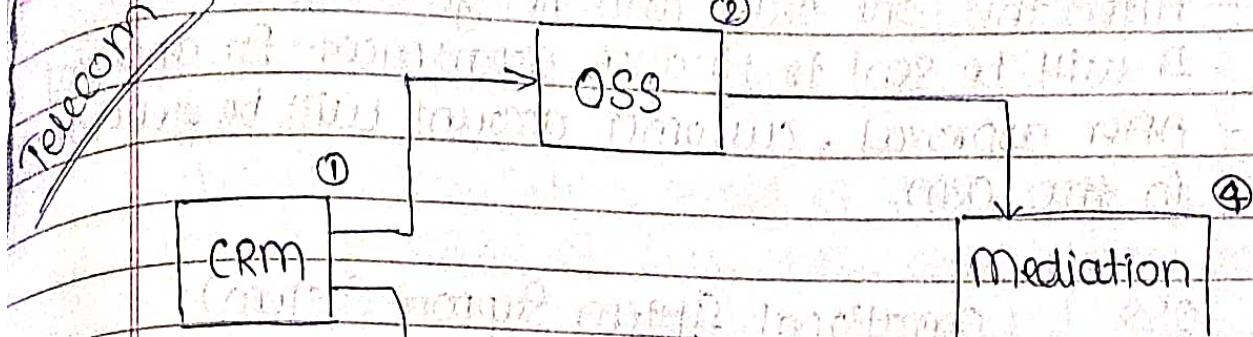


Projects



1.

CRM (Customer relationship Management)

- It is application used maintain customer record.
- Let us, go briefly into telecom domain.
- We want to buy a telecom product, suppose fibre connection.
- And we enquire regarding this online. We chose one product and then we go to the official website.
- Here we need to do registration first (This registration data will be saved with the help of CRM).
- Like Name, mobile Number, address. These are the detail we fill up during registration.
- In a telecom product different services are provided (suppose Airtel Sim is product then they provide calling, sms, etc).
- We also need to select the type of service we require, during the registration process.
- So in the CRM below details are present. These details are filled by user or service provider can also do the registration on behalf of user.

① Customer/User data

② Product

③ Service Requirement

④ Plan,

- After this one order will be generated.
- It will be sent to finance department for approval
- After approval, customer account will be generated in the CRM.

OSS (Operational System Support System).

- Customer order is placed now
- Product provider, then do the installation / Setup of products (e.g. fibre) as per customer requirement specified in the order
- Hardware setup
- Software setup / Network Setup / Activation / Provisioning
- Before this provider will check whether (this data is present in OSS database) location is accessible or not, (with the help of this appn's process) whether we have connection in the area or not (zip code)
- According provider will decide to take the order or not
- Then after Hardware setup, Software Setup, Activation and provisioning will be done
- Once above processes are done, OSS will send the response to CRM that activation is done
- CRM will send the request to BSS for billing account creation.



- BSS (Business Support System):

- All the billing related activities are done in BSS.
- After receiving request from CRM that activation & provisioning is done and create the billing account for this user
- Billing account is then created with reference to unique customer ID generated during registration process in CRM.

* CDR (call detail Record) / (user detail record)

- Whenever we use the services, one CDR file is generated.
- This file keeps entire record of user data.
- This data consists of (How many ~~data~~ internet data is used, How long, When it is activated, Speed etc)
- This data is stored in binary or ASCII language
- BSS doesn't understand this language
- BSS only understands human readable language
- (*) To convert binary language to human readable language mediator / mediation is used.
- Generally the CDR file is generated and stored inside switch, router or hub in binary format.
- After conversion mediation sends the data to BSS to generate the Bill.
- In BSS, based on the usage of services, product Bill will be generated in a specific interval of time or Bill generation cycle details will be present in CRM as well.
- User can decide the date or plan, according bill will be generated.

Traffic	Rate's	usage	charges
1 SMS	1 Rs	1	1
1 MMS	4 Rs	2	8
1 min/call	50 p/min	2	1
Data	10 mb/rs	200	200

- BSS will do the charging and rating as per the CDR file generated, then Billing will generate
 - After that BSS send the request to Billing Systems (prepaid/postpaid).
- Billing consist of:
1. Usage charges
 2. Rental charges (This will be one time)
 3. Late fees (fine)
 4. Credit Note (Balance payment will be added in next Billing cycle)
 5. Debit Note (Call month pending)
 6. tax (GST)



- CDR attribute: Today with no band, effective.
- * - calling Party
 - called Party
 - call start date & time
 - call end date & time
 - Duration
 - Call type (video/video/sms/data)
 - unique ref. no. of unique identification Record

(*) IPDR (Internet Protocol Detail Record) attribute (IP Detail record),

- This provides the information above internet protocol (IP) Based service usage and other activities that can be used by operation support system (OSS)

④ CDR

- CDR further divided into below records.
 1. OK call Record
 2. Rejected Record
 3. missed Record.
 4. Duplicate Record
 - All above records will be present in CDR
 - Medication is unable to differentiate these records & it will pass on same as it is CDR to BSS in readable format
 - BSS will generate Billing based on the billing Requirements, means charges will be not applicable for rejected calls.
 - charges not applicable for missed call
 - charges not applicable for duplicate call
 - In BSS, minimum input conditions are provided if these conditions satisfies then only billing will generated
- When CDR file generated, there is one more file is generated CTL C

- CTL file is copy of CDR
- It is not volatile in nature, we can only read it
- This CTL file can be used, if any CDR is getting corrupted or data inside CDR is not as per requirement (Data missing, Improper formatted)
- Read only memory

④ Rating & Renating

- CTL & CDR both files are generated in switch, router or hub.
- These are stored in mediation, mediation is file System Storage. (file based storage system). Repository Storage
- Suppose one CDR file is generated and along with CDR CTL file is also generated
- In mediation, both files gets compared
- If both files are ok, then CDR will be passed through mediation to BSS, This is called rating
- If the CDR & CTL files are different then CDR will be generated one more time ^(After correction) and then it will be passed through mediation to BSS , This is called re-rating
- Here there are 2 possibilities -

 - 1 Duplicate record:- We need to validate whether the duplicate record is valid or not. If one record is present in billable directory & other same record is present in duplicate directory then it is valid duplicate record
 - If the duplicate record is not valid then we will do the re-rating, 'CDR file will be generated once again'

2 Rejected Record:-

- Record is rejected if one or more attribute parameters are not available in CDR file
- This can be validate with the help of CTL file (comparison)
- One more time CDR file is generated for rejected file then we will validate whether it is billable or non billable

④ CRM (Brief Explanation)

→ ~~Information system for vertical~~

Vertical :- Telecom, Banking, Insurance

Horizontal :- CRM, OSS, BSS, Medication, Payment

⑤ Customer relationship Management (CRM)

- Is a tool which manages customer data

e.g Amdocs CRM, Seibel CRM, Salesforce CRM. These are different CRM tools.

- It is also known as Gateway for telecom project

- CRM having its own database for storage of customer data

⑥ Seibel CRM Workflow (Product:- Multimedia, fibre, wifi, etc).

1. First page account creation

- F-Name, L-Name, address, email Id.

2. Second page contact information

- Contact No, Social media id etc, all contact

3. Leads

- Leads generated as per address

- Area is checked if connection is available or not

- We can proceed only if customer area is eligible

→ If not, we will keep data as it is and if in future network is available then we will contact with the customer in future

4. Opportunity:- Financial status

- financial status is checked with the help of Bank acc no, credit card details etc.

- One web request is generated and details will be fetched from bank like cibil score, repayment history

- this is done to check if customer is eligible for the services & if he is able to pay the bill

- Accordingly we will decide whether to give the connection or not

- If the customer is not eligible as per criteria, then the CRM account is not generated.

- This is also called as risk management.

5) Quote: - Here customer is able to select plan & place the order

- Order is placed and order ID is generated.

- Ready to use connection.

CRM Journey

1. Create → Account LG → Open Quotes

2. Modify

modify the existing accn (new offer, new terms)

3. Delete

Delete the acc. for temporary basis (offer)

4. Cease

- permanently cancel the acc.

Q) What are the flows of CRM you have worked in

1. Create → Customer acc creation → End-to-end process

2. Change → We check if change is successfully done
offer/device/as per requirement, change

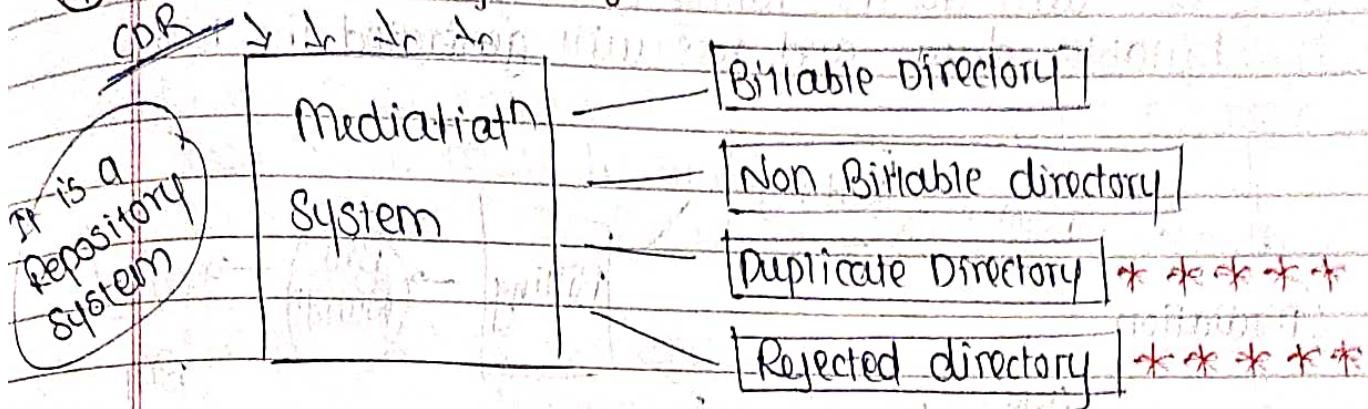
3. Suspend → Temporarily disconnect the services

4. Resume → Connect temporary disconnected Services

5. Cease → CRM data available but order management services are deleted permanently.

6) Re-establish:- CRM data can be used i.e., can we use for customer id & new services.

* mediation System:



* Billable directory

- In CDR file, if called no. and every details are fine then it ~~book~~ to CDR file is moved to Billable directory

* Non-Billable directory

- Non billable events like missed call, rejected call etc can be moved to Non Billable directory

* Duplicate

- 2 CDR files are generated same

* Rejected

- One or more attributes are missing in CDR file

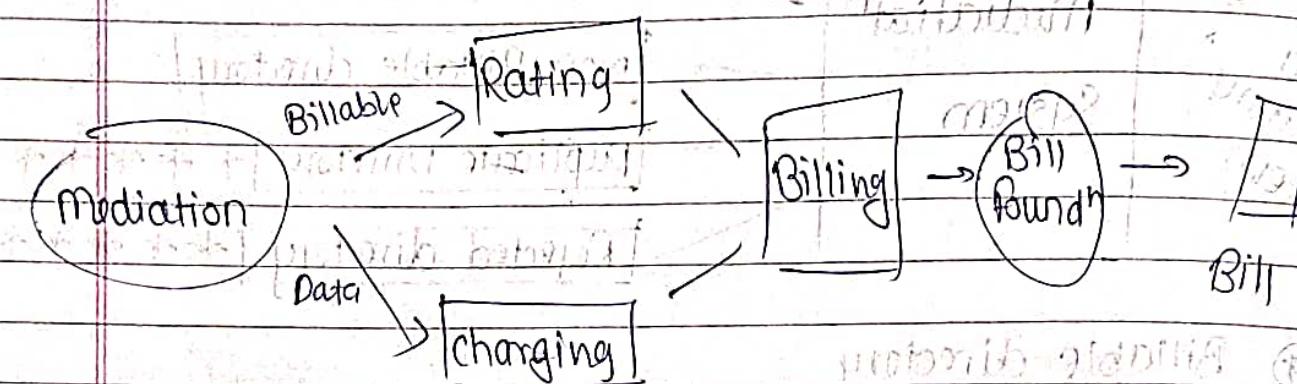
→ Medication will divide the CDR into above 4 directories

AFTER this data will be sent to BSS for billing

→ For duplicate & rejected record we will do the re-rating. We need to check whether duplicate & rejected records are billable or not.

(*) BSS

- All the billable data from mediation will map to go to the BSS (Business support System).
- BSS will do the rating & charging of the data on billable data, and BSS will generate the bill.



- Bill will be generated as per plan selected by customer e.g. (monthly, quarterly etc). ← Postpaid case

(*) Rating concept

(*) Rating Engine

1. Determine the account that has to be charged

2. Charges to be applied to all billable events

- Inputs from mediation is stored to BSS database in table format

- CDR file format is .csv

- When file is loaded it has 16 columns of jobtype is BSS database - This is additional column

Call_No Called_No St-Time End-time duration Area code Job Type

97-- 98-- 109 9:00 10:00 1:00 1377 1

④ Jobtype has 2 values

1. Rating is done

2. Waiting for the rating

- When .CSV file data is loaded in the BSS we need to do count validation to check the source & target data count must be same.

- In this case .CSV file is the source which generated by mediation

- Target will be BSS database

- If count is different we will check CTI file for any missing record. Or we will ~~do~~ do the job run once again.

- During working in BSS, main task of tester is to check the job type status after ~~job run~~ each job run.

The status should be changed from 2 to 1 after each job run.

To get the plan details, one web service request will be sent to CRM.

With this BSS will get all plan details & then BSS will generate the Bill.

⑤ Bill Generation Precondition

1. Customer account status should be OK

Eg PA → Pending for activation

OK → Services are OK

TA → Termination Activation.

2. Billable events should be present

3. Rejected & duplicate records should be rerated.

3. Bill cycle date

4. Bill type must be there (Paper | mail)

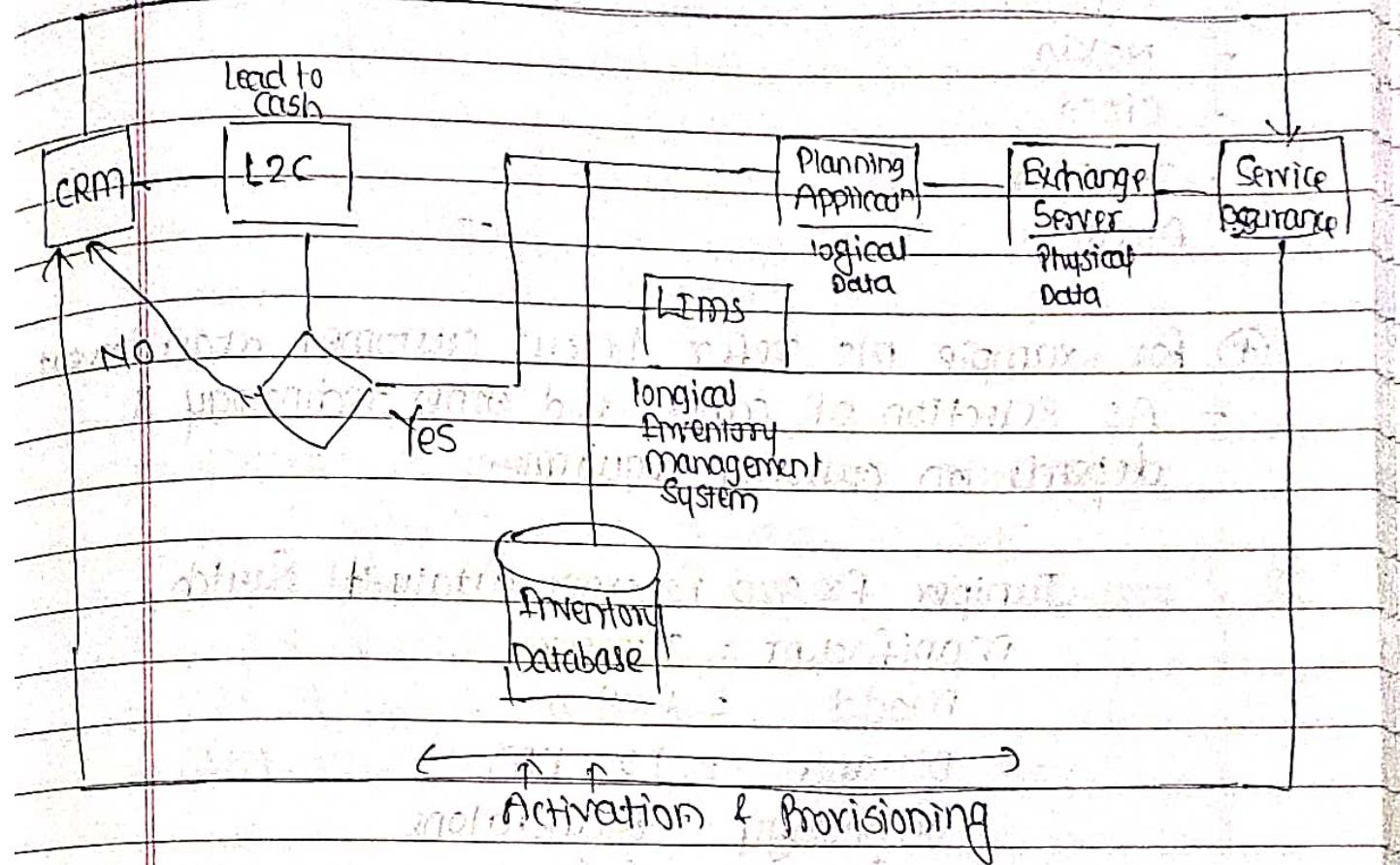
* * * If customer select bill type by mail
Then company provide discount to customer
this is called as 'go green discount'

② Bill Attributes

- Costed events :- Internet, call, mms
- Rental charges
- Discount :- 'Go Green', 'Promocode'
- Tax :- CGST
- Roaming :-
- Credit Note :- Previous month extra money will be minus from bill
- Debit Note :- Previous month ex money is not paid by customer, (say ^{some} bill is 1000) customer only paid 900; then 100 will be added during current month bill generation
- Outstanding :- Money/Bill not paid on time then late fees will be added in the bill
- Late fee ↑

Total Amount = Fixed amount + Variable amount

④ OSS Workflow



1. Device Integration :- Switches, routers, hubs.
2. Network design :- ~~no specific~~ → Ethernet
3. Technology - cable type (copper / fibre optics)

⑤ Provider :-
 Network Provider :- ~~providing the channel of communication~~
 Service Provider :- ~~providing the service~~ ~~through network provided by network provider~~
 our company provides ~~our own facilities~~ ~~with help of network provider~~
 the ~~both~~ both

4. Topology used in OSS :- ~~ring topology~~ ~~and star~~

⑥ Standalone - ~~single node~~ ~~not connected to other nodes~~

⑦ Ring - ~~full mesh~~ ~~interconnected nodes~~ ~~each node is connected to two adjacent nodes~~

④ Cable Providers (fibre optics)

- Ericson
- Nokia
- Cisco
- Juniper
- Alcatel

- * for example, pls refer below customer requirement
- As selection of cables and other technology is depends on customer requirement

Juniper FX 320 Ethernet, catalyst Switch

manufacture = Juniper

model = FX 320

Distance = 100 KM

Technology = standalone

Port = 8 front

Data transmission

(distance) total = 500 mB

* Client wants to launch the technology

- If airtel wants to establish network in an area then switches and routers are installed in the area then switches & routers are installed in the area

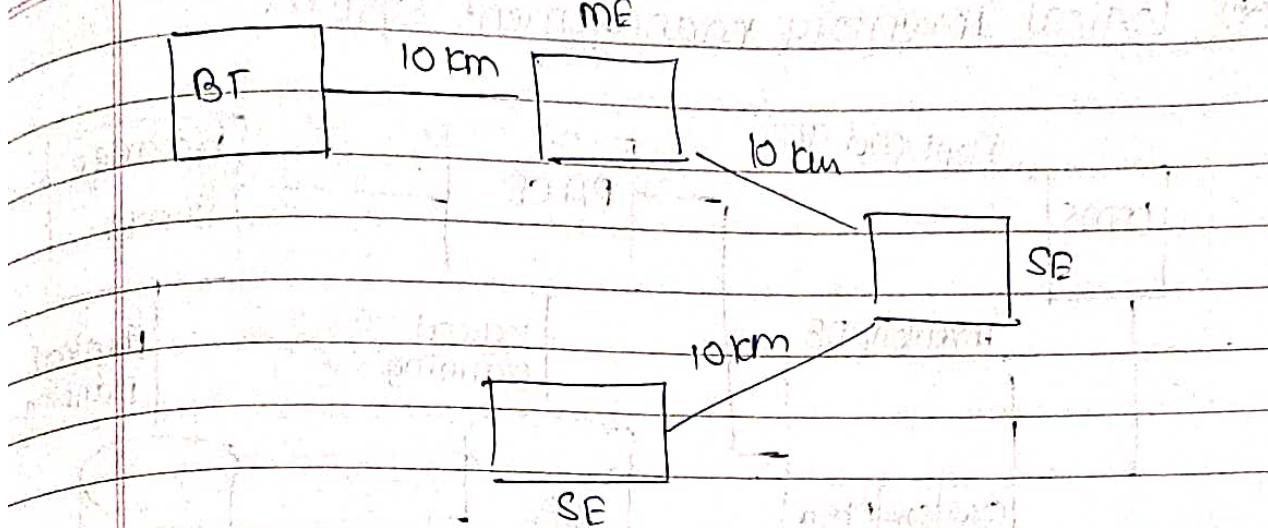
BT - British telecom

In 10 km main exchange is installed

In 10 km sub exchange is installed

The main|sub exchange can use any manufacturers switches devices.

④ Network



- Network is placed as per client requirement

1. How to place ~~water~~ network

2. How far Distance betn main exchange & SE

3. Distance betn SF & SE

- All things are planned logically

- After that physical installation is done.

④ Network attributes or components eg. card, bus of LED

Shelf mobile or bus which are



Rack



Card

battery

memory card

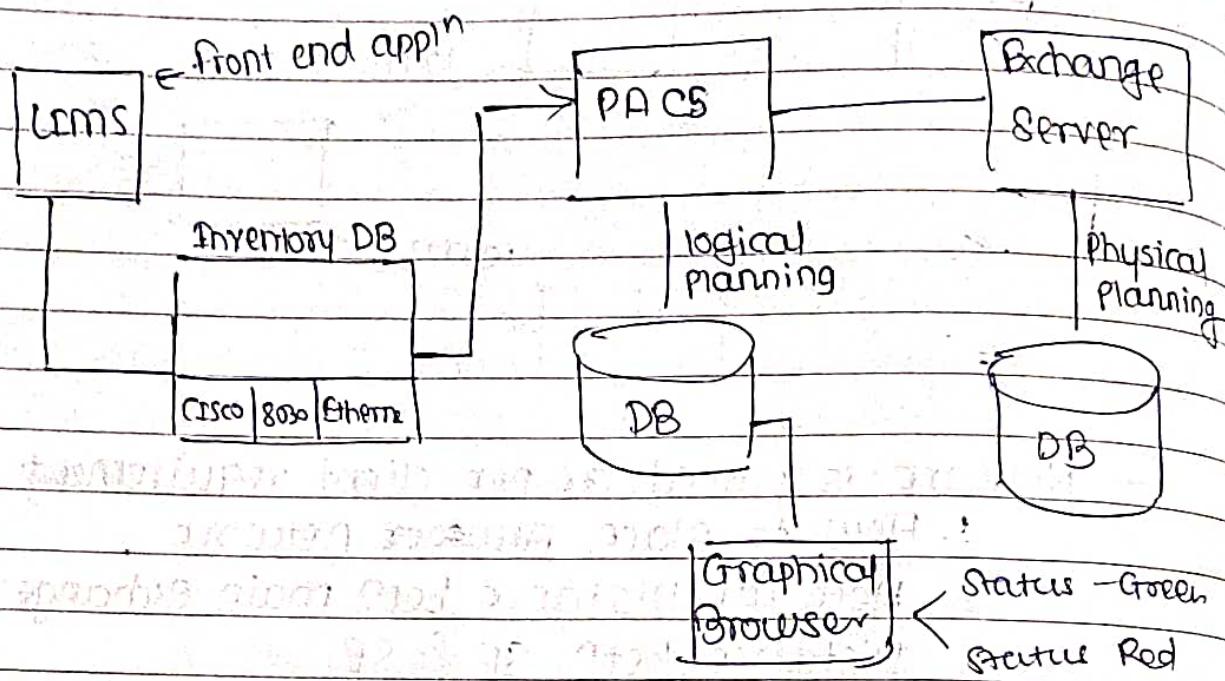
Subcard

sim card

Child card

micro / mini card

④ Logical Inventory management System



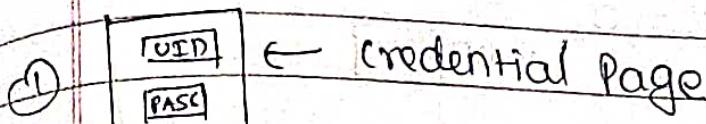
① LIMS

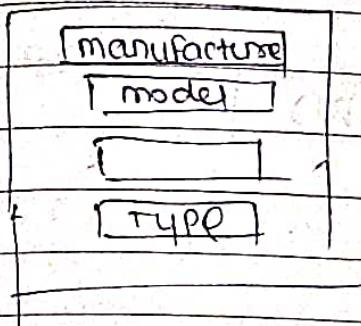
It is a front end application, which displays all the information related logical Inventory like which cable to use, Stock available, CRF etc. This application is connected to inventory data base

② Inventory database :-

- Saves the information about connection used
- PCAS - Planning & configuration System
- Real time application
- Planning about what apps to be used all this is stored in db
- that database is connected to graphical browser
- Graphical Browser
 - Green means connection is good & network can be used
 - Red → Bad connection

* logical planning:-



② 

manufacturer			
model			
type			

logical page :-

object of logical page is to increase readability of program how much work is done at different time by different people
so it is good to have logical page because it is more readable and time does not get minimized
but it is not good to have logical page because it is more difficult to find the error or point out the problem
so it is better to have logical page with some modification in it so that it is more readable and easy to understand

* Standalone

Shelf

Shelf 1 ,

ADD

Shelf 2 ,

Shelf 3 .

Racks

R1

R2

R3

ADD

Card

ADD

Subcard

ADD

Submit

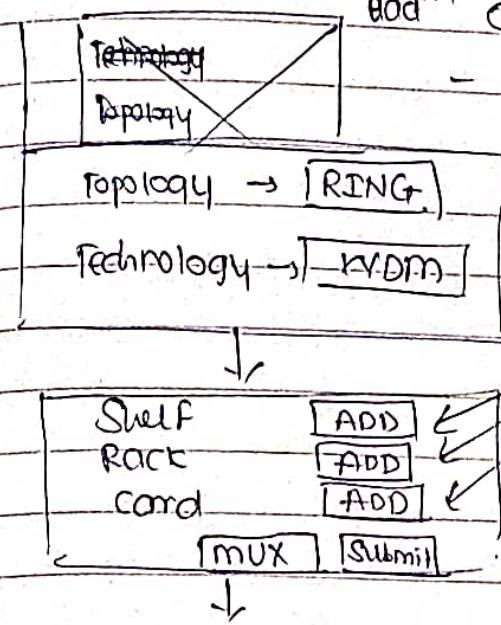
- In Standalone topology if we needs to add new Shelf it will be added using add button as shown above
- Similarly we can add racks cards & subcards
- After all Shelf, rack or card & Subcard details added we need to click on Submit
- After that one schema ID is generated
- In standalone only one Schema ID is generated

* Ring Topology

- In ring topology there is one additional option of mux.

- multiplexor

This option will be enable if we add 3 times



- Here we need to click

to 3 times submit

means → After adding

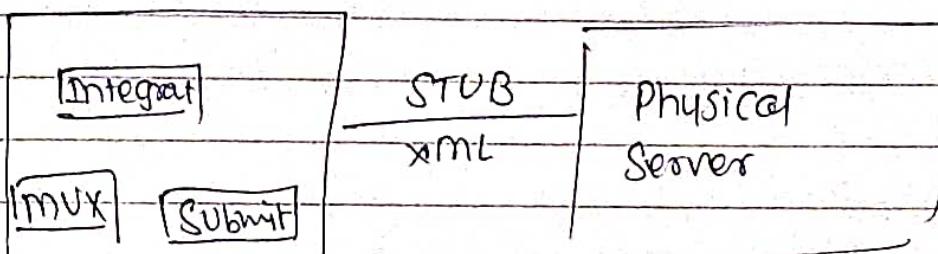
3 shelves & clicking 3 times

Submit mux option will be enabled 3 Schema ID's

generated.

After that mux optn will be enabled

which further generate one primary ID



logical server

- We need to check whether logical server is in sync with physical server or not
- for this we are using STUB (.xml) file and we validate the request file and response file