Software Project Management

Lab 3 Project Cost Estimation, Activity Planning, and Risk Assessment

Graphical Password Strategy

A picture is worth a thousand words

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Project Effort Estimations

Function Point Method

Project Requirements (From Lab 2, Section 4)

1. The Graphical Password interface will be implemented using a web application. It will have both a mobile application and web interface so that cross platform users are able to sign in with this option.
2. A Login API will be constructed to handle all platform logins to save on hosting costs. It will be implemented using the NodeJS Express framework with HTTPS to allow for quick and easy secure authentications to the system.
3. An SQL database will be required to store the user information such as their username and a hashed version of their password combination for sign in, this way a user can seamlessly sign in on any of their devices and pick up where they left off.
4. The application will be hosted on a distributed cloud service (such as AWS) so that it can be scaled to meet different user demand for peak and off times. This way the cost of hosting can be minimized while still maintaining a great user experience.

Function Point Estimates for Project:

	Complexity						FP
Description	Low	*	Medium	*	High	*	Total
EI (Inputs)	10	3	4	4	4	6	70
EO (Outputs)	3	4	4	5	2	7	46
EQ (External Inquiry)	2	3	2	4	3	6	32
LIF (Internal Interfaces)	6	7	3	10	2	15	102
EIF (External Interfaces)	2	5	2	7	1	10	34
					Total Function Points:		284
Days/FP:	3				Duration (Day):		95

From previous experience, our development team is familiar with both the Android and IOS environments, however not as many of us are experienced with API development for this specific application. Additionally not everyone is as experienced with SQL as others. We estimate that it will take 1 day for 3 FP's.

Given this, our team estimates 95 days, or just over 3 months for the project.

Cocomo Method

Cocomo Tables:

Project Type	a	b
Organic	3.2	1.05
Semi-detached	3.0	1.12
Embedded	2.8	1.20

Project Type	a	b
Organic	2.5	0.38
Semi-detached	2.5	0.35
Embedded	2.5	0.32

Project Scope

The project deliverables state that the application will be hosted on multiple ecosystems such as iOS and Android devices. The team is familiar with working on both platforms, but not necessarily the languages for both. For this reason the project is semi-detached. Using our past experiences, we estimate the project will contain approximately 10,500 lines of code.

Effort Estimation

$$E_i = a * (KLOC)^b$$

E = 3.0(10.5)^1.12
E = 42 Person Months

Duration Estimation

$$M = a * E^b$$

M = 2.5(42)^0.35
M = 9 Months

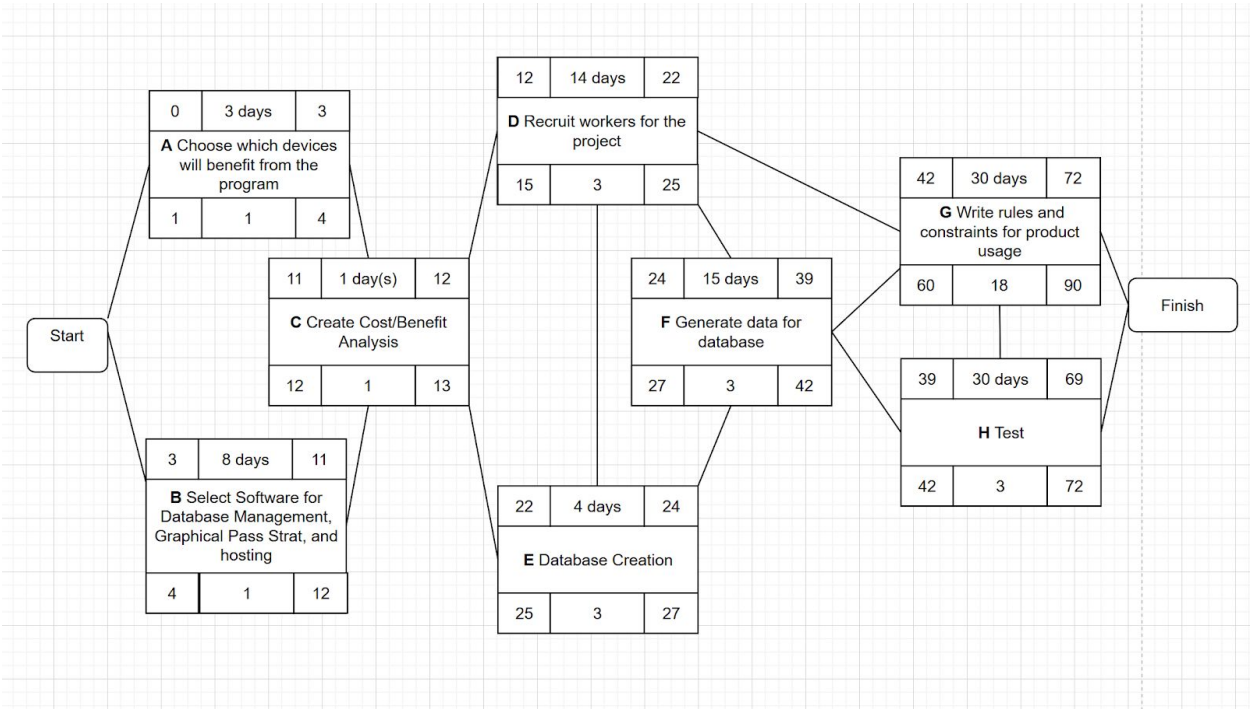
Recommended Team Size

S = Person Months / Duration
S = 42 / 9
S = 4 People

Activity Diagrams

A: Product will be released for all smartphones and desktop computers
B: Software that will be used is as described in our previous proposal submission
C: Analysis required to provide a sense of security that product creation will net a profit before an investment should be made to hire and build.
D: Many tasks with many different required skill sets. Finding skilled workers will take time
E: Create Database with AWS
F: Generate data for database
H: Test product with generated data and record metadata that is found
G: Use metadata and generated data to complete rules and constraints for product usage

G and H take a long time because this product is being developed for the first time for our needs. To ensure that our cost estimates are accurate, we need to run tests to ensure reliability of our software product before making it available.



Please note that the large float value at stage G is a result of the testing stage H. The testing will be used to generate test data, which is then used with generated data to describe rules and constraints. For this reason, it may not be reasonable to assume that rule and constraints on product usage can be written at the beginning of the real product evolutionary cycle.

Risk Assessment

In this software project, a variety of risks may be present or reveal themselves as the project progresses. Risks are something that can delay or interrupt the progress during the project and when issues such as this arise, steps must be taken to ensure their impact is minimized or eliminated entirely. Here is a list of risks, as well as solutions for them:

- Learning Curve Delays: most of the team members are not familiar or have experience with API development and SQL programming. While the team learns and familiarizes themselves with the new skills, there can be delays in deliveries and a decrease in productivity with the extra workload
    - Solution: ensure that team members take time to learn about these new technologies and have more experienced members assist the members who are new to API development and SQL programming
- Poor Productivity: team members may be working for extended periods of time and may lose motivation to produce optimal work due to not being able to meet the objectives that were set in place at the start of this project
    - Solution: make sure that team members do not fall behind on their work, set sub goals in between objective deadlines to assure that objective deadlines are being met