Software Engineering

CS5002NI

Week 09

Objectives

- Structured Analysis and Design Overview.
- Learn about Process Specification.
- Structure Chart.
- Course work discussion.

Structured Analysis and Structured Design

During Structure Analysis:

- High level functions ----------→ into more detailed function.

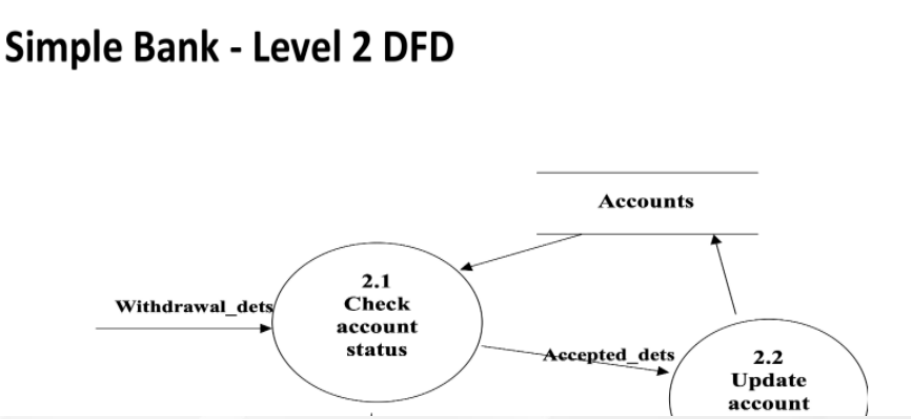
During Structured Design:

- Detailed functions are mapped into module structure.

Process Specification

- A *process specification* is used to describe processes on a data flow diagram, more precisely and in more detail.

Process Specification.



Process Specification

Number:2.1

- Name :check account status
- Description : this process checks and verifies the customer account for withdrawing
- Input data flow : withdraw details and customer account
- Output data flow: accepted details or rejected message
- Process logic:
- i) clerk enters the withdraw details
- ii) the account to withdraw is verified from the accounts data store
- iii) if the account credentials is valid, then it proceeds towards the next sub-process update(2.2)

Structure Chart

- Represent **hierarchical structure** of modules
- **Breaks down** the entire system into **lowest functional modules**, describe **functions** and **sub-functions** of each module of a system to a greater detail
- Partitions the system into **black boxes** (functionality of the system is known to the users but inner details are unknown). Inputs are given to the **black boxes** and **appropriate outputs** are generated.

Structure Chart

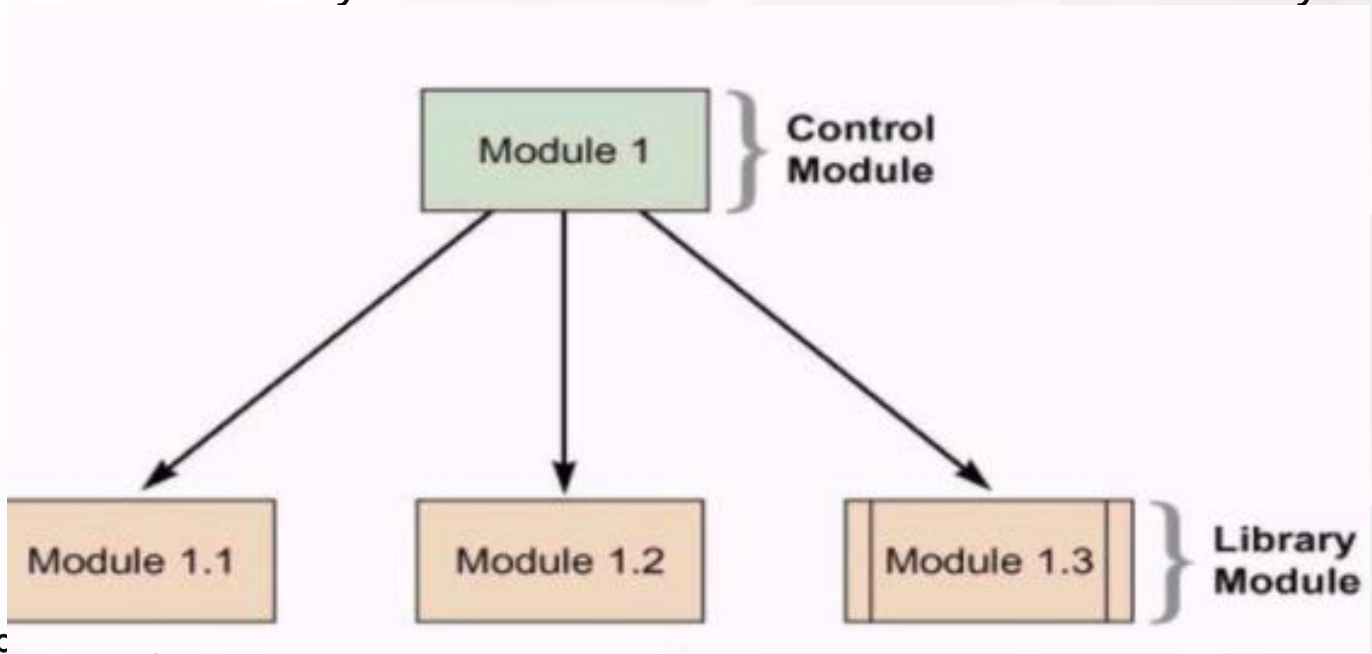
- Modules at **top level** called modules at **low level**.
- Components are read from **top to bottom** and **left to right.**
- When a module calls another, it views the called module as **black box**, passing required parameters and receiving results.

Module

- **Module** Represents the process or task of the system
  Control Module: A control module branches to more than one sub module

  Sub Module: Sub Module is a module which is the part (Child) of another module

  Library Module: Library Module are reusable and invokable from any module



Structure Chart

Process:
Module / Subroutine

Process: Module / Subroutine
A series of instructions that are to be carried out by the program at a specific point.

Decision
Used to represent SELECTION and split the charts sequence into multiple paths.

Call Line
Indicates the path (SEQUENCE) between modules / subroutines.

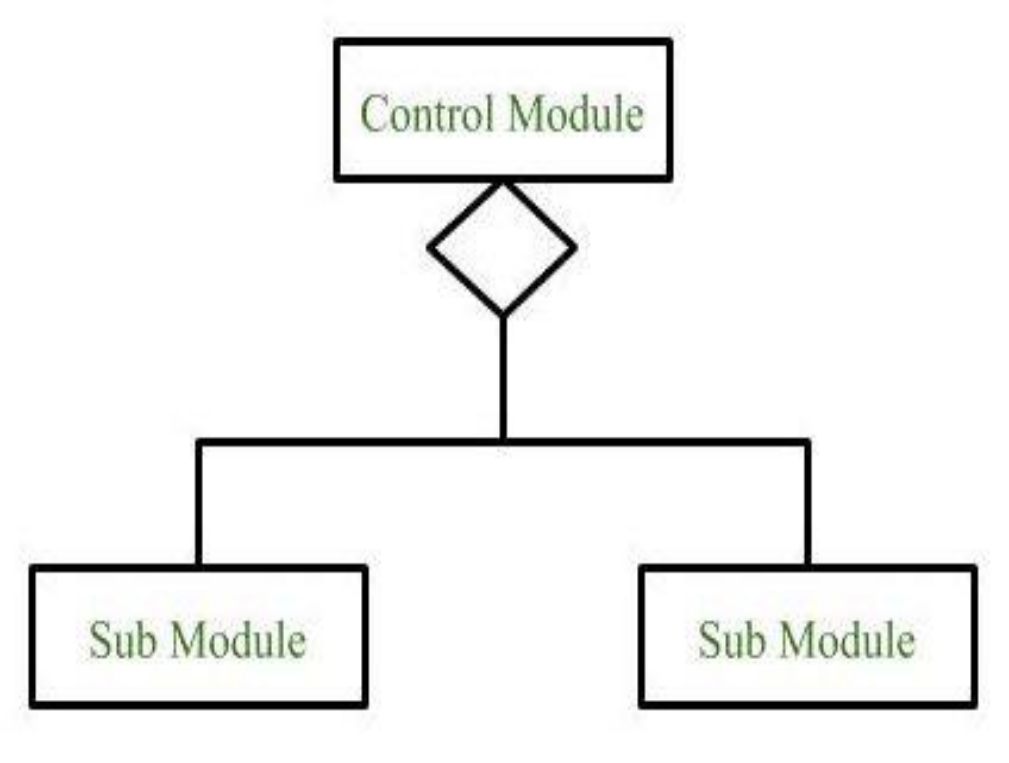
Repetition
Used to represent REPETITION and highlight that a process can occur multiple times.

Parameter
Indicates the flow of DATA between processes, which is labelled with the symbol

Control Parameter
Indicate that a criteria has been met, providing confirmation for the system to proceed. E.g. Flags.

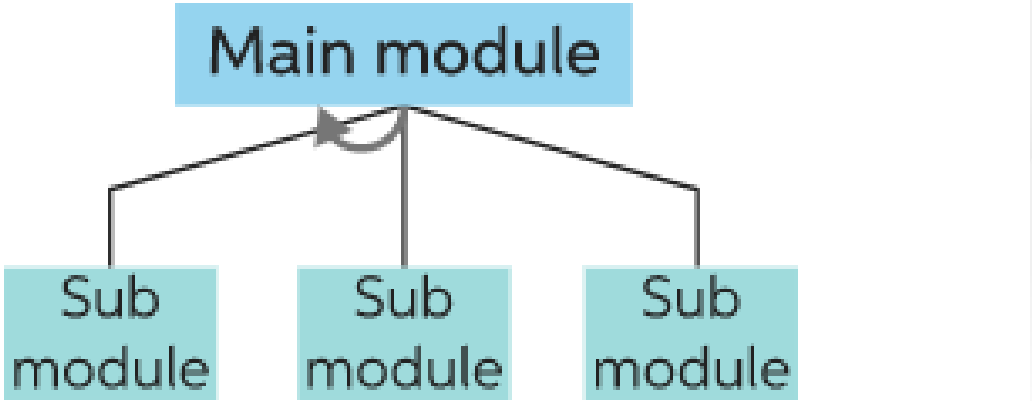
Condition call

It represents that **control module can select any of the sub module** on the basis of **some condition**.



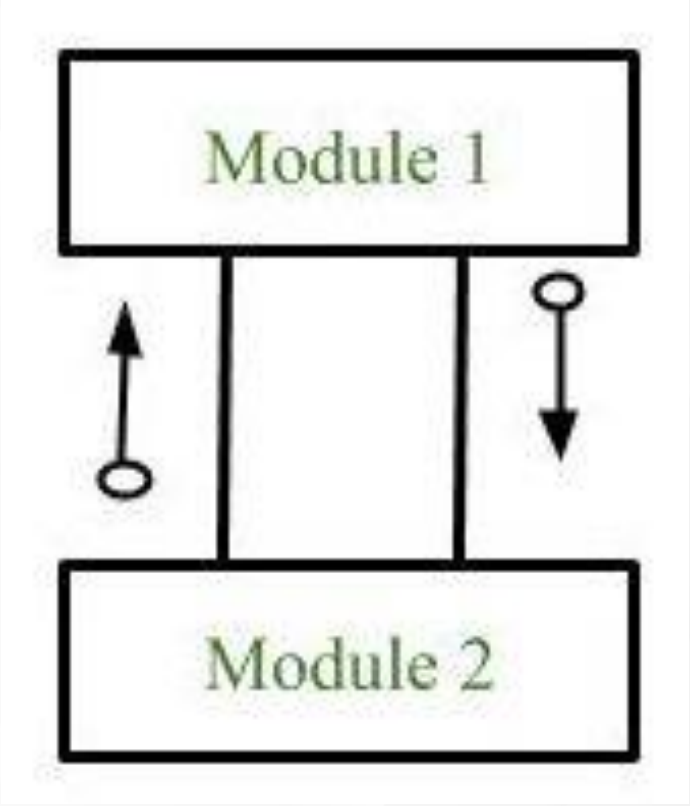
Loop (Repetitive call of module)

It represents the **repetitive execution** of module by the **sub module**.
A **curved arrow** represents loop in the module.



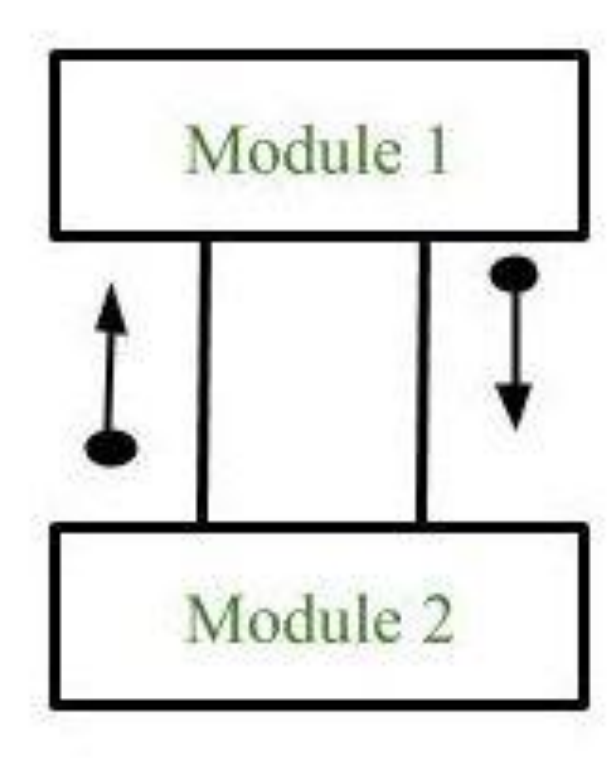
Data Flow

It represents the **flow of data** between the **modules**. It is represented by **(parameter)** directed arrow with empty circle at the end.



Control Flow

It represents the **flow of control between** the modules. It is represented by (**control flow**) **directed arrow** with filled circle at the end.



DFD to Structure chart mapping methods:

Transform Analysis:

These type of structure chart are designed for the systems that **receives an input** which is **transformed by a sequence** of operations being carried out by one module.

Transaction Analysis:

These structure describes a system that processes a **number of different types** of **transaction**.

Transform Analysis

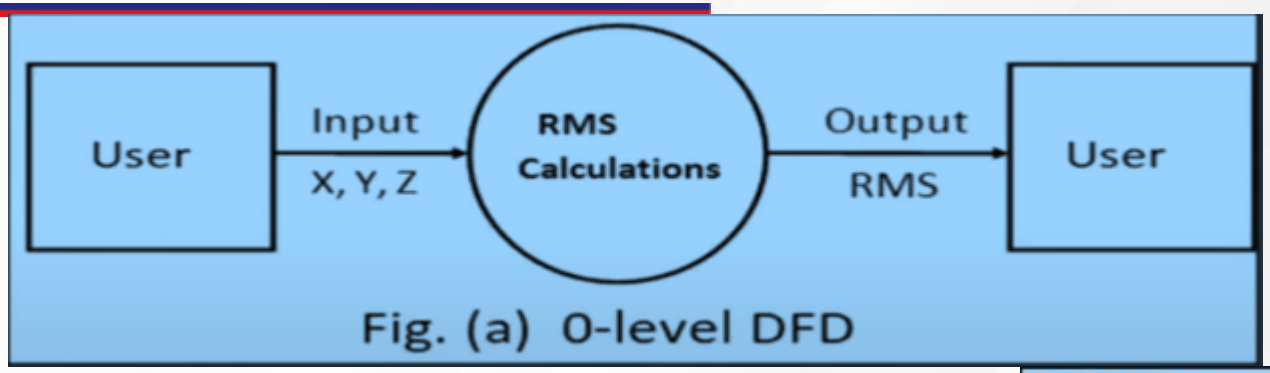
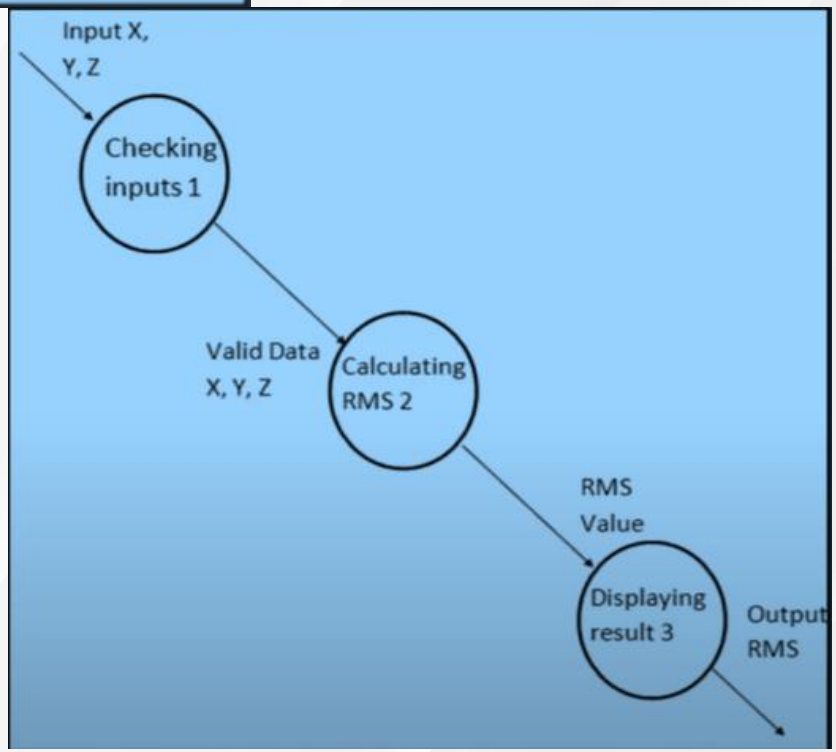
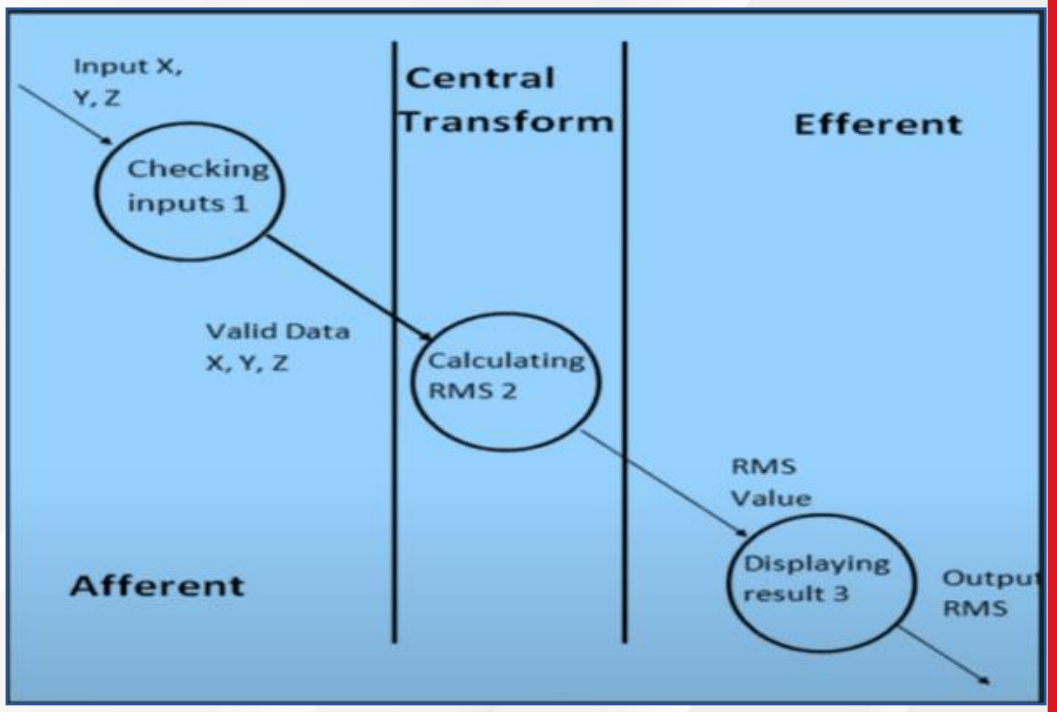


Fig. (a) 0-level DFD



Steps in transformation analysis :Step 1 Divide DFD into 3 portions:

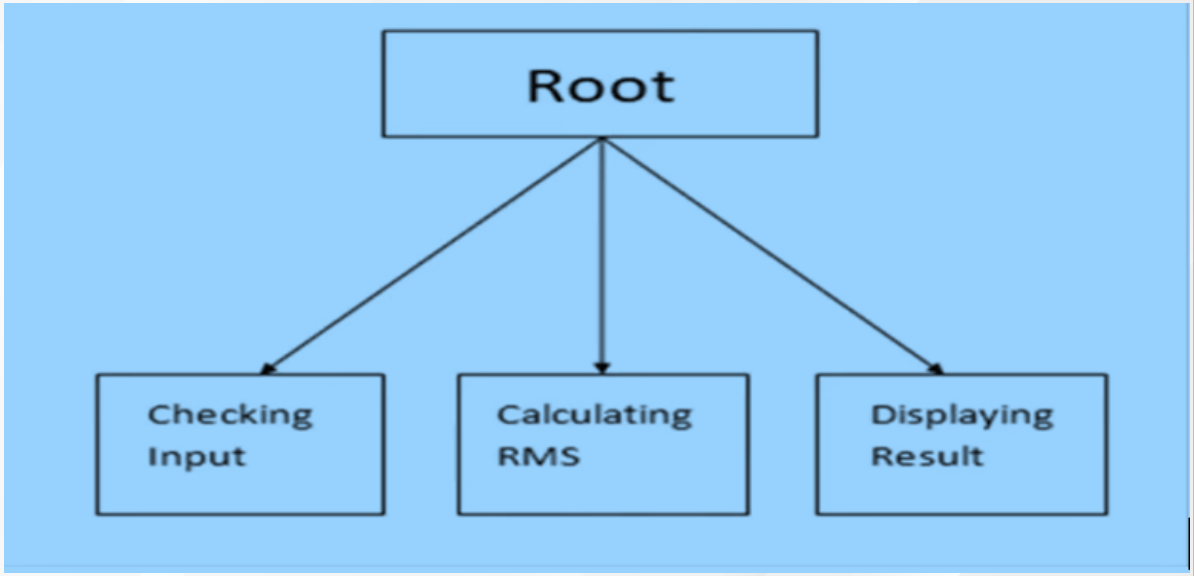
- Input portion of DFD called **Afferent** , Output Portion of DFD called **Efferent** and the remainder Portion is **Central Transform**.



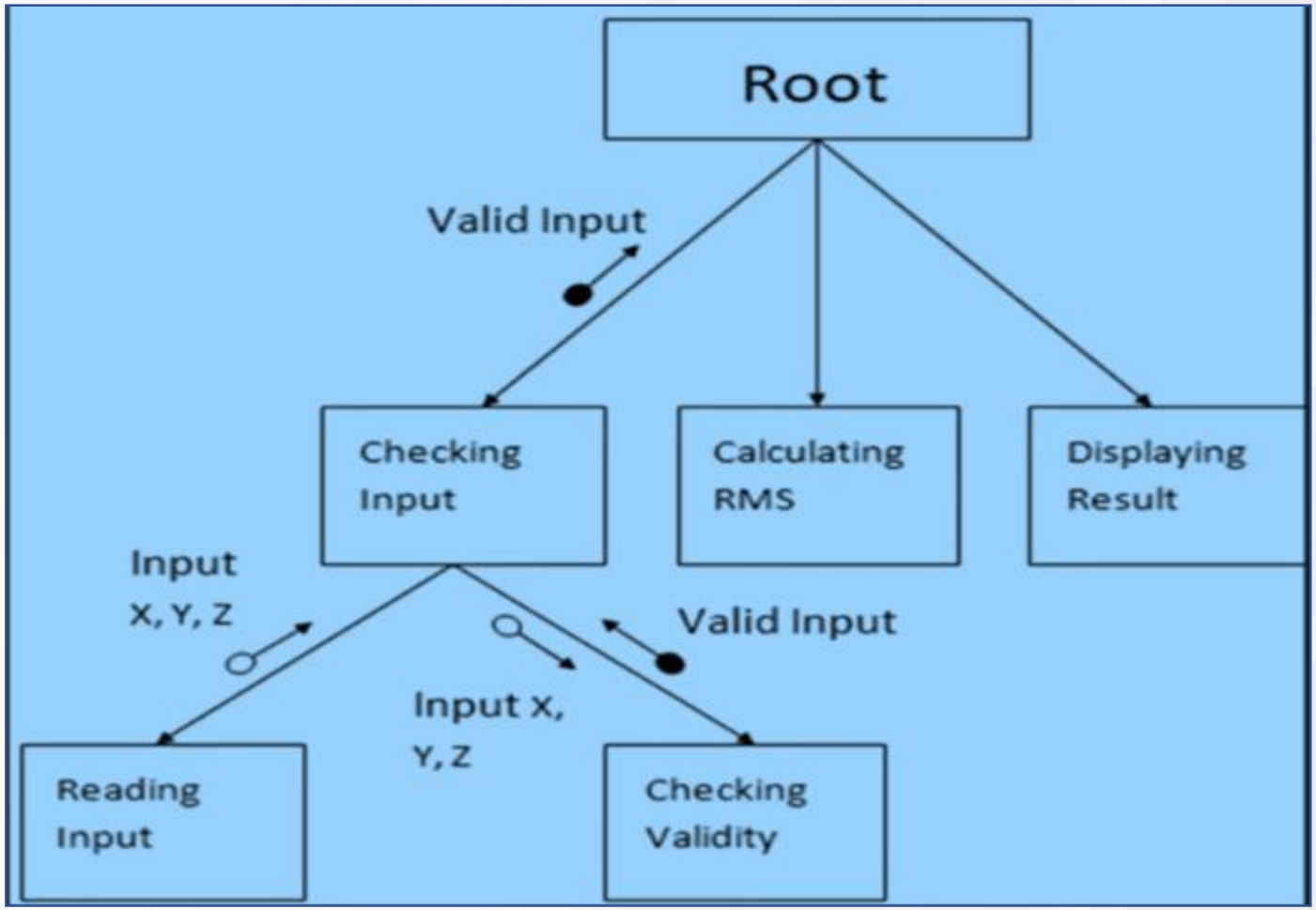
Step 2: Alignment of Modules

- Main module is known as Root Module
- Afferent module in the left side.
- Efferent module in the right side.
- Remaining portion in the middle .i.e

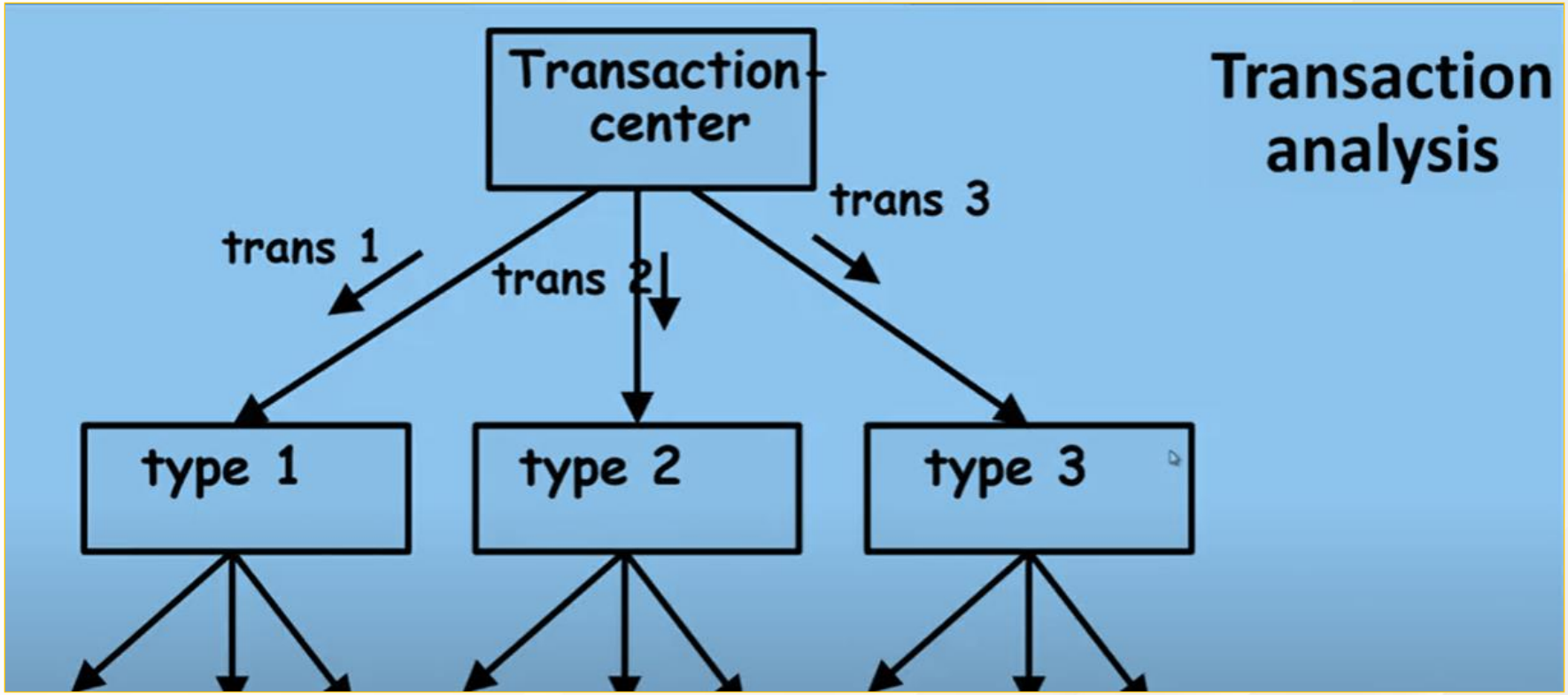
Central Transform.



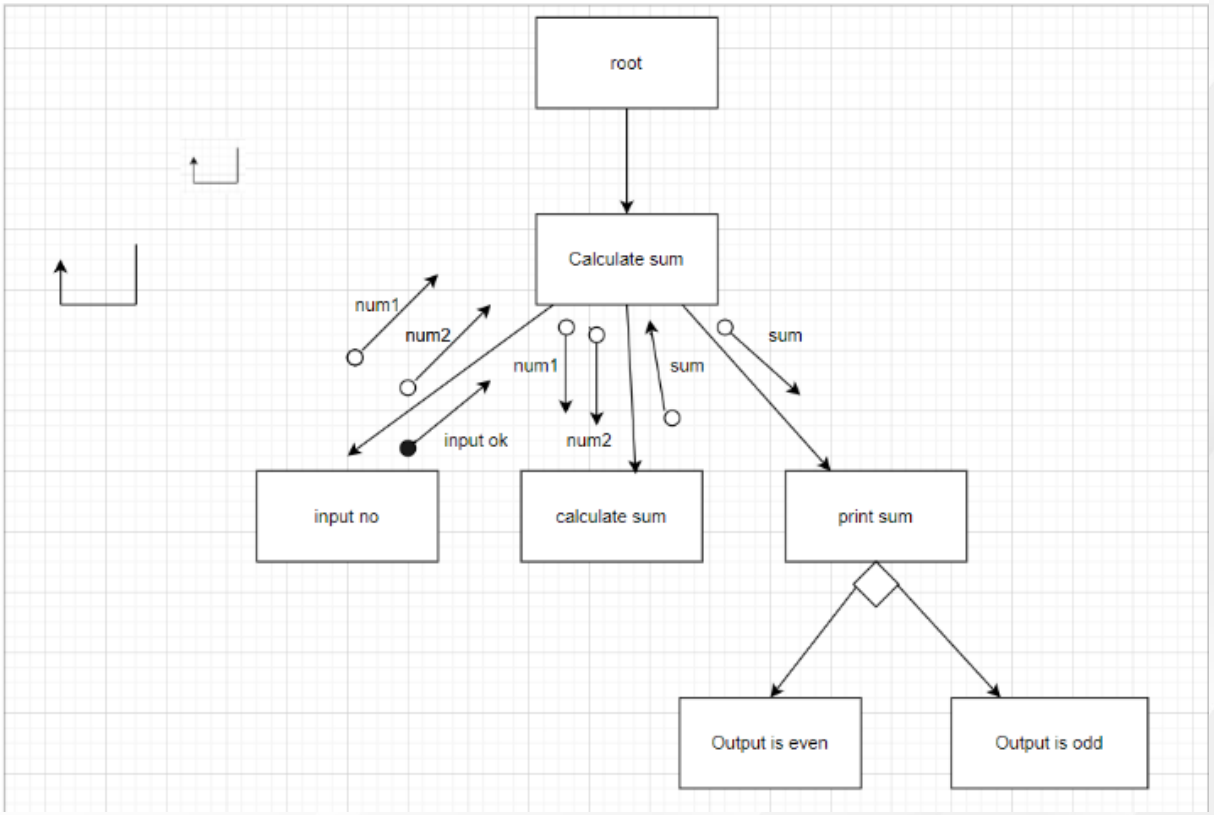
Step 3
Refining the structure chart with the addition of sub functions



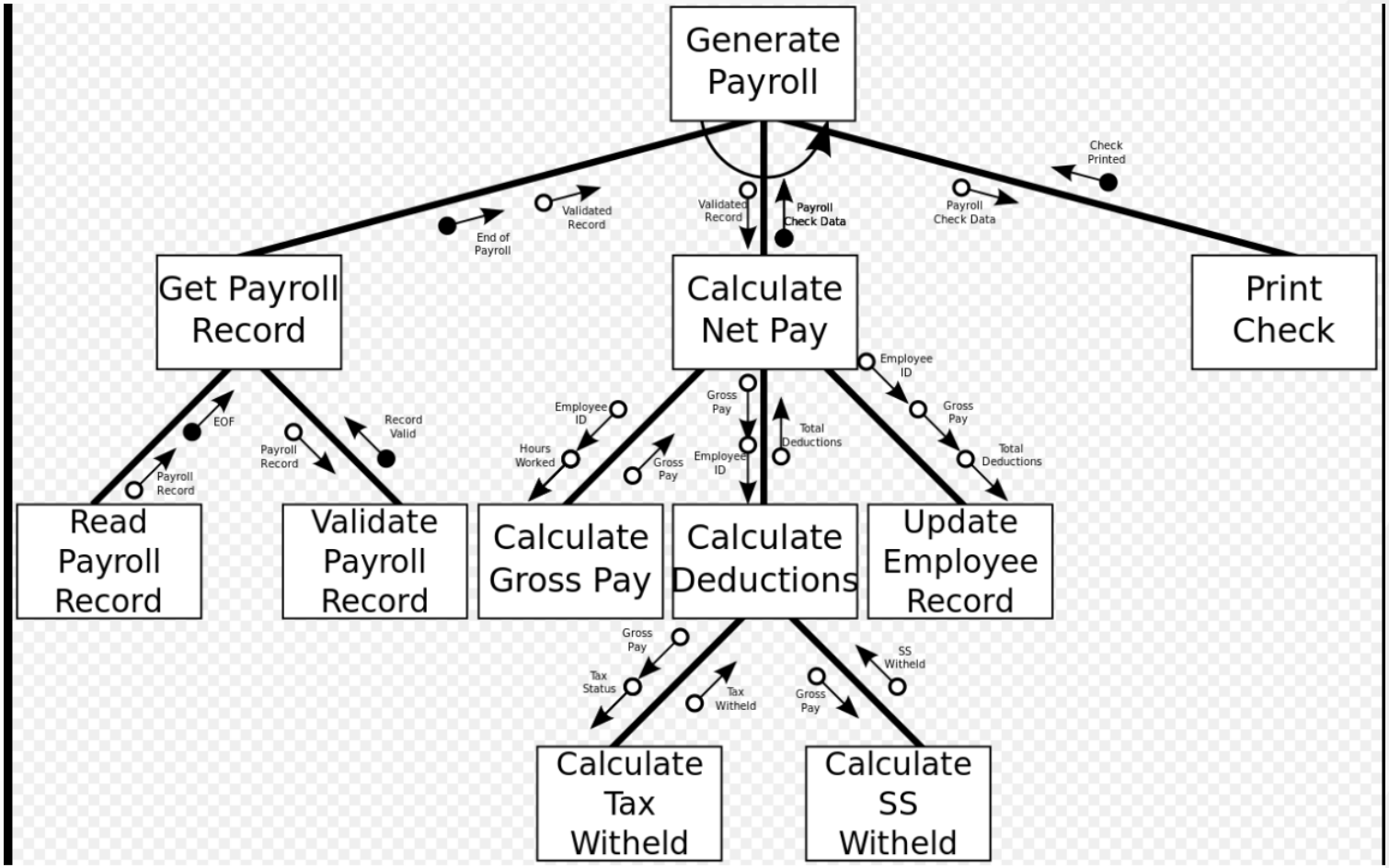
Transaction Analysis



Structure Chart examples



Structured Chart Examples



Any Question ?


thank you