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MANAGEMENT SKILLS DEVELOPMENT PROGRAMME

MODULE 3:

- 3.1 How to control a meeting
- 3.2 Basics of network planning

الهيئة القومية للمياه - الخرطوم
ابحاث المياه الجوفيه - هولندا

WADS

NATIONAL WATER CORPORATION SUDAN
TNO-DGV THE NETHERLANDS
IN COOPERATION WITH IWACO B.V.

Rotterdam, July 1988

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T A B L E O F C O N T E N T S

Module 3.1: HOW TO CONTROL A MEETING?

Section 1 I N F O R M A T I O N S H E E T

Section 2 S E S S I O N N O T E S

1. INTRODUCTION
2. PREPARATION OF A MEETING
3. THE MEETING
4. FOLLOW-UP AFTER THE MEETING
5. SUMMARY

Section 3 T R A I N I N G A I D S

- VI : Holding a meeting
- V2 : The structure of the agenda

Section 4 H A N D O U T

1. INTRODUCTION
2. PREPARATION OF A MEETING
3. THE MEETING
4. FOLLOW-UP AFTER THE MEETING
5. SUMMARY

Section 4 H A N D O U T (Exercice E1)

Section 4 H A N D O U T (Exercice E2)

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Section 1 INFORMATION SHEET

Duration : 90 minutes.

Training objectives: After the session the trainees will be able to:

- list the three stages of holding a meeting;
- summarize the main points of attention in the various stages;
- describe the tasks of the chairman and secretary of a meeting.

Trainee selection : - Managerial staff WADS project.

Training aids : - Viewfoils : PL&Cl/V 1-2
- Exercise : PL&Cl/E 1-2
- Handout : PL&Cl/H 1

Special features :

Keywords : Meeting

Section 2 S E S S I O N N O T E S

1. INTRODUCTION

Explain that during this session we will pay particular attention how to conduct a coordination meeting.

Carefull attention should be paid to the different stages of the process to hold a meeting:

Show V1

- preparation of the meeting;
- the meeting itself;
- follow-up of the meeting.

The success of a meeting depends on the meeting techniques and behaviour of the participants.

It is also necessary to review the role of the chairman and the secretary.

2. PREPARATION OF A MEETING

Be carefull in determining the objectives of the meeting.

In case of the coordination meeting, the objectives could be to coordinate and plan the work of the different sections for the coming 2 weeks by:

- informing the sections of relevant developments;
- reviewing the work of the last 2 weeks;
- coordinating the work for the next 2 weeks;
- identifying and resolving bottlenecks.

General policy does not belong in such a meeting.

Only persons who can contribute to the realization of the objectives should be selected.

The total of participants must be limited to 10 - 12 persons.

A chairman and secretary should be nominated.

The main activity for preparing a meeting is the preparation of the agenda.

This is the task of the secretary but he should involve the participants as much as possible.

Ideally an agenda comprises three blocks.

Show V?

The first block comprises:

1. Opening
2. Changes of the agenda;
3. Approval of the minutes of meeting;
4. Announcements of the chairman.

The second block covers the actual subjects of the meeting.

What should it cover in case of the coordination meeting?

Mostly covers the reports of the sections. It is useful to indicate whether a decision or a discussion is expected or whether this is only included to inform the meeting.

The third block usually contains the following items:

1. A.o.B. (Any other business);
2. Date next meeting;
3. Closure.

Suggestions:

- consultation between the chairman and secretary;
- useful to indicate the timing per agenda item;
- maximum duration of 2 hours for the whole meeting;
- avoid items with an unpredictable time requirements;
- introduce guest-speakers separately.

The secretary should contact the participants for suggestions for the agenda and verify the execution of the list of actions.

He should, well in advance of the date of the meeting with the approval of the chairman, issue the agenda and annexes to the participants.

3. THE MEETING

The success of the meeting, however, depends very much on the behaviour and discipline of participants and chairman.

Ask the participants what they think a chairman should do?

Write answers
on blackboard

The role of the chairman comprises:

- checking the action points during the approval of the minutes of meeting;
- reminding "sinners" of their commitments;
- controlling the time;
- summarizing the discussions after each agenda point;
- formulating decisions and conclusions, and repeating this, if necessary, for the secretary;
- having the responsibilities recorded in the minutes of meeting.
- creating a pleasant and productive meeting climate;
- stimulating the inputs of the participants, making sure that questions and remarks of participants will not be lost, but cutting off too long, irrelevant discussions.

Subjects on the agenda will not be treated during the approval of the minutes.

Also subjects about which everybody is already informed sufficiently in written form, will not be treated.

Ask what the participants should do?

Write answer
on blackboard

- Arrive well prepared at the meeting and to have read all materials in advance.
- observe elementary rules of discussion techniques such as sticking to the subject, listening to each other and avoiding bilateral discussions (speak at all times to the chairman) should be observed.

Apart from schemes and small notes, no written materials should be distributed during the meeting.

Why? - Disturbs the meeting!

4. FOLLOW-UP AFTER THE MEETING

The follow-up of the meeting mainly concerns the minutes of meeting.

They should be prepared as soon as possible

- the memory of the meeting is still fresh;
- reminder to the participants of the commitments they have made.

Note that the secretary will only send the draft minutes of meeting which should be approved on the next meeting.

In general a short list of all decisions will be preferred above a long report.

The lay-out should be standard and follow the agenda.

At the end of the minutes, a list of all action points and still open agenda points can be added.

The chairman and secretary should try to act as example to all other participants of the meeting.

5. SUMMARY

Carefull attention should be paid to the different stages of the process to hold a meeting:

- preparation of the meeting;
- the meeting itself;
- follow-up of the meeting.

The success of a meeting depends on the meeting techniques and behaviour of the participants. The effectiveness of the chairman will for a large part determine the success of the meeting.

He will need to

- control the meeting
- create an atmosphere where all participants will contribute optimally.

The secretary is responsible for the preparation and follow-up of the meeting.

He will prepare

- the agenda and remind the participants of their commitments to the meeting;
- the minutes of meeting as soon as possible after the meeting

Give H

Section 3

T R A I N I N G A I D S

V1 : Holding a meeting

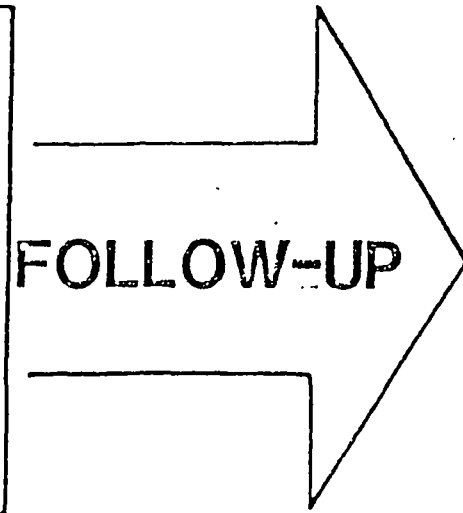
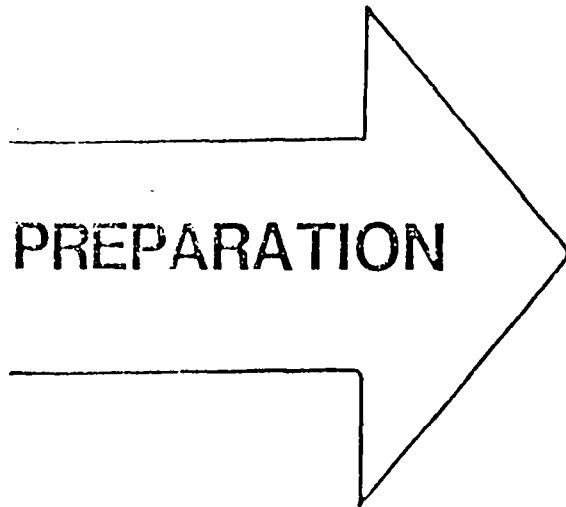
V2 : The structure of the agenda.

BEFORE

DURING

AFTER

THE MEETING



The first block

- 1 Opening
- 2 Changes of the agenda
- 3 Approval of the minutes of meeting
- 4 Announcements

The second block

Actual subjects of the meeting

The third block

- 1 A.O.B.
- 2 Date next meeting
- 3 Closure

Section 4

H A N D O U T

1. INTRODUCTION

Meetings take place every day. They range from a 2-minute consultation during a normal working day to a 4 hours-session of a coordination meeting. During this session we will pay particular attention how to conduct a coordination meeting.

At every occasion it is important what must be discussed: the objectives of the meeting should be realized. The objectives determine the participants of the meeting.

Carefull attention should be paid to the different stages of the process to hold a meeting:

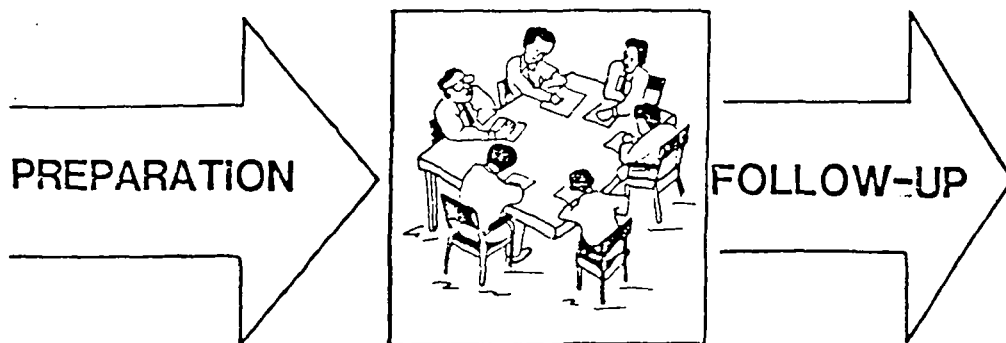
- preparation of the meeting;
- the meeting itself;
- follow-up of the meeting.

BEFORE

DURING

AFTER

THE MEETING



The success of a meeting depends on the meeting techniques and behaviour of the participants. It is also necessary to review the role of the chairman and the secretary.

2. PREPARATION OF A MEETING

Be carefull in determining the objectives of the meeting; no more and no less should be realized. In case of the coordination meeting, the objectives could be to coordinate and plan the work of the different sections for the coming 2 weeks by:

- informing the sections of relevant developments;
- reviewing the work of the last 2 weeks;
- coordinating the work for the next 2 weeks;
- identifying and resolving bottlenecks.

General policy does not belong in such a meeting but should be discussed at a different meeting.

Only persons who can contribute to the realization of the objectives should be selected. The total of participants must be limited to 10 - 12 persons. A chairman and secretary should be nominated.

The main activity for preparing a meeting is the preparation of the agenda. This is the task of the secretary but he should involve the participants as much as possible.

Ideally an agenda comprises three blocks. The first block comprises:

1. Opening
2. Changes of the agenda;
3. Approval of the minutes of meeting;
4. Announcements of the chairman.

Item 4 offers the chairman to inform the meeting briefly on items which do not merit a separate agenda point, such as incoming letters, etc. The secretary could also play a role in this respect.

The second block covers the actual subjects of the meeting. In case of the coordination meeting, this mostly covers the reports of the sections. The agenda points should be clearly described. The participants must prepare themselves well and need therefore often documentation.

It is useful to indicate whether a decision or a discussion is expected or whether this is only included to inform the meeting.

The third block usually contains the following items:

1. A.o.B. (Any other business);
2. Date next meeting;
3. Closure.

When preparing the agenda, consultation between the chairman and secretary is desirable. It is useful to indicate the timing per agenda item; a maximum duration of 2 hours for the whole meeting seems to be most effective. Items with an unpredictable time requirement should be avoided but be the subject of a separate meeting. Guest-speakers should be introduced separately.

The role of the secretary is important during the preparation. He should contact the participants for suggestions for the agenda and verify the execution of the list of actions. He should, well in advance of the date of the meeting with the approval of the chairman, issue the agenda and annexes to the participants.

3. THE MEETING

If the preparation has been carefully enough, there is a good chance that the meeting will pass smoothly without any unexpected incidents. The success of the meeting, however, depends very much on the behaviour and discipline of participants and chairman.

The role of the chairman is of prime importance and comprises:

- checking the realization of action points of the last meeting during the approval of the minutes of meeting;
- enforcing the discipline of the meeting by reminding "sinners" of their commitments;
- controlling the time of each agenda point and the total meeting;
- summarizing the discussions after each agenda point, drawing conclusions, formulating decisions, and repeating this, if necessary, for the secretary;

- having it recorded in the minutes of meeting who is responsible for certain actions and within which time;
- creating a pleasant and productive meeting climate;
- stimulating the inputs of the participants, making sure that questions and remarks of participants will not be lost, but cutting off too long, irrelevant discussions.

Time management during the meeting should be observed. Subjects on the agenda will not be treated during the approval of the minutes. Also subjects about which everybody is already informed sufficiently in written form, will not be treated.

The participants have their own responsibility for the success of the meeting. They should arrive well prepared at the meeting and to have read all materials in advance. Elementary rules of discussion techniques such as sticking to the subject, listening to each other and avoiding bilateral discussions (speak at all times to the chairman) should be observed.

Apart from schemes and small notes, no written materials should be distributed during the meeting.

4. FOLLOW-UP AFTER THE MEETING

The follow-up of the meeting mainly concerns the minutes of meeting. They should be prepared as soon as possible, not only because the memory of the meeting is still fresh, but also because it reminds the participants of the commitments they have made. This is a major responsibility of the secretary. Note that the secretary will only send the draft minutes of meeting which should be approved on the next meeting.

The participants decide on the format of the minutes of meeting. In general a short list of all decisions will be preferred above a long report. The lay-out should be standard and follow the agenda. At the end of the minutes, a list of all action points and still open agenda points can be added.

The chairman and secretary should try to act as example to all other participants of the meeting.

5. SUMMARY

Carefull attention should be paid to the different stages of the process to hold a meeting:

- preparation of the meeting;
- the meeting itself;
- follow-up of the meeting.

The success of a meeting depends on the meeting techniques and behaviour of the participants. It is also necessary to review the role of the chairman and the secretary.

The effectiveness of the chairman will for a large part determine the success of the meeting. He will need to control the meeting to make sure that the objectives of the meeting will be realized in an efficient and effective manner but he should also create an atmosphere where all participants will contribute optimally.

The secretary is responsible for the preparation of the meeting; he will prepare the agenda and remind the participants of their commitments to the meeting as indicated in the minutes of meeting. He will prepare the minutes of meeting as soon as possible after the meeting.

Section 4 H A N D O U T (Exercice E1)

Duration : 45 minutes

- Task : 1. Form a group of 5 persons who
 wide discuss the following issue:
 Should the workweek of the
 project change from 6 working
 days (as it does at present) to 5
 working days (but compensated by
 longer working hours)?
2. Assign the following roles to the
 members of the group
- chairman;
 - secretary;
 - one person of favor of the
 proposition;
 - one person who apposes the
 proposition;
 - one person is neutral.
3. The remaining participants will
 act as observers stress that they
 should systematically observe the
 discussion and that they have to
 repart their observations.
4. Allow 25 minutes for the group
 discussion. The ask the observers
 to state their observations, ask
 for reactions of the group and
 summarize the conclusions.

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Section 4 : H A N D O U T (Exercice E2)

Duration : 90 minutes

Task : 1. Divide the participants in 2 or 3 groups who will discuss the following question.

How can we improve our progress meeting?

Tell the groups that they should organise themselves but that they should formulate clear proposals. Time available is 60 minutes.

2. Let each group report in a plenary session their proposal.

Review the results and try to come to a concrete Plan of Action with the group.

T A B L E O F C O N T E N T S

Module 3.2: BASICS OF NETWORK PLANNING

Section 1 I N F O R M A T I O N S H E E T

Section 2 S E S S I O N N O T E S

1. INTRODUCTION
2. REVIEW OF THE PLANNING COURSE
3. NETWORK PLANNING
4. PROJECT ANALYSIS
5. CRITICAL PATH METHOD
6. PERT
7. REVIEW

Section 3 T R A I N I N G A I D S

- V1 : Major aspects of planning and control
- V2 : Functions of management
- V3 : Managing a project requires coordination
- V4 : CPM
- V5 : PERT
- V6 : Project Analysis Case Study
- V7 : Activities Case Study

Section 4 H A N D O U T

1. INTRODUCTION
2. NETWORK PLANNING
3. PROJECT ANALYSIS
4. THE CASE OF THE TRAINING CENTRE
5. CRITICAL PATH METHODS
6. PERT
7. SUMMARY

Section 4 H A N D O U T (Exercice E1)

Module 3.2: BASICS OF NETWORK PLANNING PAGE1/1

Section 1 I N F O R M A T I O N S H E E T

Duration : 90 minutes.

Training objectives: After the session the trainees will be able to:

- recite the basics of network planning;
- prepare a simple network planning.

Trainee selection: - Managerial staff WADS project.

Training aids: - Viewfoils : PL&C2/V 1-7
- Exercise : PL&C2/E 1
- Handout : PL&C2/H 1

Special features :

Keywords : Network planning/CPM/PERT

Section 2 S E S S I O N N O T E S

1. Introduction

Objective of this session is to introduce the concepts of scheduling by means of network planning.

This is a continuation of the planning course presented by S. Naar.

During this session, we will

- briefly review the planning course;
- introduce the concepts of network planning;
- illustrate these techniques with a simple case study, the construction of the training center.

2. Review of the planning course

Refer to the handouts of the planning course

Major aspects of planning & control

- Targets;
- Identification of resources;
- Analysis;
- Selection of resources;
- Preparation of resources;
- Scheduling;
- Dispatching;
- Control;
- Problem solving;
- Completion.

Show V1

Role of management

- Planning;
- Organizing;

- Directing;
- Controlling.

Show V2

Definitions

- Leadtime;
- Slack;
- Performance standard.

Information

Stress the importance of reliable information on time.

Planning structure

- master schedule;
- resources planning;
- sections planning;
- activities planning.

Results of discussion

- Do we need a systematic planning approach ?
Yes, but practical and adapted to the actual situation in Nyala;
- What should be the strategy?
Work on the organization and planning simultaneously.

3. Network planning

Basic assumption;

Managing a project requires the coordination of

- time;
- events;
- people and materials;
- money.

Show V3

We will therefore have to:

- set a time table;
- break the project down into small, separate EVENTS...these are called activities;
- assign the PEOPLE AND MATERIALS each activity requires...these are called the resources;
- enter an amount of MONEY each resource requires ...these are called costs.

Network planning techniques have been developed during 1950s for projects where it is difficult to estimate the time needed for individual activities.

We will review techniques which basics are already familiar to us:

- bar chart of activities/Gantt chart;
- flowchart.

These techniques are called

- CPM (Critical Path Method); Show V4
- PERT (Project Evaluation Review Technique). Show V5

With these techniques we can answer question like:

- How long will this project take? Can we meet the projected completion date?
- If this activity is delayed, will the entire project slide? If so, by how much?
- How can we tell if we are on schedule in time to correct any problems?
- What are the critical relationships between specific activities? Can they be arranged to provide a smoother flow of operations?

4. Project Analysis

Stress the need to analyse a project before we are able to prepare an adequate project planning.

This will be demonstrated by reviewing the case study of the construction of the training center.

We start by setting a time table.

This means identifying the deadlines of the project and the workable days.

Ask
participa

Mention holidays, Ramadan and the rainy season.

The next thing to do is to break the project down into small, separate EVENTS which are then referred to as the activities. This is the most difficult thing to do.

The following steps are distinguished:

Define the end products of a Project

- Operational Training Center.

Define the activities that must be done for each end product

- Securing finance;
- Design;
- Construction;
- Ordering training equipment.

Define third level of detail

The third and subsequent level of detail reflect further subdivision of major activities already identified.

Most projects can be clearly defined by three levels of details.

- Securing finance;
 - = proposal;
 - = approval;
- Design;
 - = preliminary design;
 - = detailed design;
- Construction;
 - = tendering;
 - = civil works;
 - = electrical works;
- Ordering training equipment.

Show V6

Define work package

Continue to subdivide the project activities until we arrive at a number of easy to manage and handle activities.

These "work packages" form the basis for planning, scheduling, and controlling the project.

The exact definition is a matter of feeling and practical considerations, amongst others

- the managerial responsibility for the work;
- the work package will be completed without interruption;
- the time needed to complete the work;
- the cost of the work package.

Once work packages have been defined, we can estimate the duration, the required resources and costs.

Now we know

Show V7

- the activities (the work packages);
- the interrelationships between the activities;
- the duration of each activity;
- the required resources for each activity;
- the costs of each activity.

This information form the building blocks of our network planning.

Resources and costs will not be treated in this example.

5. Critical Path Method

Explain the Gantt chart step by step.

Show V4

Explain the most common used symbols:

- critical activity;
- predecessor;
- critical path;
- milestone;
- slack time.

Not every project has a critical path; this means that every activity has slack time.

6. PERT

Explain the PERT chart step by step.

Show V5

A PERT chart shows the order and interrelationship of project activities.

A PERT chart is particular usefull to analyze complex projects.

8. Review

Ask the participants leading questions about the Gantt chart such as:

- How can we reduce the leadtime of the project and by how much time;
 - Is it possible to reschedule the project;
- Give a summary of the session stressing that:

Managing a project requires the coordination of

- time;
- events;
- people and materials;
- money.

We need to analyse a project before we are able to prepare an adequate project planning.

The first thing to do is to set a time table.

The next thing to do is to break the project down into small, separate EVENTS which are then referred to as the activities. The following approach is recommended:

Step 1. Define the end products of a Project;

Step 2. Define the activities that must be done for each end product;

Step 3. Define third level of detail

Step 4. Define work package

The Critical Path Method produces a Gantt chart, similar to a bar chart of activities but with some additional information is shown. The critical path consists of those activities that must be completed on time if we want to complete the project on time. Non-critical activities possess slack time.

A PERT chart is a flow chart which shows the order and interrelationship of project activities. PERT chart is particularly useful to analyze complex projects.

Section 3

T R A I N I N G A I D S

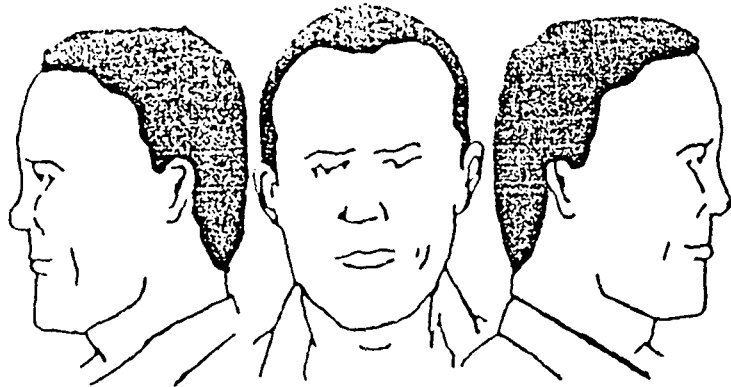
- V1 Major aspects of planning and control
- V2 Functions of management
- V3 Managing a project requires coordination
- V4 CPM
- V5 PERT
- V6 Project Analysis Case Study
- V7 Activities Case Study

Major aspects of planning and control

- Targets
- Identification of resources
- Analysis
- Selection of resources
- Preparation of resources
- Scheduling
- Dispatching
- Control
- Problem solving
- Completion

MANAGEMENT

CONTROLS



PLANS

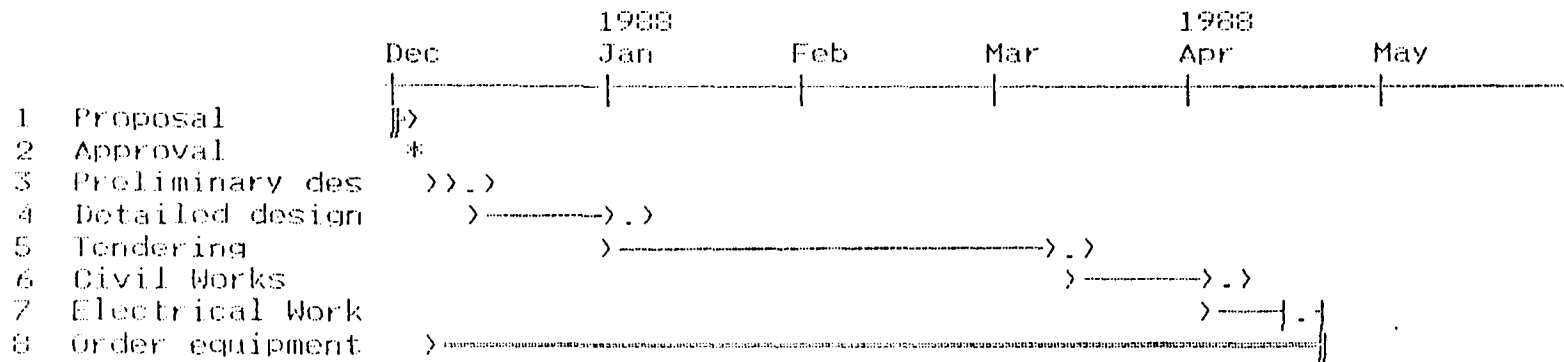


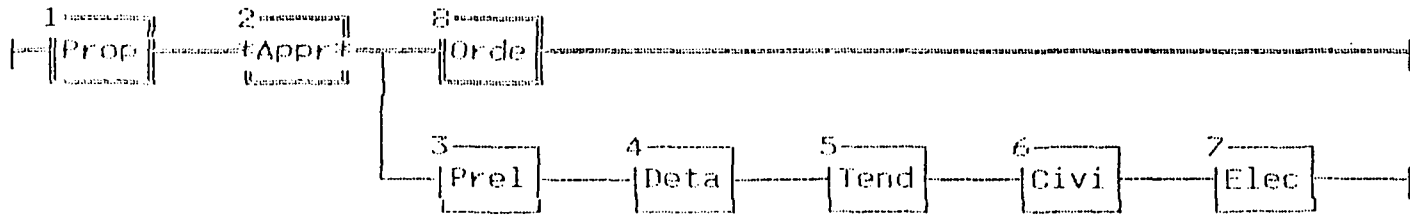
ORGANIZES

DIRECTS

Project management requires the coordination of

- Time
- Events
- People and materials
- Money





Project analysis comprises

- Step 1 Define the end products of a project
- Step 2 Define the activities that must be done for each end product
- Step 3 Define third level of detail
- Step 4 Define work package

| <u>Activity</u> | <u>Duration</u> | <u>Predecessor</u> |
|-------------------------------|-----------------|--------------------|
| 1 Proposal | 5 days | - |
| 2 Approval | 0 days | 1 |
| 3 Preliminary design | 5 days | 2 |
| 4 Detailed design | 20 days | 3 |
| 5 Tendering | 60 days | 4 |
| 6 Civil works | 20 days | 5 |
| 7 Electrical works | 10 days | 6 |
| 8 Ordering training equipment | 120 days | 2 |

Section 4

H A N D O U T

1. Introduction

Objective of this session is to introduce the concepts of scheduling by means of network planning. This is a continuation of the planning course presented by S. Naar.

During this session, we will

- briefly review the planning course;
- introduce the concepts of network planning;
- illustrate these techniques with a simple case study, the construction of the training center.

2. Network planning

Managing a project requires the coordination of time, events, people, materials, and money. We will therefore have to:

- set a time table;
- break the project down into small, separate EVENTS...these are called activities;
- assign the PEOPLE AND MATERIALS each activity requires...these are called the resources;
- enter an amount of MONEY each resource requires...these are called costs.

Network planning techniques have been developed during 1950s to solve these specific questions. We will review techniques which we basically already know:

- bar chart of activities/Gantt chart;
- flowchart of activities.

These techniques are called CPM (Critical Path Method) and PERT (Project Evaluation Review Technique).

With these techniques we can answer questions like:

- How long will this project take? Can we meet the projected completion date?
- If this activity is delayed, will the entire project slide? If so, by how much?
- How can we tell if we are on schedule in time to correct any problems?

- What are the critical relationships between specific activities? Can they be arranged to provide a smoother flow of operations?

3. Project Analysis

We need to analyse a project before we are able to prepare an adequate project planning. This will be demonstrated by reviewing the case study of the construction of the training center.

The first thing to do is to set a time table. Such a time table should contain the deadlines of the project and the workable days. Consider holidays, Ramadan and the rainy season.

The next thing to do is to break the project down into small, separate EVENTS which are then referred to as the activities. This is the most difficult thing to do.

The following approach is recommended:

Step 1. Define the end products of a Project;

Step 2. Define the activities that must be done for each end product;

Step 3. Define third level of detail

The third and subsequent level of detail reflect further subdivision of major activities already identified. Most projects can be clearly defined by three levels of details.

Step 4. Define work package

We continue to subdivide the project activities until we arrive at a number of easy to manage and handle activities. These "work packages" form the basis for planning, scheduling, and controlling the project.

The exact definition is a matter of feeling and practical considerations, amongst others

- the managerial responsibility for the work;
- the work package will be completed without interruption;
- the time needed to complete the work;
- the cost of the work package.

Once work packages have been defined, we can estimate the duration, the required resources and costs.

Now we know

- the activities (the work packages);
- the interrelationships between the activities;
- the duration of each activity;
- the required resources for each activity;
- the costs of each activity.

This information form the building blocks of our network planning.

4. The Case of the Training Centre

The planning approach of the construction of the Training Centre of WADS Nyala has been presented during the planning module. An project analysis is required to schedule the necessary activities.

Step 1. Define the end products of a Project;

- Operational Training Center.

Step 2. Define the activities that must be done for each end product;

- Securing finance;
- Design;
- Construction;
- Ordering training equipment.

Step 3. Define third level of detail

- Securing finance; = proposal;
- Design; = preliminary design;
- = detailed design;
- Construction; = tendering;
- = civil works;
- = electrical works;
- Ordering training equipment.

Step 4. Define work package

The third level appears to be sufficient detailed for our analysis. An analysis of the different activities shows the following duration and interrelationships:

| Activity | Duration | Predecessor |
|------------------------------------|----------|-------------|
| 1. proposal; | 5 days | - |
| 2. approval; | 0 days | 1. |
| 3. preliminary design | 5 days | 2. |
| 4. detailed design; | 20 days | 3. |
| 5. tendering; | 60 days | 4. |
| 6. civil works; | 20 days | 5. |
| 7. electrical works; | 10 days | 6. |
| 8. ordering training equipment. | 120 days | 2. |

Resources and costs will not be treated in this example.

5. Critical Path Method

Fig 1. represents the activities plotted in a Gantt chart. This is in fact similar to a bar chart of activities but some additional information is shown. The chart first identifies the critical activities, i.e. the activities that must be completed on time if we want to complete the project on time. The critical activities together form the critical path (indicated by the double line ==); activities on the critical path have no slack time (indicated by ...).

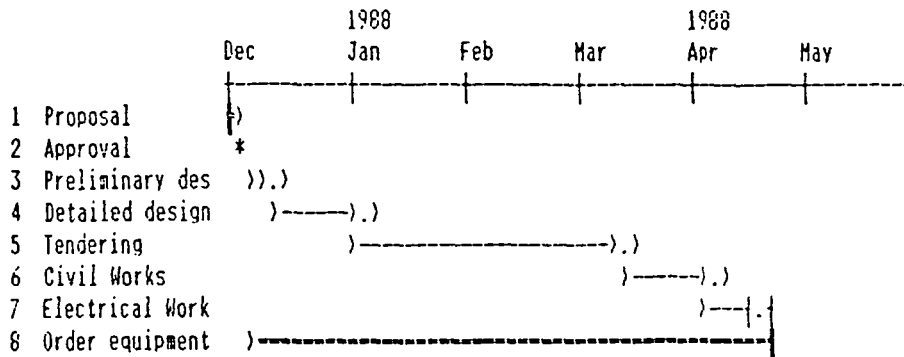


Figure 1

The most used symbols are represented in fig. 2.

| Graphics Symbol | Nongraphics Symbol | Meaning |
|-----------------|--------------------|--|
| ↑ | 0 | Start of a critical activity with no predecessors. |
| ↑ | 0 | Start of a noncritical activity with no predecessors. |
| ↓ | . | Start of an activity with predecessors, or end of an activity with successors. These symbols will appear in bold face when the activity is on the critical path. |
| ↓ | x | End of a critical activity with no successors. |
| ↓ | x | End of a noncritical activity with no successors. |
| * | . | Milestone (no duration). |
| ==== | ==== | Critical path. |
| | | Slack time. |
| ---- | ---- | Not on critical path. |
| --- | --- | Current date. |
| ↑ | ↑ | Activities or percent of activities that are completed according to the current date. |

symbols that represent activities on the critical path appear bolder than symbols for noncritical activities.

Figure 2

Note that not every project has a critical path; this means that every activity has slack time.

6. PERT

A PERT chart is a flow chart which shows the order and interrelationship of project activities. The PERT chart of our case is given in fig. 3. A PERT chart is particularly useful to analyze complex projects.

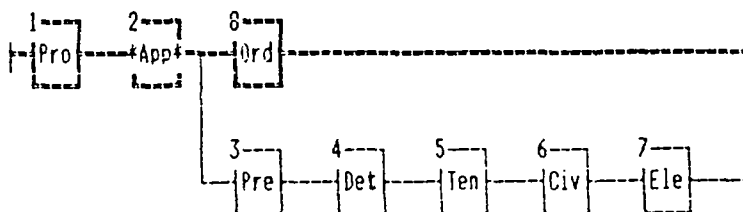


Figure 3

7. Summary

Managing a project requires the coordination of

- time;
- events;
- people and materials;
- money.

Network planning techniques have been developed during 1950s to solve these specific questions. The most common techniques are called CPM (Critical Path Method) and PERT (Project Evaluation Review Technique)

We need to analyse a project before we are able to prepare an adequate project planning.

The first thing to do is to set a time table. The next thing to do is to break the project down into small, separate EVENTS which are then referred to as the activities. The following approach is recommended:

- Step 1. Define the end products of a Project;
- Step 2. Define the activities that must be done for each end product;
- Step 3. Define third level of detail
- Step 4. Define work package

Once work packages have been defined, we can estimate the duration, the required resources and costs.

The results of this analysis will form the building blocks of our network planning.

The Critical Path Method produces a Gantt chart, similar to a bar chart of activities but with some additional information is shown. The critical path consists of those activities that must be completed on time if we want to complete the project on time. Non-critical activities possess slack time.

A PERT chart is a flow chart which shows the order and interrelationship of project activities. PERT chart is particularly useful to analyze complex projects.

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Section 4 : H A N D O U T (Exercice E1)

Duration : Open-ended

Task : Prepare with the participants a
Network Planning for the next
campaign for village water supply.