GEPM-375

Project Planning and Construction Management

What we discussed in last class:

- **Work Breakdown Structure (WBS)**
- Product Breakdown Structure (PBS)

What we are going to discuss today?

- **Cost Breakdown Structure (CBS)**
- Organization Breakdown Structure (OBS)
- **Responsibility matrix**

What is Cost breakdown structure (CBS)?

- **Cost Breakdown Structure** (CBS) represents **a breakdown of the costs** of the various components of the Work **Breakdown Structure** (WBS) or Product Break down Structure (PBS) **including all works or services done by the subcontractors.**

- It is **used to continuously compare the actual costs** with the **budget**, and **integrate to the cost control system**.

Bottom up Cost Estimate

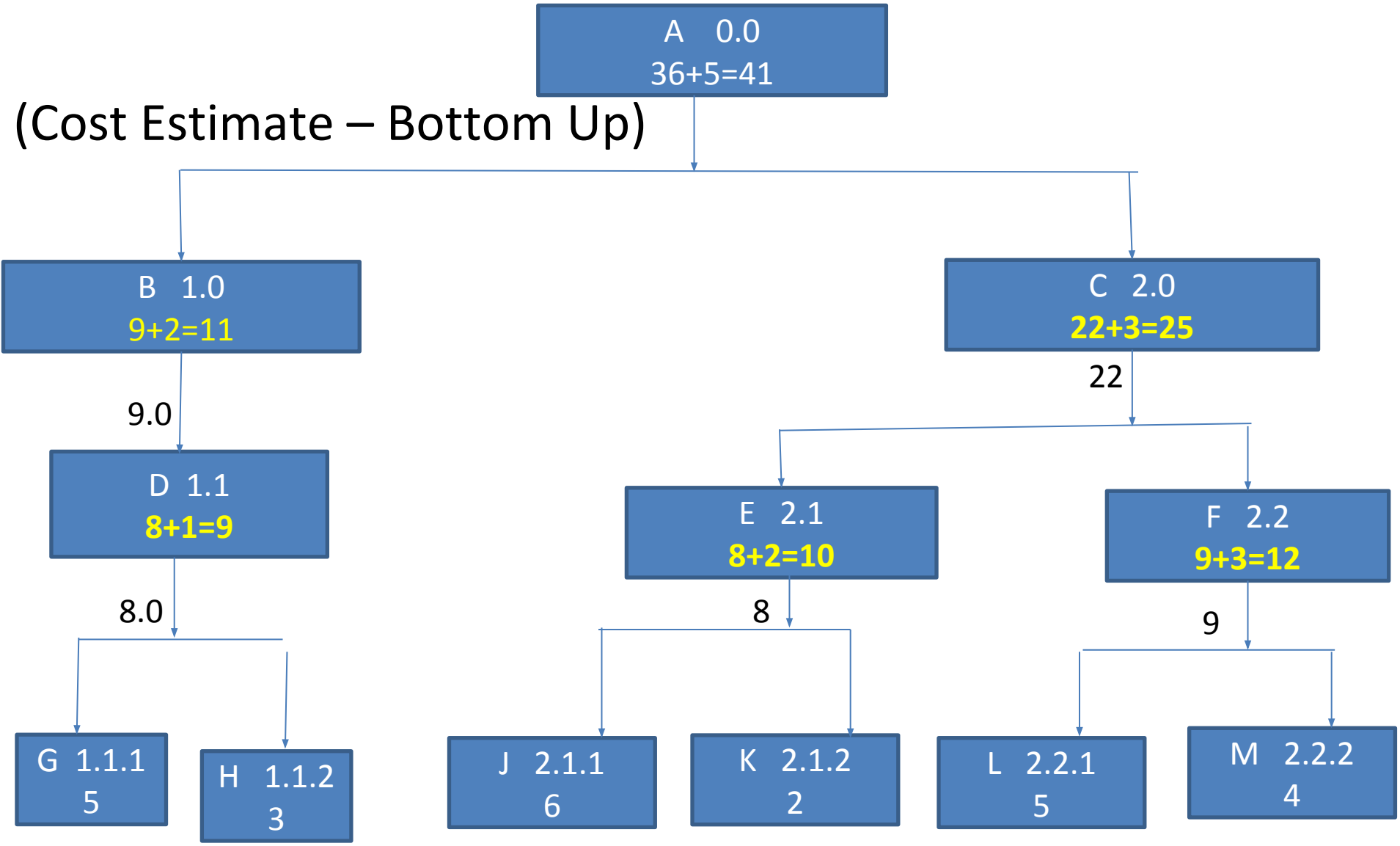
- Bottom-up cost estimate can be produced **starting at the lowest branch** of family tree (WBS or PBS).

- **Each work unit** is costed and arranged in such a way that the **total cost** of the packages on any branch **must add up** to the cost of the package of the parent package of the branch above.

- If the **parent package has a cost value of his own**, this must clearly be added before next stage of the package.

- **Following Figure** shows the bottom-up estimating process and also how the packages are can be **coded to produce a project cost coding system.**

(Cost Estimate – Bottom Up)



CBS: Top-down – Cost Estimate

- **Top-down estimating** is a **technique used by upper-level management** to **estimate** the **total cost** of a project by using **information from a previous, similar project**.

- In other words, one going to **estimate** the **cost** of the current project **based on the last time projects**.

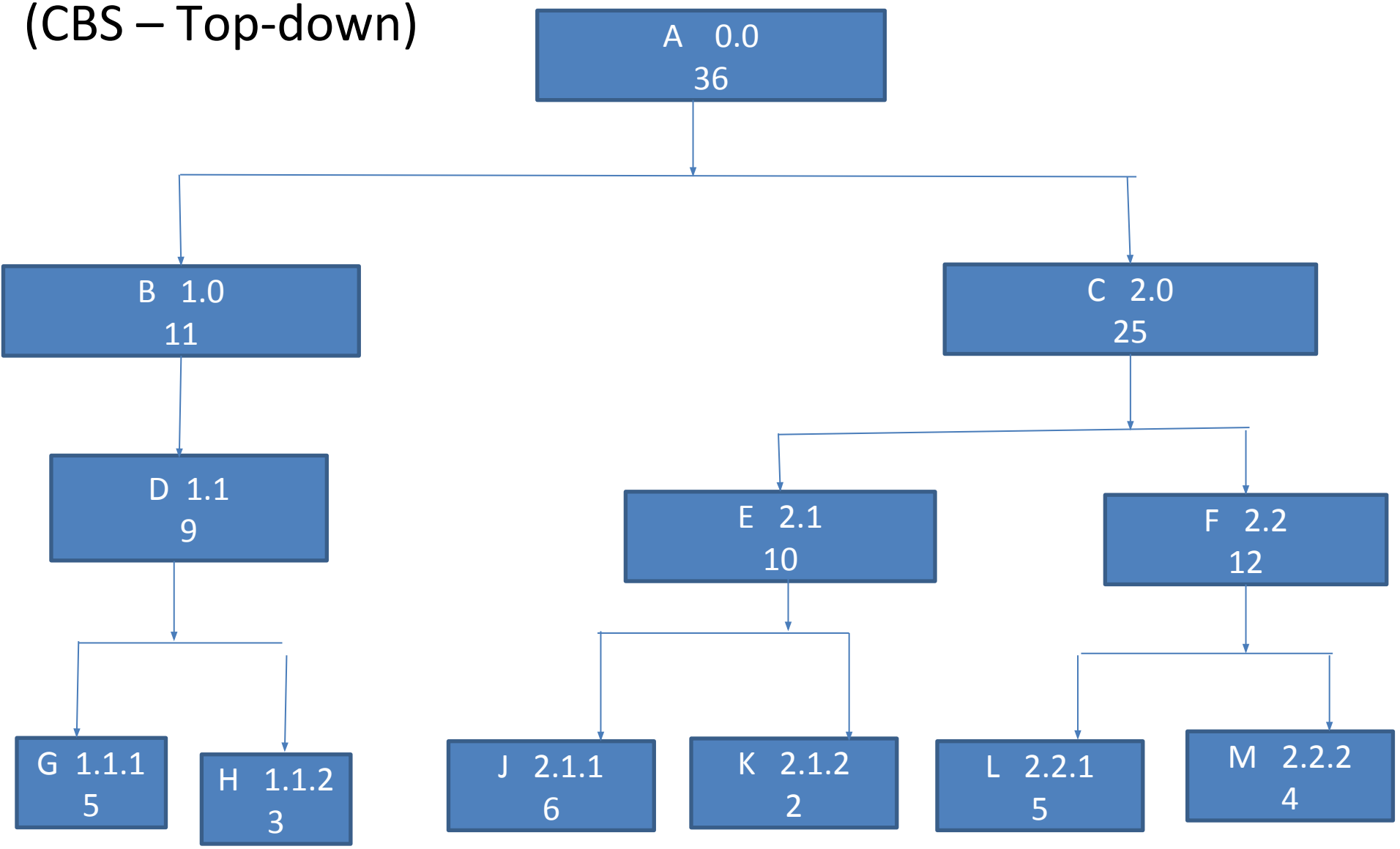
- Cost of the total project (sub project) has been **determined.**

- Total cost is **allocated to the top packages** of the WBS (PBS) diagram.

- **Work packages below are forced to accept** the appropriate cost.

- Total cost of each branch **cannot exceed of the package**.

(CBS – Top-down)


A 0.0
36
B 1.0
11
C 2.0
25
D 1.1
9
E 2.1
10
F 2.2
12
G 1.1.1
5
H 1.1.2
3
J 2.1.1
6
K 2.1.2
2
L 2.2.1
5
M 2.2.2
4

Use of CBS to Cost Estimate of a project.

- Estimator of a project **normally use bottom up** method on a WBS or PBS diagram to calculate the cost.

- When **total cost given** to the Project Manager,

  -he/she may **break the total cost down** into the different departments of the organization.

  -Ensures that sum of **total cost does not exceed** the estimated cost.

Top-Down vs. Bottom-Up

- Top-down usually encompasses a **vast area of macro variables** while bottom-up is **more narrowly focused**.

- Top-down **investing strategies** typically focus on **exploiting opportunities** that follow market cycles while bottom-up approaches are **more fundamental** in nature.

- While top-down and bottom-up can be very distinctly different. But **both are often used** in all types of financial approaches like **checks and balances.**



Organization Breakdown Structure (OBS):

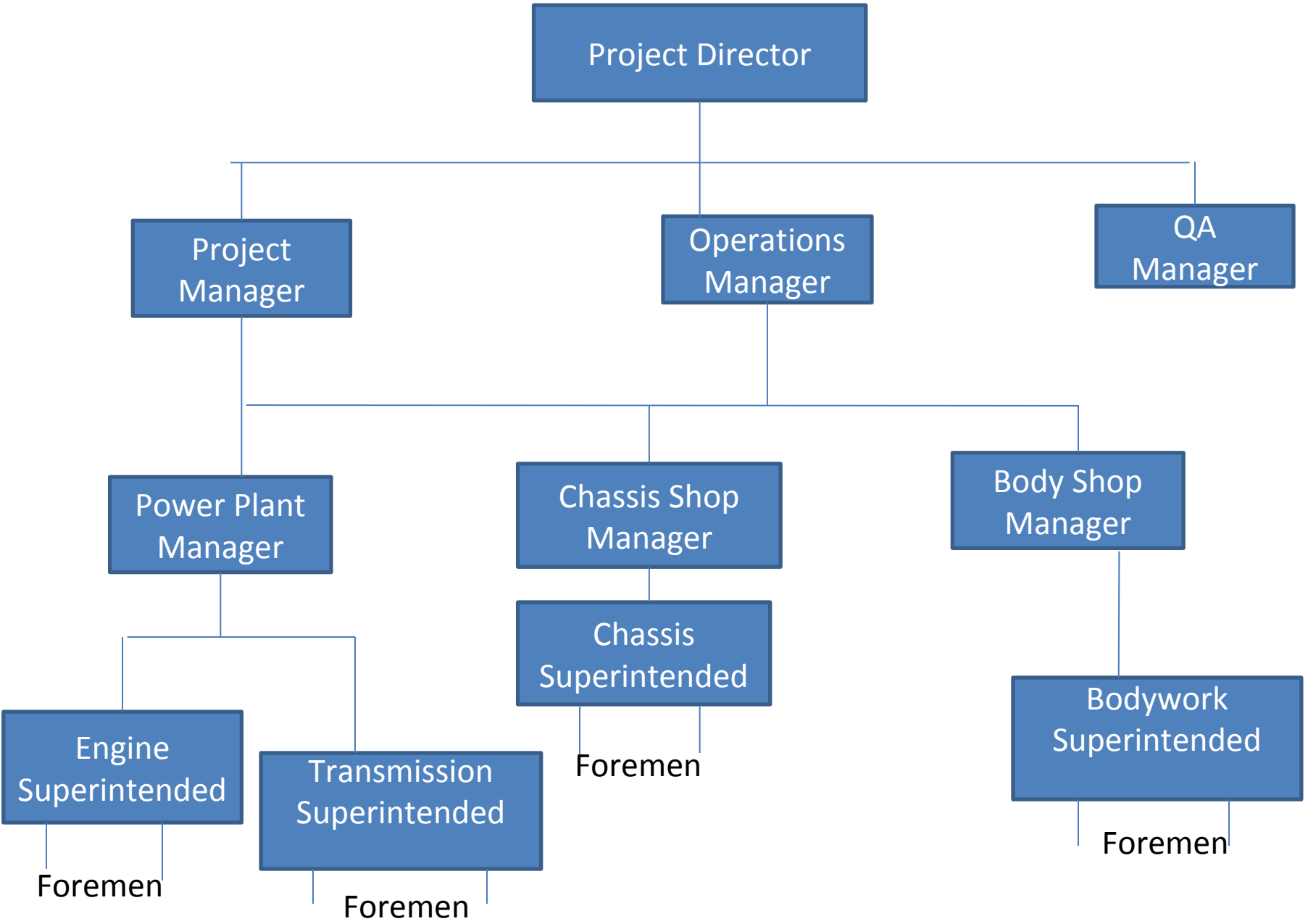
OBS is a hierarchical model describing the **establishing organizational framework** for:

- **project planning**,
- **resource management**,
- **time and expense tracking**,
- **cost allocation**,
- **revenue/profit reporting**, and
- **work management**.

Example of OBS

- If **names/designations** are given to WBS or PBS, it **becomes OBS**.
- Typical OBS for manufacturing Project-**Assemble of a Prototype Motor Car** shown.
- **Not identical** in lay out of WBS or PBS.
- **One of manager or task owner** can be **responsible for more than one task.**

Organization Breakdown Structure (OBS)



Project Director:

- A **project director** **directs** and **integrates** the activities of multiple, primary project operations.
- Have overall responsibility for the **successful conclusion** of construction projects.

Project Manager:

- A **project manager** is a **professional** who **organizes, plans, and executes projects** while working **within restraints** like budgets and schedules.

Operation Manager:

- **Operations managers** play a critical role in **overseeing** the day-to-day operations of an organization and **ensuring** their profitability.

QA Manager:

- **Quality assurance managers** work with other staff **to establish procedures and quality standards** and **to monitor** these against agreed targets.

Operational Manager:

- Responsible for **ensuring the quality** of their company's products and **services meet** or exceed customer expectations.

- They do this by **running various** processes, like **hiring** new employees, **training** them in specific skill sets and procedures, and **monitoring existing workers**, so **nothing falls through the cracks.**

Superintendent:

- A **skilled person** who is in charge of a particular department, group of workers.
- **Work on the ground** and is responsible for the execution of the work of his unit.

Foremen

- **A person in charge of leading a number of employees** in a particular field or profession, such as construction or engineering.

Where are the difference between OBS and WBS?

- **Operations manager** is in charge of the actual operating departments for pay and rations.
- **Each departmental manager** (or his designated project leader) has a reporting line to project manager.
- **Quality Assurances (QA) manager** reports directly to the director to ensure independence from the operating and the project department.

What are the responsibility of QA Manager?

- QA manager **will assist** all operating departments with **producing quality plans.**
- QA manager **will advice** on QA **requirements and procedures**
- QA Manager will **point out any short comings** if he observes.
- **Reports directly** to the Director to ensure independence from the operating and projects departments.

Responsibility Assignment Matrix (RAM)/RACI Matrix

RAM Matrix:

- **Describes the role and responsibilities** of various people and/or organizations in completing specific tasks for a project**.**

- By **combining the WBS/PBS with the OBS** it is possible to create Matrix.

- Using Car Assemble example, matrix is drawn by writing the **WBS work area vertically** and the **OBS personnel horizontally**.

- By placing a **suitable designatory letter** into the **intersecting boxes**, the **level of responsibility** for any work area can be recorded on the matrix.

A= Receiving monthly reports

B= Receiving weekly reports

C= Daily supervision

Responsibility Assignment Matrix (RAM for Car Assemble)

OBS → / WBS/PBS ↓	Director	Project Manager	Ops Manager	QA Manager	Power Plant Manager	Chassis Shop Manager	Body Shop Manager	Engine Supdt	Transmission Supdt	Chassis Supdt
Car Assembly	A	B	A	B						
Power unit	A	B	A	B	C					
Chassis	A	B	A	B		C				
Body Shell	A	B	A	B			C			
Engine		B	A	B	C			C		
Transmission		B	A	B	C				C	
Side Members		B	A	B		C				C
Cross Members		B	A	B		C				C
Roof and Floor		B	A	B			C			
Interior and Trim		B	A				C			

- **Vertical list giving PBS stages** could be replaced by the WBS stages.

- Horizontal lists showing the **different managers**, could have, the **names of departments** or **even consultants**, **contractors**, **sub-contractors**, and **suppliers** of materials or services.

RACI Matrix (For an Aesthetic Work)

RACI matrix example

R	Responsible
A	Accountable
C	Consulted
I	Informed

Project Activity / Deliverable	Project Manager	Consultant	Architect	Contractor	Client
Define functional and aesthetic needs	I	I	C	I	R
Assess risk	A	R	I	C	I
Define performance requirements	A	R	I	I	I
Create design	A	C	R	I	C
Execute construction	A	C	C	R	I
Approve construction work	I	I	C	C	R

So far what we have discussed today?

- **Cost Breakdown Structure (CBS)**
- Organization Breakdown Structure (OBS)
- **Responsibility matrix**

Thank You