

# CS 525M – Mobile and Ubiquitous Computing Seminar

Brian Demers  
April 27, 2004

# Overview

- FlightManager: Project Scenario
- Key Requirements
- Approach
  - Technologies
  - Libraries
- Demo
- Conclusions

# Scenario

- Information system for passengers in airports
  - Would run on PDA
  - Determines a passenger's "context"
    - Location
    - Itinerary
    - Current time
    - Airline information
  - Displays context-specific information to passengers
    - Maps
    - Flight/gate information
    - Other external information (ex: commercial sites)

# Scenario

- Information system for passengers in airports
  - Would run on PDA ← *Demo on PC*
  - Determines a passenger's "context"
    - Location ← *Implemented*
    - Itinerary ← *Implemented*
    - Current time ← *Implemented*
    - Airline information
  - Displays context-specific information to passengers
    - Maps ← *Implemented*
    - Flight/gate information
    - Other external information (ex: commercial sites)

# Requirements

- Application: Show maps that apply to the current context
  - User's current area
  - Short on time: show essential information only
    - Gate locations
    - Their location (not implemented)
  - Lots of time: include nonessential information
    - Restaurants
    - Bookstores

## Requirements (cont.)

- Information must be created and used by different applications
  - Itinerary – Calendar Program
  - Location – Hardware Device/OS
  - Time – OS
  - Airline Info – Published in well-known format
- User agent – combines this info and makes decisions

## Approach: Design

- Data Portability using XML/RDF
  - Semantic Web idea
  - XML/RDF triples: *<subject><verb><object>*

```
<rdf:Description rdf:nodeID="http://myURI">  
  <vcard:Given>Brian</vcard:Given>  
  <vcard:Family>Demers</vcard:Family>  
  <vcard:email>bjdemers@wpi.edu  
  </vcard:email>  
</rdf:Description>
```

- **Ontologies** (other XML documents) describe types of information (verbs and objects), allowing programs to infer meaning of data

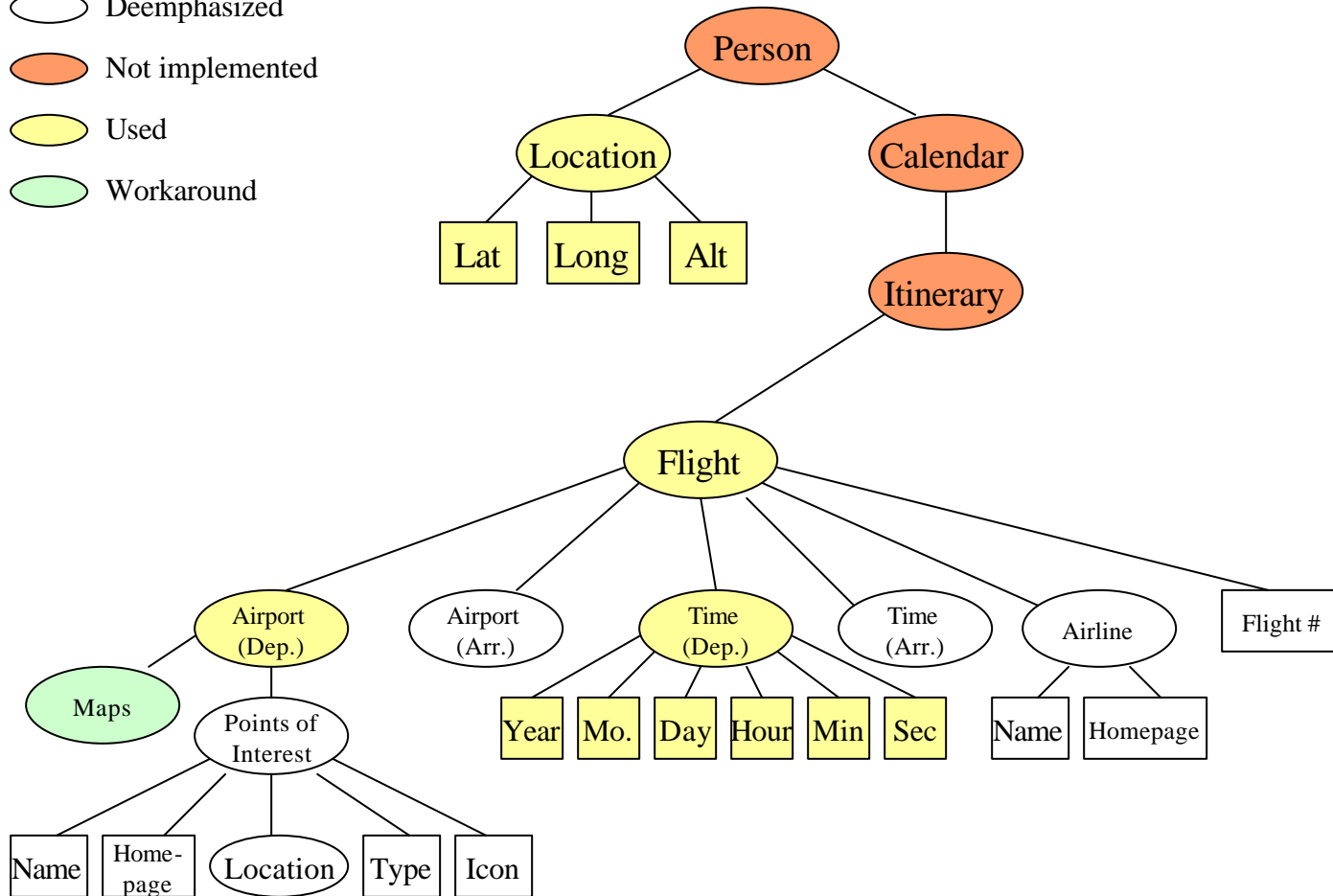
# Approach: Data Hierarchy

○ Deemphasized

● Not implemented

● Used

● Workaround



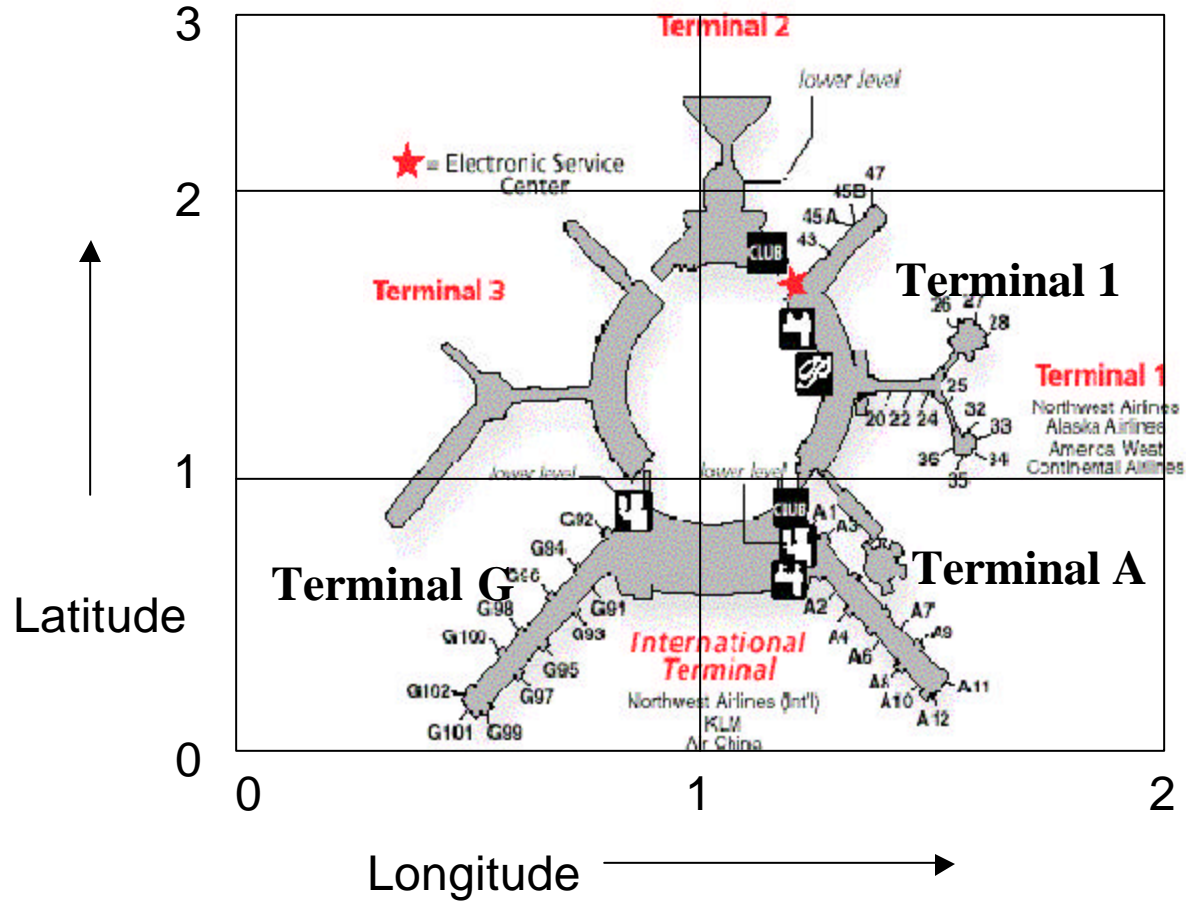


## Approach: Implementation

- Java
  - Free, portable, familiar
- Jena
  - Java library for manipulating XML/RDF documents
- NetBeans IDE
  - Java development environment

# Demo

## SAN FRANCISCO INTERNATIONAL



Demo

## Observations/Conclusions

- Map Idea: so-so
  - Already lots of maps in airports
  - Could just ask for directions!
  - May be useful for anyone overcoming a language barrier
  - More useful (?) (but harder?) alternative: maps for outdoor locations (parks, trails)

# Observations/Conclusions

- Semantic Web/XML/RDF
  - Lack of standard ontologies
    - Are often multiple ontologies covering the same concepts
  - Theory: developers will start slowly with standard ontologies, build steam, eventually reach a critical point and begin growing exponentially
  - ...but still a ways off
- Jena
  - Just scratched the surface; probably some poor design decisions in FlightManager app.
  - Basic functions are nonetheless cumbersome to use
  - Jena's query language, RDQL sounds more promising (tie in to MySQL)

Questions/Comments?