





































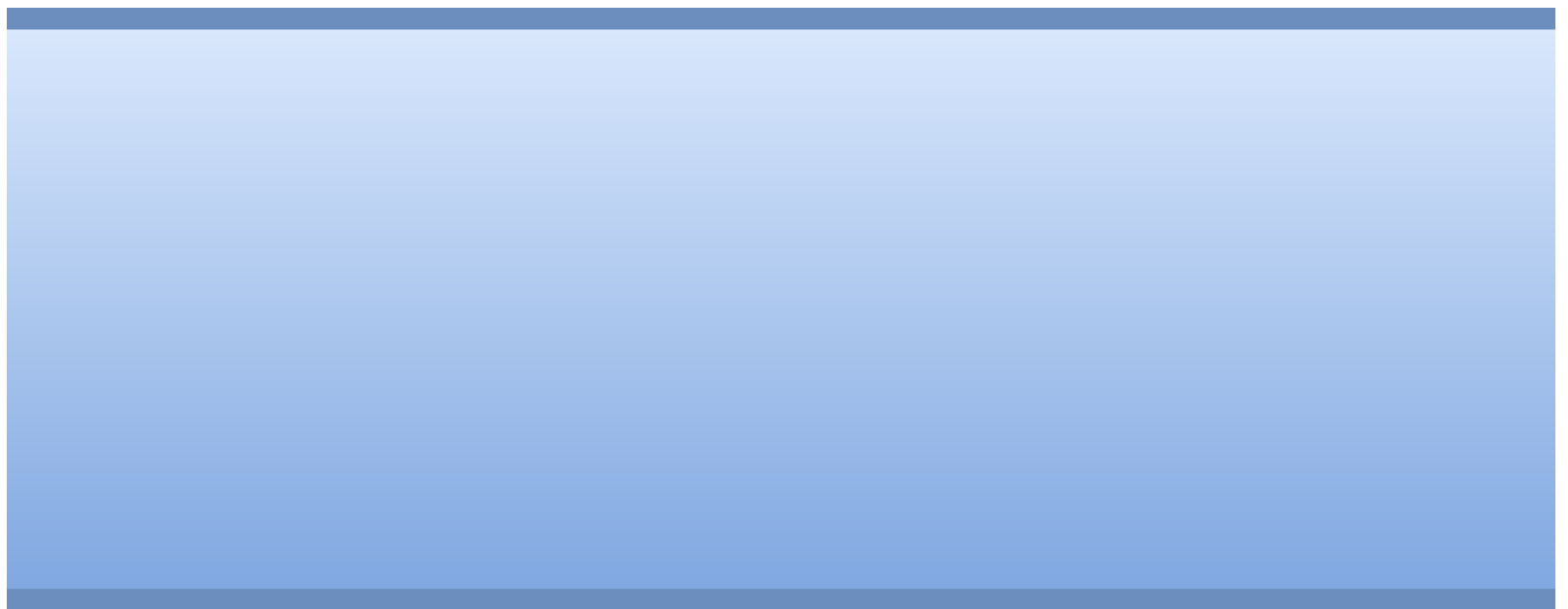




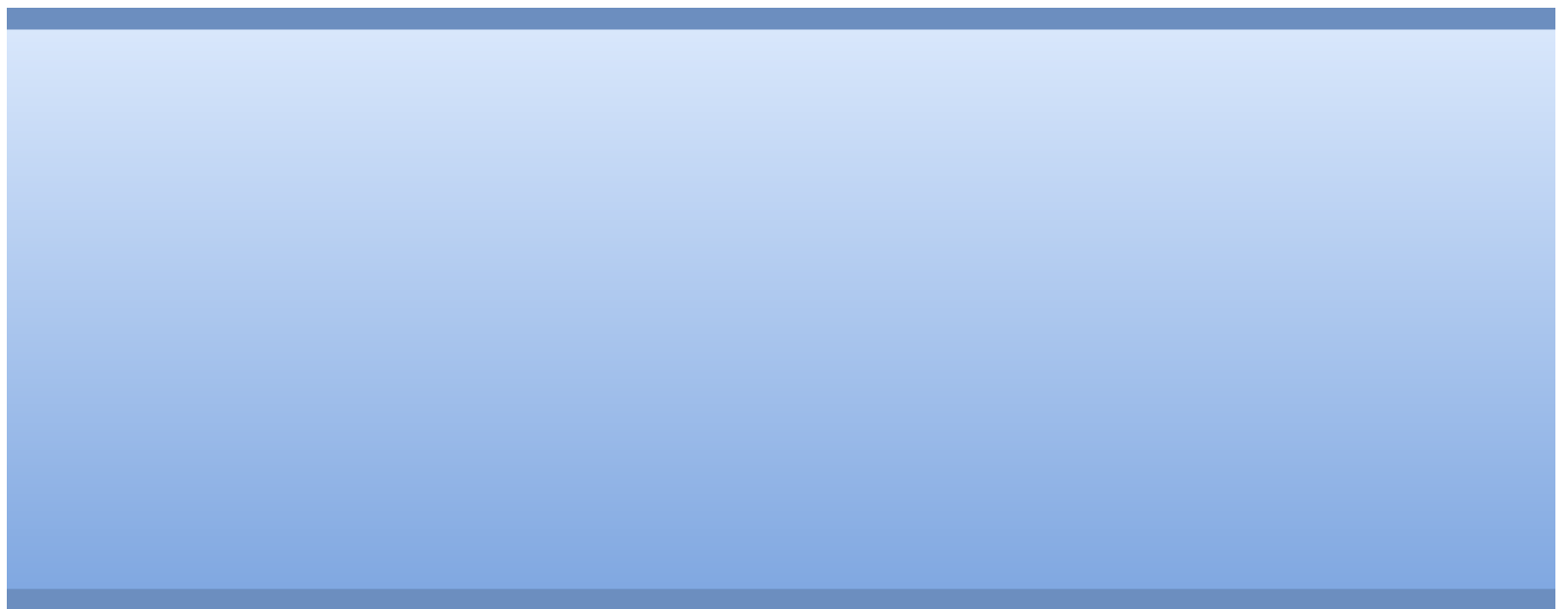


**SA**

**AD NOTES**











## REQUIREMENTS

Requirements means "what the system should do"  
means "what the system should do"



**MENTS**  
he user wants" and also  
em should have"







# Characteristic of Good Code

## Uniqueness

The code must be unique and non repetitive

## Flexibility

The design of codes should be easy to be modified and improved

## Stability

The design of code should be stable enough to not required frequent changes to it

## Expandability

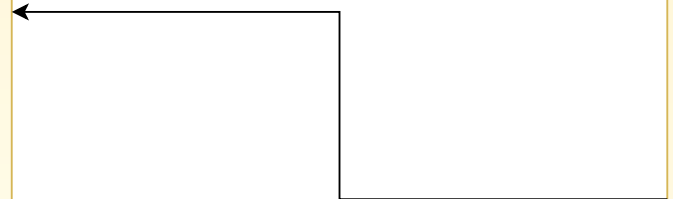
Alllow the growth of the code design, aka improve and suit the new needs of the business

## Simplicity

The code must be simple to read an understood even by different level of users

## Meaningfulness

Code must be meaningful and easy to remember and understood as well



*Database Expected to be ok as students taking*

## DBDL Format

STUDENT ( Student\_ID, Name, Address, City, Stai

BORROW (Borrow\_ID\*, BorrowName, BorrowTime

# Type of Codes

## Sequence Codes

The design of the code is usually number and follow a sequence with order.

Example : Waiting number from 0001- 0100

## Block Sequence Codes

The design of codes is usually contains blocks of numbers for different reason / meaning together with the sequence

Example: Course Code : CM001 , CM means Chemistry, 001 is the sequence

## Significant Alphabetic Codes

Usage of alphabets to represent a certain meaning for the ready to easy remember

Example : BRB - be right back, SW - software, HW - Hardware

## Significant Alphabetic Codes

The Usage of numbers to represent a certain meaning for the ready to easy remember, same like Significant Alphabetic Codes but now it uses numbers

Example :20052023 - means 20 is the day, 05 is the month , 2023 is the year

## Derivation Code

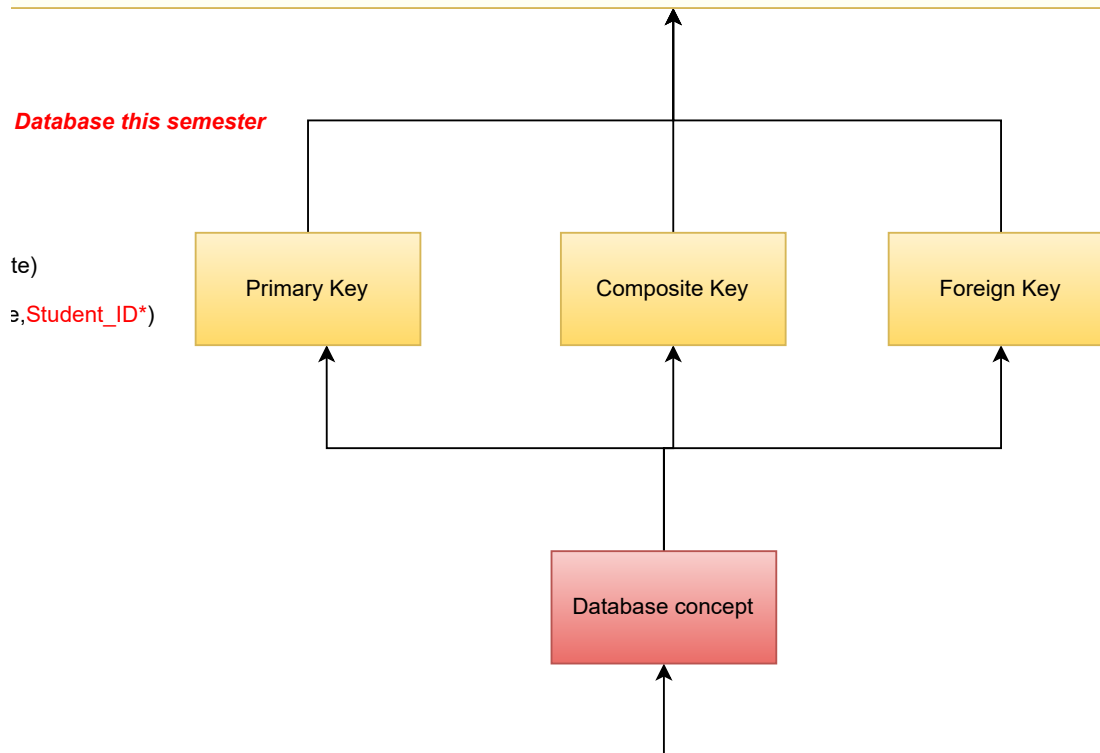
Its basically the combination of ALL, which each codes have deep meaning and is made up with more than 2 type of code design (Attributes, characterisitic , sequence)

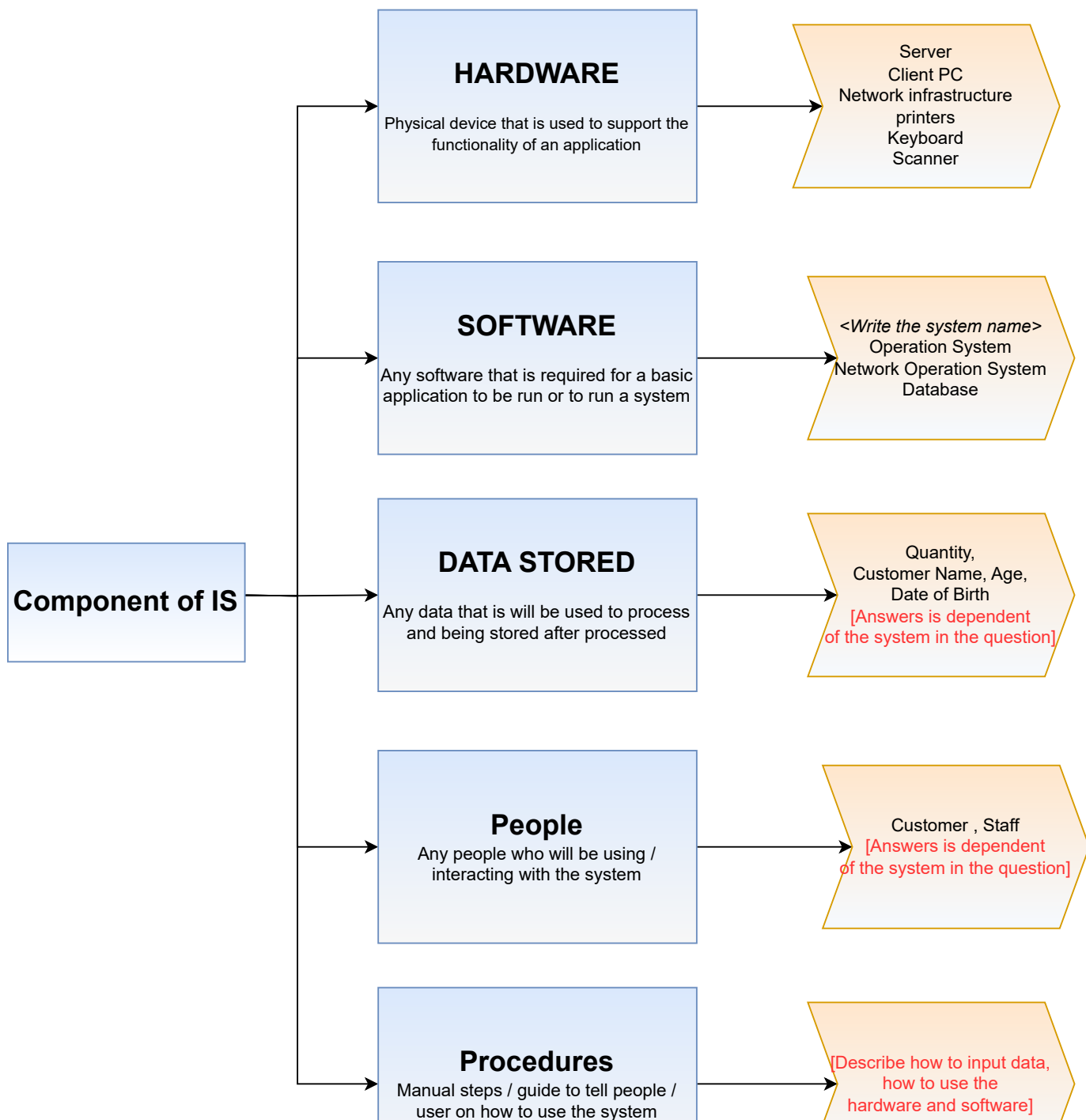
## Pull Down List

these are used for values that are fixed and allow the user select

## Default Values

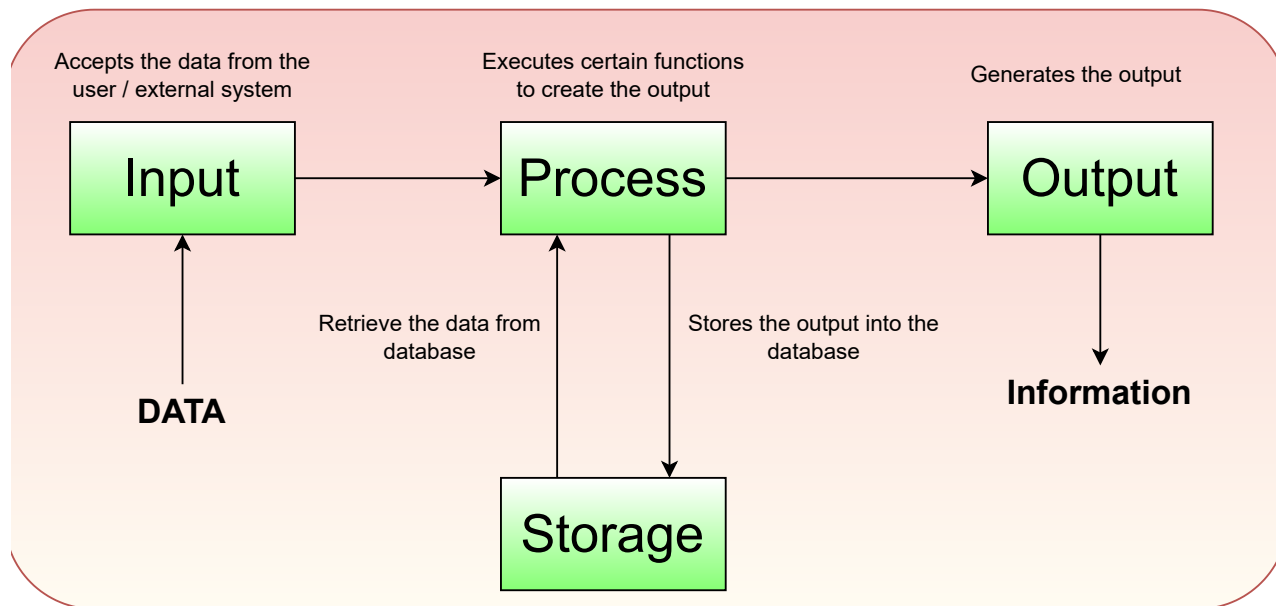
Field that are defaulted to certain value and allows user to make change if needed







## Functions of Information System



## Source of System Request

- Directive from Top Management / Top Management
- From user / Customer of <System Name / Company Name>
- Existing System Problem - **ONLY use this if the scenario have an Existing System !**
- Existing Process Problem - **If the scenario don't have a system but their process got issue then use this**
- External Sources - **Like government new rules, competition from other company, market trends**
- IS department / IT department - **Complain or request from the client IT department**

## Type of Improvements / Why the client wants a new system

- **Improve Performance of the business** - They want to make the process of the business better from 5 steps to 3 steps to complete a task
- **Better performing system** - They want a better system that does not affect their business or delay it
- **Better services for the business / customer**
- **To have better quality of information produced** - Accurate information required for stronger decision making
- **Better control on inputs (Effective Control)** - to have accurate validation for all the inputs or data required for processing
- **Reduction of Operation Cost**

## Feasibility Studies

- Its Study to determine if or not requested is Doable OR not, F
- For Feasibility we will need to Social & Operational , Econom

## Technical Feasib

- Studies of Hardware / Software
- Check whether the existing d or enough to create the new support it
- Check if the proposed solutio done or not

### ISSUES To take NOTE

1. Number of users
2. Data Inputs (Number of i
3. Response Time of the sy
4. Accuracy of Outputs

If all 4 is ok then you may proceed

t the new system / the improvement  
feasible or NOT.

look into 3 categories (Technical ,  
ny)

## ility

are and Human requirements  
devices, software are suitable  
support / improvement or

on is technically possible to be

(inputs)  
system

d to the next study...

## Social and Operational Feasibility

- Study whether the new system / improvement can fit / accepted by the current organizational structure or not / people in the client office
- Will the behavior of the people create any additional cost?

### ISSUES To take NOTE

- 1. Employee skills** - are they good enough to operate the system? do they need extra training ?
- 2. Employee Motivation and resistance** to learn the system - are they open enough to accept the change? or they prefer the old methods
- 3. Organization Structural changes** - will the new system results in the company to change their structure?
- 4. High Cost-** will there be any additional cost like RETRAINING the staff?

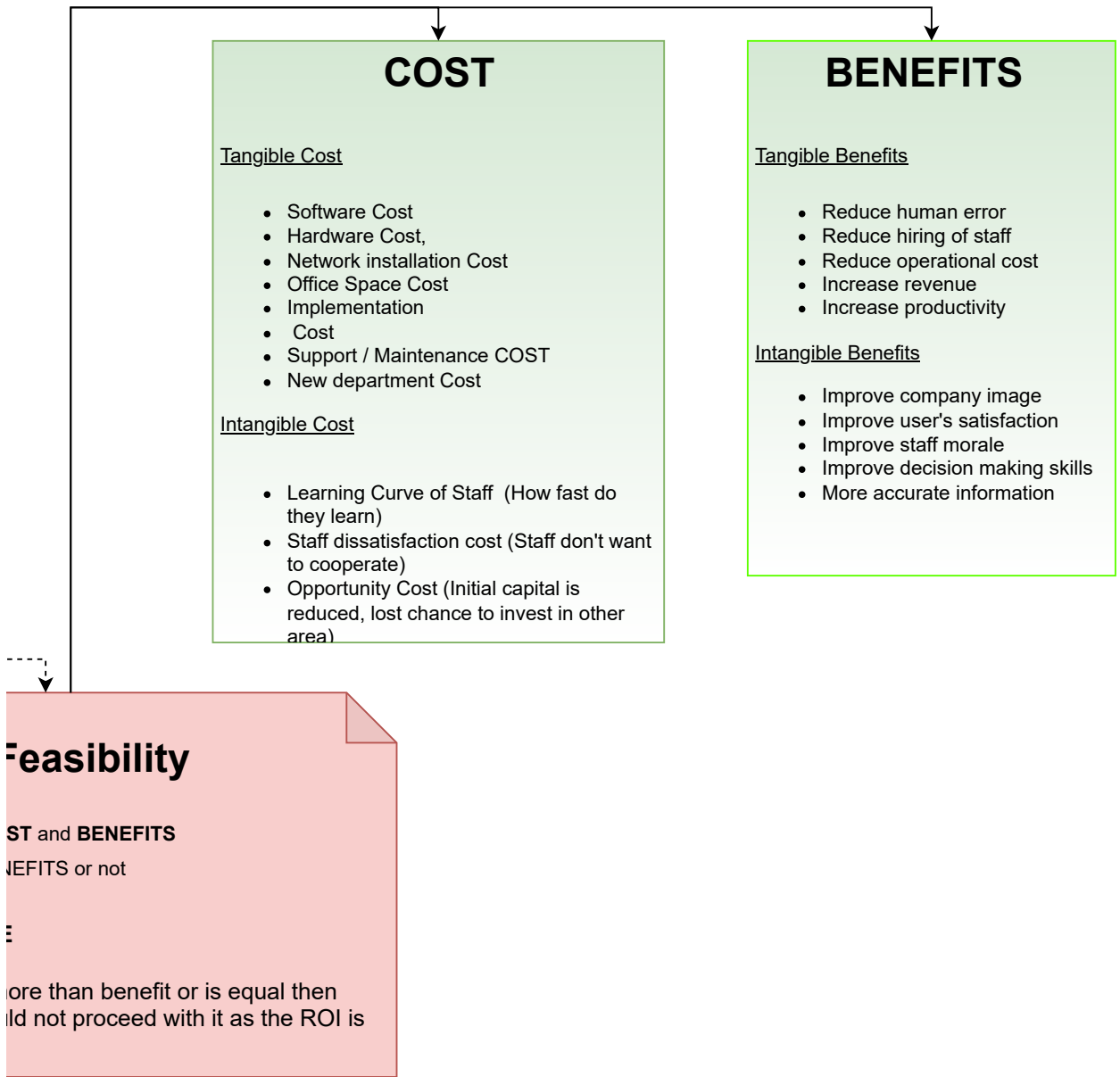
If all 4 is ok then you may proceed to the next study...

## Economics F

- Identification of CO:
- See if COST > BEN

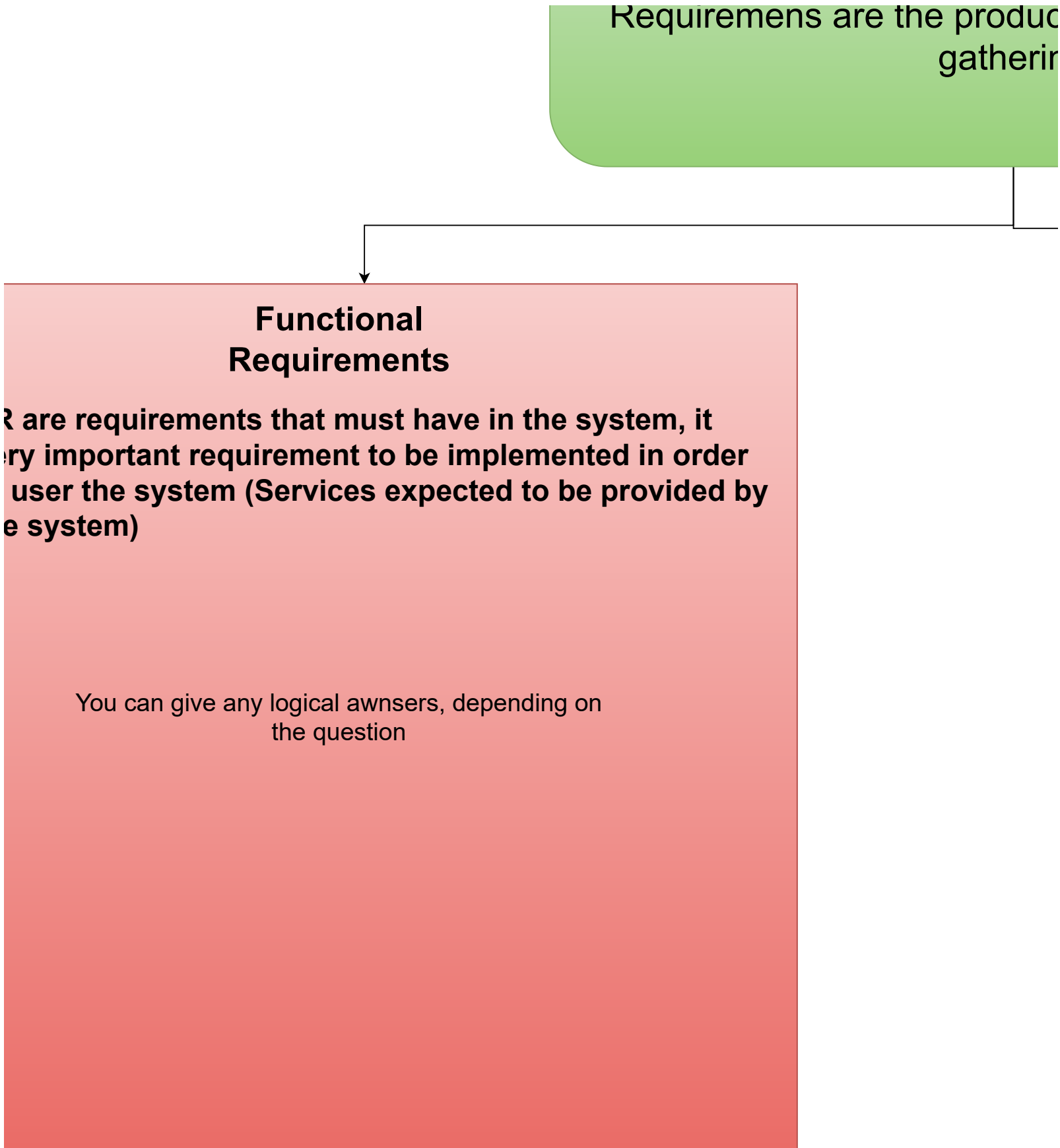
### ISSUES To take NOTE

- If the COST is m usually they wou low



FR  
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th

Requirements are the product  
gathering



## Functional Requirements

are requirements that must have in the system, it  
very important requirement to be implemented in order  
user the system (Services expected to be provided by  
the system)

You can give any logical answers, depending on  
the question

ct from the requirement  
ng

## Non

## Functional Requirements

**NFR are requirements that is best to have. Its fine if the system do not have this, but it would be better and complete if it does.**

Awnsers for this is usually related to the quality attributes of the sytem

- The system should be efficient by completing the function in few seconds
- The system should be realiable and do not produce error often
- The system should have auditing features
- The system should be able to backup and do recovery when needed
- The system should have high usuability by allowing users to perform task easily







## Verification

- is a process of design, code, and check if the software according to the
- Example : If the "Customer can have to check if booking or not

# User Friendliness Characteristic

Meaning, any design concept that is used for User interface design to easy the usage of the system.

## Ease of Data Entry

No random colours, Clear wordings and titles, Data entry is in logical order, Validation checks

## Meaningful Error Message

Validation if there are any errors, a meaningful message will be prompted or shown to the user on the errors that they did

Error messages must be clear and not to lengthy and must allow the user to know what to do

## HELP facilities

Provide basic guide to the user such as with Shortcut keys, hyper link, tooltip

## Consistent design

The UI should be consistent and be familiar to any range of users, example, 'x' means exist or close, so you should not design that X means OPEN.

All the pages in the system should have the same colour code scheme and same design so that user will not get confused.

## Escapability (Forgiving)

Allow the user to recover from mistake, example, if they deleted something, there is an undo button for them to retrieve back the deleted data

## Pull Down List

these are used for values that are fixed and allow the user select

## Default Values

Field that are defaulted to certain value and allows user to make change if needed

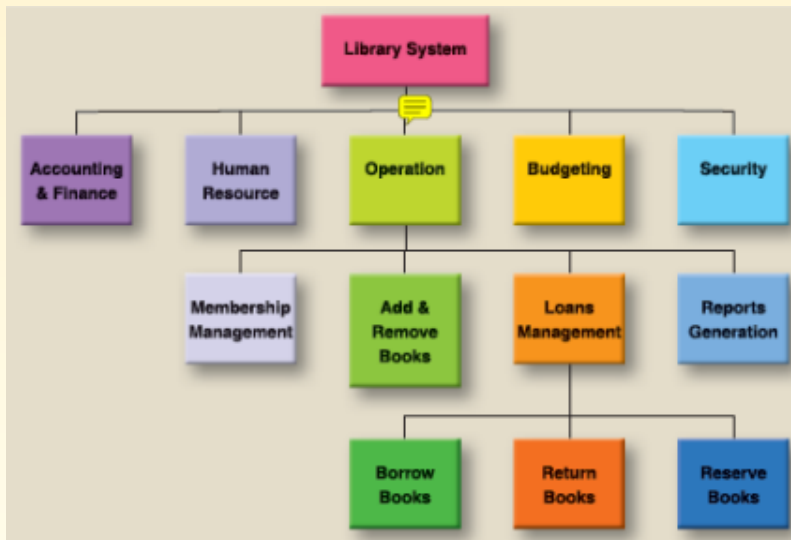
checking documents,  
and program in order to  
software has been built  
the requirements or not  
the document say the  
"make booking" THEN we  
if the Customer can make

## Validation

- is a dynamic mechanism validating if the software actually meets the exact customer or not
- Example : if the document "Customer can make booking" check with client and see if needed.

## Functional Decomposition Diagram

Top-down representation of the functions in the system, it would like interns of modules and submodules

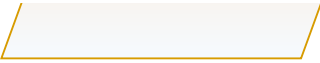
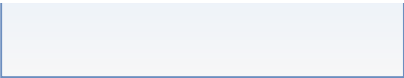


## Logical Design

- Happens during SYSTEM ANALYSIS
- Describes the FUNCTIONS AND their inputs and output)
- Defines / tells WHAT must the system do physically

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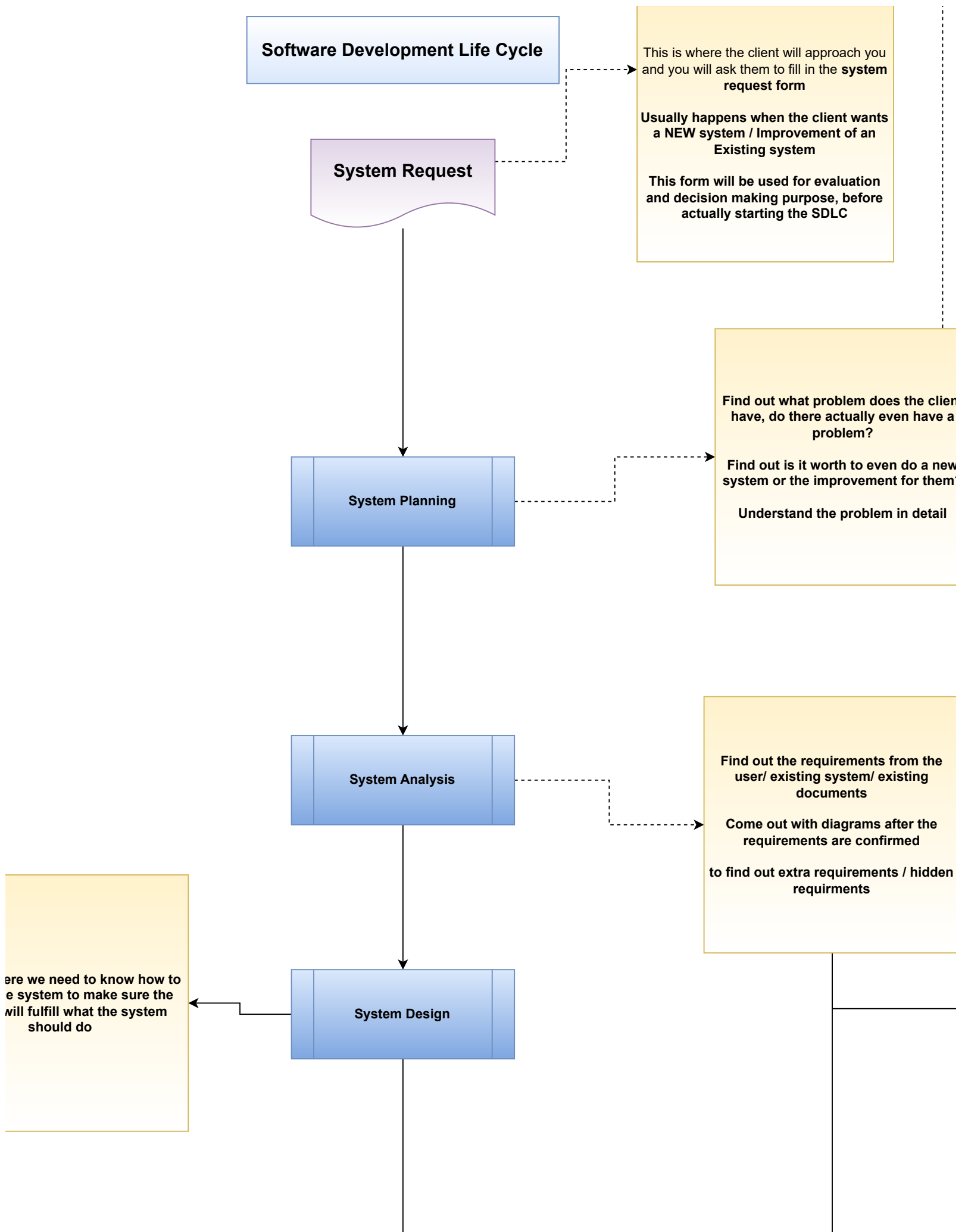
**Type of Design**

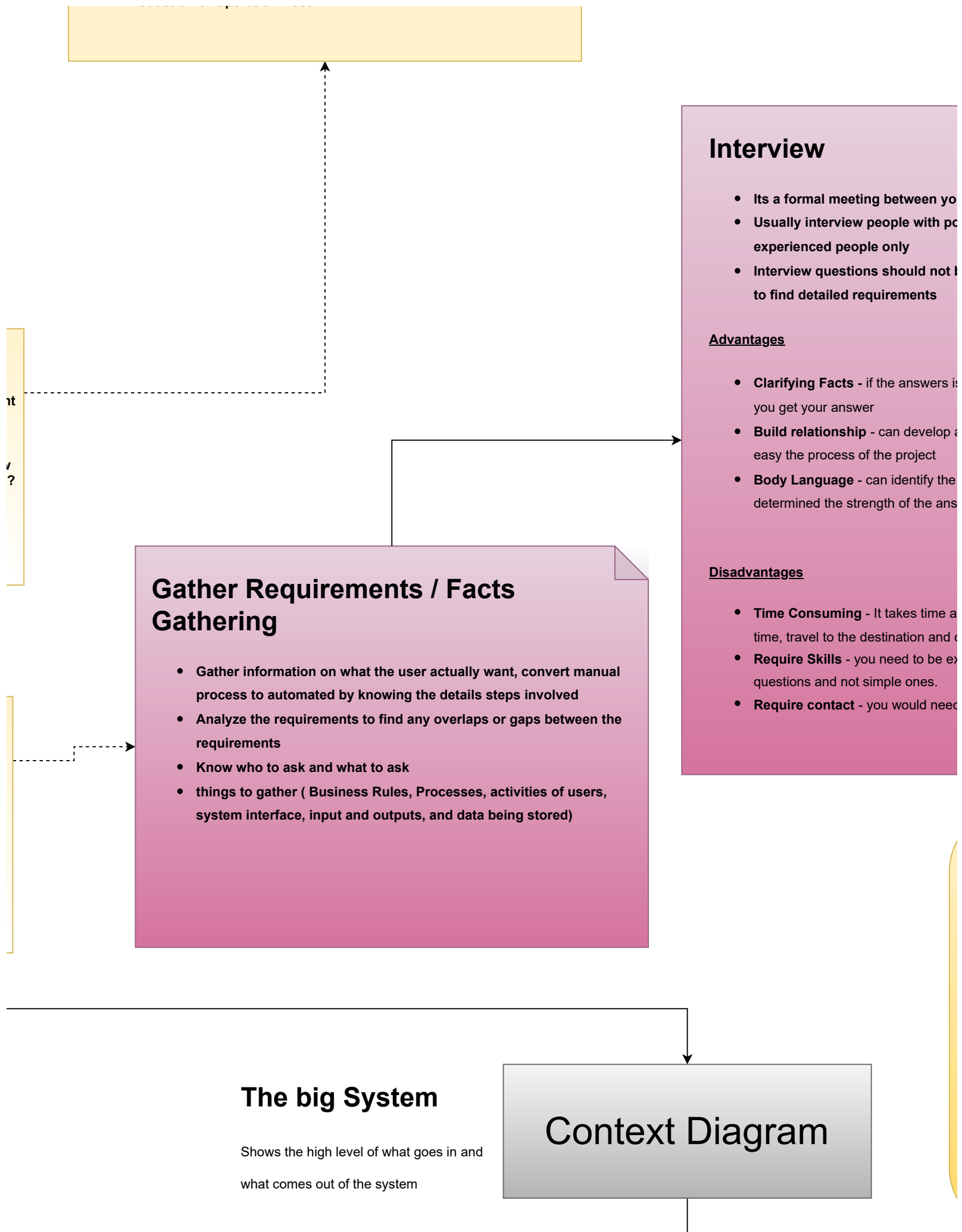
SYSTEM DESIGN phase  
FEATURE (What to input, process  
system does, and nother talking about

**Physical Design**

- Happens during SYSTEM DESIGN phase
- Describe the actual physical processes of entering, verifying, and storing date
- Defines how the system will be implementaed physically

This is whe  
design th  
system v





you and the client (F2F)  
power to make the decision,  
be basic but its should be designed  
is too blur, you can continue to ask until  
a good relationship with the client to  
behavior of the interviewee to  
power provided.  
is you need to setup place, available  
clarifying facts could be long as well  
experienced enough to create GOOD  
d the client's individual contacts

## Questionnaire / Survey

- Its a list of questions like google form to be sent to many people at the same time via online or physically.
- mix of closed and open end questions, like rating questions or multiple choice questions
- its usually used to collect mass amount of data to act as a initial idea drafting

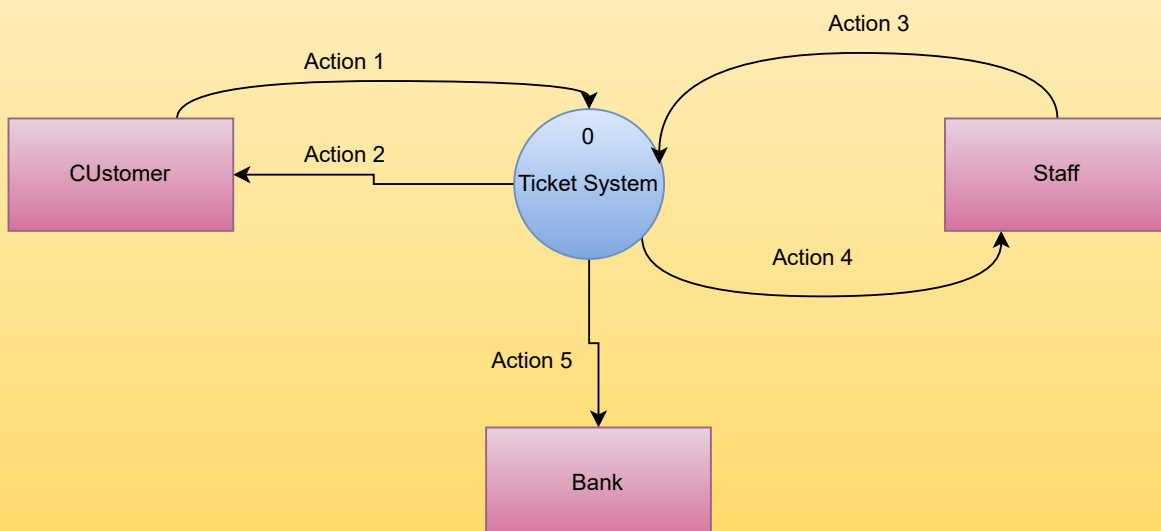
### Advantages

- **Mass distribution** - Can be send to mass people at the same time and collect lots of response
- **Worldwide reach** - can easily send to anyone at anywhere and collect different range of response
- **Sensitive issues / privacy** - people can choose to be anonymous and respond honestly
- **Can respond at their own leisure** - people can take their own time to respond and will not feel rushed.

### Disadvantages

- **Not all forms will be returned** - if you send out 1000 forms, maybe only 50 will respond
- **cannot clarify facts**
- **cannot built relationship**
- **No body language**

**MUST HAVE THE NUMBER 0 !**  
**NO Files**





## Observation

- You as an analyst would watch how the client work in their own company
- Observe how they input data / fill in the form, then what happens, what are the steps involved to complete a task or an activity
- What is being recorded, who are involved in certain task

### Advantages

- **Additional Perspective** - seeing the client work will give you additional view and let you confirm if the answers provided by them is accurate or not.
- **Can determine hidden requirements**
- **Understand better on how the new system / improvement will be required to be implemented**

### Disadvantages

- **Time consuming** - as you would required to travel there and spend time involving in the client's daily process observation
- **Need Prior Understanding of Procedure** - need to have some domain knowledge about the business else this method will be pointless
- **Concentration** - need to concentrate during observation

## Existing Documents

- This document is used to describe the current business process
- Documents such as (Flowchart, etc.)

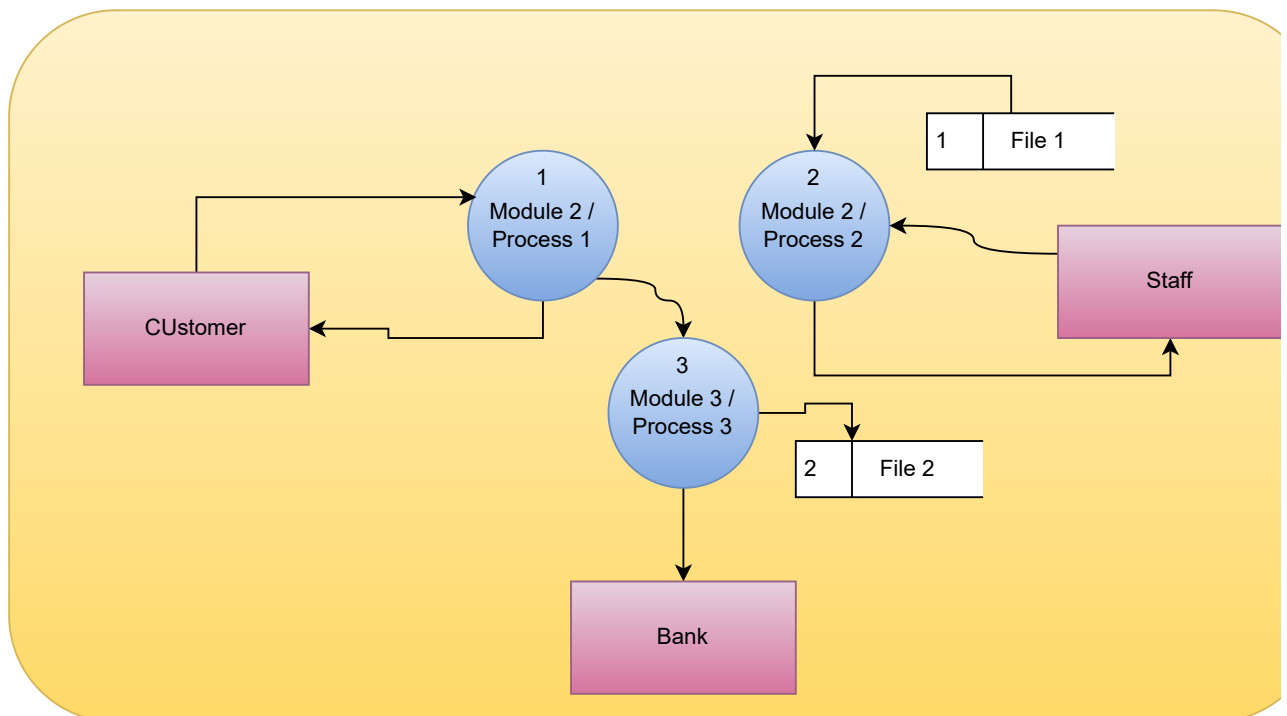
### Advantages

- Have Detailed description of the current business process
- Better understanding of the current business process
- Have guide to current business process

### Disadvantages

- Outdated Documents - some have outdated information
- Current Practice not Followed - document, currently the practice is breaking the rules to create a new system
- Need to be careful on the information provided

DIAGRAM 0



## Document Analysis

used for reference of the current system / current  
Reports, business rules, manuals, regulations)

Descriptions of Procedures of the business  
of the procedures  
practice

- Not all organization maintain the documents,  
Following Documents - even with latest  
the client not following the document steps and  
complete the task  
which document to be used for analysis

## Joint Application Development (JAD)

- its like a workshop for the clients / the users (who will be using the system) where you will sit and discuss about the requirements as a big group
- using CASE tools to aid in the requirement gathering process

### Advantages

- Easier to identify hidden requirements
- Solving of conflicting requirements will be easier

### Disadvantages

- **Time consuming**- its a big group therefore discussion could take hours just to solve one conflicting requirements
- **Unsure requirements** - sometimes the users themselves are not too sure about certain requirement, therefore analyst needs to be experienced enough to route them in the right path

## Background Research

- Its an extra method to have an overall idea of the business
- Can get information from online resources like journals, newspaper, books
- Visiting to similar sites of clients can help as well

### Advantages

- Have better basic understanding of the business
- Easier to come up with relevant questions for interview / questionnaires

### Disadvantages

- different industry have different concept and business process thus researching alone is not enough to gather facts
- Could not 100% rely on resources alone as it could be not align with user's requirement

## Prototyping A

- Its a model of a base
- its used as a back bo of the system
- used to gather more on demo of the new
- Its like a "clay" conc requirement gatherin mold the "clay" into
- **Example** : if the user them a fake system / c and let the user to use tell us what they want

### Advantages

- Better understanding could be done and ic
- uncover hidden requ what they need and t
- Uncover potential pr
- solving potential cor

### Disadvantages

- Costly: as prototypin
- Never ending require user's potentially ke



## Approach

the system that have simple functionalities  
one and to let the user to feel and have an idea

detailed requirements as the user get the hands  
system

cept where as the user view and use it during the  
ng, they will know better on what they want and  
what they wanted.

wants a hotel system , then usually analyst will give  
demo system that has basic hostel functionalities,  
e, as they are using during the workshop, they will  
or what to improve.

g : users able to understand better on what  
identify what they really need

irements : as they use it, they will focus on  
things that was missed out could be raised  
problems  
nflict

ng is expensive to be done  
ements : as they have an idea of the system,  
ep want more and more features to be added







## Size Check

Check if the input is following the size expected

Exp : Telephone number : Must be X number of digits

## Format Check

Checks if a certain data is following a certain format?

Exp : Email - xxxxx@hotmail.com

## Limit Check

Check if the data is following a certain upper / lower limit set

its an extra checking on top of Range checking

## Existence Check

Check if the data keyed in is existing in or not

## Range Check

Checks if the data is within a range set

## Null Value Check

Check if the mandatory fields are not left

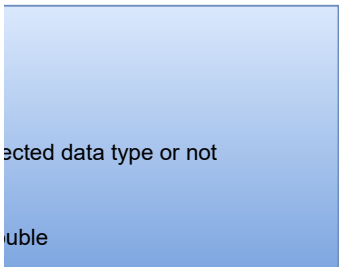
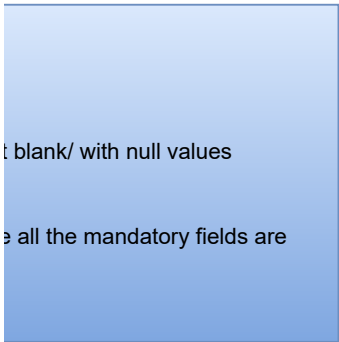
Exp : when submitting a form make sure filled in

## Data Type Check

Check if the data is following the expected

Exp : Age : Should be INT and not do



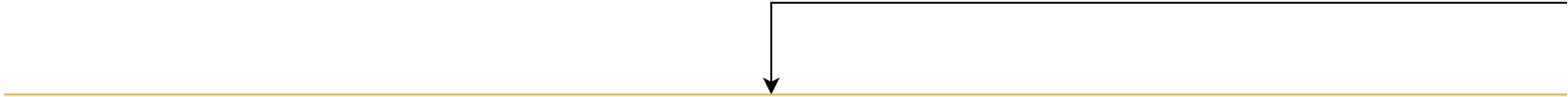


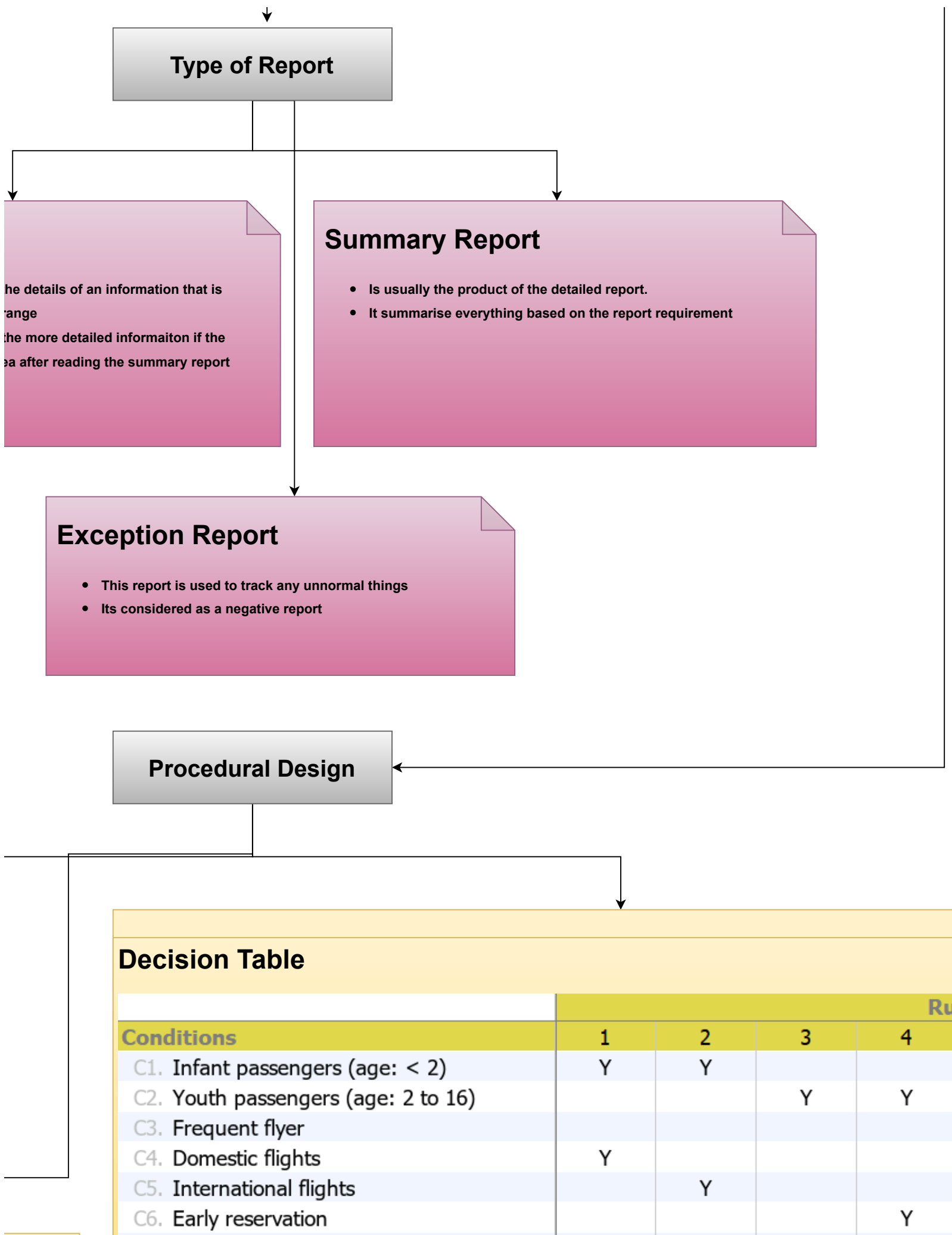
## Detailed Report

- This type of report shows the data in a tabulated format with a certain number of columns and rows.
- This report is used to find the data that a person could not get an idea of.

## Structured English

- Rules Include
- DO WHILE - END DO
- IF ELSE - END IF





les	
5	
	Text
Y	

## The Disect of Context Diagram

Shows the surface details of the system

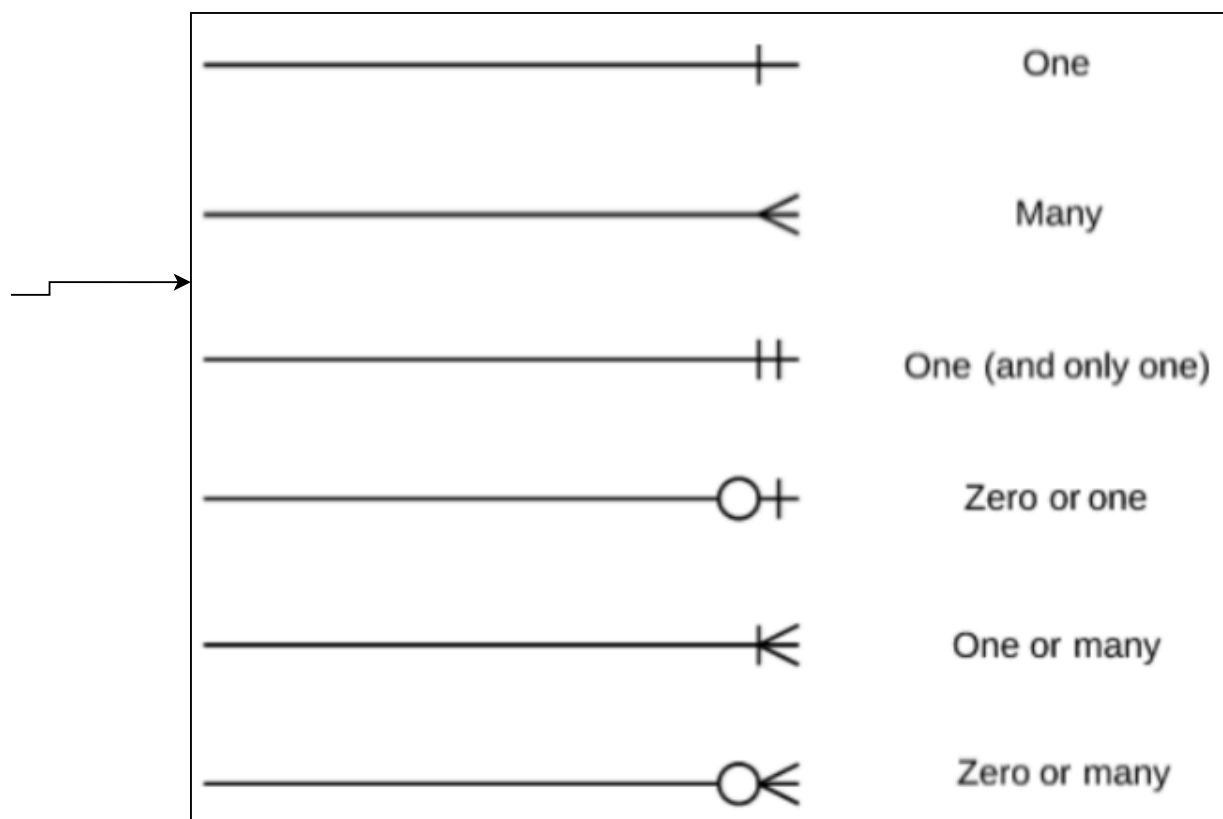
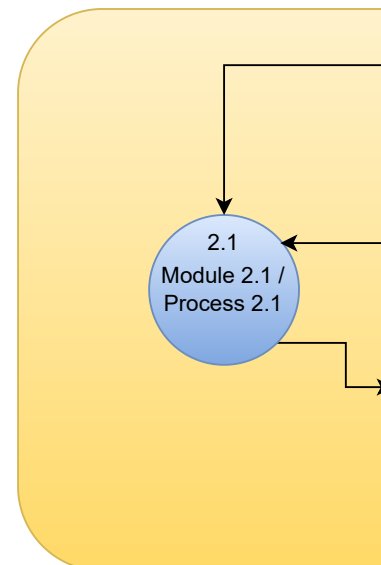
Diagram 0

## The Disect of Diagram 0

Shows the detailed of a module

Diagram 1

ERD DIAGRAM



**Reso**

During re

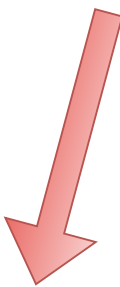
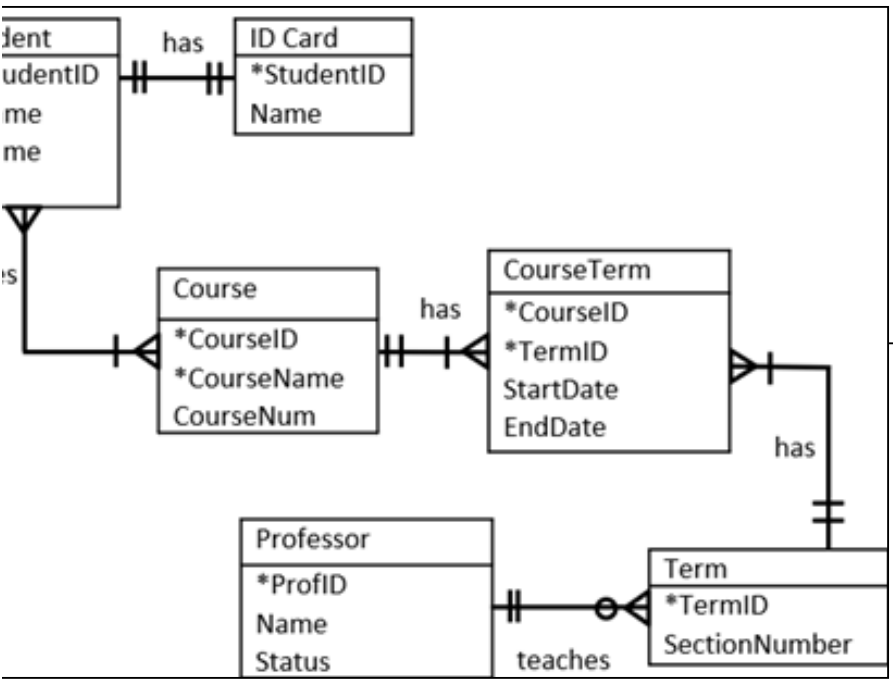
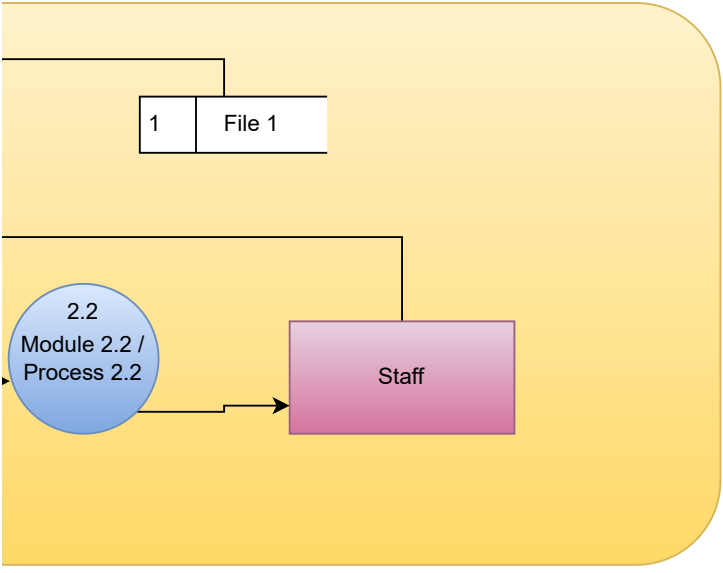


DIAGRAM 1



**DBDL Format**

Student (S...

Course (C...

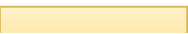
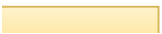
Underline - I

\* - foreign ke

\* and Under

**Solving Many-to-Many Relationship**

solving, please make sure to copy both table name and join it together



it

studentID,Fname,LName)

courseID,CourseName,CouseNum)

Primary Key

ey

line - Composite Key











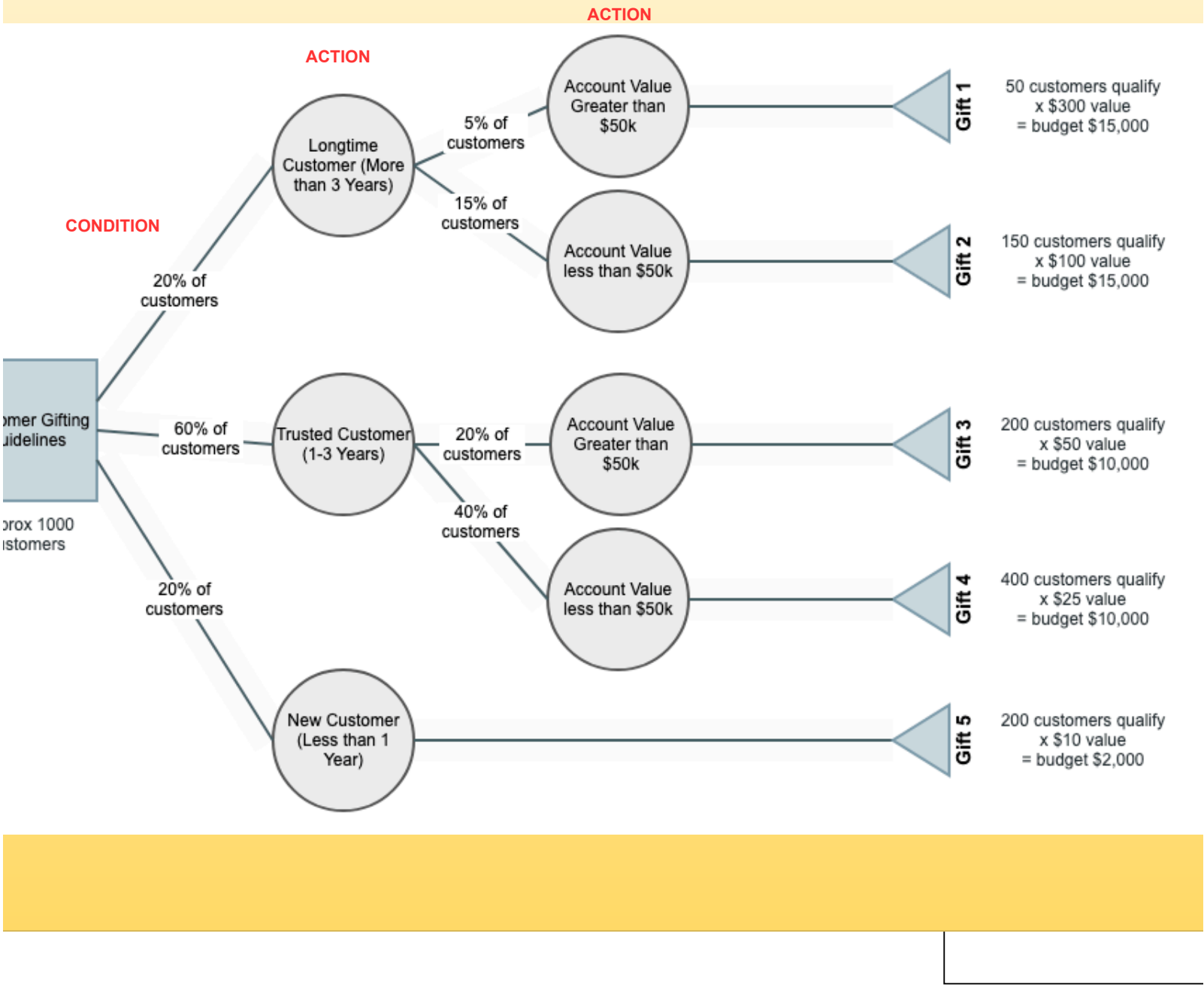


Decision

Custo  
Gu

App  
cu

on Tree



C7. Off-season traveling

**Actions**

A1. Offer 10% discounts

A2. Offer 15% discounts

A3. Offer 20% discounts

A4. Offer 70% discounts

A5. Offer 80% discounts

1

2

3

4

X

X

X

X

## RULES

- 2 POWER N (Determined the row, but take this as a guide only)
- List down Conditions
- List down actions
- Summarize Conditions and Actions ( if 1 yes makes the other confirm to NO then summarize it).

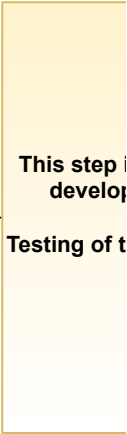
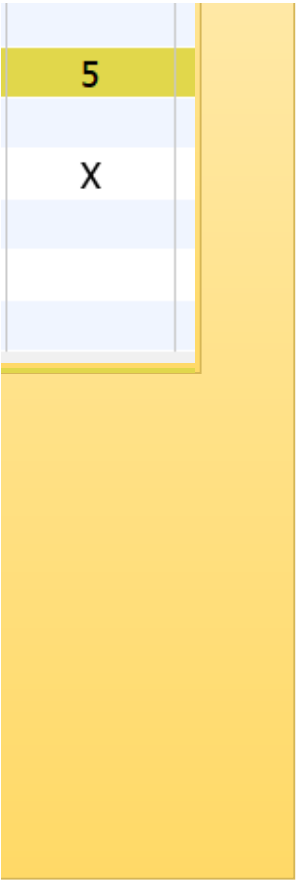
## CHARACTERISTIC OF GOOD DESIGN

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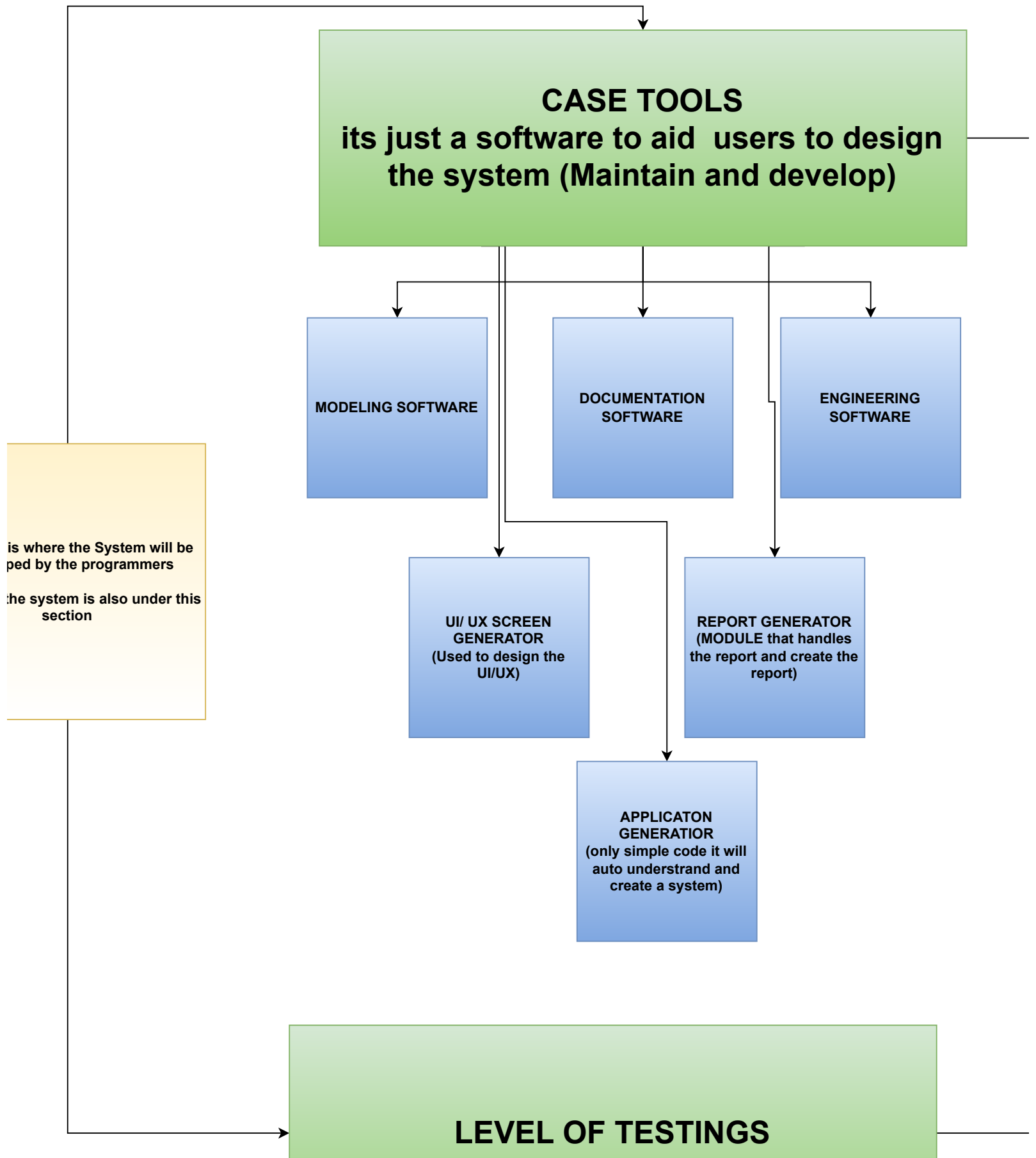
he design is in

**Coupling**

**Cohesion**



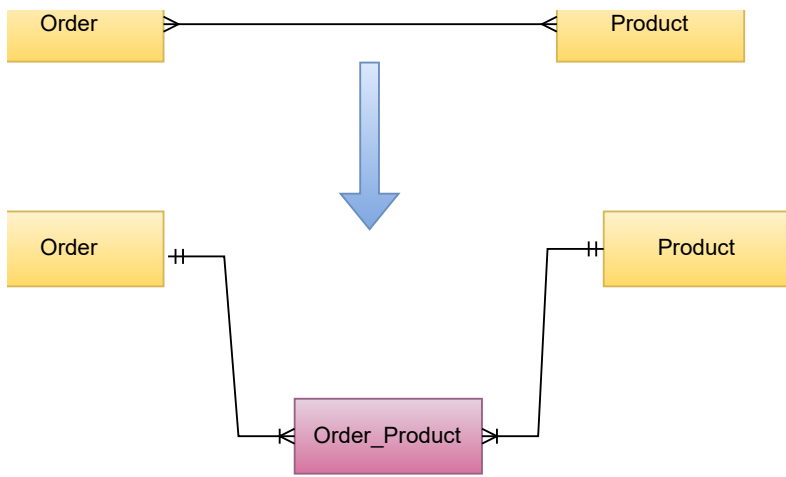




## BENEFITS OF CASE TOOL

- Enforcing Standards- so that entire team and future staff will understand what was done and how it was made
- A central Data Dictionary - Its like a reference document or source for everyone to come and study and refer
- Ease of diagram drawing
- Easy for maintainga the diagrams, and documents
- Easy to produce prototyping software

Areas	Unit Test	Integration Test	User Acceptance Test	System Test
Number of modules	Testing of individual programs, separately and independently.	Testing of two or more programs which are connected together.	Testing of the entire system consisting of many programs	Testing of the entire system.
Purpose	Ensure that each unit / module	Ensure that one program can pass	Ensure that the entire system	Ensure that the entire system



## VOLUME TESTING

- behavior of an application by inserting a massive volume of the load in terms of data
- You give a HUGE number of data and see how well the system performs

## STRESS TESTING

- To test the system by pushing the system to its limits, see what's the maximum stress and the maximum limit the system can handle
- You give a HUGE number of data and see how well the system performs













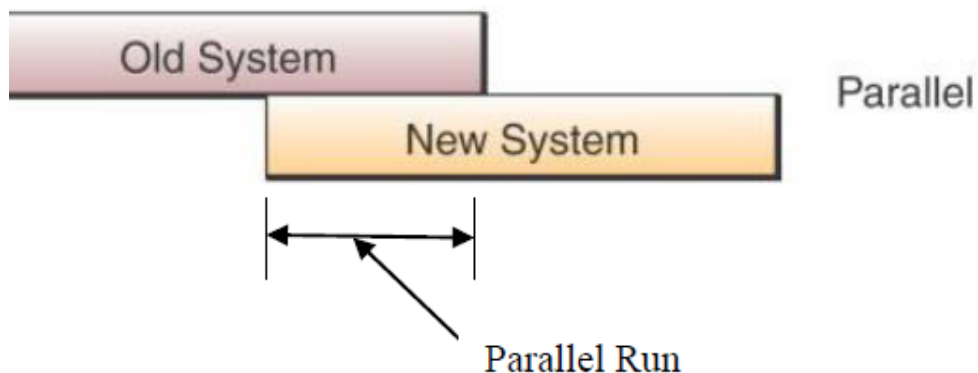


**This is o  
so the ne  
Informat  
RUN**



## Type of System Changeover

only when there is not current system, new system will be used as the first system, thus will be using PILOT



### BOTH OLD and NEW run together

- Both will be used and run like normal. If the new system fails, the staff can roll back to the old system.
- This is usually used in big industries.
- Outputs from the new system will be compared with the old system to make sure that it's the same.
- Once the new system is able to run with little to no issues, the old system will be phased out.
- Benefits of this is that the user can see the new system in action and if something goes wrong, they can report it.
- Bad of this is, since the old system is still being used, the staff may not be that motivated to convert to the new system.

Make sure to  
modular course  
Module 1, Module 2  
this is to have the  
ability, can be used  
projects, and

Type

## NEW system will

normal, so in case when the new  
back and use the old system

tries that has HIGH risk

will be compared with the OLD  
same

perform better than the old  
on the user will stop using the old

always have a backup in case

item is present, the user might  
to the new system yet

## Public Course

- Sending the staff to a training company to allow them to get trained
- Training of this sort are very basic and not focused on BAU usually
- Training of this sort allows staff to get exposure from other staff from other companies
- BUT, this type of training takes too long to complete as we need to cover all the staff, and the training is standardized across so it's not specific

## CBT

- This training is like the

- Module 2, Module 3
- easy to maintain
- be reused for other
- easy for testing

Example : An issue with 1 Module auto have affect on other modules because of HIGH dependency

- > Easy for testing and the code

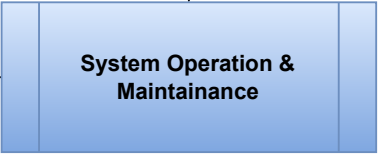
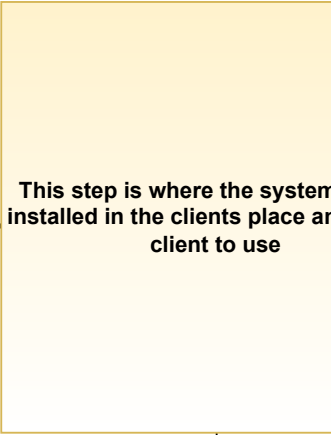
**This step is also includes training  
how are we going to give them the  
system**

- Request an external training to come to the company and train the staff
- This type of trainings are very focused on the subject
- Teaching will be relevant to what the staff is doing
- BUT, too many people are away from their BAU so it will interrupt with the workforce, and expensive to held this type of trainings

they send you a zip file that contains all the

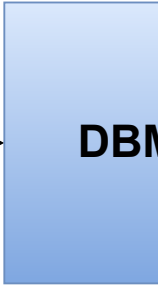
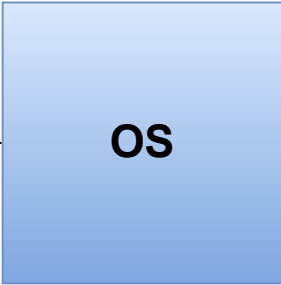
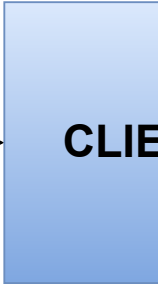
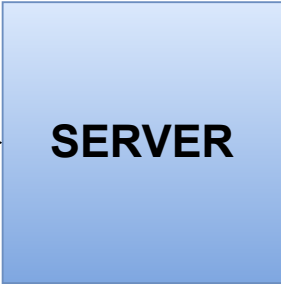
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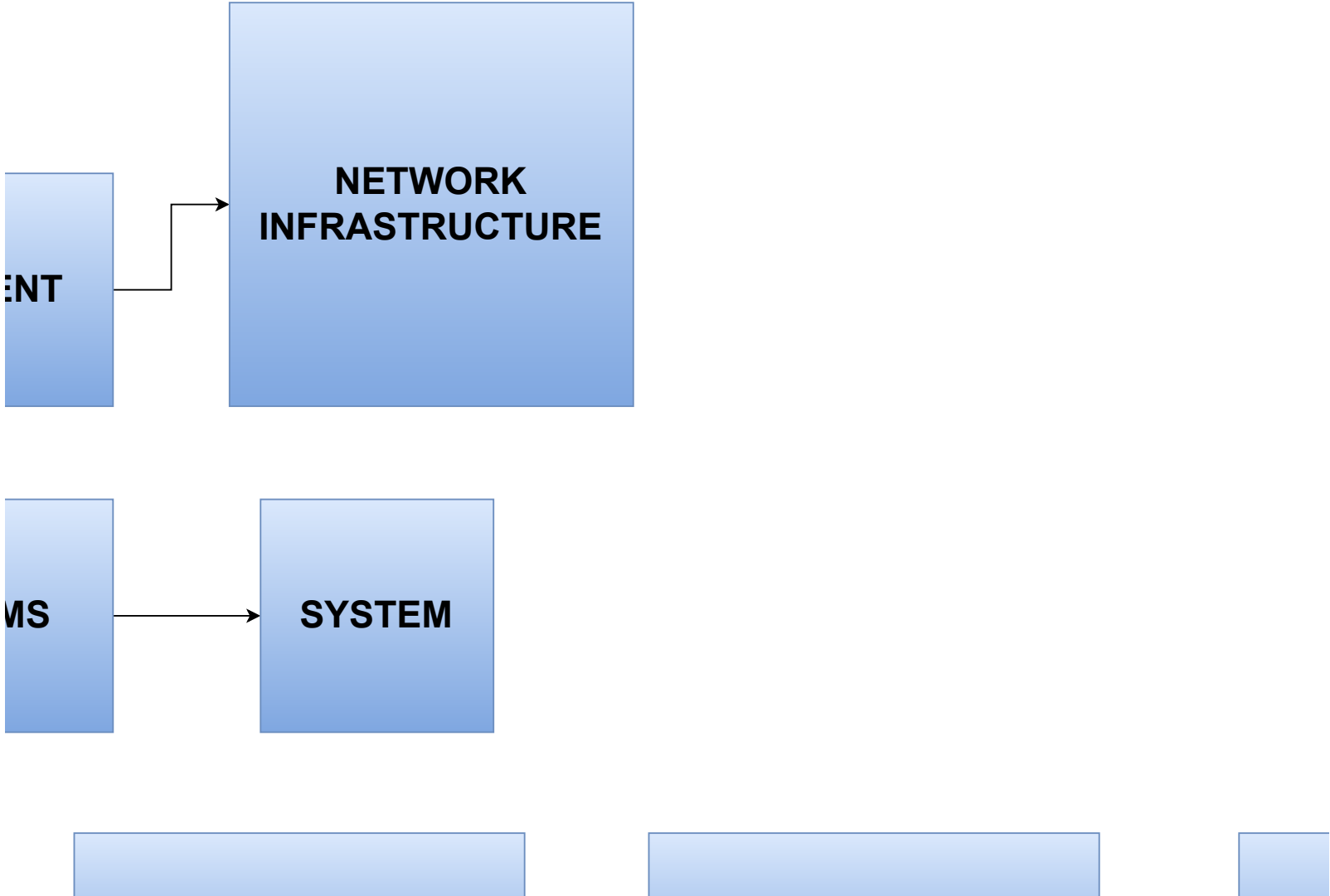




n will be  
nd let the



	functions properly & works in accordance with <i>program specification</i> .	data successfully to another program.	meets the users' <b>requirements</b> as stated in the System Requirements Specification.	consisting of many programs can <b>work together</b> as one whole system.
<b>Who Perform</b>	Programmers who have been assigned	Programmers of the related programs	End-users (sometimes with assistance from the programmers).	End-users, <b>Development Team</b> <b>Operation group</b>
<b>Test Data</b>	Dummy Data	Dummy Data	Dummy and Real Data	Real Data





The diagram consists of a red vertical bar on the left. A horizontal line extends from the bar to the right, then turns 90 degrees downward, and finally turns 90 degrees to the right, ending in an arrowhead pointing to the left side of a green box. The green box has a light green gradient and contains the text 'LOAD TESTING' and a bullet point. Above the green box is a solid green rectangular bar. Below the green box is a solid blue rectangular bar.

## LOAD TESTING

- To test the system by have it perform under many number of users to simulate as real as possible over a period of time











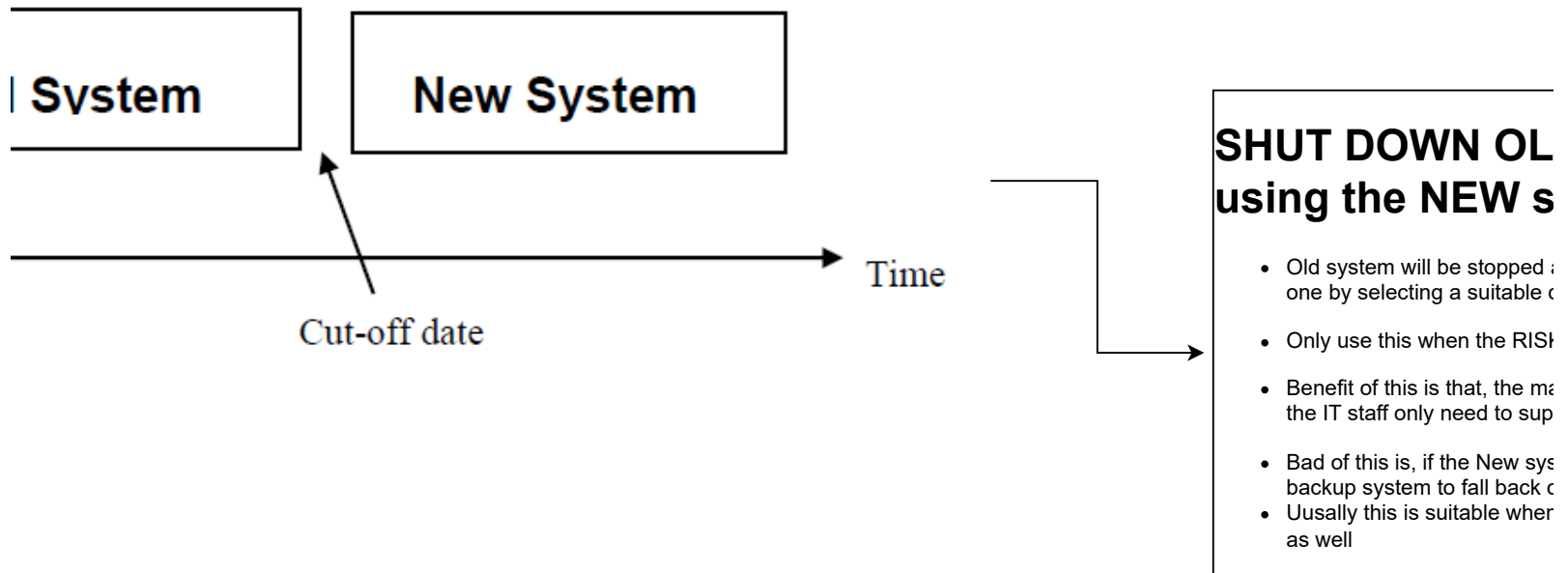


**DIRECT  
CHANGEOVER**



**Old**

---



## OLD and START system

and totally change to use the new  
date and time

K is LOW

aintenance cost is low because  
port 1 system

stem failed, the staff have no  
on  
n the Industry or company is small

materials

- Staff an study at their
- Staff work / BAU will
- Cheapest options
- BUT, there are not in  
won't be able to ask c  
well

## Corrective Maintenance

- Solve any bugs in the system
- Happens usually only the vendor's mistakes or on n  
gap
- Basically its a correction type of maintainance to m  
everything runs smoothly



own time  
not be interrupted

person guidance there to guide the staff, you  
questions and staff will not be motivated as

This step is where the user is using the system and then continuing to support and maintainance

## Type of Maintainance

requirement

make sure

### Adaptive Maintainance

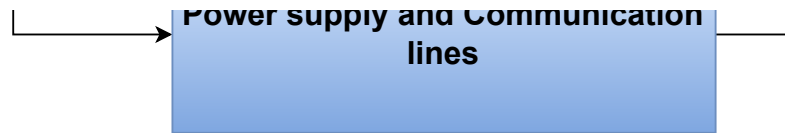
- Happens when there are new LAW, changes in the business, changes in technology (Hardware, software changes)
- Usually will incurr charges to the client

### Perfective Maintainance

- The system has no issue, but client would like to make it better and more perfect
- This maintainance is optional and usually will be charged / with cost

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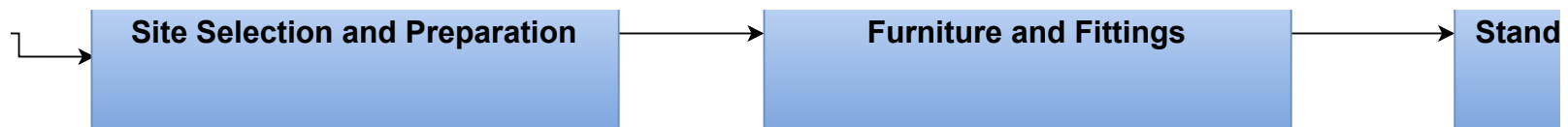


## FILE conversion (data conversion)

This is important when you still want to the data from the old system to be present in the new system. So data conversion is needed, to make sure that the new system will have the existing data from the old system as well

ISSUES when doing this :

- 
- **Technical incompatibility of the two systems** - when new software runs on a different hardware. It will not be technically feasible to covert the data.
- **Problems of new data fields** - The tables size is different between the new system and the old system
- **Problems of matching data fields** - The data stored in old system is different with the new system, meaning like old system stores FIRST NAME, LAST NAME, but new system just one column as FULL NAME
- **Problems with different data lenght** - The size of data for each column is different
- **Problem with data type** - Old system might store AGE as string, but new system stores it as INT

























## Maintainance guidelines

Everytime there is maintaiance, we will have to give them RELEASE NOTE

Release note contains "what have we done, what are the changes / fixes that are being deployed"

During maintainance there could be newly found BUG / issues so we would have to solve it based on the severity of the bug

All the agreement are in a contract basis :

- **Contract will mention how long are the vendor will be giving free maintainance**
- **What type of maintainance are eligible for FOC**
- **How long the contract are valid**
- **What are the fees in the contact**
- **Protects the client and the vendor**















