**Learning Journal Template**

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**Course:**Software Project Management

**Journal URL:** <https://github.com/sameer1130/SPM-journals->

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**Key Concepts Learned:**

Chapter 3 – Software project effort and Cost estimation  
  
  
Effective Software project estimation is an important activity in software development process.

Estimation in software project predicts the time and cost that the project requires for completion of the project. It requires the use of complex tools and mathematical understandings as well as knowledge about planning.   
one of the main reason Software program fail is our inability to accurately estimate the software size.  
  
Factors affect on Project Estimation

1. Cost: The project will fail if you do not have sufficient funds to complete it. So, At early stage

estimate project cost & ensure you have enough money to complete the work.

2. Time: Estimate both overall project duration & timing of individual tasks. It also enables you to

manage client expectations for key deliverables.

3. Size & Scope: All the tasks that must be completed in order to deliver product on time. You can

ensure that you have right materials & expertise on the project by estimating how much work is

involved and exactly what tasks must be completed.

4. Risk: Estimating predicting risk, what events will occur during the projects life cycle and how serious they will be. Create risk management plans.

5. Resource's: Resource management ensures that you have all the resources you require and make best

use of them. Like, tools, people, materials, hardware, software & other resources  
  
Steps of Software Project Estimation

1. Estimate Product Size (LOC & FP):

• It is the very first step to make an effective estimation of the project.

• A Customer's requirements, SRS Document & System design document used for estimating

the size of a software.

• Estimate project size can be through similar project developed in past. This is called

estimation by Analogy.

• The system is divided into several subsystems depending on functionality & size of each

subsystem is calculated.  
  
2. Estimate Project Efforts:

• The estimation of effort can be made from the organizational specifics of SDLC.

• Software development project involves Design, Coding, Testing, Writing, Reviewing

documents, Implementing prototypes & Deliverable it decide overall project efforts.

• The project effort estimate requires you to identify and estimate & then sum up all the

activities you must perform to build a product of the estimated size.

There are two main ways:

1. The best way to estimate effort is based on the organization's own historical data of

development process. Suppose you have similar SDLC, Project size, Development

methodology, Tools, Team with similar skills and experience for the new project.

2. If the project is in different nature which requires the organization to adopt different

strategy or different models based on algorithmic approach. Ex. COCOMO Model.

3. Estimate Project Schedule:

• It involves estmating number of people who will work on the project and what they will work

on (the Work Breakdown Structure).

• Also when they will start working on project & when they will finish.

• Once you have this information, you need to lay it out into a calendar schedule.

• Efforts in man-month are translated to calendar months thumb rule is used.

Schedule in calendar months = 3.0 \* (man-months) 1/3

• The parameter 3.0 is variable, used depending on the situation which works best for the organization.

4. Estimate Project Cost:

• The cost of a project is derived not only from the estimates of person efforts and size.

• Other parameters such as purchase hardware, software, travel for meeting,

telecommunication costs (long distance phone calls, video-conferences), training , office

space etc.

• Exactly how you estimate total project cost will depend on how your organization allocates

costs.

• The simplest labor cost can be obtained by multiplying the project's effort estimate (in hours)

by a general labor rate ($ per hour).

• A more accurate labor cost would result from using a specific labor rate for each staff position

(e.g., Technical, QA, Project Management, Documentation, Support, etc.)

**COCOMO Model :**

1)Basic Cocomo model:  
Formula:

Effort (E) = a\*(KLOC)b MM

Scheduled Time (D) = c\*(E)d Months(M)

Where,

• E = Total effort required for the project in Man-Months

• D = Total time required for project development in Mon

• KLOC = The size of the code for the project in Kilo lin

• a, b, c, d = The constant parameters for a software project

2) Intermediate

Formula:

Effort (E) = a\*(KLOC)b \*EAF MM

Scheduled Time (D) = c\*(E)d Months(M)

Where,

Pulll up for

• E = Total effort required for the project in Man-Months

• D = Total time required for project development in months

• KLOC = The size of the code for the project in kilo lines of code

• a, b, c, d = The constant parameters for the software projects

3) Detailed complete cocomo model:  
  
• The model incorporates all qualities of both Basic COCOMO and Intermediate COCOMO

strategies on each software engineering process.

• The whole software is divided into different modules and then apply COCOMO in different

modules to estimate effort and then sum the effort

The Six phases of detailed COCOMO are:

1. Planning and requirements

2. System design

3. Detailed design

4. Module code and test

5. Integration and test

6. Cost Constructive model  
  
Advantages of COCOMO Model:

1. Provides a systematic way to estimate the cost and effort of a software project.

2. Estimate cost and effort of software project at different stages of the development process.

3. Helps in identifying the factors that have the greatest impact on the cost and effort of a

software project.

4. Provide ideas about historical projects.

5. Easy to implement with various factors.

**Application in Real Projects:**

1)Early Stage Cost and Resource Estimation

2)Time Management and Client Expectations

3)Size, Scope, and Risk Management

4)Effort Estimation and Project Scheduling

5)COCOMO Model Implementation

**Potential Challenges:**

Data Accuracy

COCOMO may not fit all types of projects

**Challenges Faced:**

1. Lac of time.
2. Management of various subjects deadlines.

**Goals for the Next Week:**

Prepare Chapter 4 and deep dive into it. Look carefully about the risk management and have a better understanding of it.