In Your Orbit
Design Review

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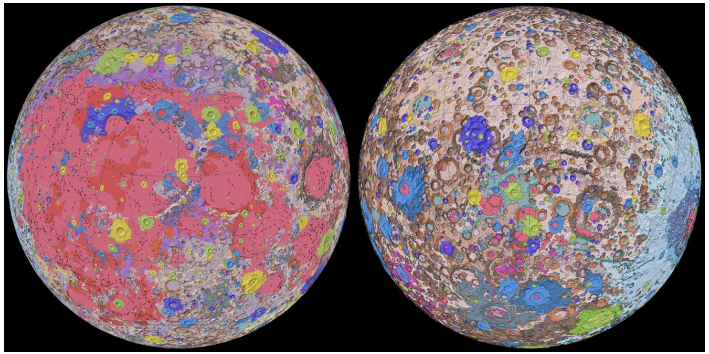
Introduction

- Rapid growth in planetary science and NASA missions
- Importance of sensor models in mapping planetary surfaces
- Challenges of accessing NASA's vast SPICE database
- **Capstone Project:** cloud-based service for ISD retrieval
- **GOAL:** Improve accessibility for new planetary scientists

Problem Statement

- Image Support Data (ISD) crucial for planetary missions
- USGS Astrogeology generates ISDs from satellite images
- Current system issues (cost, performance, time, data size)
- New system will be faster, free, and user friendly

USGS
science for a changing world
ASTROGEOLOGY



Solution Overview


- ISD Generation: The web service generates ISD using ALE, a NASA tool for ephemeris data.
- Caching for Speed: Stores frequently requested ISDs on Amazon DynamoDB for fast retrieval.
- AWS Integration: Uses Amazon ECS for scalability, enabling the service to handle large volumes of requests.
- Data Efficiency: Compressed JSON format reduces data size, speeding up data transfer and minimizing storage needs.

Key Requirements

- The most important User and Functional Requirements are:
    - Queryable system for retrieving ISDs
    - Web Service that acts as interface between user and ISD retrieval
    - Caching server that stores and updates ISDs

High Level Requirement Example:

- Update ISDs
    - Use web service
        - Generate ISD
            - Use ALE
        - Return ISD to Caching server
    - Store ISD using incremented ID

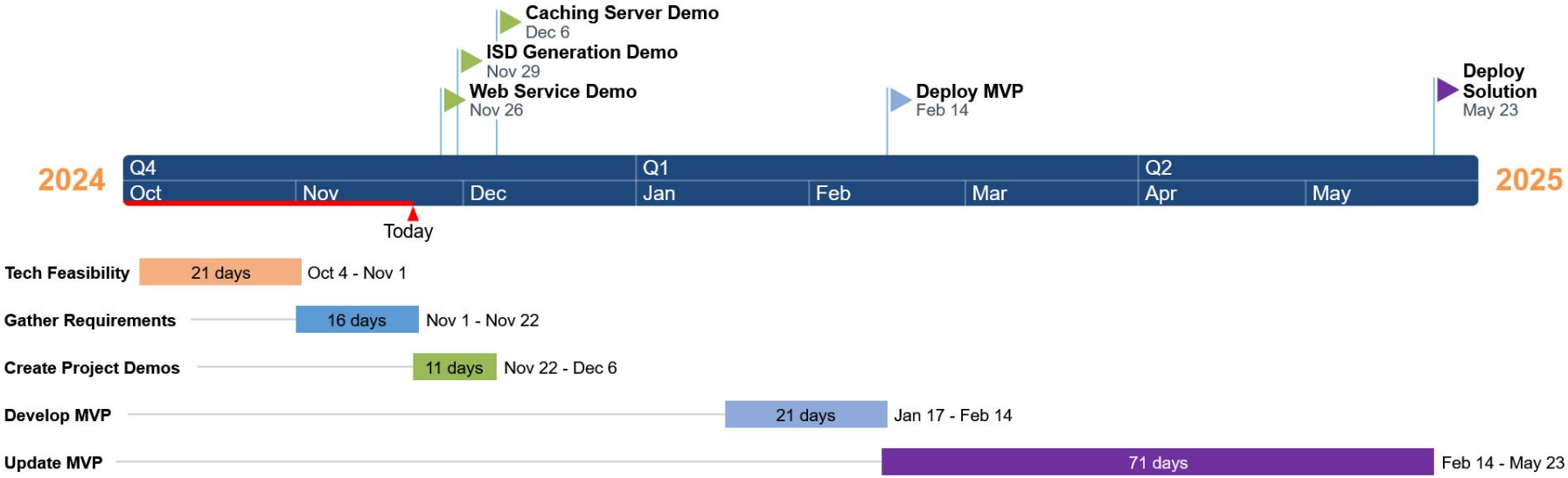
Risks and Feasibility

- Scalability Issues
  - Utilize Amazon EC2 Autoscaling to ensure that web service scales appropriately

- Accuracy Issues
  - Utilize verification mechanisms to test generated,cached and retrieved ISDs

➔ Feasibility proven through analysis of AWS services and ISD testing

In Your Orbit Project Plan



Conclusion

- We are developing a Web Service and Caching Server for USGS and NASA
- Solution will allow easy generation, querying and retrieval of ISDs
- Need to generate, store, retrieve and update ISDs
- Potential risks are both scalability and accuracy related
- Our team has a strong foundation, prepared to handle any risks and deploy a successful solution
- Next, we will create tech demos and develop, then deliver our solution