MICHIGAN STATE UNIVERSITY

# Project Plan

# Navigating Campus Using Augmented Reality

## The Capstone Experience


Team Michigan State University

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*From Students…*
*…to Professionals*

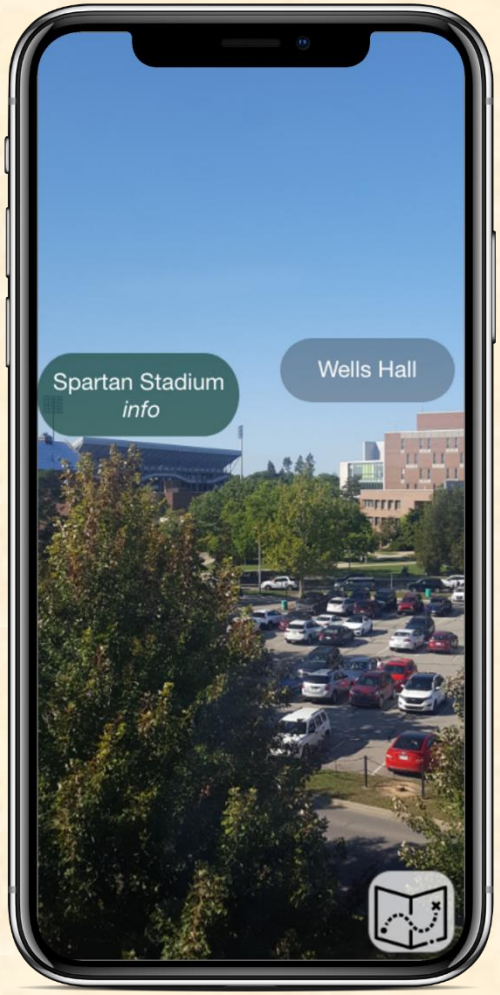
# Functional Specifications

- Navigating campus using the online map can be difficult and time consuming
- AR tech can make navigating and exploring campus easier for new students and visitors
- Inserting graphics into the real world is both intuitive and fun

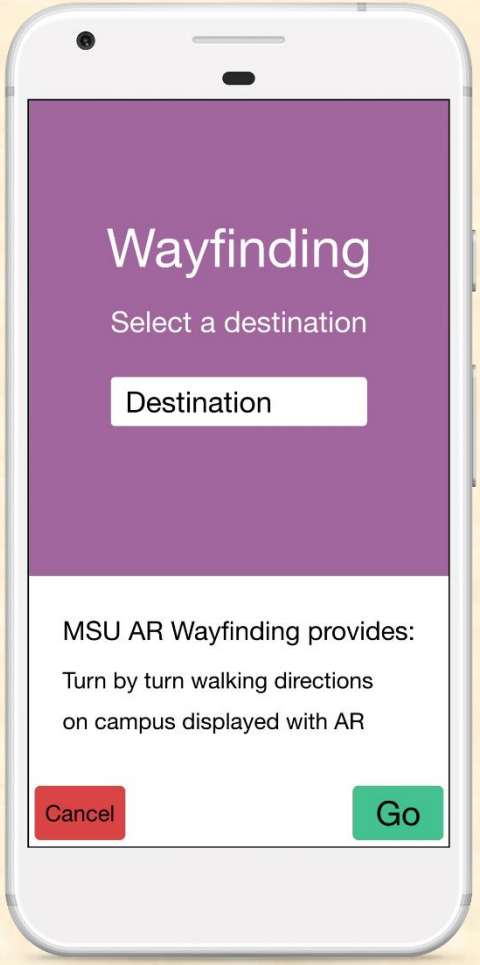
# Design Specifications

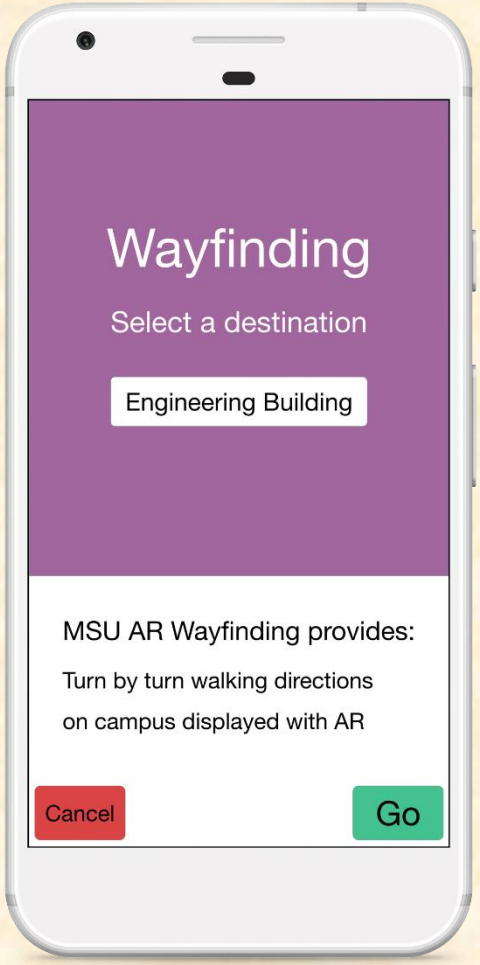
- The design within the AR experience is most important
- Limited user input for quick and easy use
- Easy to use while walking

# Screen Mockup: Tour AR

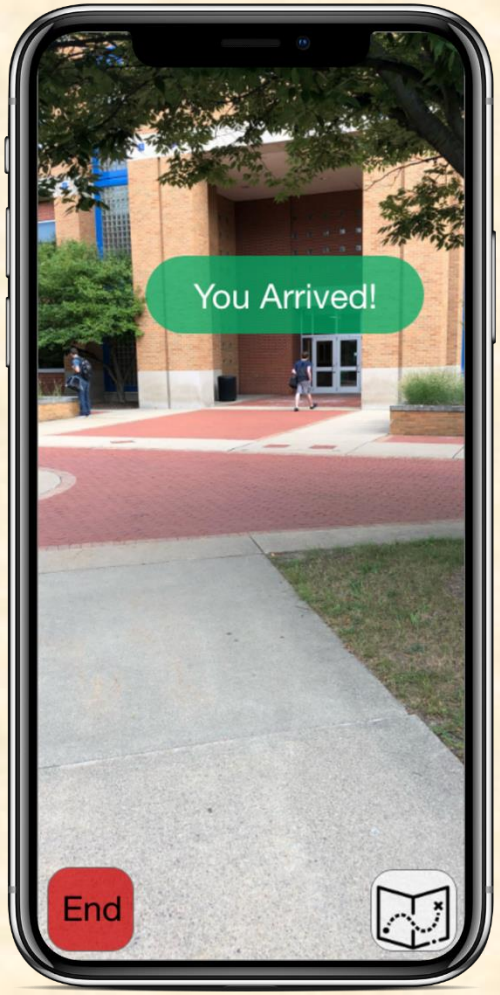



# Screen Mockup: Wayfinding Select

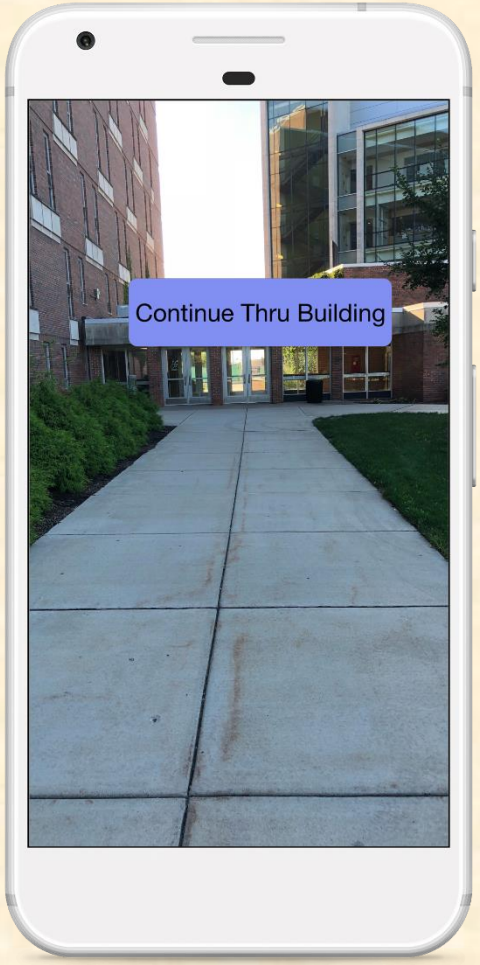


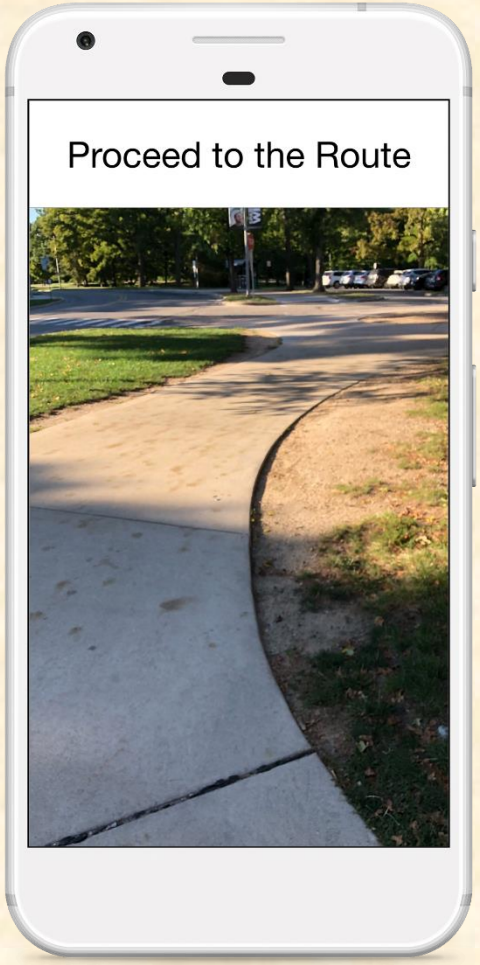



# Screen Mockup: Wayfinding AR

# Screen Mockup: Special Cases

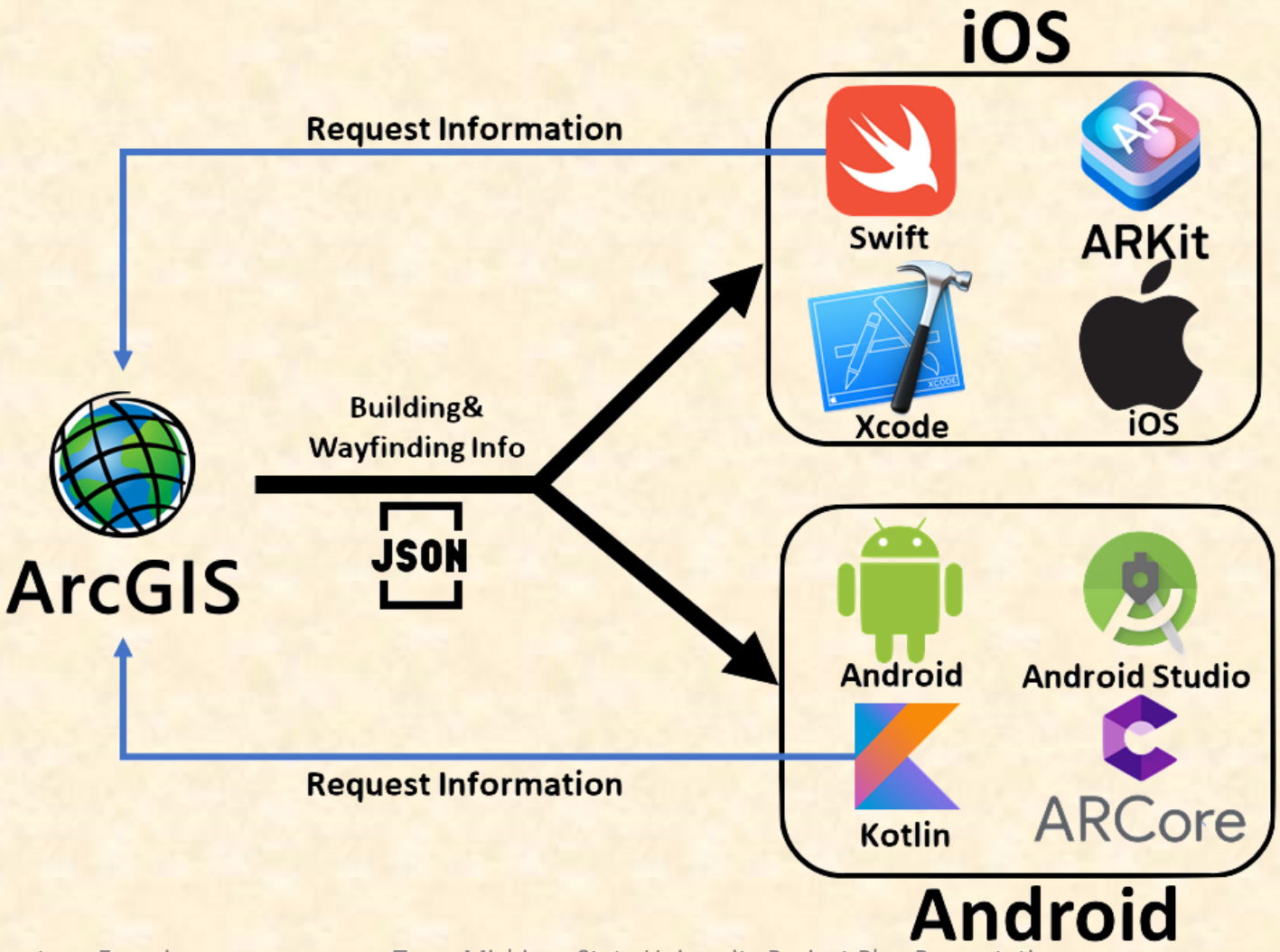


# Technical Specifications

- Native Android and iOS apps
  - Android – API level 24-27
  - iOS – iOS 11.0
- Written in Kotlin (Android) and Swift (iOS)
- Augmented Reality
  - Android – ARCore
  - iOS – 'ARKit + CoreLocation'
- Location and directions through MSU GIS

# System Architecture



# System Components

- Hardware Platforms
  - No server
  - Run entirely on iPhone X, Samsung S9, and Google Pixel 1
- Software Platforms / Technologies
  - Android Studio
    - ARCore
  - XCode
    - ARKit
  - ArcGIS

# Risks

- Risk 1 - Lack of resources (Medium)
  - Description: There are not many resources for location-based AR apps.
  - Mitigation: There is GIS information available for building locations on campus. We'll learn how to label locations from existing examples.
- Risk 2 - Instability of GPS inside a building (Hard)
  - Description: AR navigation leads users to go through foreground objects when operating inside a building
  - Mitigation: Develop the app assuming user is running outside first and then get more accurate information from GPS.
- Risk 3 - Capability of supporting AR on each platform (Easy)
  - Description: There is no true consensus as to which platform works better with location-based AR.
  - Mitigation: We will develop different features on each platform
    - Will decide which platform to continue with after 9/24.
- Risk 4 – Inaccuracy of compass (Hard)
  - Description: The compass in the phone is very inaccurate.
  - Mitigation: For android, have the user walk in a straight line for about 10 feet. We can calculate the device rotation based on the bearing between the starting point and the ending point.

# Questions?