Cloud/Data/Solution Architect Proposal

AWS-based Application Modernization & Data Migration Strategy

Role: Solution Architect

Name: Prem Vishnoi 2024-08-17

Introduction

Objective: Migrate to AWS, modernize applications, and build a Data Analytics Platform (DAP).

Scope: Cloud migration, application modernization, data governance, and AI integration.

Outcome: Scalable, reliable, and compliant IT infrastructure.

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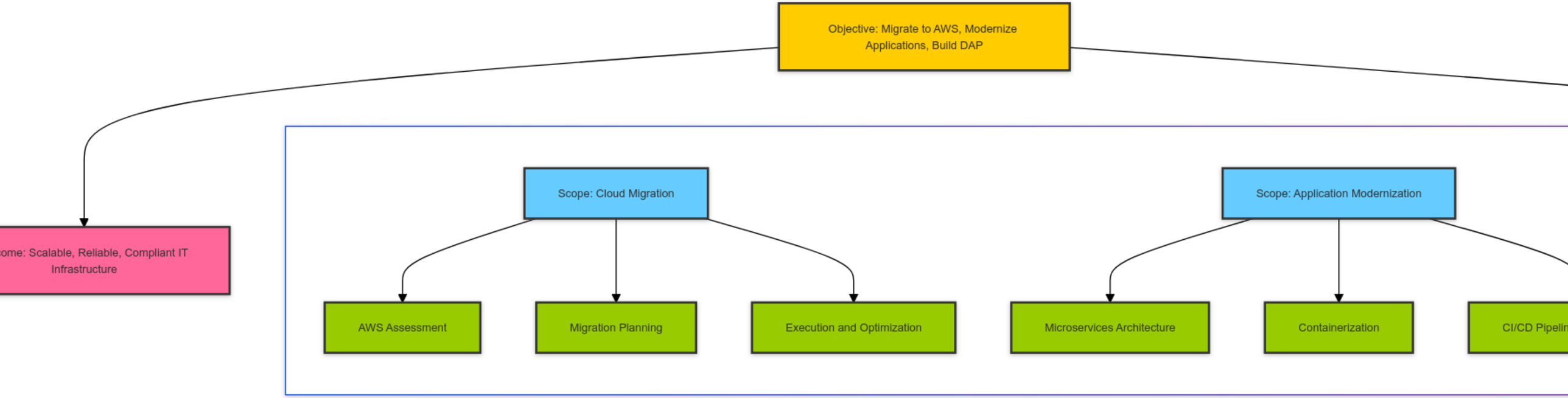
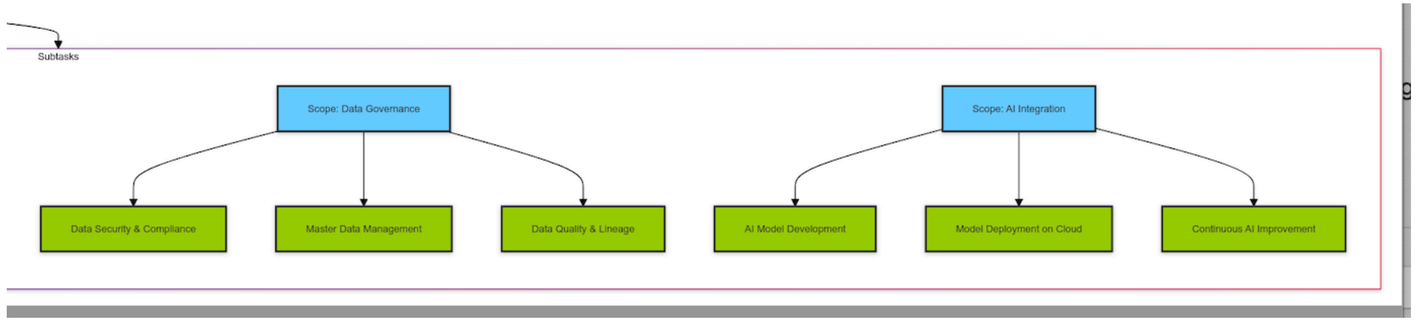
Introduction





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Agenda

1. Current Architecture Overview
2. Future Architecture Overview
3. Requirement Analysis
4. Key Questions for Solution Design
5. Approach Overview
6. AWS Cloud Migration Strategy
7. Application Modernization Strategy
8. Data Migration & Governance
9. Security & Compliance
10. Implementation Plan
11. Conclusion & Next Steps
12. Q&A

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Current Architecture Overview

On-Premise Infrastructure: Distributed systems across US, EU, and Asia.

Databases: Postgres, Oracle, Sybase with outdated versions and large volumes of data.

Applications: 100 in-house developed apps, 10 COTS apps (Case360, S4Hana).

Reporting Tools: Power BI, Tableau, MS Excel.

Challenges: Obsolete data, security concerns, lack of standardization across subsidiaries.

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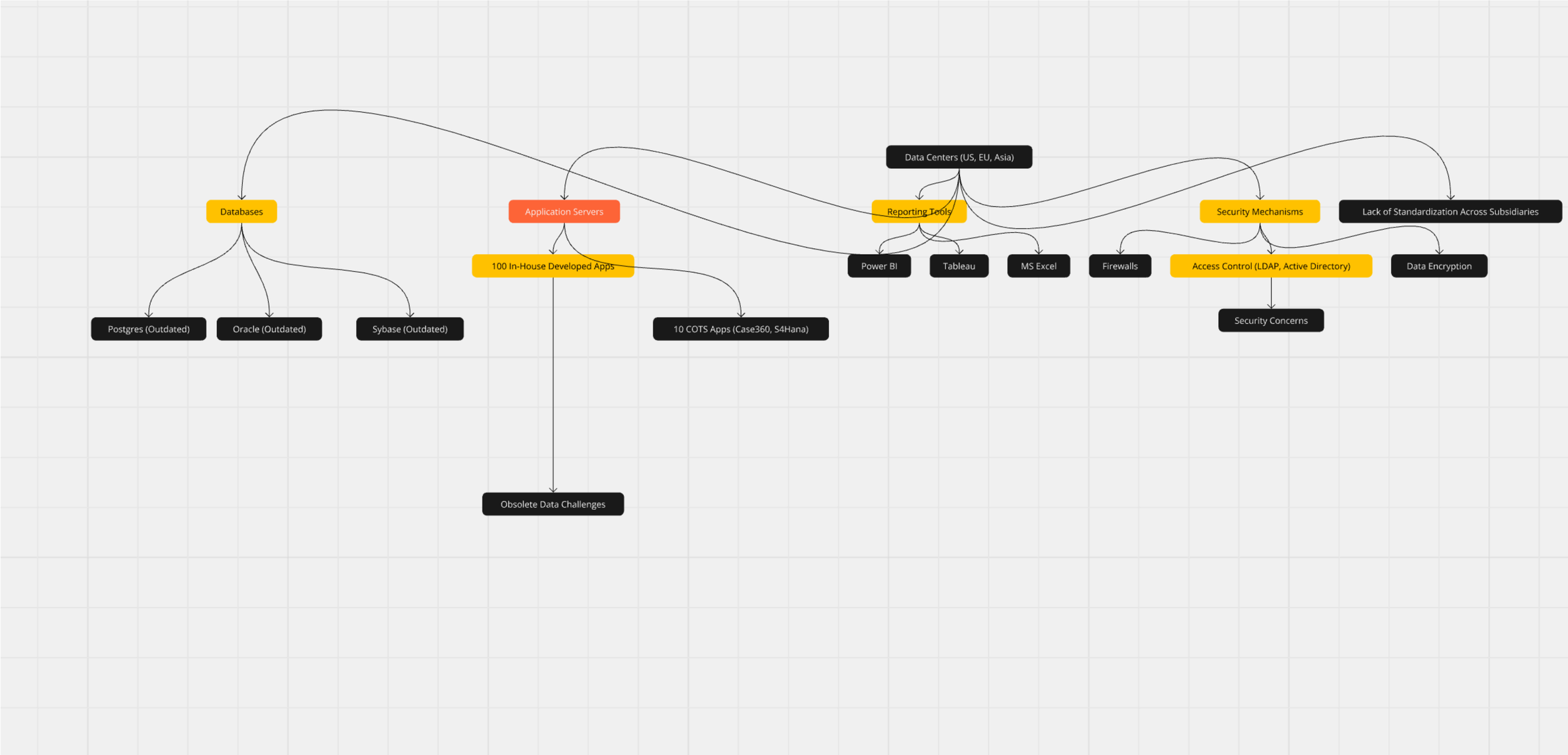
Current Architecture Diagram



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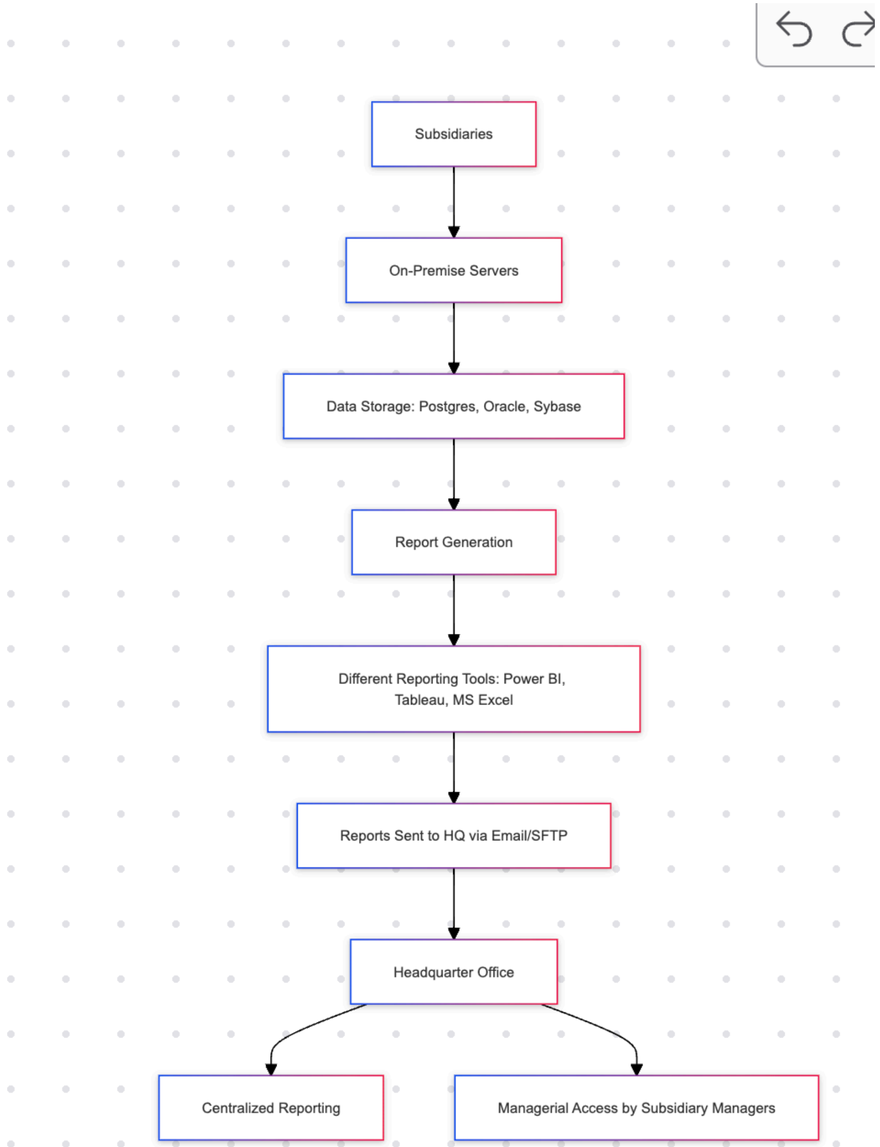

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Future Architecture Overview

Target Infrastructure: AWS Cloud-based infrastructure with **centralized management.**

Data Analytics Platform: Unified data lake with advanced a**nalytics capabilities.**

Modernized Applications: Refactored applications using microservices, containerization, and serverless architecture.

I**ntegrated analytics tools** (Redshift, SageMaker), AWS Glue,S3

Security and compliance tools (IAM, GuardDuty, KMS)

Enhanced Security & Compliance: Standardized RBAC, data encryption, and adherence to global data protection regulations.

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Future Architecture Diagram

- **Visual Diagram:** As in next slide
- AWS VPC setup
- Centralized data lake in S3
- Refactored applications using ECS/EKS and Lambda
- Integrated analytics tools (Redshift, SageMaker)
- Security and compliance tools (IAM, GuardDuty, KMS)

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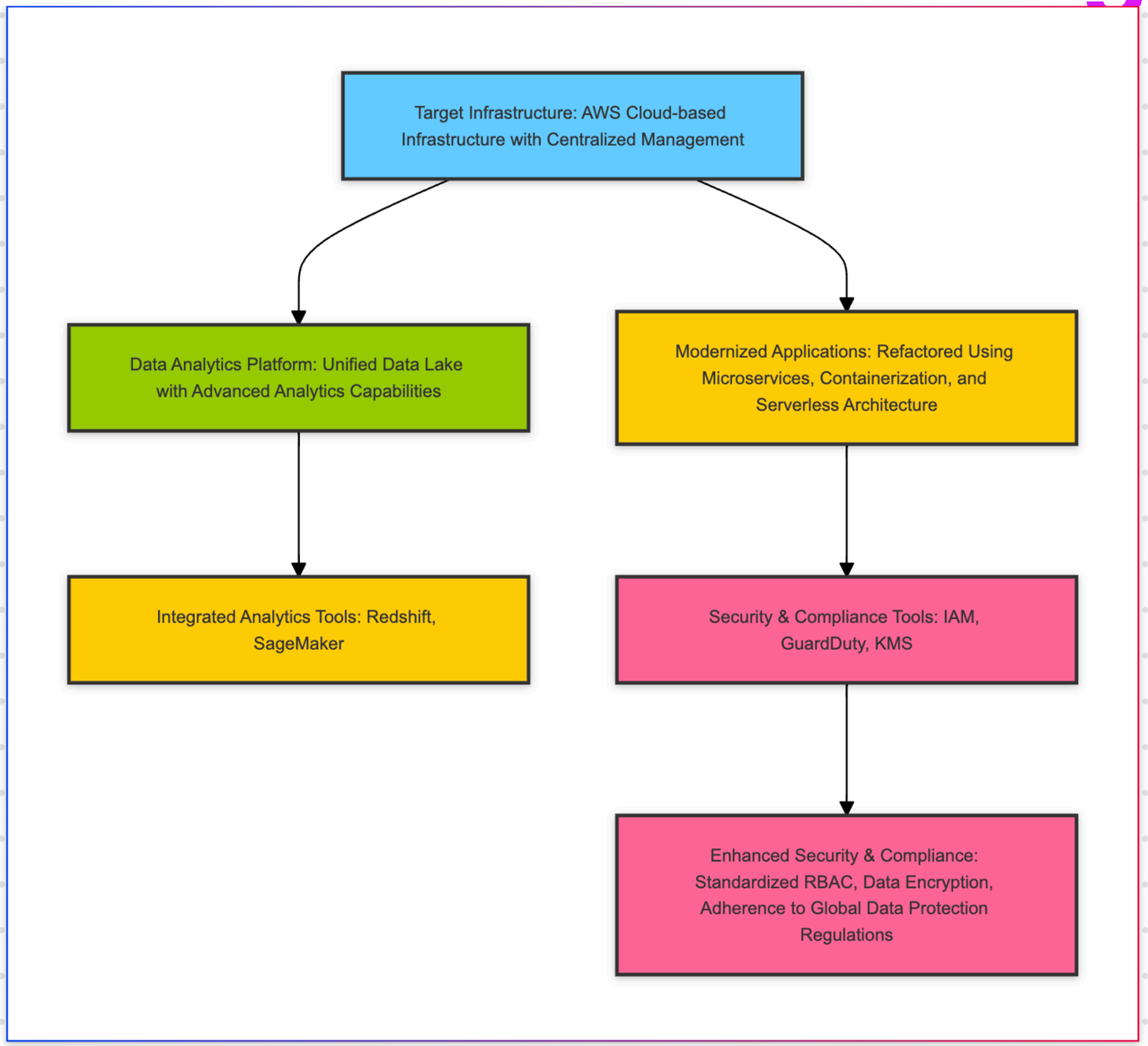
Future Architecture Diagram



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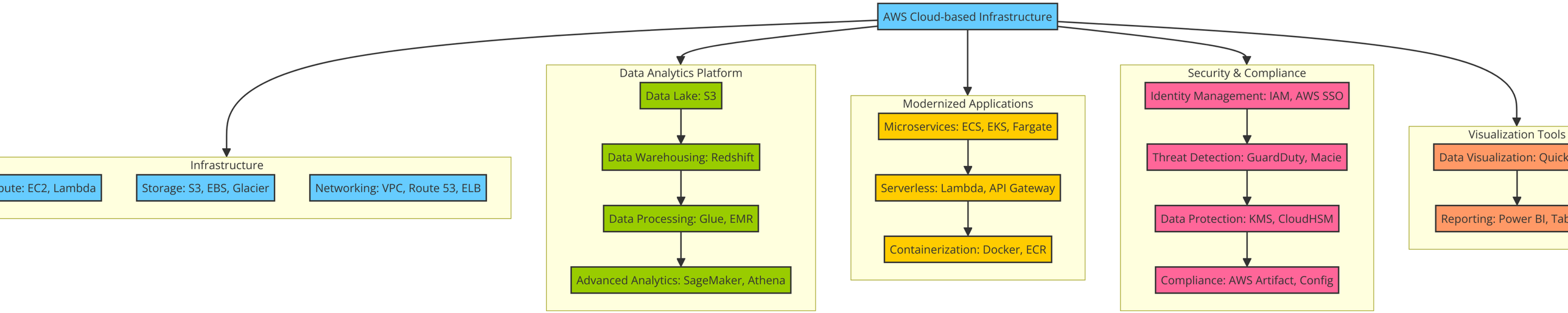

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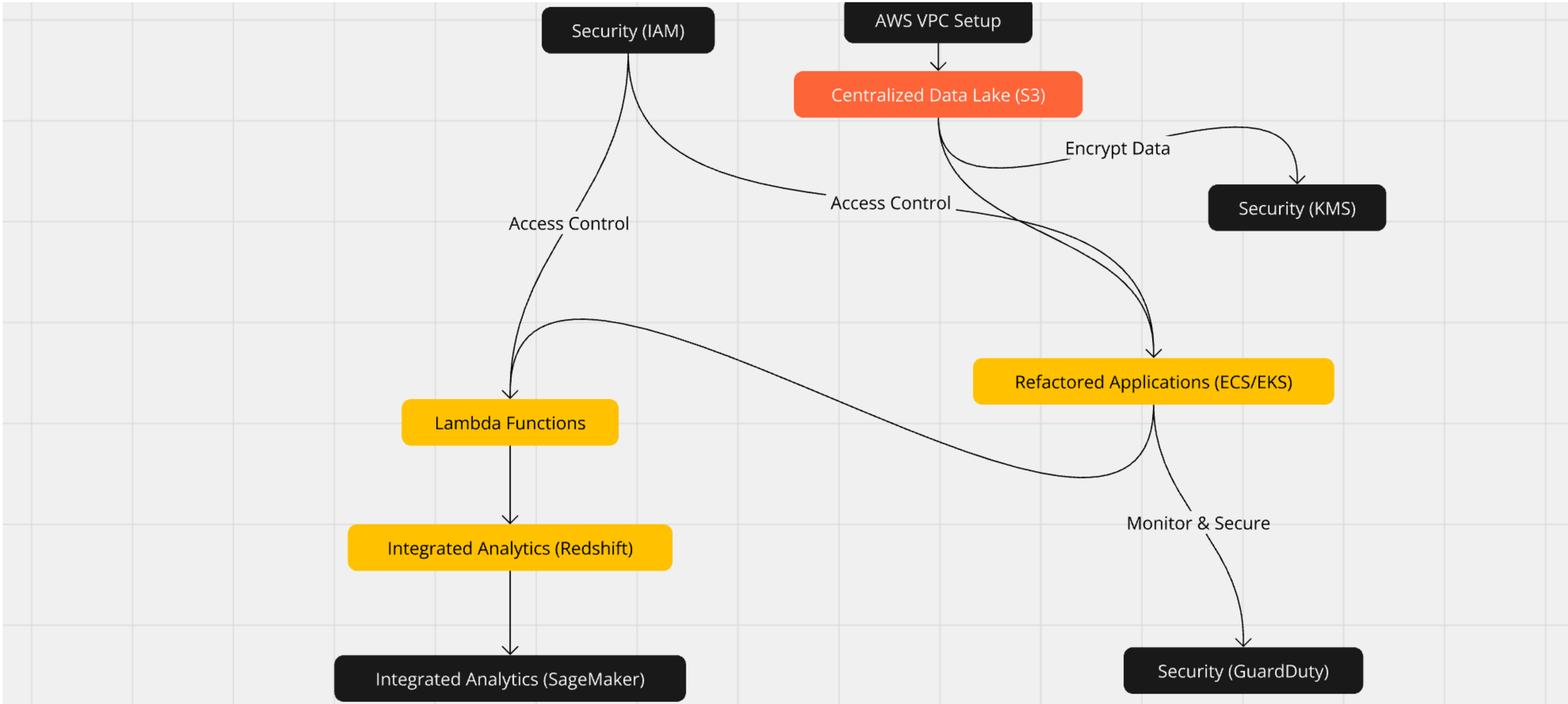

Requirement Analysis

Scalability & Reliability: Cloud infrastructure to support growth and disaster recovery.
Compliance: Adherence to GDPR, PDPA, PIPL, and CCPA.
Data Governance: Ensuring high-quality, well-managed data.
Cost Efficiency: Optimized resource utilization and reduced redundancies.

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Key Questions for Solution Design

1. What is the **timeline** and budget for the migration?
2. Are there any specific **compliance** requirements for each region?
3. What are the **business** processes that need to be optimized?
4. How do different **subsidiaries** interact with the IT systems?
5. What are the data **retention** policies?

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Approach Overview

Cloud Migration: AWS Lift-and-Shift, Re-platform, and Refactor strategies.
Application Modernization: Transition to microservices, containerization (ECS/EKS).
Data Migration: ETL processes, data cleansing, and archival.
Governance & Compliance: AWS IAM, encryption, and compliance frameworks.
Unity catalog and metadata : Using Glue catalog

AWS Cloud Migration Strategy

Lift-and-Shift: Migrate applications as-is using AWS EC2.
Re-platform: Move databases to AWS RDS (Postgres, Oracle, MySQL).
Refactor: Re-architect legacy applications to microservices using AWS Lambda, ECS, or EKS.
Data Lakes: Implement AWS S3 for centralized data storage.

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Application Modernization Strategy

Microservices: Break down monolithic applications into microservices.
Containerization: Use Docker, managed with ECS or EKS.
Serverless: Implement AWS Lambda for event-driven tasks.
CI/CD Pipeline: Use AWS CodePipeline, CodeBuild, and CodeDeploy for automation.

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Data Migration & Governance

Data Assessment: Analyze data sources, identify obsolete data, and classify sensitive data.
ETL Process: Use AWS Glue for extraction, transformation, and loading.
Data Governance: Implement AWS Lake Formation for data cataloging and access management.
Compliance: Use AWS Macie for data security and compliance monitoring.

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Security & Compliance

AWS IAM: Centralized access control with role-based access (RBAC).
Encryption: AWS KMS for data encryption at rest and in transit.
Compliance: AWS Config, CloudTrail, and GuardDuty for monitoring and compliance.
Disaster Recovery: Multi-AZ deployment, AWS Backup, and automated failover.

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Implementation Plan - Phase 1: Discovery & Planning

Activities: Stakeholder meetings, requirements gathering, current system assessment.
Timeline: 2-3 weeks.
Deliverables: Detailed project plan, risk assessment, and migration strategy.

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Implementation Plan - Phase 2: Migration & Modernization

Activities: Lift-and-shift, re-platforming, application refactoring.
Timeline: 3-6 months.
Deliverables: Migrated applications, modernized infrastructure, initial data governance setup.

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Implementation Plan - Phase 3: DAP Implementation

Activities: Set up data lakes, ETL pipelines, and analytics tools.
Timeline: 2-4 months.
Deliverables: Fully functional Data Analytics Platform with integrated AI capabilities.

Implementation Plan - Phase 4: Testing, Training, & Go-Live

Activities: End-to-end testing, user training, final deployment.
Timeline: 1-2 months.
Deliverables: Tested systems, trained users, and successful go-live.

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Team Structure & Responsibilities

Lead Solution Architect: Oversee entire project, ensure alignment with business goals.
Cloud Architect: Design AWS infrastructure, ensure scalability and security.
Data Engineer: Handle data migration, ETL processes, and governance.
Application Developer: Refactor applications, implement microservices, and containerization.
Project Manager: Manage timelines, budgets, and stakeholder communication.

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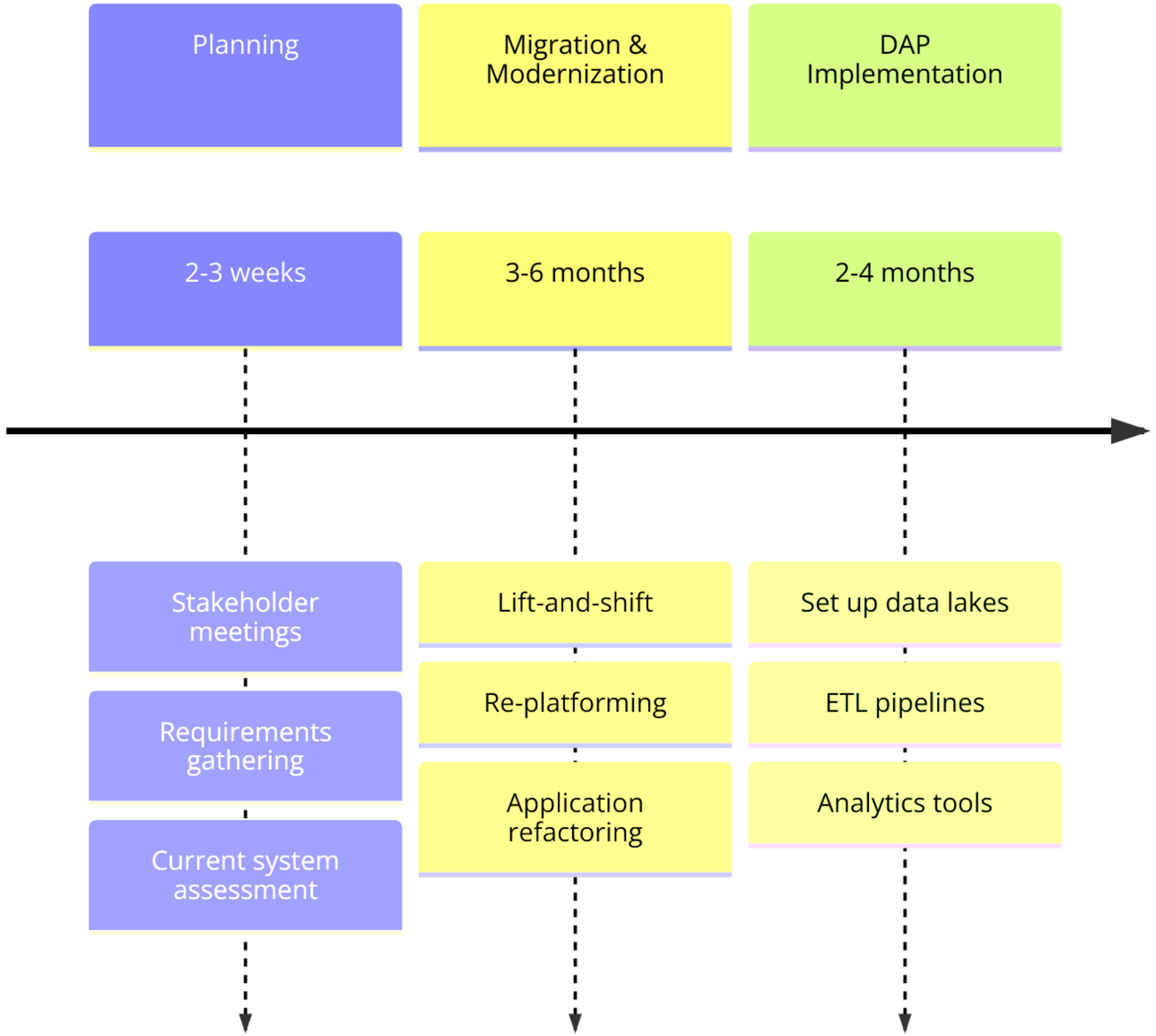
Project Implementation Timeline



Conclusion & Next Steps

Summary: Recap of the proposed solution and its alignment with business goals.

Next Steps: Confirm the project team structure, roles, and responsibilities, ensuring that all key stakeholders are aligned and onboarded.

Call to Action: Schedule a follow-up meeting for further discussion and planning and project kick-off

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Summary: Recap of the Proposed Solution

Cloud Migration:
Transition all existing on-premise systems, including legacy databases and applications, to AWS Cloud.
Aligns with business goals by reducing operational overhead, improving disaster recovery, and supporting future growth.
Application Modernization:
Modernize existing applications by adopting microservices architecture, containerization (ECS/EKS), and serverless computing (AWS Lambda).
Enhances agility, reduces costs, and aligns with evolving business needs.
Data Analytics Platform (DAP):

- Implement a unified Data Analytics Platform on AWS, integrating various data sources into a well-governed data lake.
- Empowers business users with self-service analytics, leading to faster insights and better decision-making.

Security & Compliance:
Implement a comprehensive security and compliance framework using AWS tools (IAM, KMS, GuardDuty).
Ensures data protection, compliance with global regulations, and reduces legal risks.
Cost Efficiency & Operational Optimization:
Streamline data storage, reduce redundancies, and optimize processing power through cloud solutions.
Results in significant cost savings and better resource allocation.

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Conclusion & Next Steps

2. **Next Steps**
   - **Approval**: Seek stakeholder approval to proceed with the detailed implementation plan.
   - **Resource** Allocation: Finalize the project team and ensure resource availability.
   - **Detailed Planning**: Develop a comprehensive project plan with a clear timeline and risk management strategies.
3. **Call to Action**
   - **Follow-Up Meeting**: Schedule a meeting within the next week to finalize the implementation plan and address any questions.
   - **Kick-Off:** Initiate the project with a formal kick-off meeting upon approval.

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Recap of the Proposed Solution

•**Cloud Migration:** We propose migrating all on-premise systems to AWS to enhance scalability, reliability, and disaster recovery capabilities. This includes moving legacy databases to AWS RDS and transitioning applications to cloud-native architectures using EC2, ECS/EKS, and Lambda.

•**Application Modernization:** Legacy applications will be refactored into microservices and containerized to improve flexibility, scalability, and maintainability. This modernization will streamline operations and reduce technical debt.

•**Data Analytics Platform (DAP): I**mplementing a centralized Data Analytics Platform on AWS will unify and govern data, ensuring high-quality data management.
The DAP will provide self-service analytics capabilities, empowering business users and accelerating time-to-insight.

•**Security & Compliance:** The proposed solution includes robust security measures and ensures compliance with global data protection regulations (GDPR, PDPA, PIPL, CCPA). AWS's built-in security tools, like IAM, KMS, and GuardDuty, will be leveraged to maintain a secure environment.

•**Business Alignment:** The solution is designed to align with the company's business goals by promoting cross-functional collaboration, enabling faster decision-making, reducing costs, and improving overall resource utilization.

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Conclusion

Q&A

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