data retention and availability





Problem Definition

Volume: Large-scale data generation from millions of transactions globally.

Velocity: Real-time data flow from customer interactions, inventory updates, and payments.

Sensitivity: High privacy concerns regarding personal and financial data

Retention & Availability: Balancing long-term data retention and secure access



Possible Solutions

Cloud Storage Solutions: Scalable storage to manage large data volumes.

Real-Time Data Processing: Algorithms for handling rapid data flow

Data Sensitivity Protocols: Secure storage and access control for sensitive information.

Data Retention Policies: Clear guidelines for data longevity and access control.



Amazon's Solution: AWS for Volume Management



AWS (Amazon Web Services):

- Scalable cloud infrastructure for storing massive data.
- Handles both structured (transactional data) and unstructured data (customer behavior). Example: Amazon manages product catalog, order history, and customer interactions using AWS, ensuring storage scalability as business grows.





Real-Time Data Processing with AWS Lambda

AWS Lambda:

- Serverless computing platform for real-time data processing.
- Processes transactions, payments, and updates inventory instantly.
- Example: During flash sales, AWS Lambda ensures real-time payment processing and stock updates, preventing overselling.





Data Security: Encryption & Access Control



- End-to-End Encryption: Protects data during transmission and at rest using AES-256 encryption:
- Access Control: Role-based access with multi-factor authentication to limit access to sensitive data.
- Example: Only finance employees can access payment data, ensuring restricted and secure access to sensitive information.



Data Retention & Availability Policies



Data Retention: Guidelines for how long various types of data should be stored:

- Customer orders retained for years (for returns/refunds).
- Non-critical data (e.g., website traffic) archived after shorter periods.

Data Availability: Defined access levels for different teams, ensuring appropriate availability while protecting sensitive information.





Compliance with Global Data Protection Laws



GDPR & CCPA Compliance: Ensuring Amazon's data handling practices align with privacy regulations in different regions.

Example: Customer rights under GDPR (e.g., data deletion requests) are honored, and clear policies are in place to ensure lawful data handling.





Business Benefits of Data Management



Operational Efficiency: Real-time processing and scalable storage solutions streamline operations.

Cost-Effectiveness: Cloud-based solutions optimize storage costs.

Customer Trust: Secure and compliant data handling builds consumer confidence.





Summary:



Effective data management is critical for large-scale operations.

Solutions must address volume, velocity, and sensitivity challenges.

Security and compliance are essential for maintaining customer trust and avoiding legal issues.

. Amazon's approach can serve as a blueprint for businesses facing similar data challenges.



Thank You.....