Augmented Reality (AR) Navigation System for Commercial Spaces

Software Projects - Group 14

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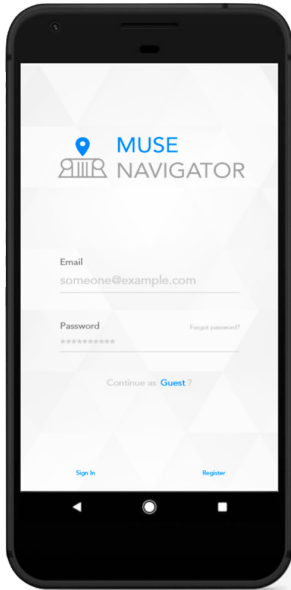
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Motivation

- From stakeholder research:
  - Lack of maps and signage in museums.
  - Old technology currently in use, e.g. portable audio guides

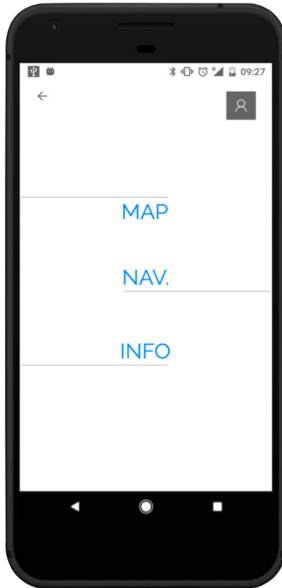- Various applications to other scenarios, e.g. supermarkets or libraries.

Scope

▶ Display navigational routes in real-time.

▶ Calculate the shortest route to the user specified location.

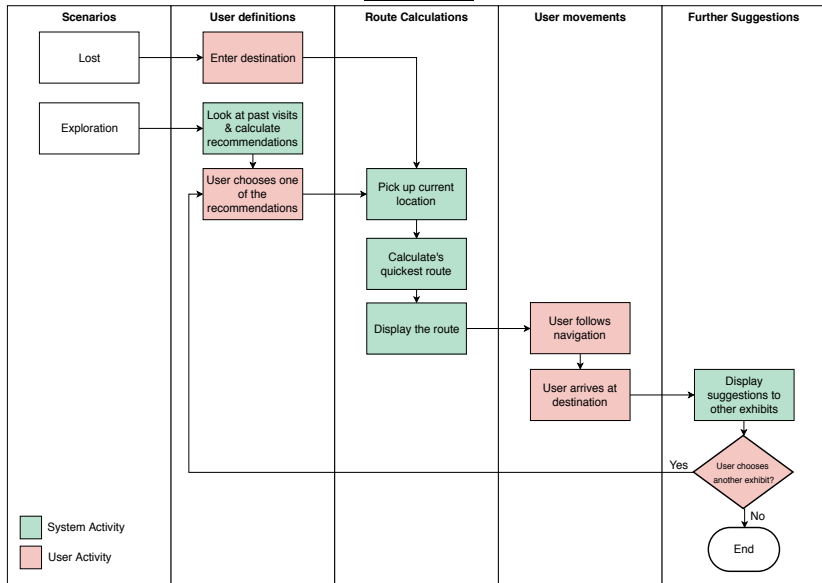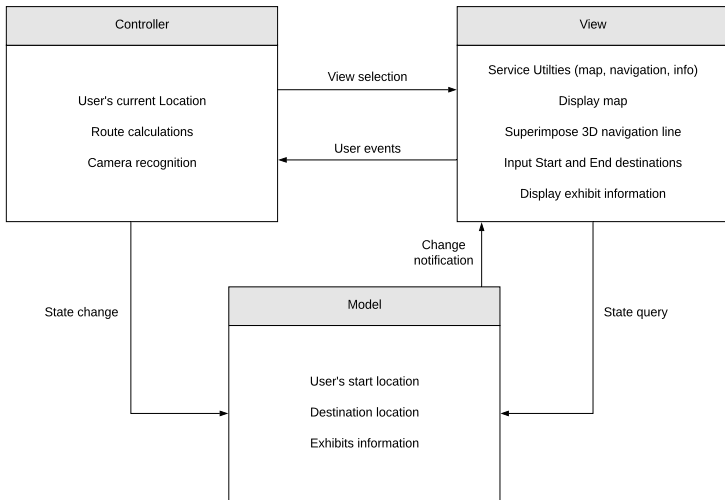▶ Use Augmented Reality (AR) to enhance user navigation routing.

Design

- ▶ Android Prototyping

- ▶ User flow diagrams

- ▶ Model-View Controller

Login Screen   Menu Screen   Navigation with AR

Use Case Model

Scenarios	User definitions	Route Calculations	User movements	Further Suggestions

Lost → Enter destination

Exploration → Look at past visits & calculate recommendations

User chooses one of the recommendations → Pick up current location

Calculate's quickest route

Display the route → User follows navigation

User arrives at destination → Display suggestions to other exhibits

User chooses another exhibit? — Yes / No

End

System Activity
User Activity

Model-View Controller

Development Process & Testing

- ▶ Used Agile with Scrum instead of Waterfall or Lean

- ▶ 4 Sprints Conducted

- ▶ TDD approach
  - ▶ Unit
  - ▶ Integration
  - ▶ Regression
  - ▶ Performance & Stress
  - ▶ User Acceptance (UAT)

Outcomes
Sprints Conducted

▶ Arduino hardware construction and Bluetooth

▶ Navigation using A* path-finding algorithm

▶ AR: Rendering objects on screen

Evaluation

▶ High technical standard in the back-end

▶ Very "agile" in moving things between sprints to accommodate changes

▶ Good feedback from industry professionals and users

▶ Executed plans as of our proposal according to stakeholders and user requirements

Questions?