Fall Monitor

SOFE 3490U-001
Software Project Management
Lab 5

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Problem

The reason for choosing Fall Monitor as our topic is to deal with the increasing number of accidents that happen to the senior citizens and people with disability. The motive is to use this device, decrease this number, and provide the right assistance to the ones in need.

Introduction

- An automatic fall detection system
- Enables health and safety officers to attend to the elderly, disabled and other citizens of Ontario, if a fall occurs and no motion is detected
- Focuses on developing a fall detection device using wearable sensors that can be integrated into watches, shoes, belts, etc.
- Performance metric of fall detection system includes precision like true positive, true negative, false positive rate

How it works ?

- Uses an accelerometer to track any changes in a person’s acceleration

- When it detects too fast of an acceleration or no motion for a long period after a fall, it sends out signal to the health and safety officers

- Uses a cellular modem and a built-in GPS system to track where the client is, and sends a call for client’s medical information

Objective

1. Device is able to detect when a fall occurs, using a motion sensor

2. Cloud server database should automatically update the fallen users record, when a fall event occurs

3. Devices should be able to read some of the vital signs of the patient i.e. heart rate, blood pressure, blood oxygen saturation, temperature, posture and physical activities

4. Devices come in the form of wearable sensors that can be integrated into watches, shoes, belts etc.

5. The system also includes the design and evaluation of user interfaces such as smartphone applications for fall prevention intervention and educating subjects on fall risk factors

Measure of Success

1. Fall detection accuracy should be 95% or higher
2. Call should be placed to emergency services within 15 seconds of fall detection
3. GPS should have 5m accuracy or better
4. Fallen users records should update immediately when fall event occurs
5. Vital signs should be accurate with 10% and sample every 30s or less

Required Infrastructure

- **Body sensor** containing accelerometer and cellular modem with GPS
- **Software on the body sensors to detect falls** and contact cloud server in the event of a fall event (using TCP/IP)
- **Cloud server** for sensor to call home to, with access to a phone line to place 911 calls in the event of fall
- **Database** containing information on device holder, such as medical information, location, device number, history of fall events

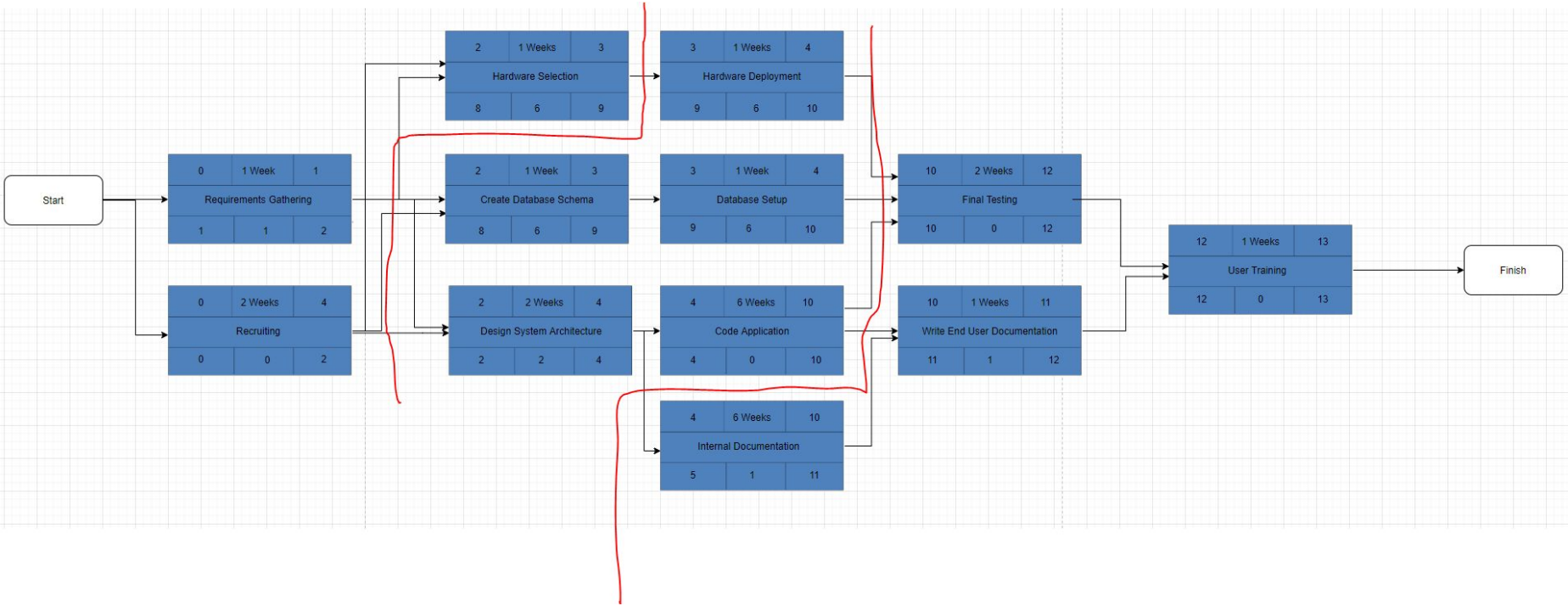
Risks Associated

- Requirements may not be understood properly by every member in the team
- Client / Stakeholder requirements may change
- Some fall detectors might behave slightly differently depending on the smartphone model / device in which it is installed
- Smartphones cannot be overloaded with continuous sensing commitments that undermine performance of the phone, i.e., by depleting battery power
- The product may be too complicated to build
- Errors may be overlooked or missed during the testing phase
- To save time, developers may sometimes neglect design processes

Risk Associated Continued

- Actual cost may exceed target cost, cost overrun and / or inaccurate budget estimation
- Fall detection can lack strategies to ensure data privacy
- Employees may lack productivity. Some deadlines may not meet
- Resources such as systems, staff, skills of employees may stay untracked
- Employees may lack knowledge of the product and their responsibilities
- Can include competition, foreign exchange, commodity markets, and interest rate risk, as well as liquidity and credit risks
- These are risks, which can’t be controlled or estimated; starting from technologies being discontinued to even changes in government policy

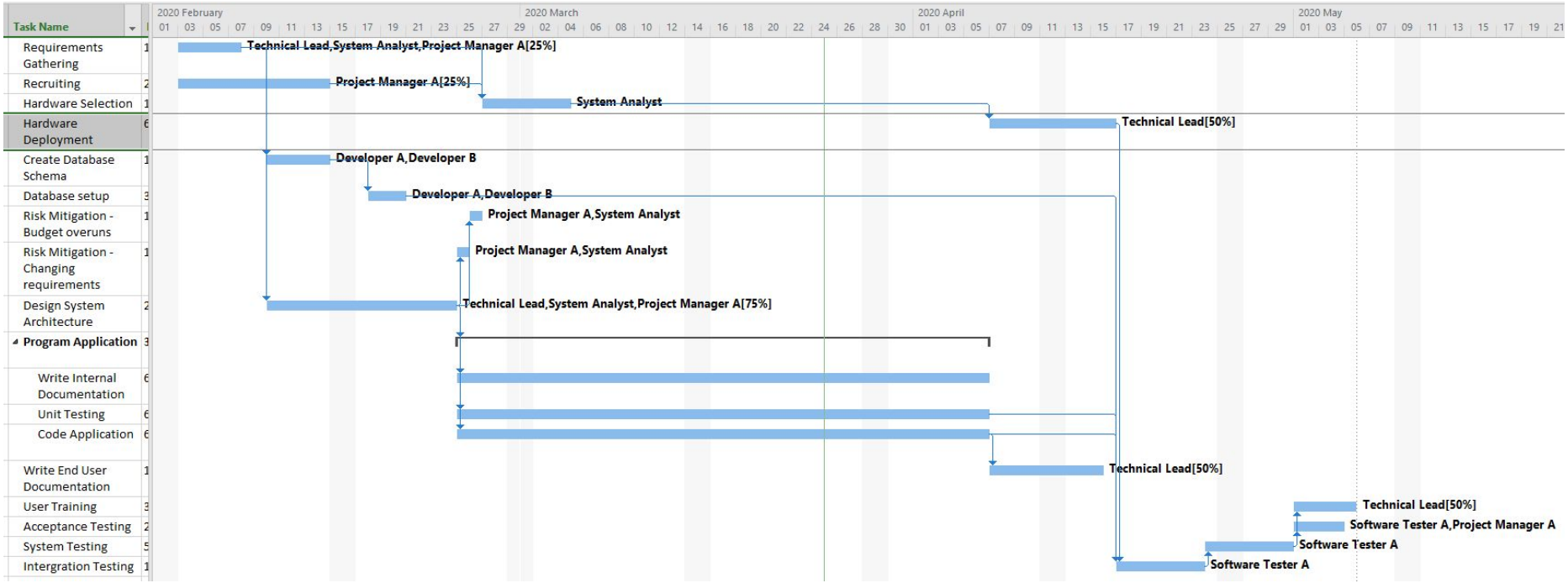
Activity Diagram



Resources

- Developers-2
- Project manager-1
- System analyst-1
- Technical lead-1
- Software testers-1

Gantt Chart


Task Name
2020 February
2020 March
2020 April
2020 May
Requirements Gathering
Recruiting
Hardware Selection
Hardware Deployment
Create Database Schema
Database setup
Risk Mitigation - Budget overuns
Risk Mitigation - Changing requirements
Design System Architecture
Program Application
Write Internal Documentation
Unit Testing
Code Application
Write End User Documentation
User Training
Acceptance Testing
System Testing
Intergration Testing
Technical Lead,System Analyst,Project Manager A[25%]
Project Manager A[25%]
System Analyst
Technical Lead[50%]
Developer A,Developer B
Developer A,Developer B
Project Manager A,System Analyst
Project Manager A,System Analyst
Technical Lead,System Analyst,Project Manager A[75%]
Technical Lead[50%]
Technical Lead[50%]
Software Tester A,Project Manager A
Software Tester A
Software Tester A

Thank You for listening !

Github group # (Group 101)

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