Answer 1

Architecture Diagram is attached

Answer 2.1

"Agile Software Development Model" will be suitable for our project. Though the "Waterfall model" is traditional and suitable for the small or medium scale projects, I think it would be better we go with Agile Development Model for our project.

Advantages of Agile over Waterfall model is:

1) Modularization (Preferably we work on several pieces of code or functionality i.e. Modules)
2) Easily allows you to make the changes at any point of time. (though it's not important for us now)
3) Project or Functional priorities are always evaluated weekly or sprint so that we could be able to track the work among the team and assess our productivity
4) Allows our BOSS / client to add his feedback for every sprint or week.
5) Get hold of bugs at the end of the sprint so that we can take care of the development cycle from getting mislead and also can fit into next sprint.
6) Lastly but not least, we can showcase / deploy our work or development at the beginning of the each next scheduled sprint.
7) Rapid production or development
8) Team can be independent from their contribution with less dependency on other activities

Few Major Disadvantages of Agile which can be taken as advantage for our project:

1. Active user involvement: This is much needed for any project to be successful. Even the change in requirements will not make the team panic.

2. Testing throughout the software development life cycle: Less or the more each sprint will move to UAT (User acceptance testing) which can be taken as advantage because unit testing will ensure the quality of the project simultaneously along with the ongoing development.

I believe trade-off are worthwhile.

Answer 2.2 a

Gantt Chart Snapshot is attached.

Answer 2.2b

Software Project Effort Distribution:

Based on the studies from the standard industry literature and articles, the distribution of software development effort across software life cycle is typically follows:

Requirements: 15% - 20%

Design and Analysis: 10% - 15%

Coding: 40% - 45%

Testing: 30% -35%

Integration or Implementation: 5% - 10%

Size of the development product in Lines of Code: 20K

Effort in person months: 15months

Schedule in calendar months: September 2016 – December2016

Resources: 5members

Project Duration: 3months (15months / 5resources)

Project Cost in Dollars: $30000 (Assuming 2000 salary per month)

Answer 3:

COCOMO ESTIMATION

According to Boehm, our project is classified under Semi-detached development complexity.

As the development consists of both experienced and inexperienced team members and also have limited experience and unfamiliarity towards some aspects of the system which are going to be developed.

Cost Estimation for our project is followed by basic COCOMO estimation model.

Equations:

Effort = a1 x $(KLOC)^{a2}$ PM

Tdev = b1 x $(Effort)^{b2}$ Months

Calculation1:

Efforts = 3.0 x $(20)^{1.12}$ PM (Semi-detached)

Efforts = 85.95

Calculation 2:

Tdev = 2.5 x $(85.95)^{0.35}$ Months

Tdev = 11.88 Months

Calculation 3:

MonthLOC = KLOC / Efforts

MonthLOC = 20000 / 85.95

MonthLOC = 232.69

Calculation 4:

Resources = Efforts / Tdev

Resources = 85.95 / 11.88

Resources = 7.28 (required)

Calculation 5:

Assuming the salary for each person for a month = $3000

Cost required to develop the project = 11.88 x 3000

= $35640