American International University-Bangladesh (AIUB)

Faculty of Science and Technology (FST)
Department of Computer Science (CS)

SDPM Group Project, Fall 2022

Project Title: Rental Property Management System
Section: C
Group-02

SOFTWARE DEVELOPMENT & PROJECT MANAGEMENT -- FINAL PROJECT

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Introduction:

Rental property management system is a software that enables rental property owners and admin to execute essential property related programs, including managing and tracking tenant information, accounting and billing, maintenance and posting vacancies online to help all operations run smoothly for the property. As housing is a major problem in the city area so this project will play a great role in the modern city. The seller will give all the flat/house details if buyer wants to buy a flat then he/she will contact with the seller.

Project Title: <u>**RENTAL PROPERTY MANAGEMENT SYSTEM**</u>

Objectives:

The following are our project objectives:

- Construct Software Requirement Specification document of the system.
- To develop a system that allows the users to add, edit, search and delete data from the database.
- To develop a system that allows the users to add, edit, search and delete data from the database.
- To study and analyze the requirement specifications of the rental house management system.
- To develop a system that allows the users to add, edit, search and delete data from the database

Justification:

Firstly, the Target audience and stakeholder of the project is Buyer and property owners. As a result, they will benefit the most. The number one benefit of using a PMS is that it saves time for the buyer. This system will help all the buyers and property owners connect with each other in order to do business. The single most important factor influencing buyer satisfaction is building maintenance. Online payment processing is the best way to streamline how your tenants pay their rent since they can do it from the comfort of their own homes. The customer can view the house for rent while sitting at home, which is satisfied buyer needs and expectations. This system provides great opportunities for buyers and property owners, such as contact management, financial management, advertising and marketing, etc.

System overview:
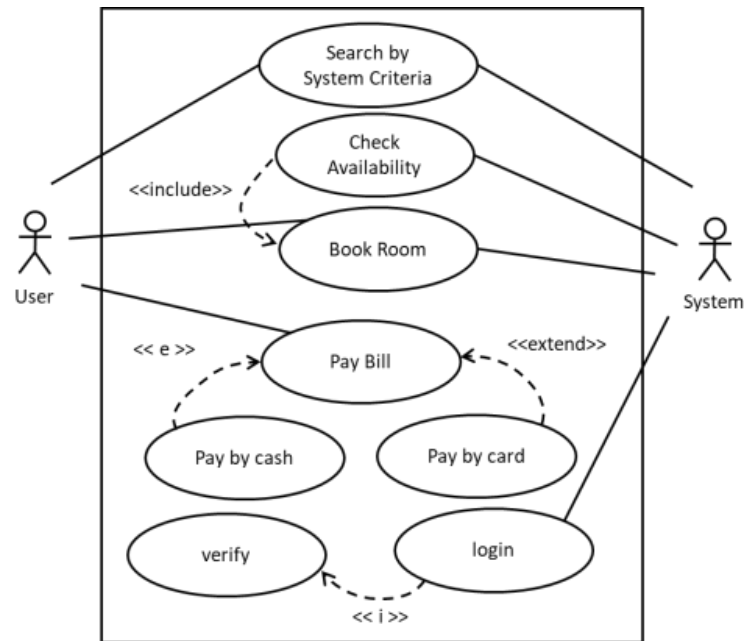
Stakeholder Analysis:

Project stakeholders may be internal or external to the project, they may be actively involved, passively involved or unaware of the project & affected either positively or negatively by the cost, time, scope, resources, quality, or risks of your project.

- Primary Stakeholder:

A positive stakeholder: Positive stakeholders help the project management team to successfully complete the project. Such as Rental Project management team- (directly involved in project management activities), Sponsors –provide financial resources

Internal to the project team: Project Manager, System Analyst, Developer, tester, analyst under the direct managerial control of the project leader,

- Secondary Stakeholder:

External to the project team but in the same organization: Rental management system project information management group, User (Admin, Buyer, Tenant, Seller), Customers/users, Negotiator

Feasibility study:

From a business point of view this is project is technically feasible. The feasibility of an individual project is evaluated

- **Technical Assessment**: It will be desktop-based application. It will suitable for different user groups to be connected. So, it is technically feasible.

  Consists of required functionality against the hardware and software available also aimed at providing a consistent hardware/software infrastructure, is likely to limit the technical solutions considered.

- **Cost-Benefit Analysis:** Identified all of the costs and benefits of carrying out the project.

➢ Costs are:
  - Development Costs:
    -Salaries and other employment costs of the staff involved in the development project
  - Setup Costs
    -Costs of any new hardware and ancillary equipment's
    -Costs of file conversion
  - Operational Costs
    -Costs of operating the system once it has been installed
➢ Benefits are:
  - Direct Benefits
    – These accrue directly from the operation of the proposed system
  - Intangible Benefits
    -Indirect benefits, which are difficult to estimate, are sometimes known asintangible benefits

We can Evaluate Cost-Benefit Evaluation by **_Return On Investment (ROI) technique:_**

Year	Rental Property Management System
0	-100000
1	10000
2	10000
3	10000
4	20000
5	100000
Net Profit	= 50000

Calculate ROI for **Rental Property Management System**

- Average annual profit
= 50,000/5
= 10,000

ROI = (average annual profit/ total investment) X 100

= (10,000/100,000) X 100
= 10%

System Component:

Registration Activity Task:

In "log in" page user to enter their required information and click on "check" button to verify their identification. This page will ask if the information is not in the database, then redirecting to "Register" page. If the User as already registered then system will show an alert message that user is already registered. If Identification No exists in the database, then the system will display the basic details of the User and proceed as below.

<table>
<tr><td>

Admin Module:

'Dashboard' module:
From Dashboard admin choose to select option among 'Properties & Building' 'Tenants & Units' 'Expense & Income' 'Expense & Income'

</td><td>

Tenants Module:

"Dashboard":
Tenants 's dashboard.

</td></tr>
</table>

Process Model to be followed:

For the project, I have selected Waterfall Process model. It is also called linear-sequential life cycle model. Here each phase must be completed before starting the next phase as there is no overlap in this process model. For this model document must be well defined and fixed and requirements must not be ambiguous. Requirements and project cannot change until the end of production or else we have to start from the beginning. Product is produced at the last of the project.

The reason I chose this model because it is very simple and linear. Our project design is not so complex which is perfect for this model. Requirements are defined clearly in project planning and analysis phase so waterfall is suitable for this project.
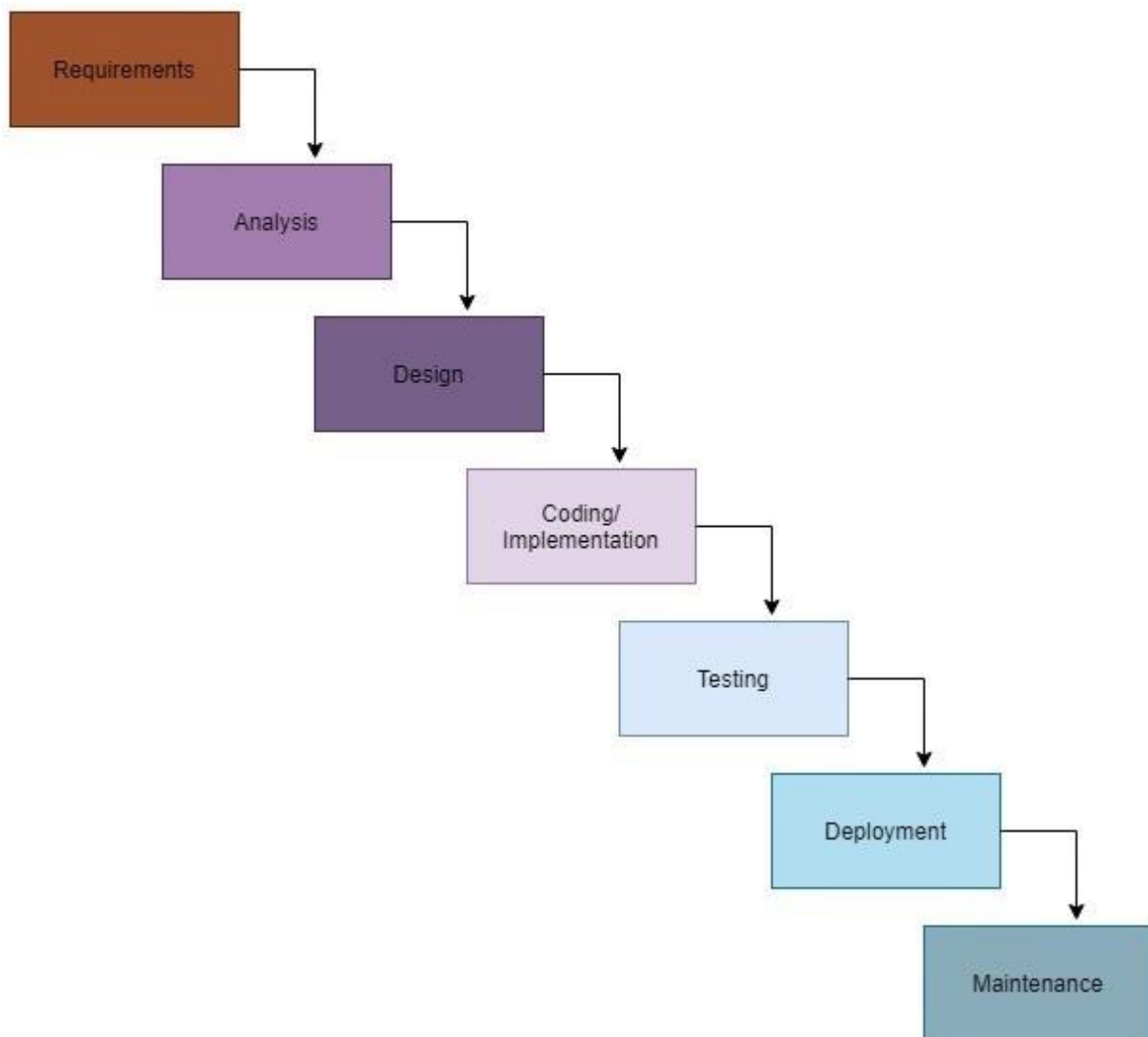
Effort Estimation:

Cocomo (Constructive Cost Model) is a regression model based on LOC. It is a procedural cost estimate model for software projects and open used as a process of reliably predicting the various parameters.

Cost Drivers	Very Low	Low	Nominal	High	Very high
Product attributes					
• Required software reliability extent			1.00		
• Size of the application database			1.00		
• The complexity of the product		0.85			
Hardware Attributes					
• Run-time performance constraints					1.30
• Memory constraints				1.06	
• The volatility of the virtual machine environment				1.15	
• Required turnabout time		0.94			
Personnel attributes					
• Analyst capability				0.86	
• Software engineering capability				0.91	
• Applications experience			1.00		
• Virtual machine experience			1.00		
• Programming language experience				0.95	
Project attributes					
• Use of software tools				0.91	
• Application of software engineering methods				0.91	
• Required development schedule				1.04	

The Intermediate COCOMO formula now takes the form:

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

Multiply all the above values,
Effort Adjustment Factor (EAF),
=1*1*0.85*1.30*1.06* 1.15*.94*.86*.91*1* 1*.95*.91*.91*1.04
=0.81

Software Projects	a	b	c	d
Organic	2.4	1.05	**2.5**	**0.38**
Semi Detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

Consider, KLOC = 8000, and the project is organic
      For, Organic Software Project,
                           a =2.4
                           b=1.05
      So,
E= (a(KLOC)^b) *EAF
 = (2.4* (8000/1000) ^1.05) * 0.81
 = (2.4 * (8) ^1.05) * 0.81
 = 17.93 man-months

The constant values a, b, c and d for the Basic Model for the different categories of system:
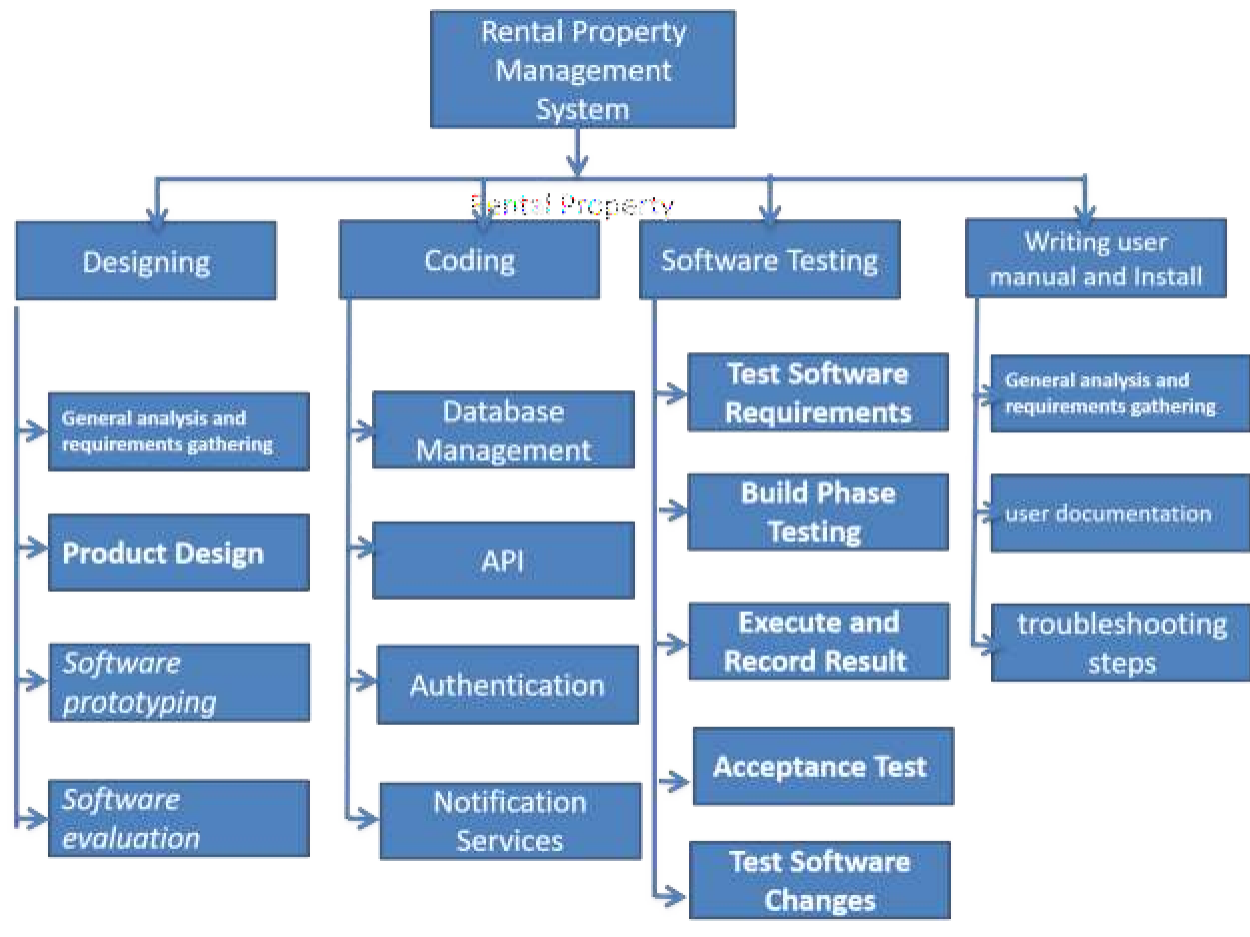
Time = c (Effort)^d
= 2.5*(23) ^0.38
=8.22 ~9
= 9
Months We know that,

Required no. of people = ST = PM/DM
= = 18/9
=2

Workbreakdown Structure:

Activity Network Diagram:

Activity	Duration (Month)	Preceedents
A.Hardware Choice	1	
B. Designing	2	
C.Code	4	A
D.Software Testing	1	B
E. Write User Manual	1	
E. Install and Test System	2	D, E, C

Activity: Labeling Convention

Earliest Start (ES)	Duration	Duration Earliest Finish (EF)
Activity Label		
Latest Start (LS)	Float	Latest Finish (LS)

$P_1 = A - B - C - F = 9$
$P_2 = A - B - D - F = 6$
$P_3 = E - F = 2$
So, Critical Path of $P_1 = 9$ months
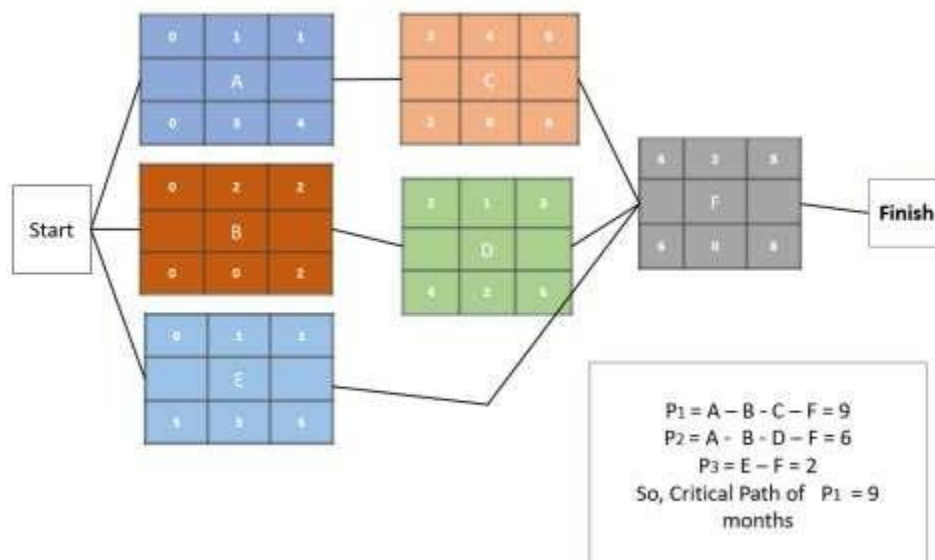
Risk Analysis:

Risk	Category	Probability	Impact	RMMM
▪ Poor management of system	BU	70%	2	Receive consulta<on form manager
▪ Technical problems during management	TE	50%	2	Before star<ng the project, listing all technical problem may aware the risk and also help find solution
▪ Environmental damage's	DE	40%	2	Check the soil conditions before building
▪ Funding lost	CU	15%	1	Secure advanced payment Frequent communication
▪ Schedule management plan	PR	60%	3	Analysis the project and do WBS may resolve this
▪ Irresponsibility of worker's	ST	20%	3	Supervised work daily
▪ Uncertain change of customer Requirement's	PS	80%	2	Use simulation to avoid those risk, and show the client before starting actual project

Impact values:
Catastrophic -1
Critical - 2
Marginal - 3
Negligible – 4

Budget For the Project:

From COCOMO model effort calculation, we can see that

      per developer salary per working hour=1020 taka.

      Working day per month = 20 days and 8 hours working hours in day

Our, estimation time for project is = 9 months=9*20*8

So, total working hours is = 1440 hours.

Total developer salary=1020*1440=1,72,800 Taka For requirement analysis,

Time 1 month=20 days*8 working hour
=160 working hour

Hourly wage of 1 requirement analysis person= 500 Taka
Total cost= 500*160 = 80000 Taka

Transport cost for 9 months= 9000 Taka
Utility cost in 9 months, 15000 Taka
Hardware Expenses= 75,000 Taka
Maintenance cost= Required time 20 hours Per hour cost 1000 taka

Net total cost=1000*20=20000 Taka

Total estimation cost=172800+80000+9000+15000+75000+20000
=3,71,800 Taka

Profit:

20 % of total estimation cost=3,71,800*20%
=74360

Total budget of project =3,71,800 + 74360
=4,46,160Taka

Conclusion:

Online house rental business has emerged with a new possibility compared to the past experience where every activity concerning house rental business was limited to a physical location only. Even though the physical search for houses has not been totally eradicated; the nature of functions and how these functions are achieved has been reshaped by the power of internet. Nowadays, renters/tenants can reserve houses online once the customer is a registered member of the website. The software of rental system has offered an advantage to both landlords as well as the tenants efficiently and effectively just with the click of a button.

Reference:

1.https://www.academia.edu/9498812/Rental_House_Management_System
2.https://www.academia.edu/18928139/PROPERTY_MANAGEMENT_SYSTEM
3.https://creately.com/lp/network-diagram-software-online/