

Student Attendance System

Outline for Technical Architecture

1. Choice of Architecture

- a. Multi-user system
- b. Web-based application
- c. Browser-based mobile support based upon responsive Web app
- d. Data store is a relational database
- e. Technology stack is Linux, Apache HTTP Server, JEE Application Server, MySQL

2. Rationale for Choice of Architecture

- a. Multi-user system
 - i. Up to 70 simultaneous student users
 - ii. Up to 5 simultaneous instructor users
- b. Browser-based Web application
 - i. System should be usable by students in the classroom on lab machines, student laptops, or student mobile devices.
 - ii. Avoids costly specialized hardware and software in the classroom.
- c. Browser-based mobile support
 - i. Mobile support is important to allow students to use their own devices.
 - ii. Use case specifications indicate normal Web app functionality and workflow.
 - iii. Responsive Web design makes use of mobile devices effective.
 - iv. No obvious justification for cost of developing dedicated mobile apps.
- d. Data store is a relational database
 - i. The conceptual data model can be easily implemented with an RDBMS.
 - ii. Normal RDBMS features of transactions, logging, commit, rollback, backup, and restore functionality are essential for meeting reliability and recoverability requirements.
 - iii. Typical RDBMS security features would meet identified security requirements for the application.
- e. Technology stack is Linux, Apache HTTP Server, JEE Application Server, MySQL
 - i. Linux servers are affordable and widely available (including SOIS).
 - ii. Apache HTTP Server is affordable and widely available (including SOIS).
 - iii. JEE Application Server has an affordable, open-source version (Tomcat) that is widely available (but not at SOIS).
 - iv. Non-Functional requirements include a preference for Java-based tools.
 - v. JEE has robust security features that are easily configurable by developers.
 - vi. MySQL Community Edition (CE) is sufficient to meet functional and non-functional requirements.
 - vii. MySQL CE is affordable and widely available (including SOIS).
 - viii. The non-functional requirements include a preference for MySQL.