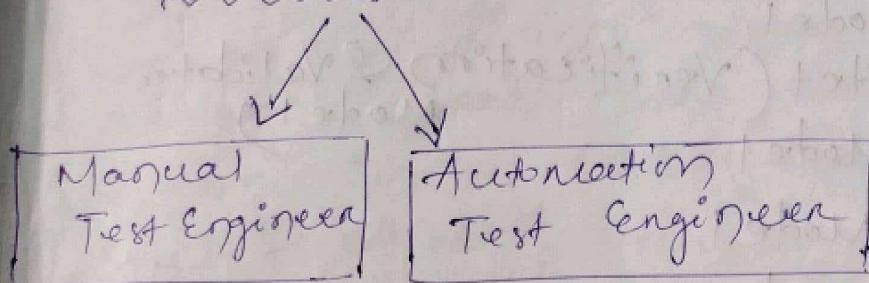


Test Engineers (2 types Testing)



<input checked="" type="checkbox"/>	Email ID
<input type="password"/>	PWD
<input type="text"/>	Login
<input type="button" value="Cancel"/>	

- Automation Test Script (ATS)
- Automation Tool ^{example} Selenium, Cucumber, QTP.

SDLC (Software Development Life Cycle)

It is a step by step procedure to develop a Software.

* Stages of software development

SDLC life cycle :

- (1) ↳ Requirement Collection ($CRS \rightarrow SRS$)
- (2) ↳ Feasibility Study
- (3) ↳ Design
- (4) ↳ Coding
- (5) ↳ Testing
- (6) ↳ Installation
- (7) ↳ Maintenance

Customer Requirements Specification

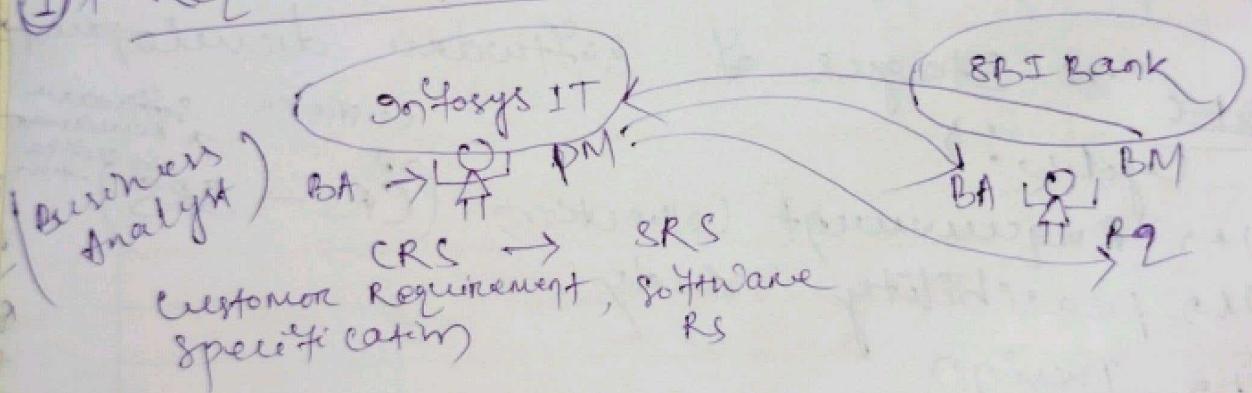
Models of SDLC / Types of SDLC

- (1) \hookrightarrow Waterfall Model
- (2) \hookrightarrow Spiral Model
- (3) \hookrightarrow V & V Model (Verification & Validation Model)
- (4) \hookrightarrow Hybrid Model
- (5) \hookrightarrow Prototype Model
- (6) \hookrightarrow Derived Model
- (7) \hookrightarrow Agile Model

* Waterfall Model : \Rightarrow Ex - HRMS, CRM, Enterprise SCMS, (Develop Application)

\hookrightarrow It is a Step by Step Procedure to develop a Software.

① * Requirement Collection



* \hookrightarrow In Waterfall Model requirement Collection is done by Business Analyst (BA)

Explanation of the Diagram :

* The Bank Manager gives a call to Project Manager at Infosys to give the contract on developing in software.

* The Project Manager at Infosys will send business Analysis (BA) to SBI Bank

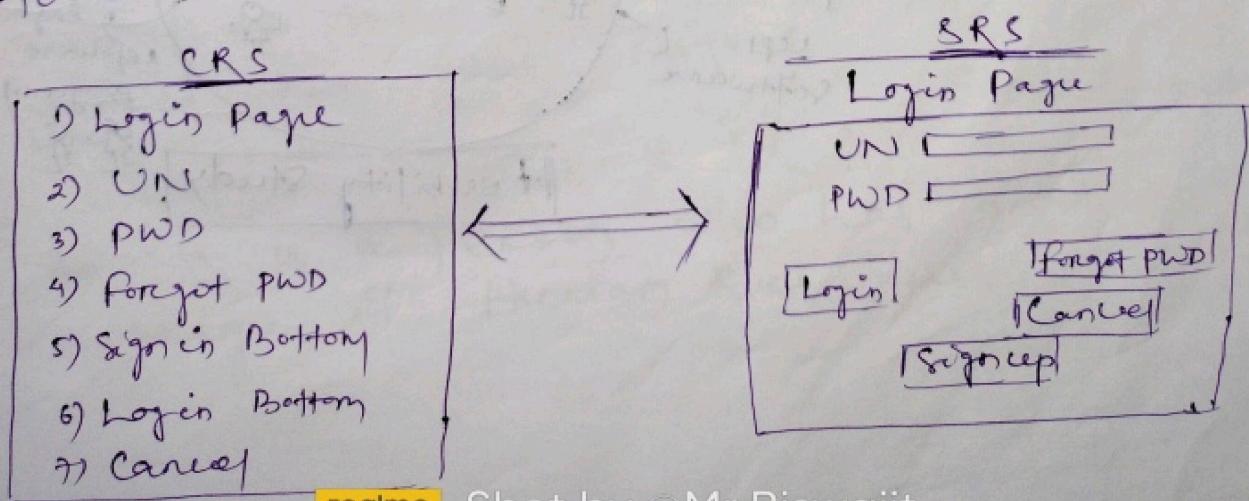
- the requirements of the Software
from the Bank Manager.
- * The Business Analyst (BA) will collect the requirement given by the bank manager. (The document is called as : CRS (Customer Requirement Specification))
 - * The BA will then convert CRS into SRS (Software Required Specifications)

Ques: Why do we convert CRS into SRS?

↳ When the BA collects the requirement specification is given the document to the Development team, as well as the testing team.

↳ The Development team & the testing team will not understand the CRS because it is in Business language.

↳ for this case the BA will convert the CRS which is in Business language to SRS which is in software language.



* Business Language any terminology which we used in any particular language is called Business Language
ex Loan, cheque, Account, OD,

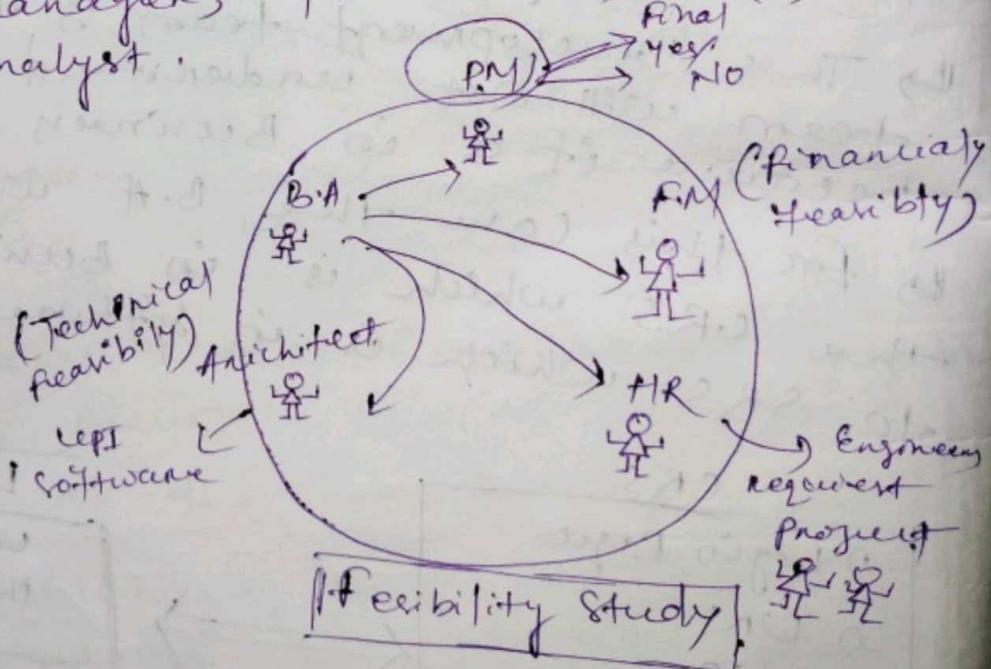
* Software Language

Any terminologies which we use while developing & testing the software called as software language
ex Login page, textbox, submit button etc...

② Feasibility Study \Rightarrow (Meeting)

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- * In this stage it is a meeting conducted by a group of Engineers.
- * In this Meeting, We have Project Manager, Finance Manager, Anitech, HR, Business Analyst.



JOB of a Project Manager ⇒

- * The Project Manager is the one who will finally decide whether to take the project or not.
- * If he accepts the projects, he has given reason. If he rejects the project, he has given reason.

Q Who can become Project Manager?

- ↳ Project Manager is the person who have good knowledge both Development as well as testing.

Q Job of a finance manager?

- ↳ Finance Manager is the person who decides the project is financially feasible or not.

Q Who can become a Finance Manager?

- ↳ A person who has good knowledge in the financial aspects is a finance manager.

Q Job of a HR?

- ↳ HR is the person who decides or makes sure that they are sufficient engineers required for that project.

Q Who can becomes a HR?

- ↳ HR is a person who has good knowledge of Human Resources.

Q Job of an Architect ?

↳ Architect is the person who decides whether the project is technically feasible or not.

Q Who can become a Architect?

↳ Architect has a Person who has good knowledge of all technologies.

Q Job of a Business Analyst?

↳ B.A will be Explain the requirement went to other in the meeting.

↳ If we have any doubt in the requirement we approach the Business Analyst.

Q Who can becomes B.A?

↳ B.A is the Person who has good knowledge of the domain.

③ Design :

↳ We go for designing only after the feasibility study will be done.

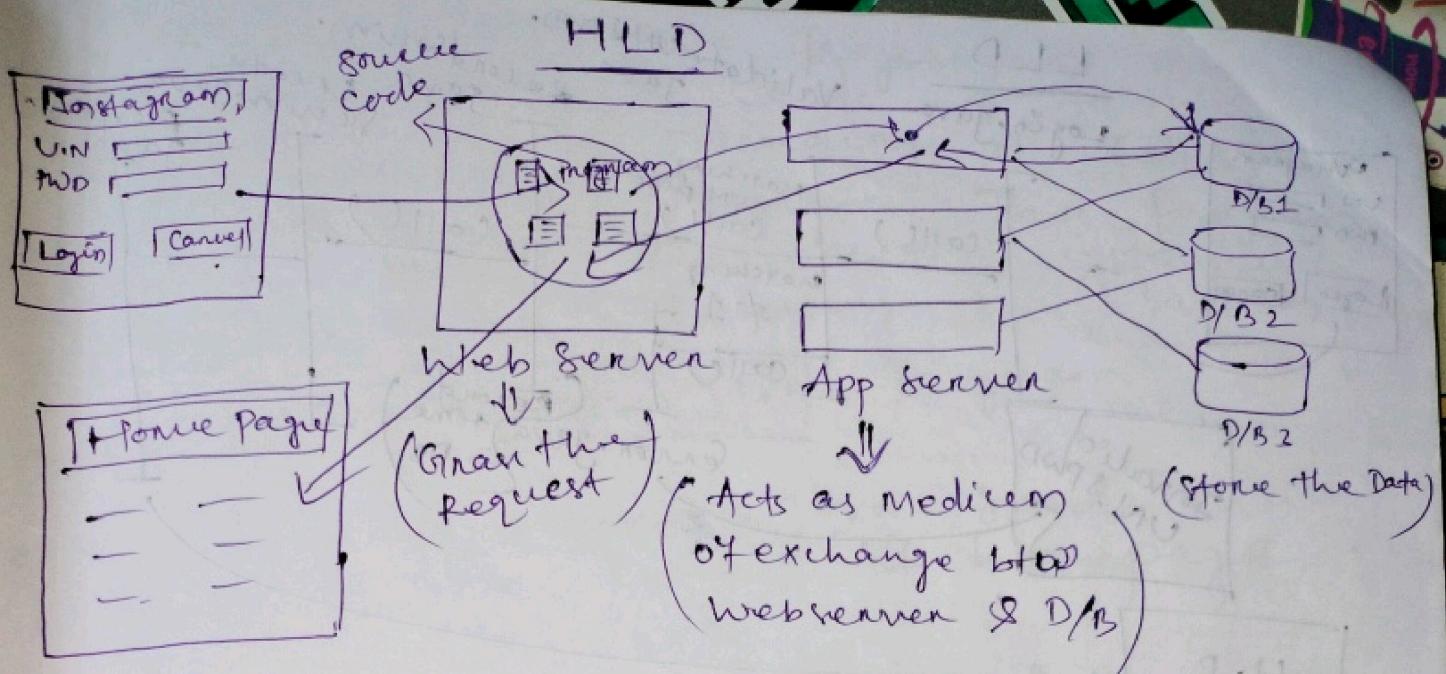
↳ Designing is done in 2 types :-

Architect → (1) HLD (High Level Design)

Since developer → (2) LLD (Low Level Design)

(1) HLD :-

↳ It is the overall architect of the software. It is done by Architect.



Web Server

↳ It grabs the request from the users.

App server

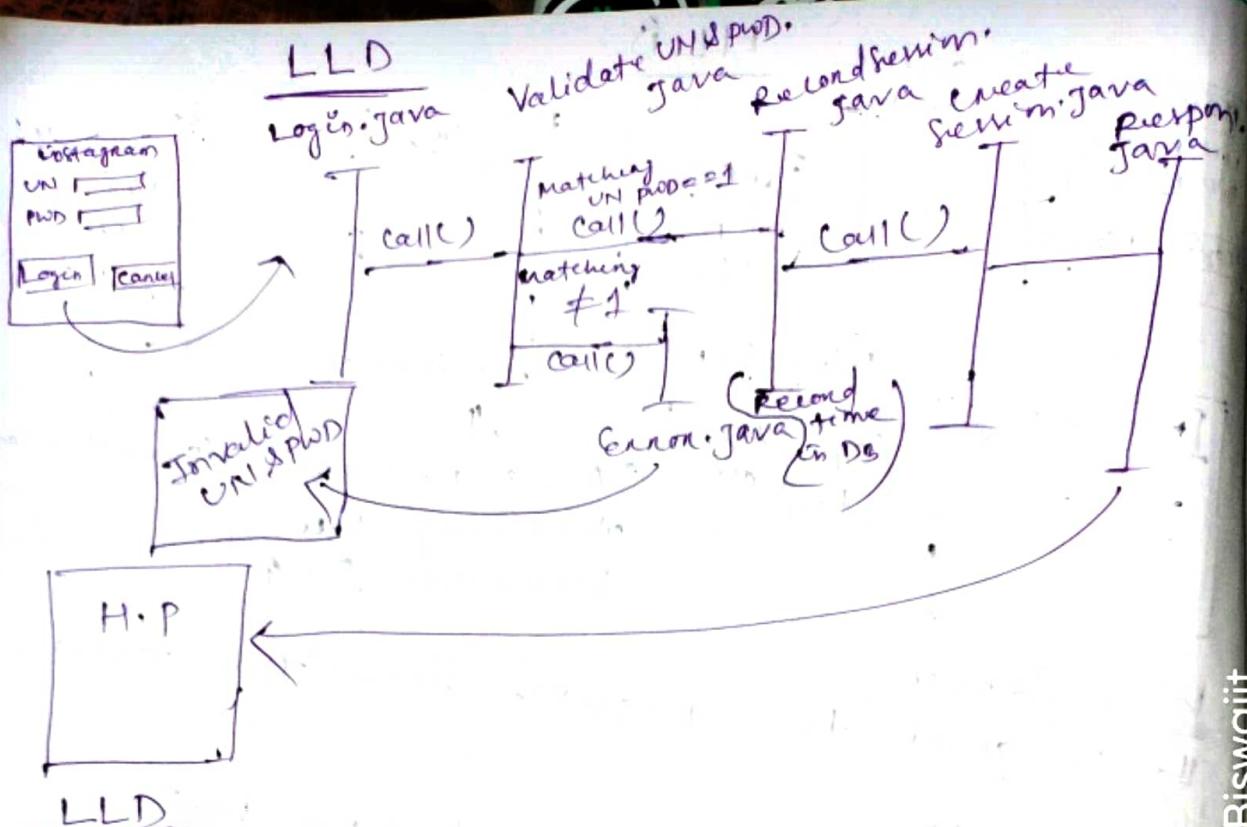
↳ It acts as a inter mediatory betw
Web server & DataBase Server.

Data Base

↳ It is a server which stores the Data.

LLD (Low Level Design)

(2) LLD (Low Level Design)
↳ It is the detail designing of the Software
↳ It is done by the finer Developers.



LLD

* As soon as the user enters Valid Email ID & Password, & click on Login button,

Login.java Program gets executed,

* Login.java Program - Call() a program
Validates Username, Password.java,

Validate UN, PWD.java checks whether the Username & password are matching or not. Continue if the PWD & UN is matching it will be called Record System.java program. If Username & PWD are not matching it will be called Error.java program.

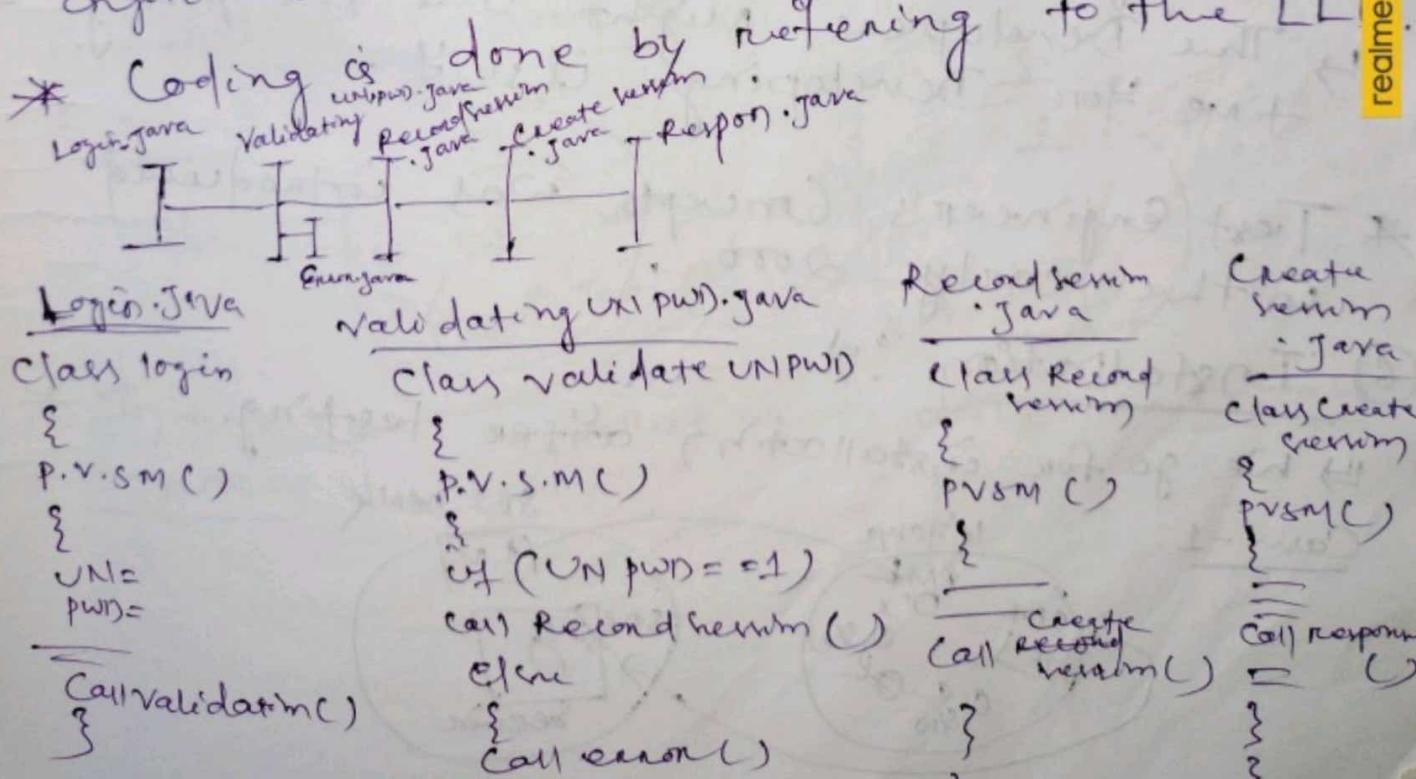
* Error.java Program will gives response incorrect UN & PWD.

- * record screen . java program to starts record the timing & sends it to the data base . After recording it called Create Session . Java Program . This Program start to create the Session instance you login . After creating the Session it called Response . Java Program .
- * This Program response . java sends the response to the user of homepage .

④ Coding \Rightarrow (Development Engineers)

- * we start the coding only after the designing is done .
- * Coding is done by Development Engineers
- * The Development Engineers are Classified into Senior Development Engineers , Junior Development Engineers , & Freshers Developers .

Engineers :



⑤ Testing

- * Testing is usually done by Test Engineers.
- * In Waterfall Model testing is done by developer. Because the Waterfall Model was developed in the late 1970 - 1980, during that time we had the concept of testing but no concept of test engineers.

Disadvantages of Developer involved in Testing:

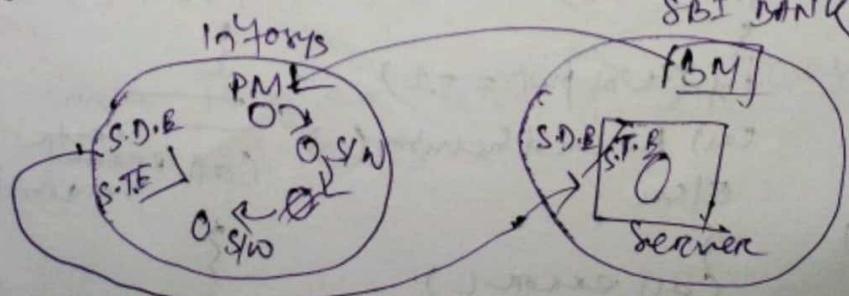
- ↳ They will always see the software in one view.
- ↳ They will never see the software in one view.
- ↳ The Developers are always Overconfidence about their code.
- ↳ The Developers while doing testing might hiding some bugs/defect.
- ↳ The Developers might use the testing time for developing itself.

- * Test Engineer's Concepts was introduced in the early 2000.

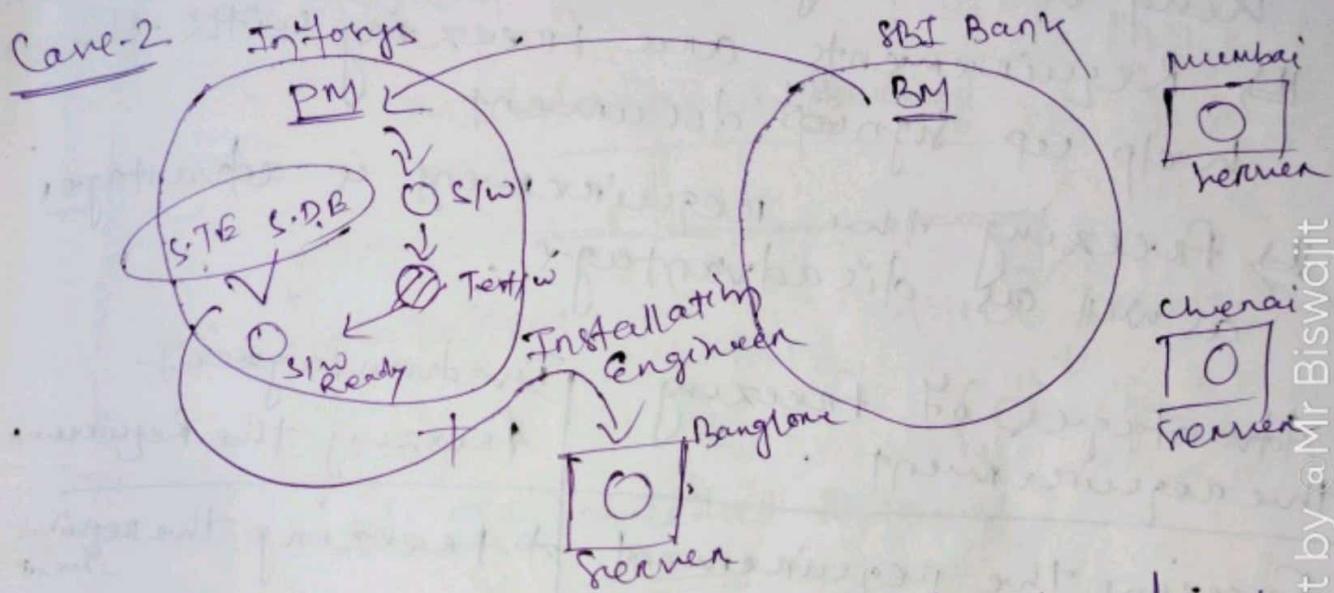
⑥ Installation :-

- ↳ We go for installation after testing.

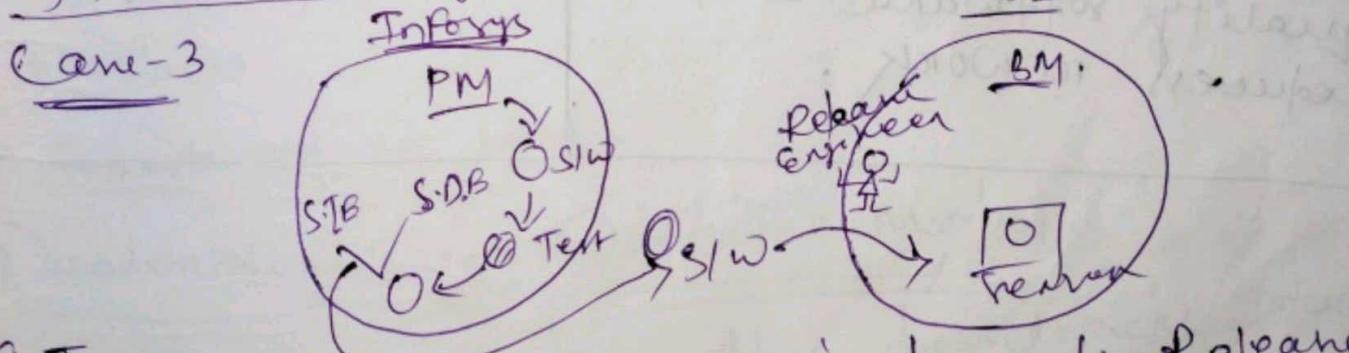
Cave-1



* In this case after the testing is done the "PM" will check whether the Senior Development / Senior Test Engineer is free. Then the Senior Development / Senior Test Engineer will go to the company with the software & installed in the company servers.



* Installation is done by the senior developer / senior test engineer along with installation engineer.



* In this case installation is done by Release engineer.

Sign off Document

This document is used to freeze the requirement.

Q Why we freeze the requirement?

- ↳ freezing the requirement means the customer is not allowed to do any kind of changes.
- ↳ Requirements are freezing with the help up sign off document.
- ↳ freezing the requirement is advantages as well as disadvantage.

Advantages of freezing the requirement

* Freezing the requirement is advantages for the Software Company because in the end, we get a high quality software & it reduces rework.

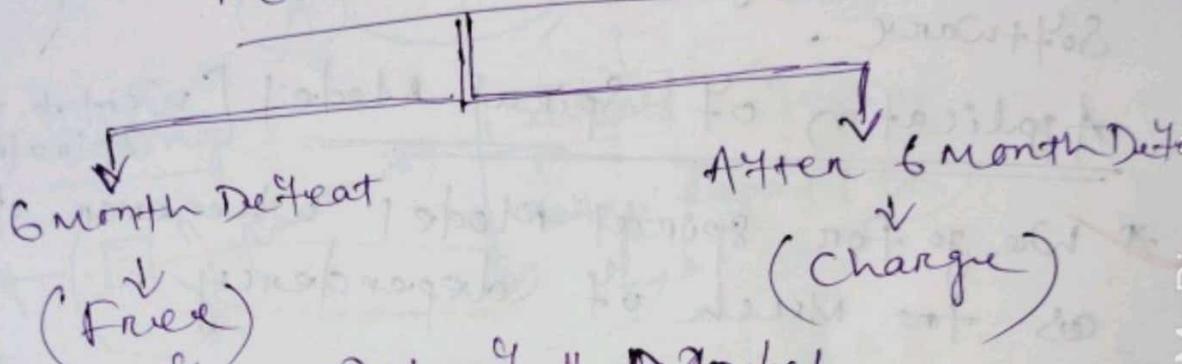
Disadvantage of freezing the requirement

* Freezing the requirement is disadvantages for the customer because he is not allow to do any kind of changes.

Maintenance :-

- ↳ It is the time Period given to the Customer by the Software Company.
- ↳ If the customer find any mistake within any maintenance Period the Software Company will be fixed, the bug free.
- ↳ If the customer find that defect after that maintenance period. We charge each Survey and defect.

Maintenance Period



Advantages of

Waterfall Model

- * In waterfall Model it is simple to adopt.
- * In waterfall Model, we freeze the requirement so that in the end we get highly qualified software.
- * Investment is less.

Disadvantages of



- * In Waterfall Model the developers are not involved in testing.
- * In Waterfall Model, the requirement & Design are not tested.
- * Because of this reworked investment will be more.

Application of Waterfall Model

- ↳ Be used Waterfall Model When the customer is sured about the requirement.
- ↳ We go for Waterfall Model when it is a short-term project. (~~10-20 days~~ 15-20)

(2) Spiral Model :- Ex (MS Excel)

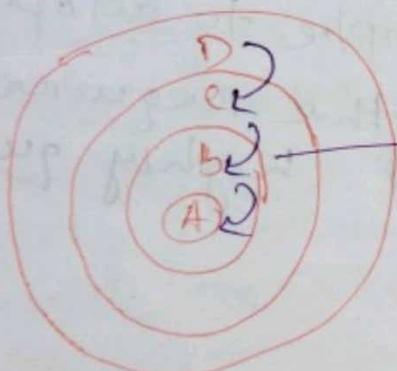
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- ↳ It is step by step process to develop a software.

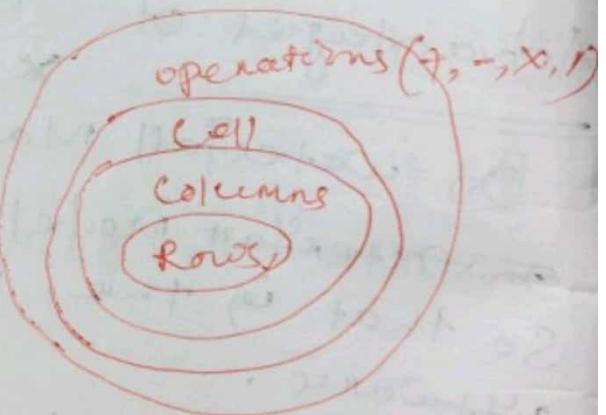
Application of Spiral Model [Went to go for spiral model]

- * We go for spiral Model whenever there is too much of dependency.

1. Dependency



Dependency



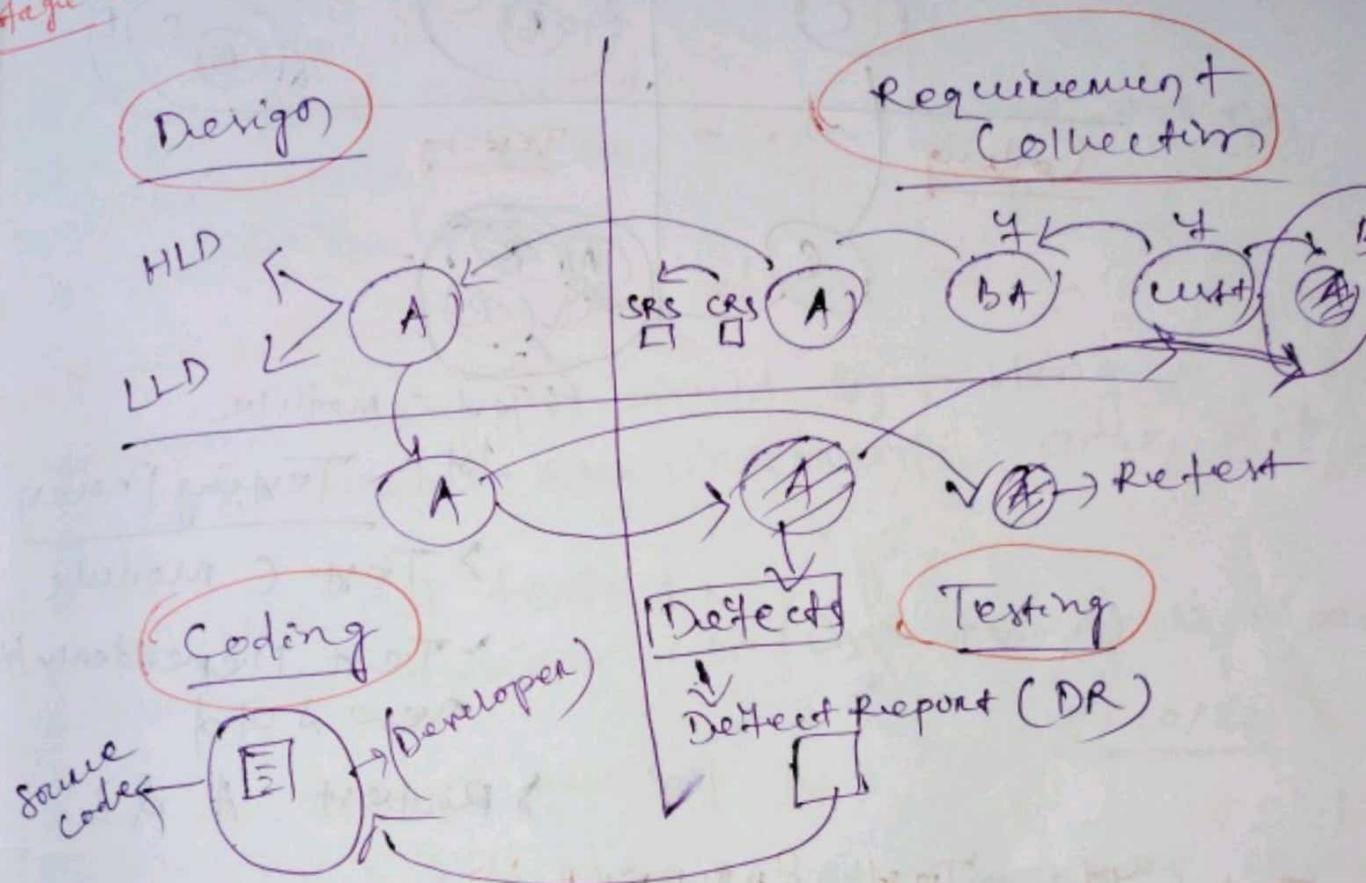
- * We go for spiral Model whenever requirement are given a stages :-

2. Stages

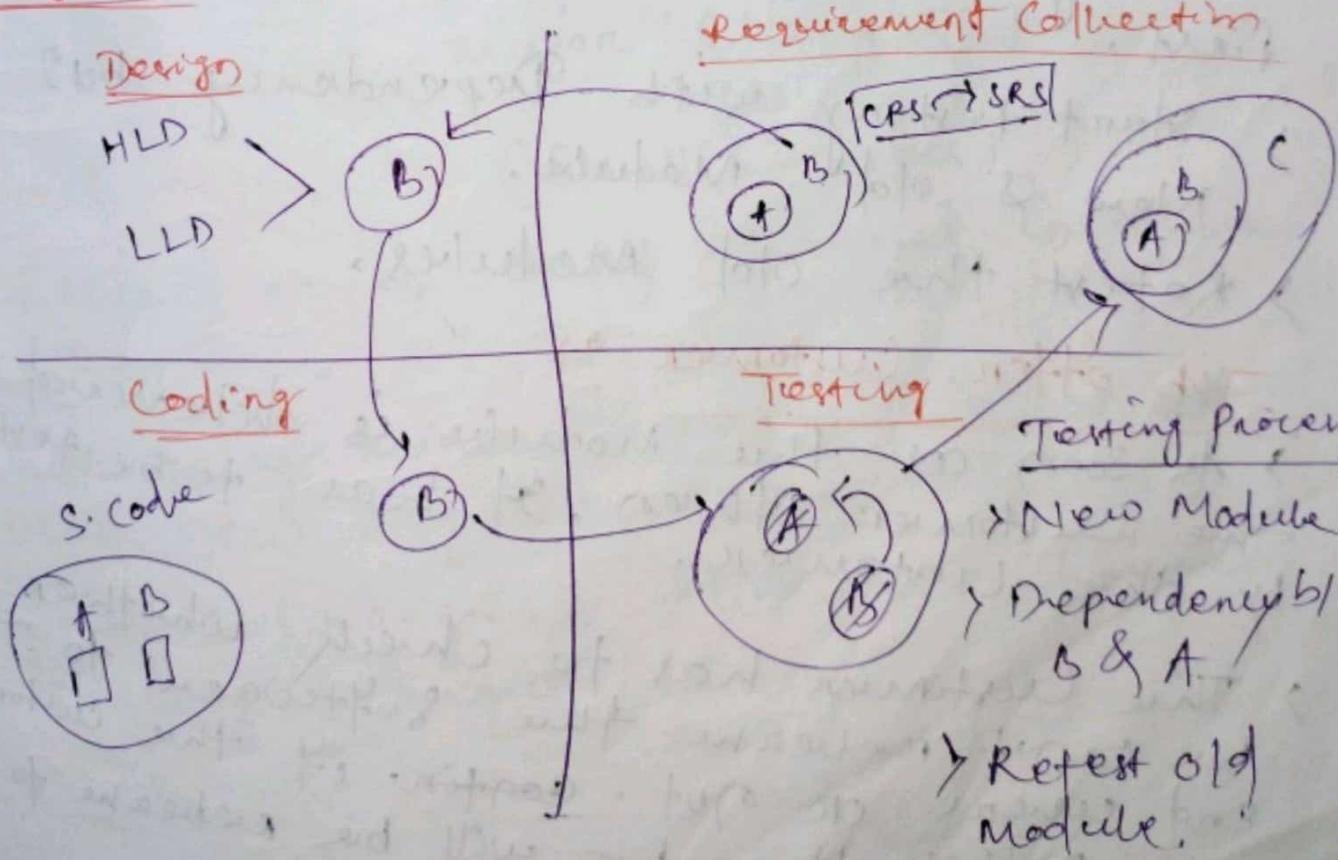
- * We get requirement in stages whenever customers having trust issues.
- * In stages whenever customer is not sure about his own requirement.

Working of Spiral Model \Rightarrow

Stage-1

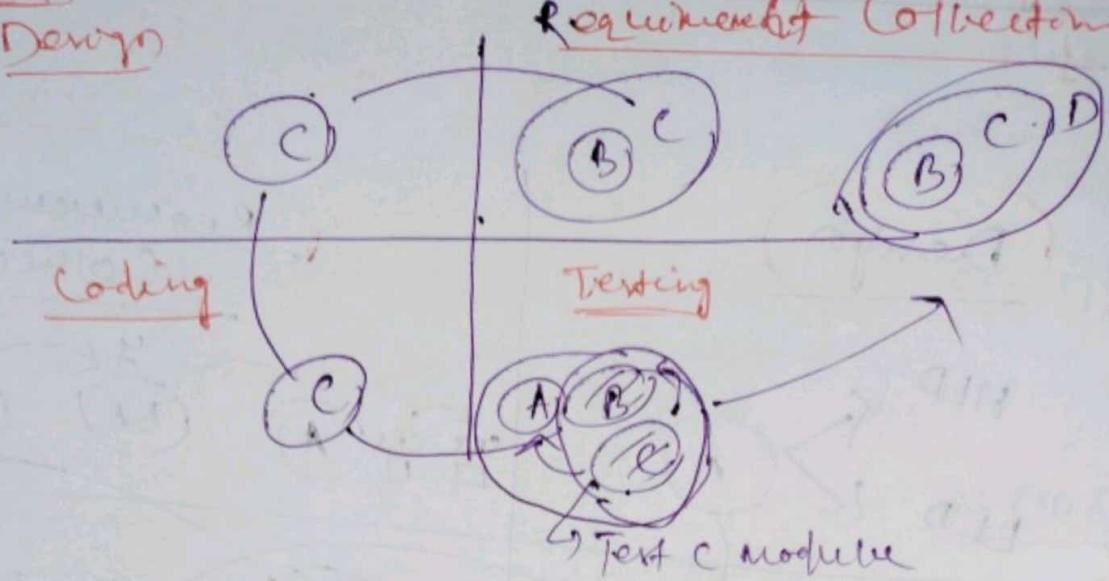


Stage-2



Stage-3

Design



1st Testing Process

- > Test C module
- > Test Dependency b/w new & old
- > Re-test A & B

Job Offer Test Engineer

- > Always we should test New Module first.
- > Start testing with Dependency b/w New & old Module.
- > Re-test the old Modules.

Job Offer Customer

- > As soon as the module is delivered to the customer then, it has to be tested by the customer.
- > The customer has to check whether he can't release the software to the end users or not. ^{content if the customer gets profits then we will be release to the end-users.}

> 94 requirement to the new modules.

Advantages of Spiral Model :-

- * It is simple to adopt.
- * Changes are allowed.
- * In spiral model less around time taken.
- * So profit is less.

Disadvantages of Spiral Model :-

- Developers are involved in testing.
- In spiral model requirements are not tested.
- Designs are not tested.
- Designs leads to rework so investment is more.

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Changes in Spiral Model :-

- * In spiral Model we accept changes in 2 ways.
 - 1) Minor Changes
 - 2) Major Changes

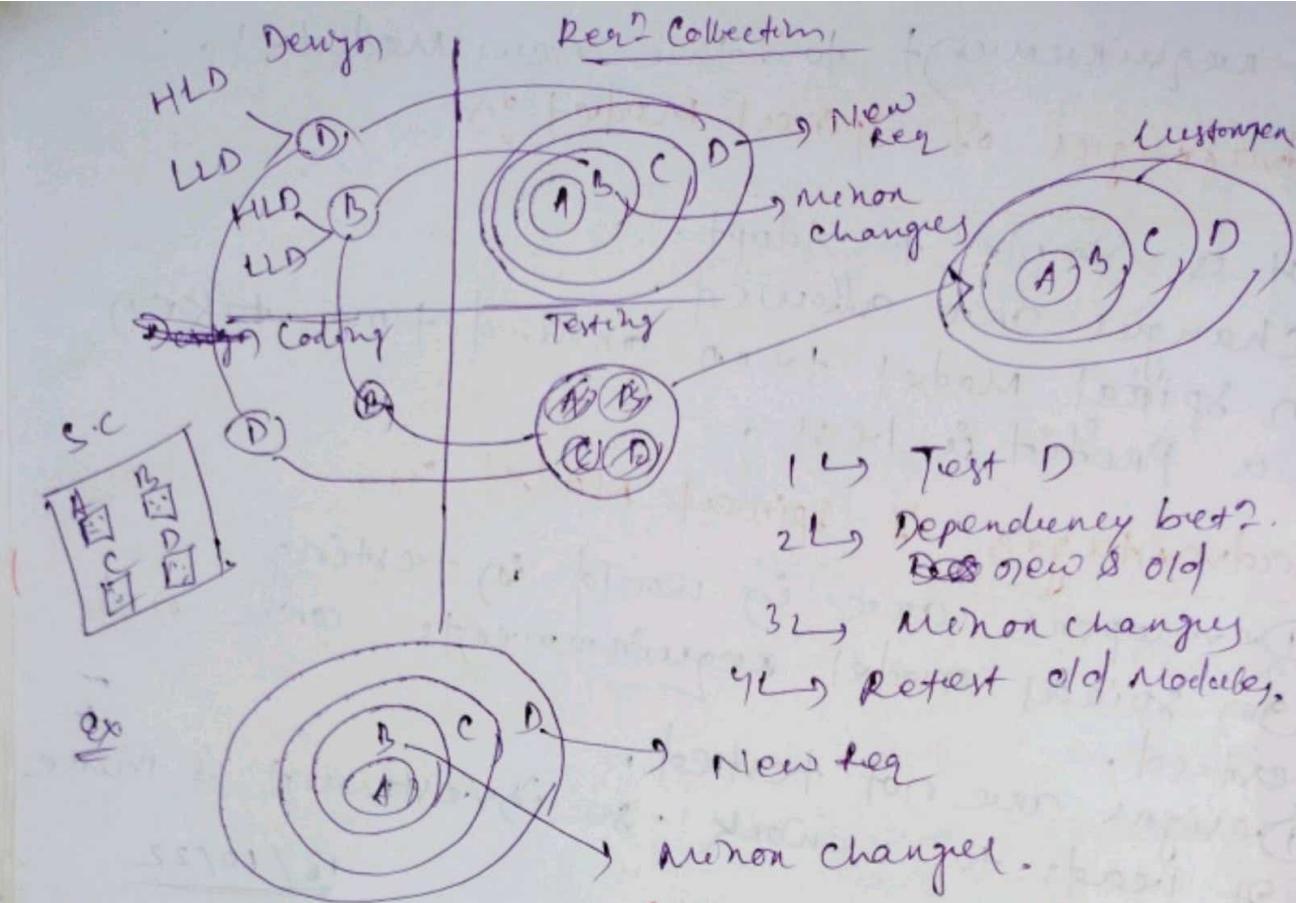
Minor Changes :- (Small Changes)

- It means to in small changes in the Software.

- While doing minor changes, We can't accept new requirement.

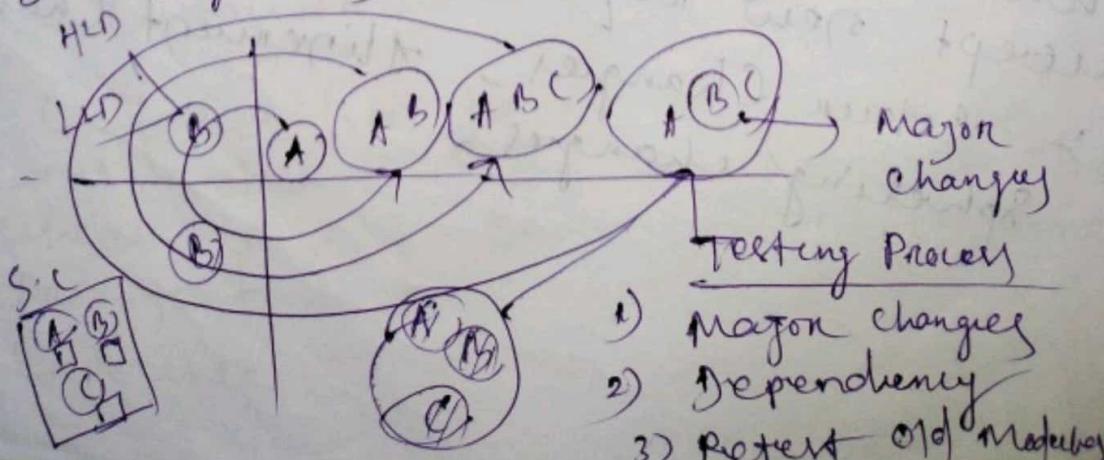
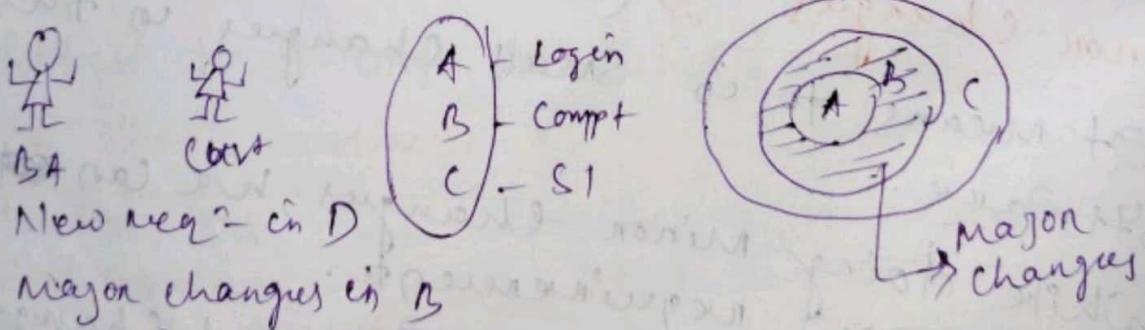
Ex:- Colour changes, alignment changes, Spelling changes.

realme



Major Changes \Rightarrow (Huge Changes)

- To a big changes in the software we called as Major changes.
- While doing major changes we generally do not accept new requirement.



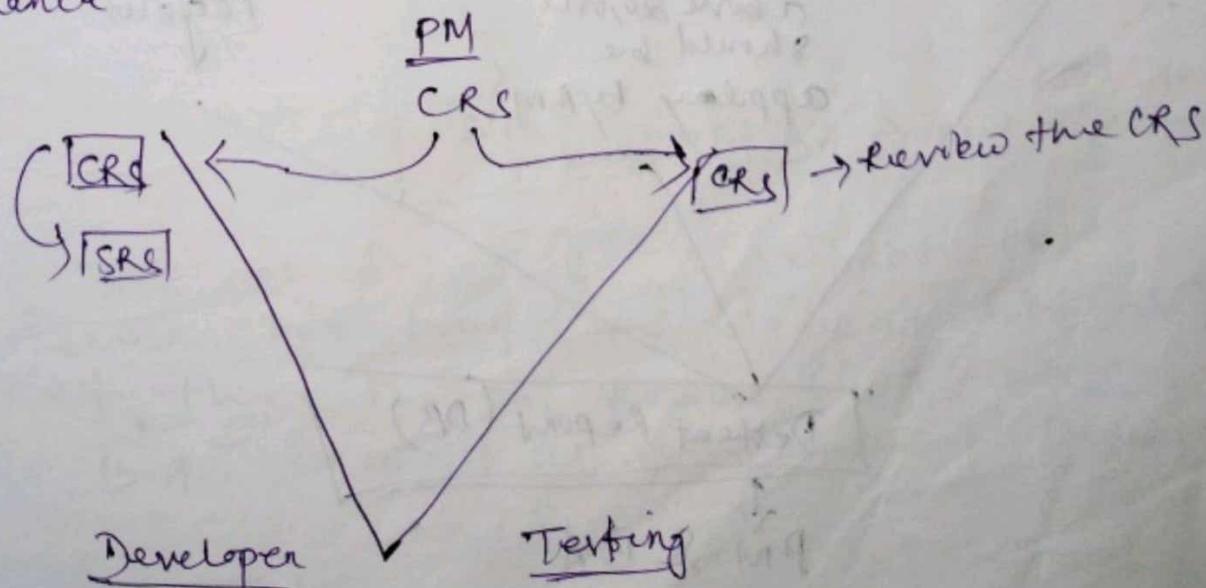
- Note:
- ↳ The Maintenance in the Spiral Model
 - ↳ We will go for each & every stage.
 - ↳ for each & Every change we will change for the customer.

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V&V Model (Verification & Validation Model)

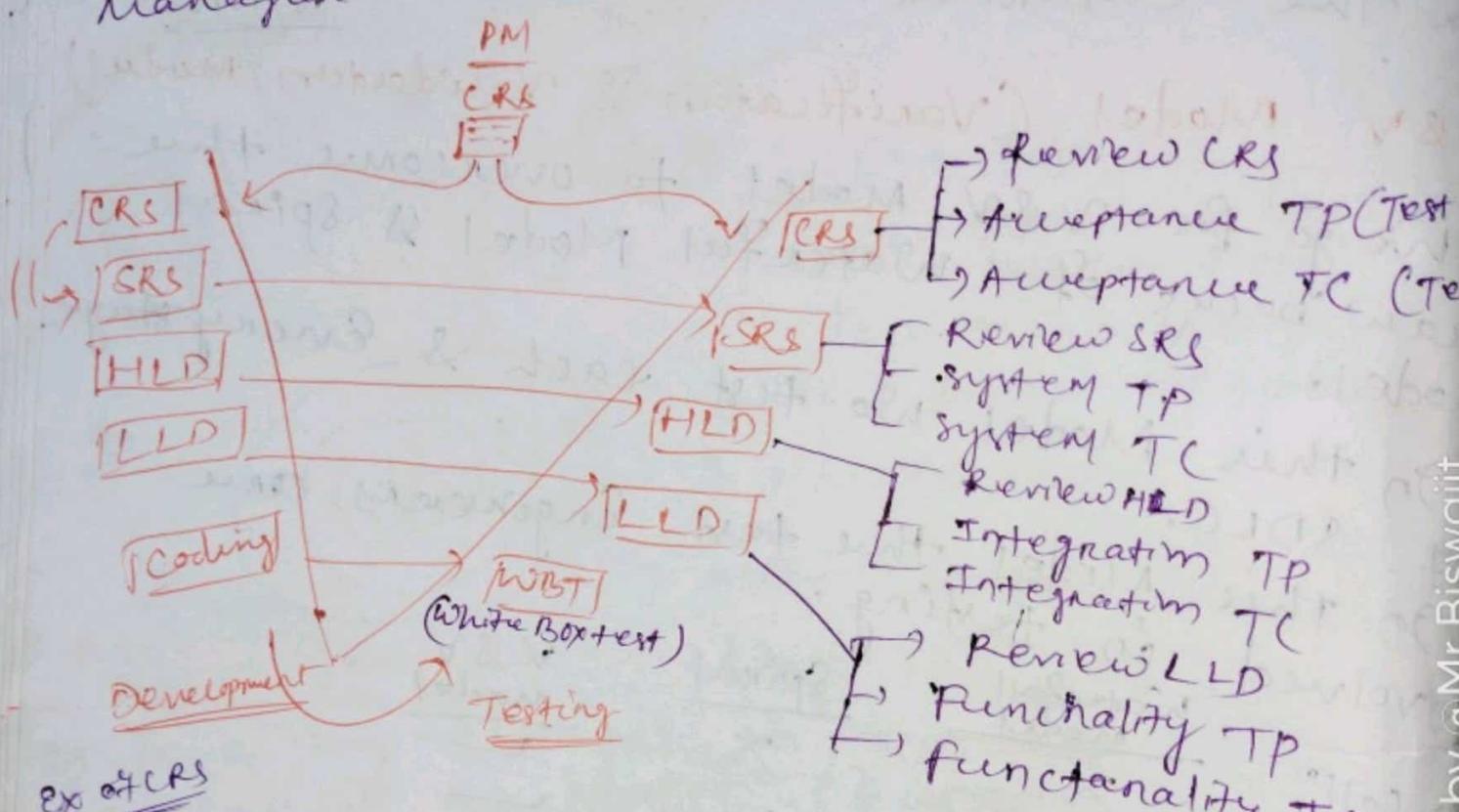
- ↳ We go for V&V Model to overcome the draw backs of Waterfall Model & Spiral Model.
- ↳ In this Model we test each & Every stage of SDLC.
- ↳ In this Model the test Engineers are involved in testing.

	<u>Waterfall Model</u>	<u>Spiral</u>	<u>V&V Model</u>
Req. Coll.	X	X	✓
F.S	✓	✓	✓
Design	X	X	✓
Coding	Dev	Dev	Dev
Testing	Dev	Dev	T.B
Installation	✓	✓	✓
Maintenance	✓	✓	✓



Stage-1

The Business Analyst Collects the requirement from the customer & gives the CRS Document to the Project manager.



Wrong CRS

Interest for personal loan is 9%.

Conflict CRS

- ↳ All loans below 30,000 should be apply by LM
- ↳ All loans above 20,000 should be apply by BM.

Missing CRS

- ↳ Loans
- ↳ Transfer
- ↳ UPI
- ↳ Balance
- ↳ Logoff

- * The Project Manager gives a copy of CRS to the development team as well as the testing team.
- * The development team will start Converting CRS \Rightarrow SRS.
- * When the development team is converting CRS to SRS the testing team will start reviewing the CRS.
- * While reviewing the CRS the testing team will find certain defects in the CRS \Rightarrow Wrong CRS.
- * Conflict CRS, Missing CRS.

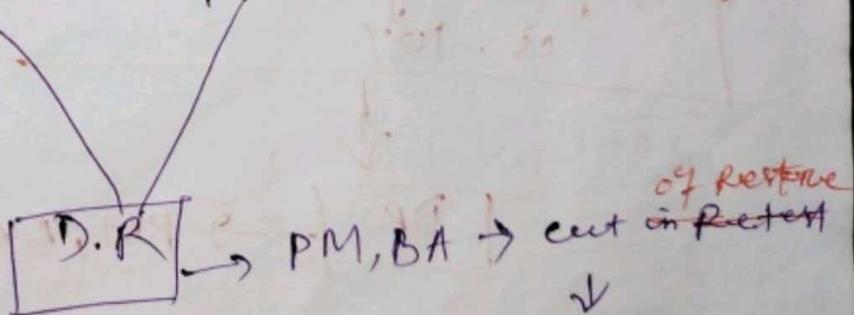
Conflict CRS \Rightarrow

Any CRS which creates confusion we call it as Conflict CRS.

Ex Loans

\hookrightarrow All loans below 30,000 should be approved by L.M

\hookrightarrow All loans Below 20,000 should be approved by B.M

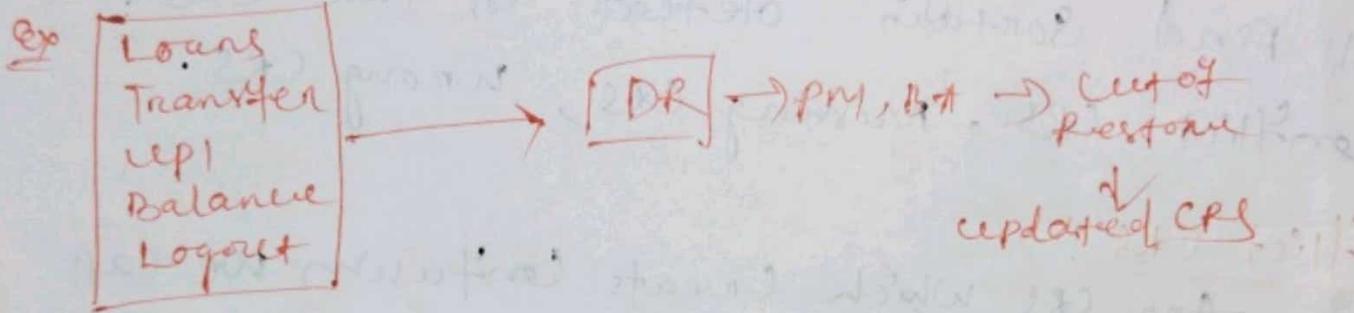


\hookrightarrow Whenever we find the defect we prepared the Defect Report (DR). We send it B.A as well as Development team.

↳ The B.A resolved the issue by going to the customer & after resolving the issue, modifies the CRS & gives the modified CRS to the testing team as well as the Development team.

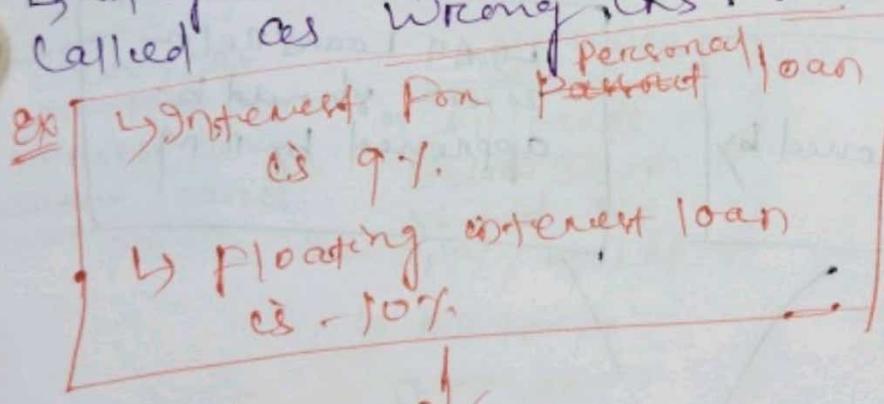
Missing CRS

↳ Any CRS which does not have proper requirements or is missing some requirement we call it as Missing CRS.



Wrong CRS

↳ Any CRS which is wrongly mentioned is called as Wrong CRS.



* After finding the defect in CRS the testing team send the report to the Business Analyst.

* The BA will resolve all the defects & prepared a modified CRS.

* The Modified CRS is going to the Development team as well as testing team.

- * The testing team will once again review the modified CRs. If there are no defects they will be continue with writing acceptance test cases & Acceptance Test Cases.
- * The Development team by rectoring to the modified CRs to make changes in SRS.
- * While writing the acceptance test cases we also called it as acceptance testing stage.

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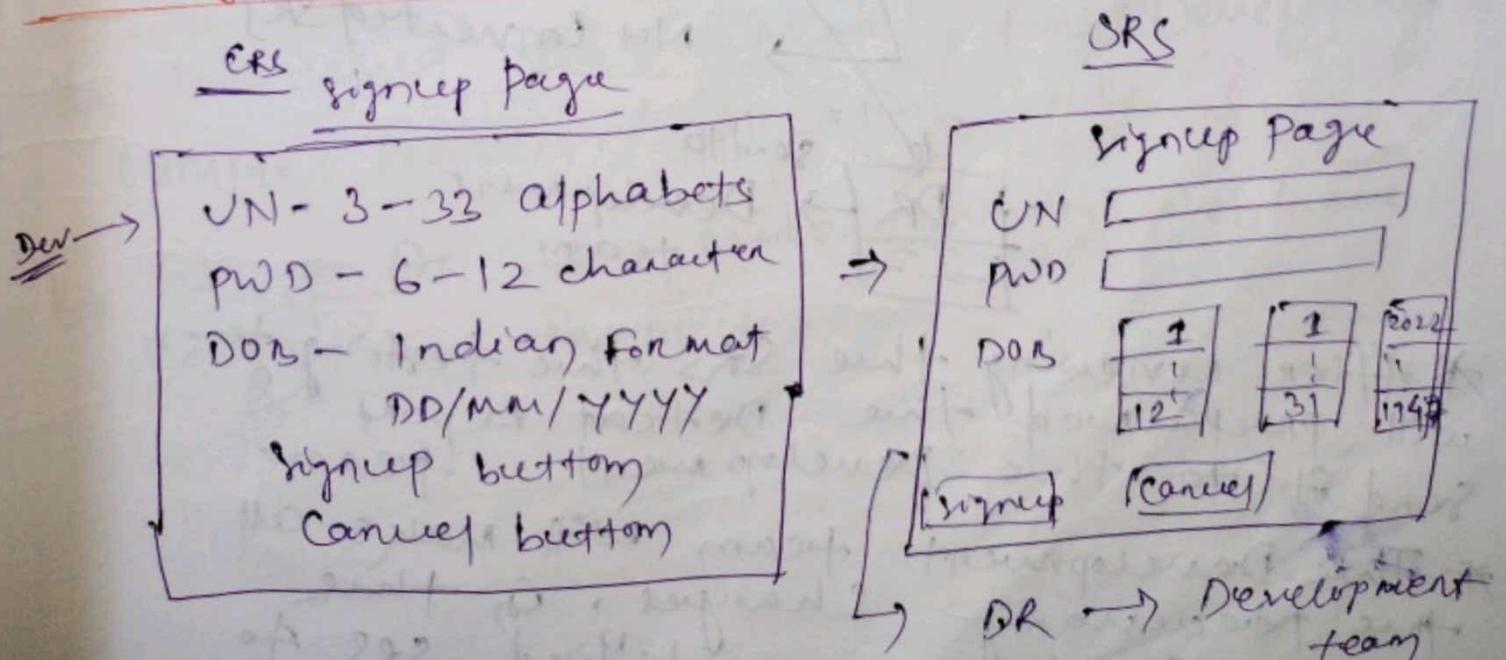
Stage 2

In this stage while Developers are converting SRS into HLD or when the Developers preparing HLD. The Testing team will start to review the SRS.

While reviewing the SRS the testing team will get 2 types of Defects:

- Wrongly converted SRS
- Not converted SRS

Wrongly converted SRS :-



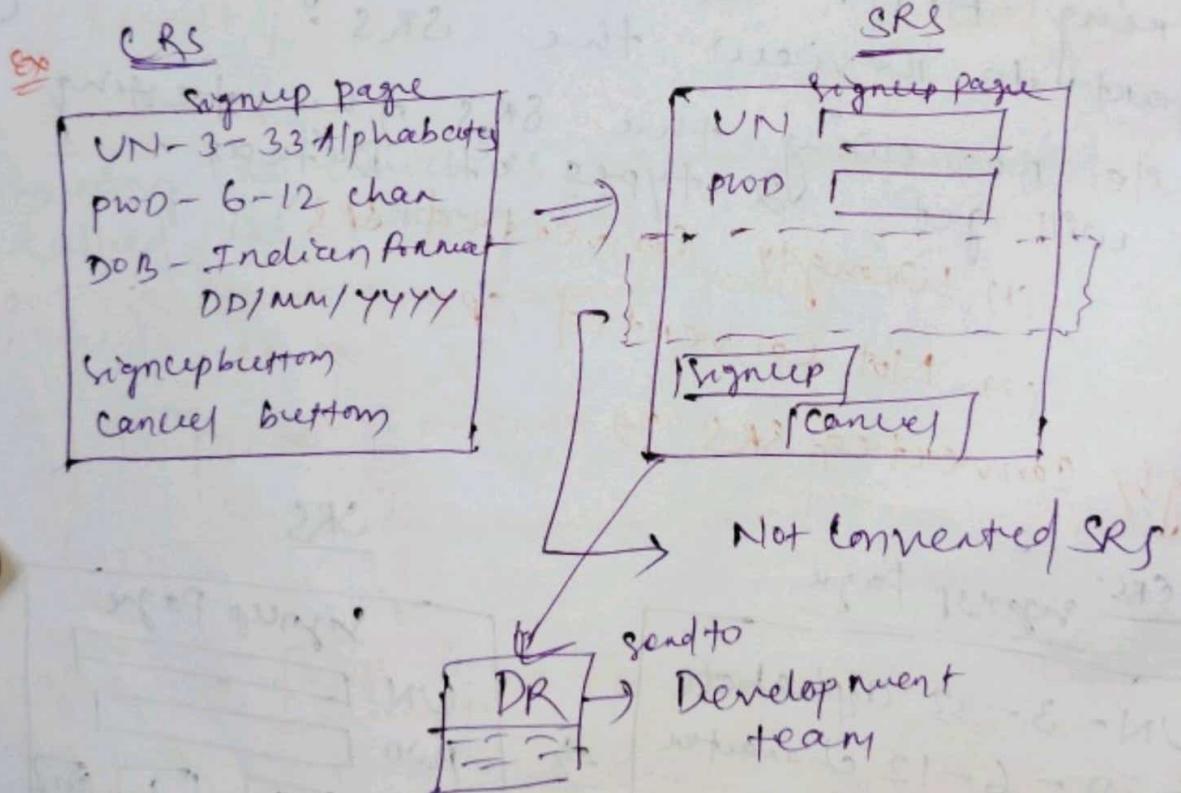
Wrongly Converted SRS

↳ In this Defect the LSS is converted into SRS, but the conversion is done wrongly.

↳ Any SRS converted from LSS which is wrongly converted we called is as wrongly converted SRS.

Not Converted SRS

↳ Any requirement which is present in LSS but not present in SRS, we called it as defect. That defect is called as Not converted SRS.



* After reviewing the SRS the testing team will prepare the Defect report & send it to the development team.

* The Development team will make all the necessary changes in the SRS & send the modified SRS to the testing team for review.

- * The testing team after reviewing will send the approval off to the Developing team. They should change in HLD.
- * The testing team after the Approval for the SRS will start writing for Preparing System Test Plan & System Test Case.

Advantages of V&V Model :-

- In V&V model the Developers are not involved in testing. the test engineers are the ones who does the testing.
- As we test each & every test is V&V model we get a very high quality software.

Disadvantages of V&V Model :-

- In V&V Model which increases time taken & More investment.
- Documentation is More in V&V Model

Application of V&V Model :-

- We used V&V model for Developing complex project / Application.
- We go for V&V model when we have Long-term Projects.

Prototype Model / (Dummy Model)

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- ↳ It is a step by step process to develop a software.
- ↳ In this Model we create a Blue-print of the original Software.
- ↳ We go for this Model when the customer himself is not sure about his requirement specification.

SDLC

Req Collection



Feasibility Study



Design & Development Prototype



Prototype testing



Customer Approval



Design



Coding



Testing



Installation

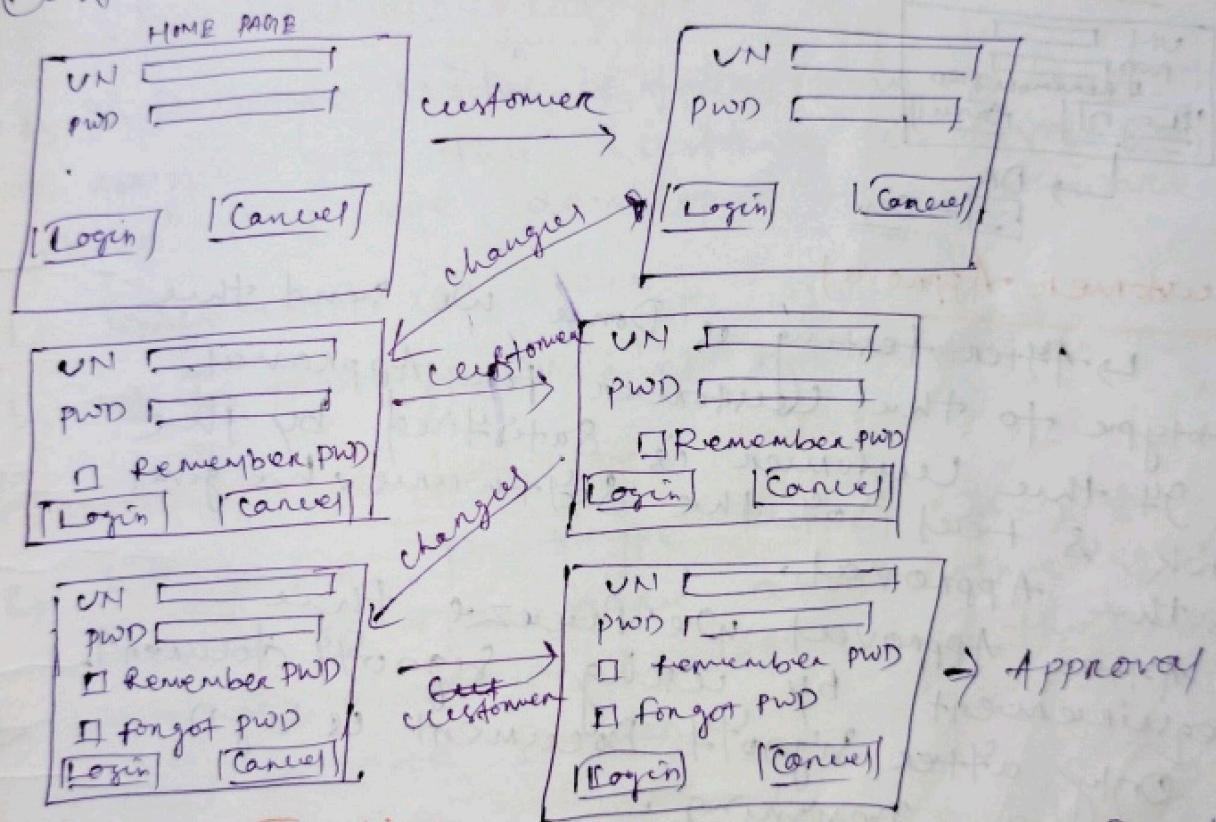


Maintenance

→ Prototype stage.

Design & Development Prototype :

- ↳ In this stage we create a basic Non-functional prototype of the software give it to the customer for approval.
- ↳ If the customer wants any kind of change we will give it to the development team.
- ↳ The development team will make all the necessary changes proposed by the customer & send the modified prototype to the customer for approval.



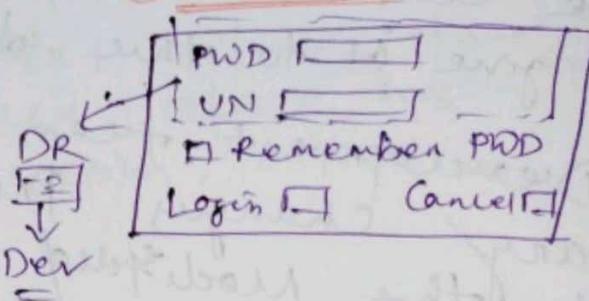
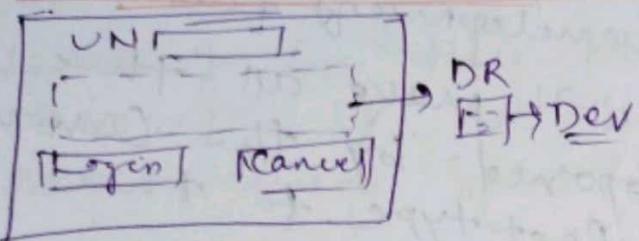
Prototype Testing

- ↳ We go for Prototype testing after Development of the prototype is Done, we cross verify the whole prototype.
- ↳ While testing we gets some Defects.
- ↳ There are some mistakes Likes :
 - (1) Missing features

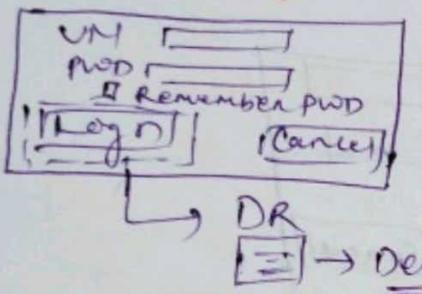
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- ↳ We check for features which are in the wrong position.
- ↳ After that we check for basic color changes & spelling mistake.

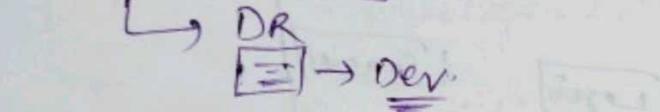
① Features are present



② Position



③ Spelling



→ DR → Dev

Customer Approval

- ↳ After testing is done we send the prototype to the customer for approval.
- ↳ If the customer is satisfied by the look & feel of the software, he gives us the approval.
- ↳ After approval we freeze the requirement by signing signoff document.
- ↳ Only after signoff Document is signed we go for Designing.

Note

↳ In Prototype Model we ~~accept~~ ^{Accept} the changes ~~only~~ only in Prototype Stage.

- Advantage of Prototype Model
- ↳ By using Prototype Model we can get a clear idea of the customer expectation of the software.
 - ↳ In this model by preparing a prototype the customer will have how a software will be developed by the end.
 - ↳ In Prototype Model we do accept changes during prototype stage.

Disadvantage of Prototype

- ↳ In Prototype Model it takes time to build the prototype get the customer approval & only after that we developed the software.
- ↳ Investment is More.
- ↳ In Prototype Model not tested is frequent.

Applications of Prototype Model

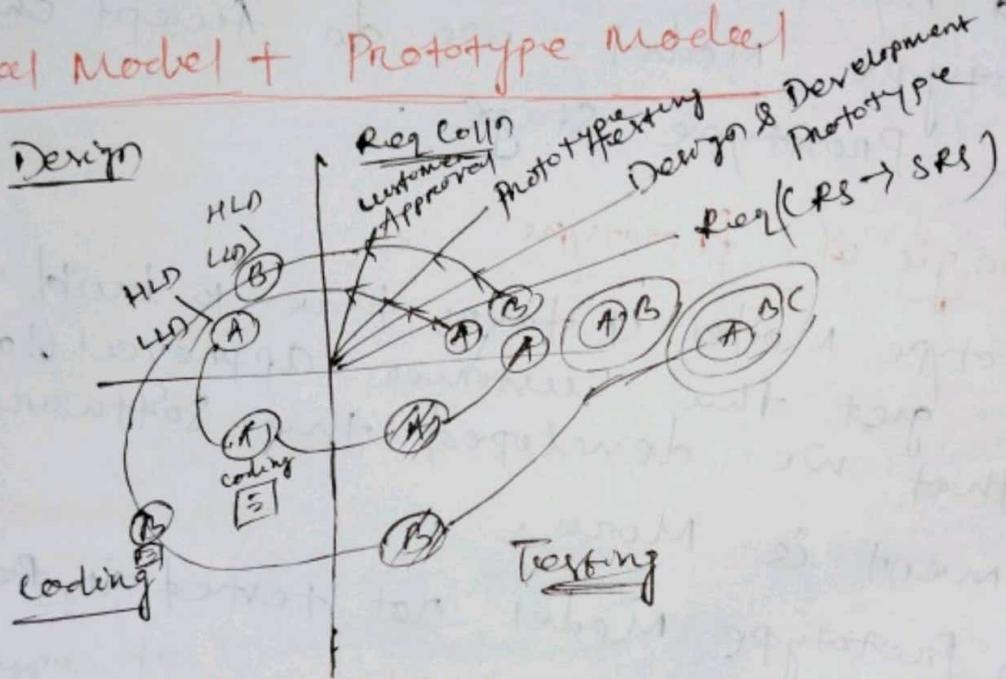
- ↳ We go for Prototype Model when the customer is not sure about the requirement.
- ↳ We go for Prototype Model when the customer is new to the domain.

Hybrid Model

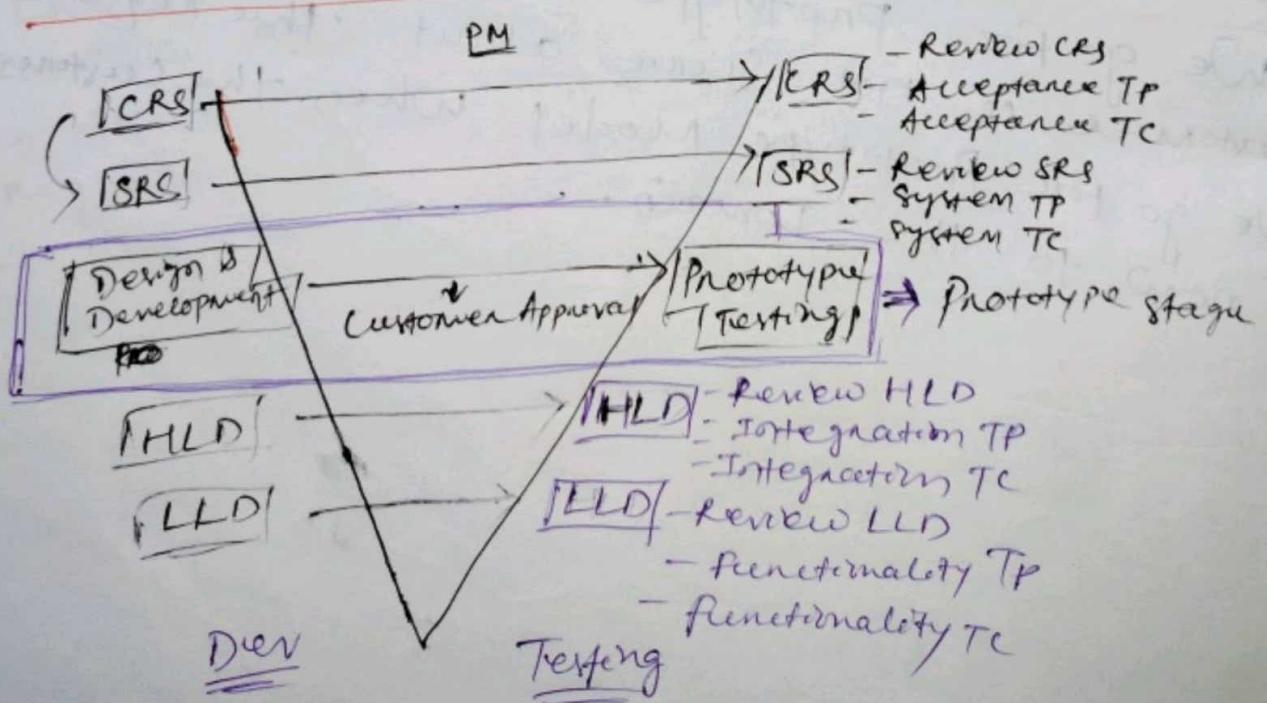
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- ↳ The Combination of two Models is called as Hybrid Model.
- ↳ Examples of Hybrid Model are:
 - * Spiral Model & Prototype Model
 - * VSV Model & Prototype Model

① Spiral Model + Prototype Model



② VSV Model & Prototype Model



- ① Spiral & Prototype Model
- combination (Application)
- 1st Combination
- Whenever there is a dependency b/w the Models.
- Whenever customer is new to the S/W business.
- 2nd combination
- When the requirements are given in stages.
- When customer is not aware of complete requirement.

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V & V Model & Prototype Model

Application (Combination)

1st Combination

- Whenever we build Large or complex application.
- When customer is not aware of complete requirement.

2nd Combination

- Whenever we go for Long term project.
- When customer is new to the S/W business.

3rd Combination

- Whenever customer is expecting very good quality software within short span of time.
- Whenever Dev are new to Domain.

Customized Model / Derived Model

- ① Here we take the Basic Model any single model and we do changes as per the customer requirements/ company standards.
↳ This changed model is called as Customized Model.

