



**SOFE 3490U-001**  
**Software Project Management**  
**Lab 3**

**Fall Monitor**

Github group # (Group 101)

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## **Introduction**

The Fall Monitor project we have undertaken requires various resources to uphold the incremental development plan and schedule. In terms of labour, our team requires teams of software, electrical, and mechanical engineers to design the device and the software that will be used on it. In addition, we require a team of web developers experienced in web design and SQLdatabases. We also require marketing teams and teams to help with debugging, testing, and quality assurance. The amount of personnel per individual team should be four max. The complexity of the device is fairly low and there are existing devices that the engineering teams can learn from and create a custom design. We estimate a total of around 24 employees for our internal project development team, having one team of four people for each different aspect of the project's development, having six of these aforementioned aspects in total. The software teams and web development teams will require a workstation for each employee, having eight total workstations. These workstations do not require high-end components, since the software teams and web development teams do not have to do any high-end computing tasks during the project's development. The Electrical and Mechanical engineering teams will need standard tools to develop and assemble the hardware prototypes using components such as accelerometers, Bluetooth chipset, and other required components. The marketing and QA teams will require a standard-range laptop in order to create and produce material related to documentation, marketing, and bug reports. The raw materials required to develop the hardware prototype and final product include: plastic outer casing, metallic inner casing to protect the inner components, Bluetooth chipset, accelerometer, a Garmin GPS chipset Type M5, an ARM CPU and accompanying motherboard, 2x AA battery, and the necessary wiring.

**COCOMO Estimation (Intermediate Model)**

Cost Driver Category	Cost Driver	Value
Product Attributes	Required Software Reliability	1.4
Product Attributes	Size of Application Database	1.0
Product Attributes	Complexity of The Product	1.0
Hardware Attributes	Runtime Performance Constraints	1.11
Hardware Attributes	Memory Constraints	1.0
Hardware Attributes	Volatility of the virtual machine environment	0.87
Hardware Attributes	Required turnabout time	1.15
Personnel attributes	Analyst capability	1.19
Personnel attributes	Applications experience	1.0
Personnel attributes	Software engineer capability	1.0
Personnel attributes	Virtual machine experience	0.9
Personnel attributes	Programming language experience	1.0
Project Attributes	Application of software engineering methods	1.0
Project Attributes	Use of software tools	0.91
Project Attributes	Required development schedule	1.0
		EAF = 1.52

Its a medium size project, moderately complex, therefore using semi-detached Project for estimation. A=3.0 B=1.12. Also given previous experience I am going to estimate about 5KLOC primarily driven by reliability requirements.

$$E = a(KLOC)^b * EAF$$

$$E = 3 * 5^{1.2} * 1.52$$

$$E = 31.46 \text{ person-months}$$

For semi-detached project duration estimation A=2.5, B=0.35

$$D = a(KLOC)^b * EAF$$

$$D = 2.5 * 5^{0.35} * 1.52$$

$$D = 6.67 \text{ Months}$$

Estimated People

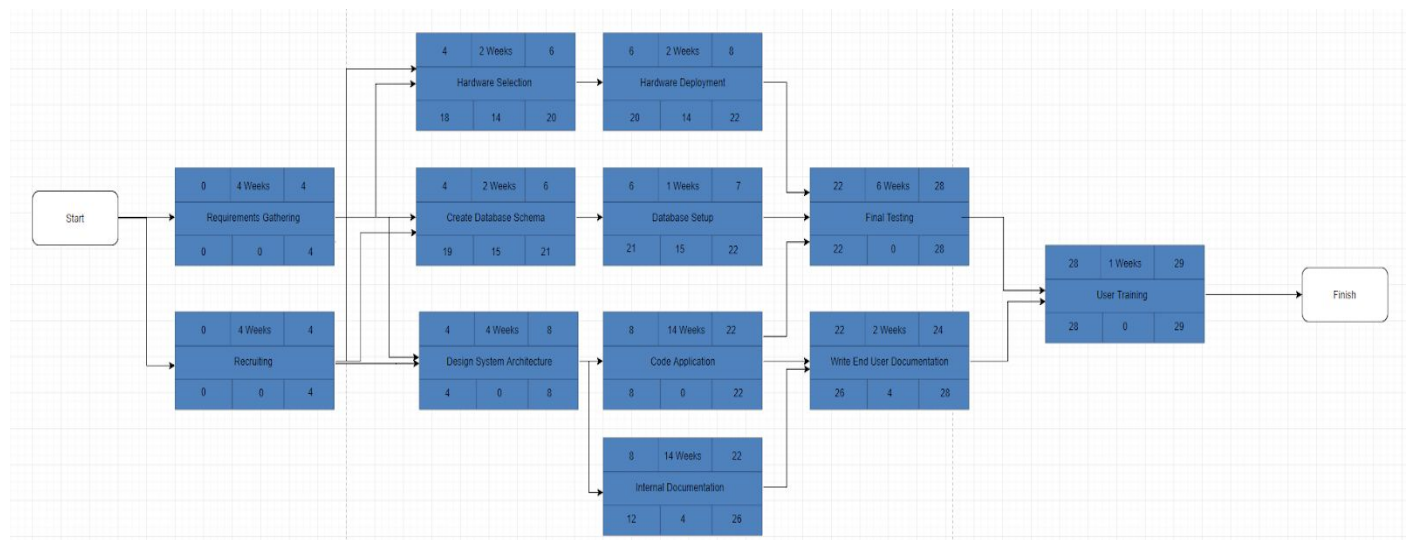
$$P = E/D$$

$$P = 31.46/6.67$$

$$P = 4.71$$

For this Project it is estimated it will take 6.67 months for 5 people to complete the 5 KLOC project.

## Activity Diagram



## Risk Analysis

- Requirements may keep changing by stakeholders
  - Proper understanding of the product within the team and communication amongst team members
- Some fall detector might behave slightly different depending on the smartphone model / device in which it is installed
- Smartphones cannot be overloaded with continuous sensing commitments that undermine the performance of the phone, for example, by depleting battery power. It is essential to manage the sleep cycle of sensing components in order to trade off the amount of battery consumed. Nonetheless, the smartphone's battery life is always low, which could hinder its acceptance. This is not a minor problem, especially considering that the system is intended for older people with impaired mobility
- Vision-based systems in particular, are much more prone to privacy concerns than, for example, body-worn acceleration-based devices

- Fall detection usually lacks strategies to ensure data privacy. This shows that they are still far from a real-life deployment
- It is unclear whether the simulated activities are representative of their real counterparts.
- Employees may lack productivity. Some deadlines may not meet.
  - Running a strict recruitment process, having a group of people be monitored by their bosses could avoid certain risks
- Resources such as systems, staff, skills of employees may stay untracked
  - Performing proper tracking at early stages.