



Training on Project Management Basics

Sources of Presentation

This presentation is collected from

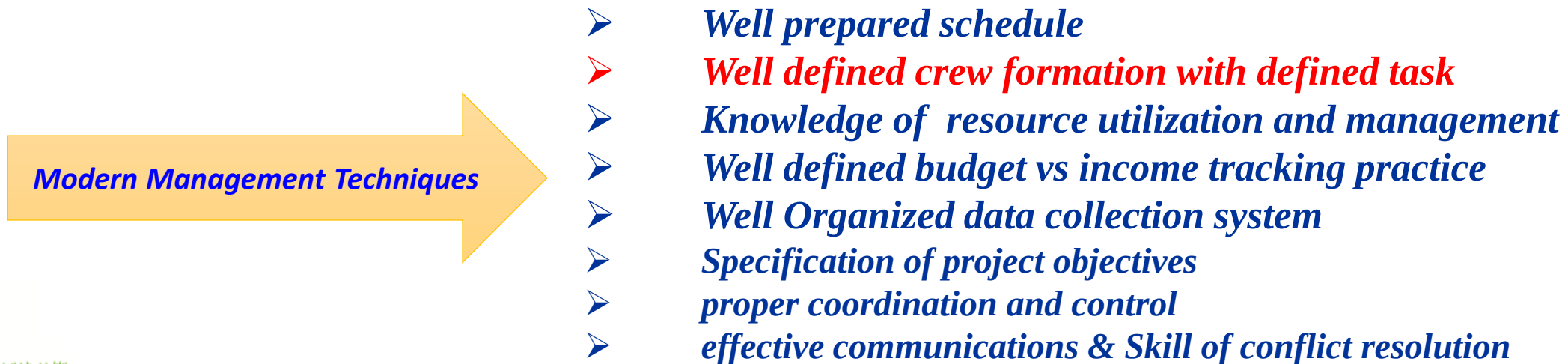
- *project management and other different trainings given for DCE staffs by different External presenters*
- *Project management basics, PRP, equipment management Training Presentations given to project managers and technical staffs by Inhouse presentations*
- *From construction management courses and Training Modules of PMBOK 5th by Salisu, Gidado Dalibi*

Contents of the presentation

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 - *Working Hours registration controlling*
 - *Fuel Consumption controlling and standards*
 - *Efficiency controlling (Availability & utilization)*
 - *Output controlling vs Cost*
 - *Data collection systems and use*

What is project management mean?

Project management is the art of directing and coordinating **human, equipment and material resources** throughout the life of a project by using **modern management techniques** to achieve **predetermined objectives of scope, cost, time, quality and satisfaction.**



By Asmare Walle;; PPECM/1563

What is project management mean?

It is the responsibility to manage conflicts between the stated objectives with regard to scope, cost, time and quality, and the constraints imposed on human material and financial resources.



These **conflicts** should be resolved at the project by creating Different alternatives.

Subsequently, the functions of project management for construction generally include the following:

- Specification of project objectives and plans including scope, budgeting, scheduling, setting performance requirements, and selecting project participants.
- Maximization of efficient resource utilization through procurement of labor, materials and equipment according to the prescribed schedule and plan.
- Implementation of various operations through proper coordination and control of planning, design, estimating, contracting and construction in the entire process.
- Development of effective communications and mechanisms for resolving conflicts among the various participants

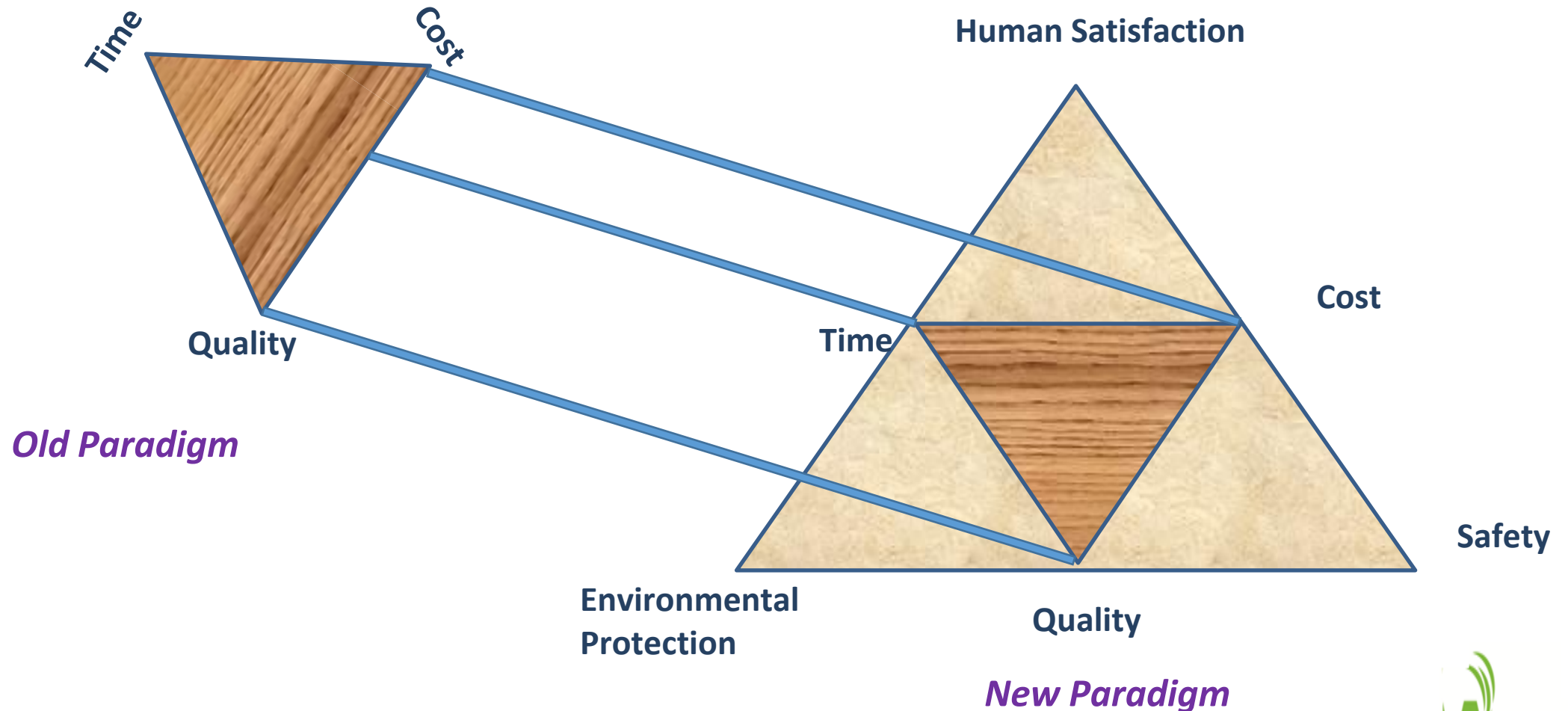
What is project management mean?

functions of project management :(contunued... ..)

- • *Identifying all requirements of stake holders and the work itself;*
- • *Addressing the various needs, concerns, and expectations of the stakeholders in planning and executing the project;*
- • *Setting up, maintaining, and carrying out communications among stakeholders that are active, effective, and collaborative in nature;*
- • *Managing stakeholders towards meeting project requirements and creating project deliverables;*
- • *Balancing the competing project constraints, which include,:*
 - Scope, ○ Quality, ○ Schedule, ○ Budget, ○ Resources, and ○ Risks.

What is project management mean?

Changing Paradigm - Owners demand More



What is project management mean?

What is Project Management Office (PMO)?

A project management office (PMO) is a management structure that standardizes the **project-related governance processes and facilitates the sharing** of:

- **resources,**
- **methodologies,**
- **tools, and techniques ---- → to all projects**

*The responsibilities of a PMO can range from providing **project management support functions to actually being responsible for the direct management of one or more projects.***

What is project management mean?

There are several types of **PMO structures in organizations**, each varying in the degree of control and influence they have on projects within the organization, such as:

- ❖ **Supportive**. Supportive PMOs provide a **consultative role** to projects by supplying templates, best practices, training, access to information and lessons learned from other projects. This type of PMO serves as a project repository. **The degree of control provided by the PMO is low.**
- ❖ **Controlling**. Controlling PMOs provide **support and require compliance through various means**. Compliance may involve adopting project management frameworks or methodologies, using specific templates, forms and tools, or conformance to governance. **The degree of control provided by the PMO is moderate.**
- ❖ **Directive**. Directive PMOs **take control of the projects** by directly managing the projects. **The degree of control provided by the PMO is high.**

What is project management mean?

A primary function of a PMO is to support project managers in a variety of ways which may include:

- ✓ • ***Managing shared resources** across all projects administered by the PMO;*
- ✓ • *Identifying and developing project management **methodology, best practices, and standards**;*
- ✓ • *Coaching, mentoring, training, and oversight;*
- ✓ • *Monitoring compliance with project management **standards, policies, procedures, and templates by means of project audits**;*
- ✓ • *Developing and managing project **policies, procedures, templates, and other shared documentation** (organizational process assets); and*
- ✓ • *Coordinating communication across projects*

Who is project manager?

What does a project manager do?

- *The Project Manager is the individual responsible for delivering the project.*
- *leads and manages the project team, with the authority and responsibility to run the project on a day-to-day basis.*
- *Most of the time a project manager is a project owner.*
- *He is responsible for the leadership of the project from site hand over to completion.*
- *The project manager leads the team and helps negotiate the multiple relationships within any project*

Who is project manager?

What does a project manager do?

Role of the Project Manager

- ☐ *Activity and resource planning*
 - ☐ *Organizing and motivating a project team*
 - ☐ *Controlling time management*
 - ☐ *Cost estimating and developing the budget*
 - ☐ *Ensuring customer satisfaction*
 - ☐ *Analyzing and managing project risk*
 - ☐ *Monitoring progress*
 - ☐ *Managing reports and necessary documentation*
-
- ✓ *The project manager is responsible for achieving the project objectives.*
 - ✓ *project managers have the responsibility to satisfy the needs: task needs, team needs, and individual needs.*
 - ✓ *A project manager becomes the link between the PMO and the team.*
 - ✓ *Effective project managers require a balance of **ethical, interpersonal, and conceptual skills** that help them analyze situations and interact appropriately*

Who is project manager?

What does a project manager do?

❑ Qualified Project Manager:

- Helps subordinates whenever necessary.
- Sensitive to the effects of decision he makes.
- Accept the command of subordinates.
- Effective leadership skill.
- Interest in employee development.
- Successful in finding and retaining new talent.
- Don't over pressure to the subordinates.

❑ Qualified Project Manager:

- Have a sense of ownership/leadership.
- Work collaboratively.
- Use both sides of the brain (Multi directional thinking)
- Be able to facilitate.
- Positive attitude.
- Interest in personal aspects of employees
- Clearly communicates the vision.

WHY PROJECT FAIL?

- ☐ *Overallocated Resources*
- ☐ *Poor Communications*
- ☐ *Bad Stakeholder Management*
- ☐ *Unreliable Estimates & planning*
- ☐ *Inadequate Risk Management*
- ☐ *Unsupported Project Culture*
- ☐ *Lack of Team building and lack of willing*
- ☐ *Lenient Monitoring and Controlling*
- ☐ *Project managers who lack experience and training*
- ☐ *Placement of improper officials*
- ☐ *Conflict*
- ☐ *Poorly defined project scope*
- ☐ *Failure to identify key assumptions*
- ☐ *Key staff leaving the project and/or company*
- ☐ *Ineffective leadership*
- ☐ *Failure to track requirements*
- ☐ *Failure to track progress*

Project Management Body of Knowledge

The Project Management Institute focuses on **TEN** distinct areas requiring project manager knowledge and attention:

1. Project integration management to ensure that the various project elements are effectively coordinated.
2. Project scope management to ensure that all the work required (and only the required work) is included.
3. Project time management to provide an effective project schedule.
4. Project cost management to identify needed resources and maintain budget control.
5. Project quality management to ensure functional requirements are met.
6. Project resource management to development and effectively utilization of human resource as well as all other resources.
7. Project communications management to ensure effective internal and external communications.
8. Project risk management to analyze and mitigate potential risks.
9. Project procurement management to obtain necessary resources from external sources.
10. Stakeholder Management to identify and engage stakeholders throughout the project

By Asmare Walle.; PPECM/1563

Project Management Process Groups

Knowledge Areas	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring & Controlling Process Group	Closing Process Group
Project Integration Management	Develop project charter	Develop project management plan	Direct and manage project work Manage project knowledge	Monitor and control project work Perform integrated change control	Close project or phase
Project Scope Management		Plan Scope Management Collect Requirements Define Scope Create WBS		Validate Scope Control Scope	
Project Schedule Management		Plan schedule management Define activities Sequence activities Estimate activity durations Develop Schedule		Control Schedule	
Project Cost Management		Plan cost management Estimate costs Determine budget		Control costs	
Project Quality Management		Plan quality management	Manage quality	Control quality	
Project Resource Management		Plan resource management Estimate activity resources	Acquire resources Develop team Manage team	Control resources	
Project Communications Management		Plan communications management	Manage communications	Monitor communications	
Project Risk Management		Plan risk management Identify risks Perform qualitative risk analysis Perform quantitative risk analysis Plan risk responses	Implement risk responses	Monitor risks	
Project Procurement Management		Plan procurement management	Conduct procurements	Control procurements	
Project Stakeholder Management	Identify stakeholders	Plan stakeholder engagement	Manage stakeholder engagement	Monitor stakeholder engagement	

Project Management Body of Knowledge

Ethiopian Construction Project Management Institute Manuals

1. MW01- Construction project **INTEGRATION** Management
2. WM02-Construction project **SCOPE** management
3. MWO3- Construction project **QUALITY** management
4. MWO4- Construction project **STAKEHOLDER** management
5. MWO5- Construction project **RISK** management
6. MWO6- Construction project **PROCUREMENT** management
7. MWO7- Construction project **COMMUNICATION** management
8. MWO8- Construction project **TIME** management
9. MWO9- Construction project **HUMAN RESOURCE** management
10. MWO10- Construction project **MATERIAL** management
11. MWO11- Construction project **HEAVY EQUIPMENT** management
12. MWO12- Construction project **COST** management
13. MWO13- Construction project **FINANCIAL** management
14. MWO14- Construction project **SAFETY** management
15. MWO15- Construction project **ENVIRONMENTAL** management
16. MWO16- Construction project **CLAIM** management

(Refer also Ethiopian Construction Project management Professional pages [Telegram page https://t.me/Asmarewalle](https://t.me/Asmarewalle))

Equipment Management

Equipment Management

(In the aspect of construction Dept.)

In any construction Projects equipment management is very sensitive and needs high attention. The followings are main areas to be controlled.

- I. Working Hours registration*
- II. Fuel Consumption*
- III. Efficiency controlling*
- IV. Output controlling*
- V. Data collection*

Equipment Management

1. Working hour registration controlling

- There are 3 types of equipment hour recording mechanisms.
 - a. Engine Hours (EH)**- started to be recorded when the machine's engine just turned on and ends when the engine turns off.
 - *this is used for:*
 - To control the working hours of the machine
 - To know the machine's fuel consumption
 - b. Working Hours (WH)** – started to be recorded when the machine just started to execute the work and ends when the working time is completed. Which is recorded by hand watch.
 - *this is used for:*
 - ✓ To know the machine's normal working hours
 - ✓ To control the working hours of the machine
 - ✓ To prepare payment if the machine is rental
 - ✓ To know the normal productivity of the machine
 - c. Contact Hours (CH)**– started to be recorded when the machine is just started to execute the work and ends when the work is stopped to be executed.
 - *this is used for:*
 - ✓ To measure maximum productivity
 - ✓ To control the time sheet

In General :- $CH < WH < EH$

2. Fuel Consumption

Fuel is a liquid cash for any construction company. Therefore ASER has a serious concern on fuel consumption rate of any equipment. Therefore each project should have a daily fuel recording mechanisms.

Delivery control

Previously delivered Qty	This Period delivered Qty	To date delivered Qty (1)
--------------------------	---------------------------	---------------------------

Consumption Controlling

Total Previously consumed Qty	This period total consumed Qty	To date total consumed Qty (2)
To date Balance		= (1)-(2)

Heavy duty trucks and Light vehicles Fuel Consumption Record

S.No.	Date	Km Reading (km)	Fuel Taken (liter)	Fuel Consumption rate (liter/km)	Remark
1					
2					
.					
.					
.					
30					
31					

2. Fuel Consumption

Fuel consumption of Machines, trucks and vehicles should be controlled by:

- ✓ **Time sheet recorded hours vs fuel taken (machine)**
- ✓ **Km traveled vs fuel Taken (trucks & vehicles)**
- ✓ **Fuel consumption vs standard**
- ✓ **Output produced by working hours vs fuel consumption**
- ✓ **Efficiencies (availability & utilization)**

Equipment Management

2. Fuel Consumption

The standard fuel consumption rate of any equipment at any working condition is limited to the following range.

S. No.	Type of Equipment	Fuel Consumption standard	
1	Dozer	= 35 - 40	liter/hour
2	Excavator with Breaker	= 20 - 25	liter/hour
3	Excavator with Bucket	= 25 - 30	liter/hour
4	Grader	= 15 - 20	liter/hour
5	Loader	= 10 - 15	liter/hour
6	Roller	= 8 - 10	liter/hour
7	Dump Truck	= 1.5 - 2.0	km/liter
8	Water Truck	= 1.5 - 2.1	km/liter
9	Light Vehicle (New)	= 8 - 10	km/liter
10	Light Vehicle (Old)	= 6 - 8	km/liter

2. Fuel Consumption

The standard fuel consumption rate of any equipment at any working condition is limited to the following range.

Equipment Type	High/Sever Condition	Medium Condition	Low Condition
D8R Dozer	38-51	28-38	23-28
Excavator (320)	17-20	13-17	9-13
Excavator (325)	25-27	18-21	13-16
Excavator (330)	34-38	24-30	18-24
Grader (140H)	22-26	17-22	12-17
Loader	19.31	14.76	9.84

LOAD FACTOR GUIDE (Dozer)

High: Steady ripping, shuttle push loading and downhill dozing. engine lugged to max. power most of the time. Little or no idling or travel in reverse.

Medium: Production dozing, pulling scrapers, most push loading. Some idling and some travel with no load.

Low: Considerable idling or travel with no load.

LOAD FACTOR GUIDE (Grader)

High: Ditching, fill spreading, spreading base material, ripping, heavy road maintenance,

Medium: Average road maintenance, road mix work, scarifying,

Low: Finish grading, light maintenance, road travel.

2. Fuel Consumption

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Excavator (330)	34-38	24-30	18-24
Grader (140H)	22-26	17-22	12-17
Loader (950G)	23-28	17-21	11-15

LOAD FACTOR GUIDE (Excavator)

High: Most pipeline applications in hard rocky material. Digging 90-95% of the daily work schedule.

Medium: Most residential sewer applications in natural bed clay. Digging 60-85% of the daily work schedule. Most log loading applications.

Low: Most utility, urban applications in sandy loam. Digging less than 50% of the daily work schedule. Scrap handling applications.

LOAD FACTOR GUIDE (Loader)

High: Steady cycling on basic loader cycle.

Medium: Steady cycling but over haul distances or work on basic loader cycle with frequent periods at idle.

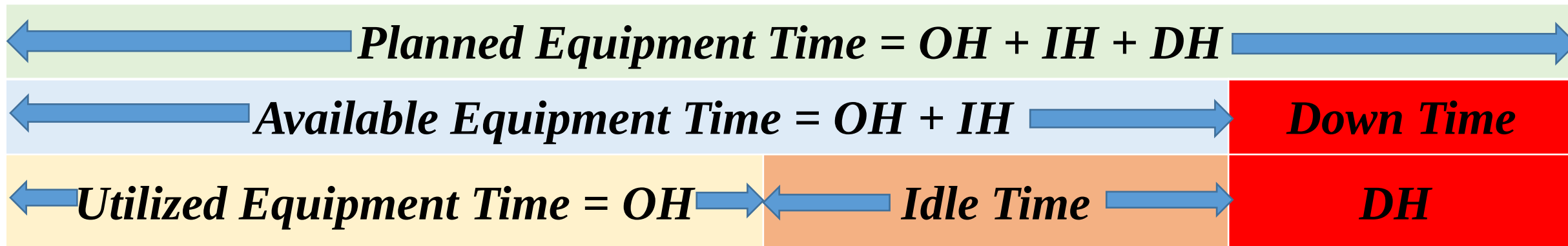
Low: Light utility work. Considerable idling.

3. Equipment Efficiencies (what is OID)

- Construction equipment has three types of **equipment hours**.
- **Planned hours (PH):** - which is usually 8 hours per day but can be extended as it is needed
- **Available hours (AH):** - which is less than planned hours due to equipment down ness (which used to evaluate equipment maintenance crew)
- **Utilized hours (UH):** - hours utilized directly for the work. (Which is working hours recorded by hand watch and used to evaluate the equipment utilization efficiency). Which is used to evaluate the technical crew (Engineers and Foremen)

Equipment Management

3. Equipment Efficiencies (what is OID)



EAE = Available Equipment Time **divided by** Planned Equipment time Or

EUE = Actual Utilized equipment Time **divided by** Available Equipment Time

EOE = Actual Utilized Equipment time **divided by** Planned Equipment Time or $EOE = EAE * EUE$

EAE = Equipment Availability efficiency

EUE = Equipment Utilization Efficiency

EOE = Equipment Overall Efficiency

OH- Operational Hours

IH = Idle Hours

DH = Down Hours

By Asmare Walle.; PPECM/1563

4. Output Recording vs cost

- Each equipment's performance should be recorded daily.
 - Recorded Available hours
 - Quantity of work performed
 - Hourly equipment rental cost
- These three should also synchronized with the fuel taken by the equipment
 - **Performance calculation** = Quantity of work performed divided by Available hour
 - **Cost of performed work** = (fuel cost + rental cost + operator cost)/quantity of work performed

Equipment type	Previous performance	This Period Performance	Average performance

Equipment Management

5. Data collection System

- All the above data should be recorded by qualified and professionals workers.
 - ✓ civil engineers,
 - ✓ construction management graduate,
 - ✓ TVET graduate in the field of construction etc.

What is the use of proper Data collection system

S.No.	Type of equipment	Qty	Rental Rate	Wasted time per day (minute)	working day per month	losing money per month
1	Dozer	12	1,600.00	10	30	96,000.00
2	Excavator	19	900.00	10	30	85,500.00
3	Loader	4	450.00	10	30	9,000.00
4	Roller	6	400.00	10	30	12,000.00
5	Grader	3	1,200.00	10	30	18,000.00
Total						220,500.00

If we have this much machines in each type we will lose ETB **220,500.00 per month.**

- this is a monthly salary of 10 civil engineers (**22,050.00 Birr per month**)
- if those machines stay for 1 year we will lose **ETB 2,646,000.00**
- if those machines stay for 2 year we will lose **ETB 5,292,000.00**
- if those machines stay for 2 year at 3 projects we will lose **ETB 15,876,000.00**

Brain storming Questions

1. You are managing a three years project. Your $CPI=0.91$ and $SPI=1.15$. That means you are earning 0.91 birr for every 1.0 ETB spent. While you are ahead of schedule by 15%. As a result you are held a meeting with the project team to resolve the budget over run. Who of the following would best address the budget over run issue?

- A. Construction Engineer recommends that fast tracking option; thus lowering the cost
- B. Office Engineer Recommends that since most of the complex technical work has been completed, he suggested that the most experienced resources could be swapped out for less experienced resources, thus lowering costs
- C. Deputy Project manager recommends that negotiate with the stake holders to reduce scope, thus lowering the costs.
- D. HR office recommends that firing out of some daily laborers, thus lowering the costs.

Brain storming Questions

2. You have a team of engineers working on your project. Two of the engineers have frequent disagreements. You ask them to resolve their differences through a discussion. However, that does not yield any results. Subsequently, you intervene, and based on your analysis of the situation, you suggest some changes in the way they work with each other. This still does not yield results, and you find that the project schedule is beginning to suffer. What is your next course of action?

- A. Take disciplinary action, if required, since the needs of the project are not being met.
- B. Don't do anything. Differences of opinion among the team members are a healthy situation.
- C. Speak to the two team members and ask them to resolve their conflict amicably.
- D. Ensure that they work in different shifts so that they don't clash with each other.

Brain storming Questions

3. *One of your team leaders informs you that a team member criticizes him constantly about the allocation of tasks. The team leader also asserts that this team member is also responsible for the delay of many tasks, leading to delays in the project schedule. What action should you take as a project manager?*

- A. Conduct a meeting with the PMO, team leader, and the team member*
- B. Approach the team member and understand his point of view*
- C. Replace the team member*
- D. Direct your team leader to issue a memo*

Brain storming Questions

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- D. HR office recommends that firing out of some daily laborers, thus lowering the costs.

B – Swapping out expensive resources for less expensive resources would most directly impact your budget and is the simplest thing to do, especially if there is no technical impact on the project. Fast tracking may not reduce your costs, but they reduce schedule.

Brain storming Questions

2. You have a team of engineers working on your project. Two of the engineers have frequent disagreements. You ask them to resolve their differences through a discussion. However, that does not yield any results. Subsequently, you intervene, and based on your analysis of the situation, you suggest some changes in the way they work with each other. This still does not yield results, and you find that the project schedule is beginning to suffer. What is your next course of action?

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A - After the project manager has tried intervening, it is time to employ more formal conflict resolution mechanisms, such as disciplinary action. [PMBOK 6th edition, Page 348] [Project Resource Management]

Brain storming Questions

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- B. Approach the team member and understand his point of view*
- C. Replace the team member*
- D. Direct your team leader to issue a memo*

B - A project manager should manage such a conflict by directly approaching the team member who caused the conflict. According to the PMI Code of Ethics and Professional Conduct, a project manager must be responsible and show respect. He or she must listen to others' viewpoints, seeking to understand them before making a decision. Neither replacing the team member nor issuing a memo is an appropriate action. Involving the PMO in team issues is not an appropriate action either, unless the issues are beyond the project manager's control. [PMBOK 6th Edition, Page 348 and PMI Code of Ethics and Professional Responsibility] [Project Resource Management]

Discussion Points:

1. *How many of us breaks the schedule to the level of Foreman and track their performance weekly?*
2. *How many of us review the monthly reports?*
3. *Which project has Well defined team structure, which has its own leader and plan set up?*
4. *How many of us do we concern about the limitation of cost components like equipment cost, labor cost, material costs and over head costs*
5. *How are we concerned about CPI?*
6. *Are we documenting the contemporary records of claim issues?*
7. *Who are seriously concern about his communication style?*
8. *Are we ready to quantify and calculate the amount of the works affected by problems?*
9. *Do we have actual cost of work items especially major ones?*
10. *Are we in the right track to address the stakeholders issues including our customers?*

THE END
THANK YOU



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