

Assignment No :- 1

A] What are the different steps of Requirement Engineering?



1) Feasibility Study :-

When the client approaches the organisation for getting the desired product developed, it comes up with rough idea about what all functions the software must perform & which all features are expected from the software.

This feasibility of study is focused towards the goal of organisation. This study analyzes whether the software product can be partially materialized in terms of implementation, contribution and as per values & objectives of the organisation.

(2) Requirement Gathering :-

If the feasibility report is positive towards undertaking the project, next phase starts with gathering requirements from the user. Analyse & engineers communicate with the client & end users to know their ideas on what the software should provide & which features they want the software to include.

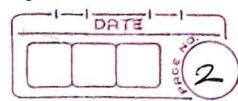
3) Requirement Analysis:-

Requirements are identified & conflicts with stakeholders are solved. Both written & graphical tools are successfully used as aid

- Example of written analysis tools : Use cases.

4) System Modeling:-

Some engineering fields require the product to be completely designed as modeled before its construction starts & therefore the design phase must be performed in advance.

~~Chandrashekhar~~

B] Explain the process of CMM.

→ 1. Level 1: Initial

This software procedure is stated as inconsistent & occasionally chaotic.

-stated procedures & standard practices that present are discarded at the time of crisis.

2. Level 2 : Repeatable :-

This level of software Development association has a fundamental & consistent project management process to keep the track of cost & functionality.

3. Level 3 : Defined :-

The software procedure for management & engineering actions are documented; standardized & incorporated into a standard software procedure for the overall association for creating & maintaining the software product.

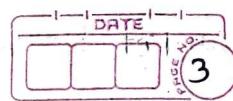
4) Level 4 :- Managed :-

- Management can successfully control the efforts required for software development through precise measurements.

5) Level 5 : Optimizing :-

The important characteristic of this level is concentrating on repeatedly improving procedures performance with the help of both increasing & innovative technological corrections.

~~Chaur~~



c) What is the use of use case diagram? Draw use case diagram for ~~physical~~ hospital management system.

- Use case is a term used in system analysis to determine, clarify & integrate all system requirements
- It describes how user interacts with the system to achieve certain goal.
- Use case consists of three basic elements as actor, system and goal.

• Use Case :-

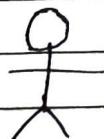
- Use case of use case diagram represent various business activities performed in a system
- All discrete business activities of a system can be modeled using use case.
- It is represented by an elliptical shape labelled with use case name.

eg.

Update account

• Actor :

- An actor is any entity or real world object which performs different functions in the given system
- An actor in use case diagram interacts with use case of use case diagram.

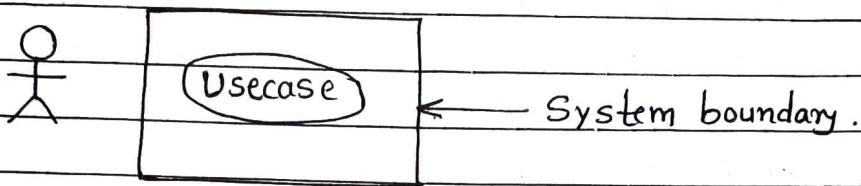


Actor_name

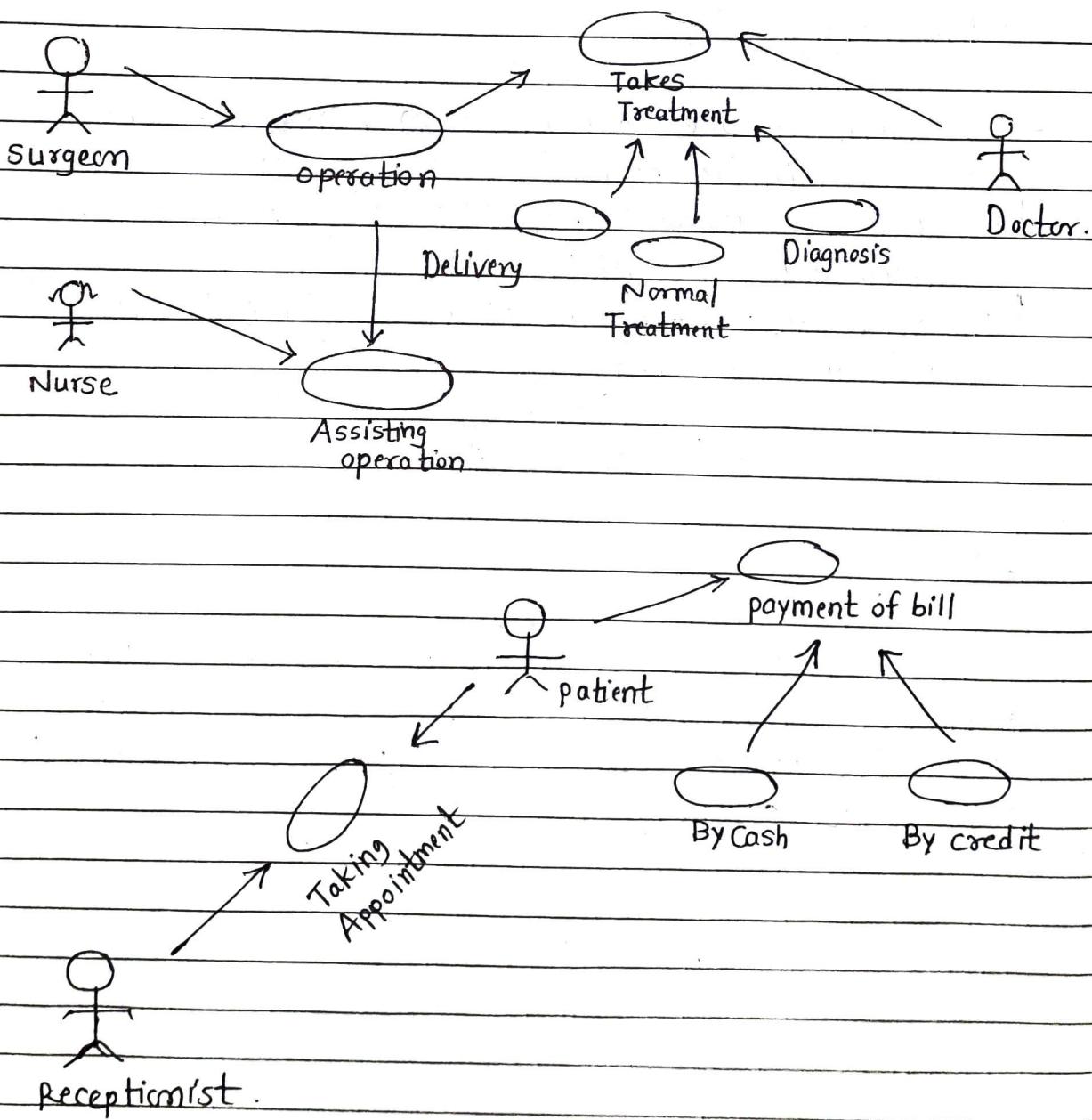
• System Boundary :-

- System boundary defines the scope of system of systems
- It is representation of entire system as described in problem statement.

- System boundary is represented by solid line rectangular box.



Use case diagram for Hospital Management System:



D] Differentiate between FP based & loc based estimation techniques.

FP Based	Loc Based
1) Function point metric is specification based	1) Loc metric is based on analogy.
2) Function point metric is language independent	Loc metric is dependent on languages.
3) Function point metric is user oriented.	Loc metric is designed oriented.
4) Function point metric is extendible to line of code.	It is changeable to FP.
5) Function point is used for data processing systems.	Loc is used for calculating the size of the computer program.

E) Define software engineering. Explain Umbrella activities of software engineering.

→ Software engineering is applying technological, scientific & administrative approach to designing, developing, testing & maintaining the software product in order to meet customers requirement with best quality of product.

Umbrella activities of software Engineering :-

1) Software project tracking & control :- This activity allows the software development. Before the actual development starts, make a software

development plan & develop on this basis, but after a certain period of time basis, but after a certain period of time, it is necessary to analyze the development progress to find out what measures need to be taken.

2) Risk Management :-

Risk management is a series of steps to help software development teams understand & manage uncertainty. It is a very good idea to identify it, access its impact & develop an "if the problem does happen" contingency plan.

3) Software quality assurance:-

The quality of the software, such as user experience, performance, workload flexibility .etc. must be tested & verified after reaching the specified milestones, which reduces the tasks at the end of the development team so that the development can achieve.

4) Technical reviews :-

It assesses software engineering work product in an effort to uncover & remove errors before they are propagated to the next activity.

F) Elaborate COCOMO method of cost estimation with proper example.



COCOMO is one of the most widely used software estimation models in the world.

COCOMO predicts the efforts & schedule of software product based on size of software.

COCOMO has three different models that reflect complexity.

- 1) Basic Model
- 2) Intermediate model
- 3) Detailed Model.

1) Basic Model :-

The basic COCOMO model estimate the software development effort using only lines of code.

$$E = ab KLOC^b$$

$$D = C_b E^d$$

E = is effort applied in person-months.

D = is the development time in chronological months & $KLOC$ is estimation No of delivered line.

2) Intermediate Model :-

This is extension of COCOMO model

This estimation model makes use of set of "cost Driver Attributes" to compute the cost of software.

$$E = a_i KLOC^b \times EAF$$

3) Detailed COCOMO Model :-

The detailed model uses the same equation for estimation as the intermediate model.

organic : Effort = $2.4 (KLOC) \times 1.05$ PM

semi-detached : Effort = $3.0 (KLOC) \times 1.2$ PM

embedded : Effort = $3.6 (KLOC) \times 1.20$ PM

Estimation of development Time :-

organic :- $T_{dev} = 2.5 (\text{effort}) \times 0.38$ Months

semi-detached :- $T_{dev} = 2.5 (\text{effort}) \times 0.35$ Months.

embedded) $T_{dev} = 2.5 (\text{effort}) \times 0.32$ Months.

Example :-

Suppose a project was estimated to be 400 KLOC calculate the effort & development time for each of the three model.

$$\text{Effort} = a_1 \times (\text{KLOC}) a_2 \text{ PM}$$

$$T_{\text{Dev}} = b_1 \times (\text{efforts}) b_2 \text{ Months}$$

$$\text{Estimation size of project} = 400 \text{ KLOC}$$

Organic :- $E = 2.4 \times (400) \times 1.05 = 1295.31 \text{ PM}$
 $D = 2.5 \times (1295.31) \times 0.38 = 38.07 \text{ PM}$.

Semidetached Model :-

$$E = 3.0 \times (400) \times 1.12 = 2462.79 \text{ PM}$$

$$D = 2.5 \times (2462.79) \times 0.35 = 38.45 \text{ PM}.$$

Embedded :-

$$E = 3.6 \times (400) \times 1.20 = 4772.82 \text{ PM}.$$

$$D = 2.5 \times (4772.82) \times 0.32 = 38 \text{ PM}$$

Q] What are agile Methodologies ? Explain any one of them.

→ 1) Scrum

2) Kanban

3) Extreme-programming (xp)

4) Lean Development

5) Crystals are the Agile Methodologies.

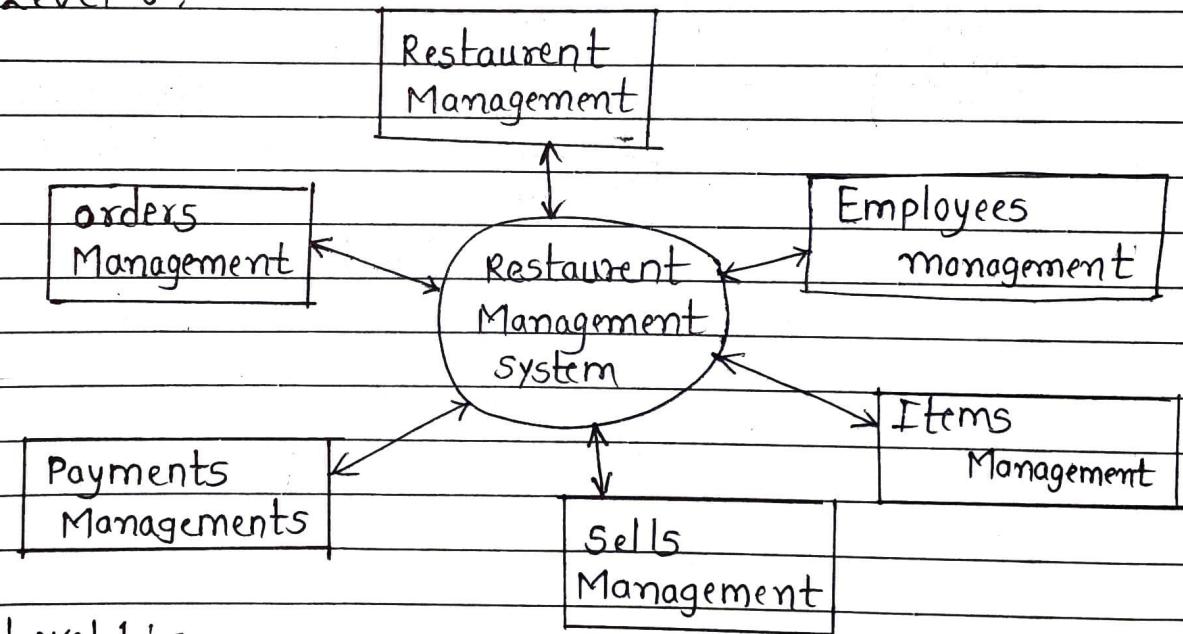
1) Scrum :

Scrum is an agile framework for managing knowledge work, with an emphasis on software development. It is designed for teams of three to nine members, who break their work into actions that can be completed within time boxed iterations.

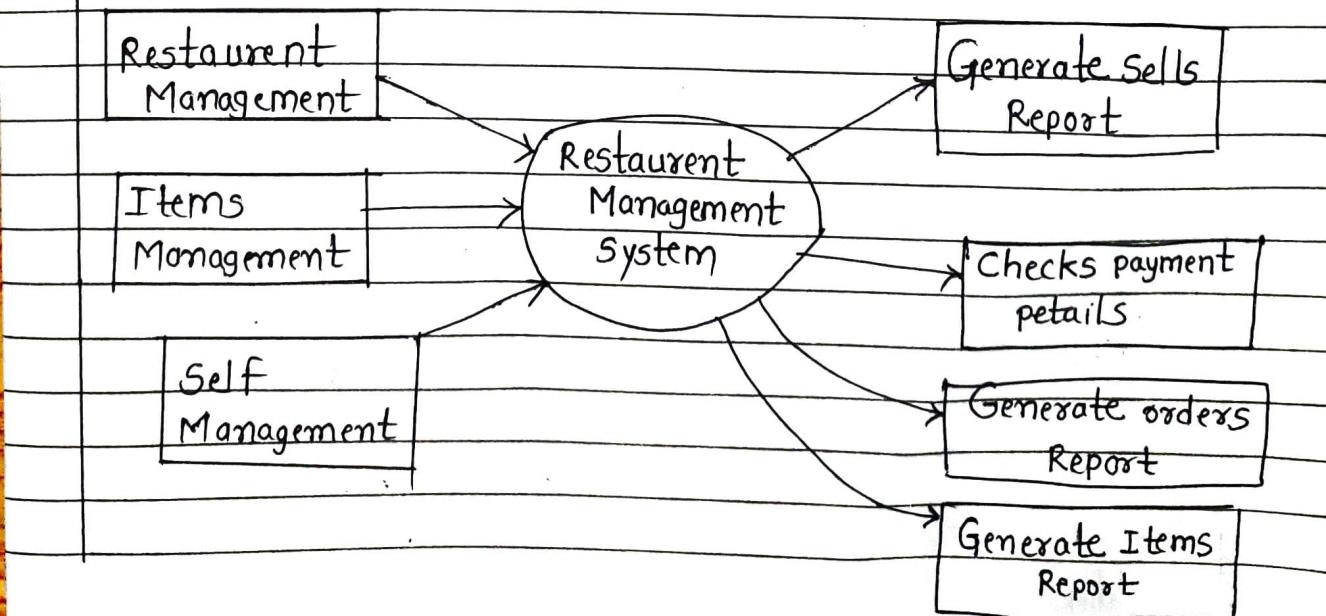
- Scrum principles are mostly based on the agile manifesto & help to guide activities regarding development inside a process which include framework activities such as requirements analysis design, evolution & delivery.
- In all the framework activities, work tasks happen within a process pattern called a sprint.

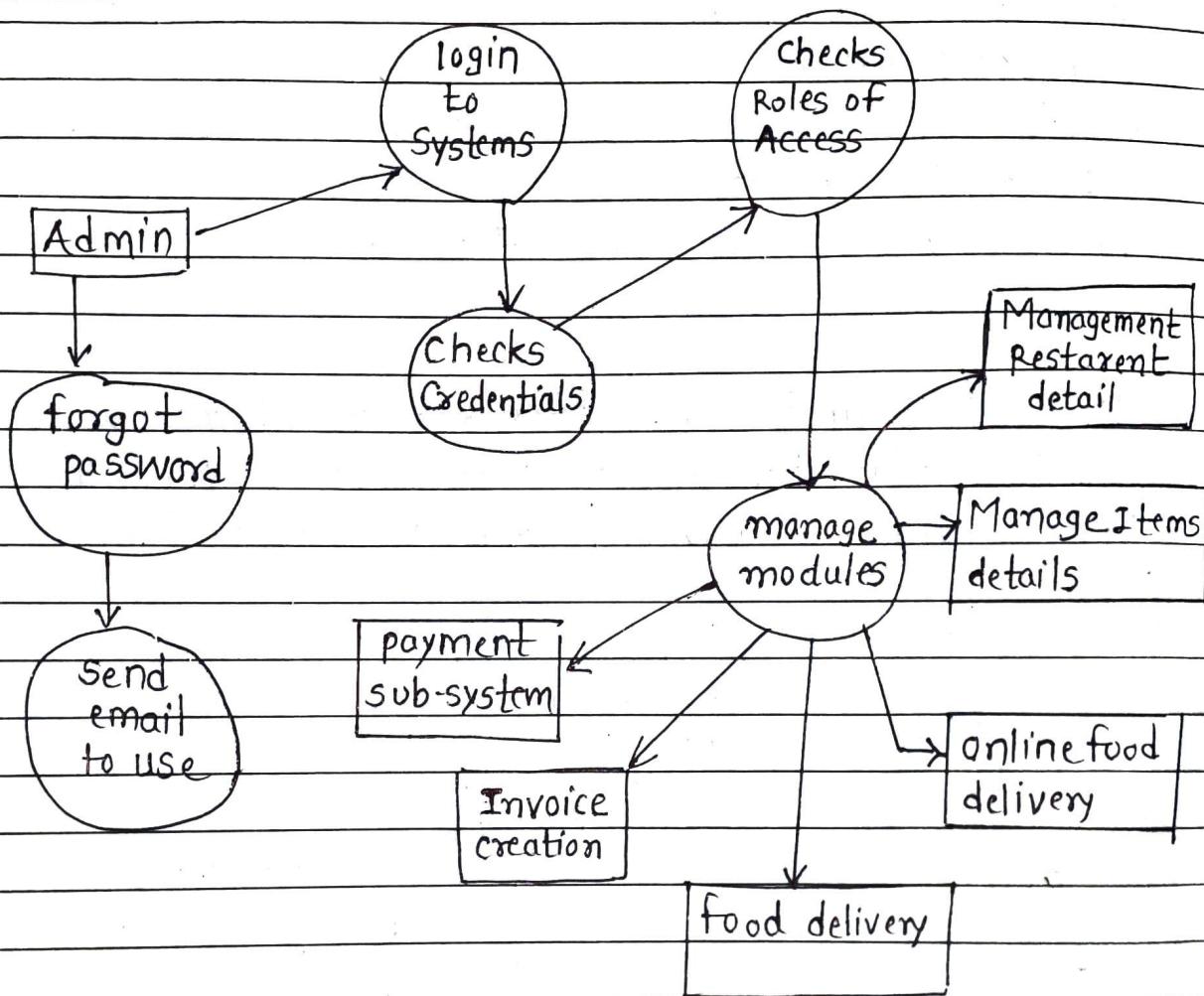
H) Draw DFD up-to-level 2 for Restaurant management system which has online food ordering, food delivery GST calculation invoice creation & payment subsystem

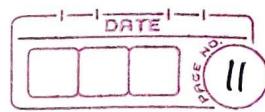
→ Level 0 :-



Level 1 :-



Level 2 :-



I) Discuss the advantages & disadvantages of RAD model ?

→ Advantages :-

- Reduced development time
- Increases reusability of components
- Quick initial reviews occur
- Encourages customer feedback
- Integration from very beginning solves a lot of integration issues.

Disadvantages :-

- Depends on strong team & individual performer for identifying business requirements.
- Only system that can be modularized can be built using RAD.
- Requires highly skilled developers / designers.
- High dependency on modelling skills.
- Inapplicable to cheaper project as set cost of modeling & automated code generation is very high.