

# Activity Planning

# Activity Planning

**A detailed plan for the project include a schedule indicating the start and completion times for each activity. This will enable us to:**

- **ensure that the appropriate resources will be available precisely when required;**
- **avoid different activities competing for the same resources at the same time;**
- **produce a detailed schedule showing which staff carry out each activity;**
- **produce a detailed plan against which actual achievement may be measured;**
- **produce a timed cash flow forecast;**
- **replan the project during its life to correct drift from the target.**

# The Objectives of Activity Planning

Feasibility assessment :Is the project possible within required timescales and resource constraints?

Resource allocation: What are the most effective ways of allocating resources to the project. When should the resources be available?

Detailed costing :How much will the project cost and when is that expenditure likely to take place?

Motivation: Providing targets and being seen to monitor achievement against discusses targets is an effective way of motivating staff,

Coordination: When do the staff in different departments need to be available to This coordination work on a particular project and when do staff need to be transferred between will normally form projects?

# Identifying Activities

**There are three approaches to identify the activities or tasks that will make up the project:**

- The activity-based approach.
- The product-based approach.
- The hybrid-based approach.

# The activity-based approach

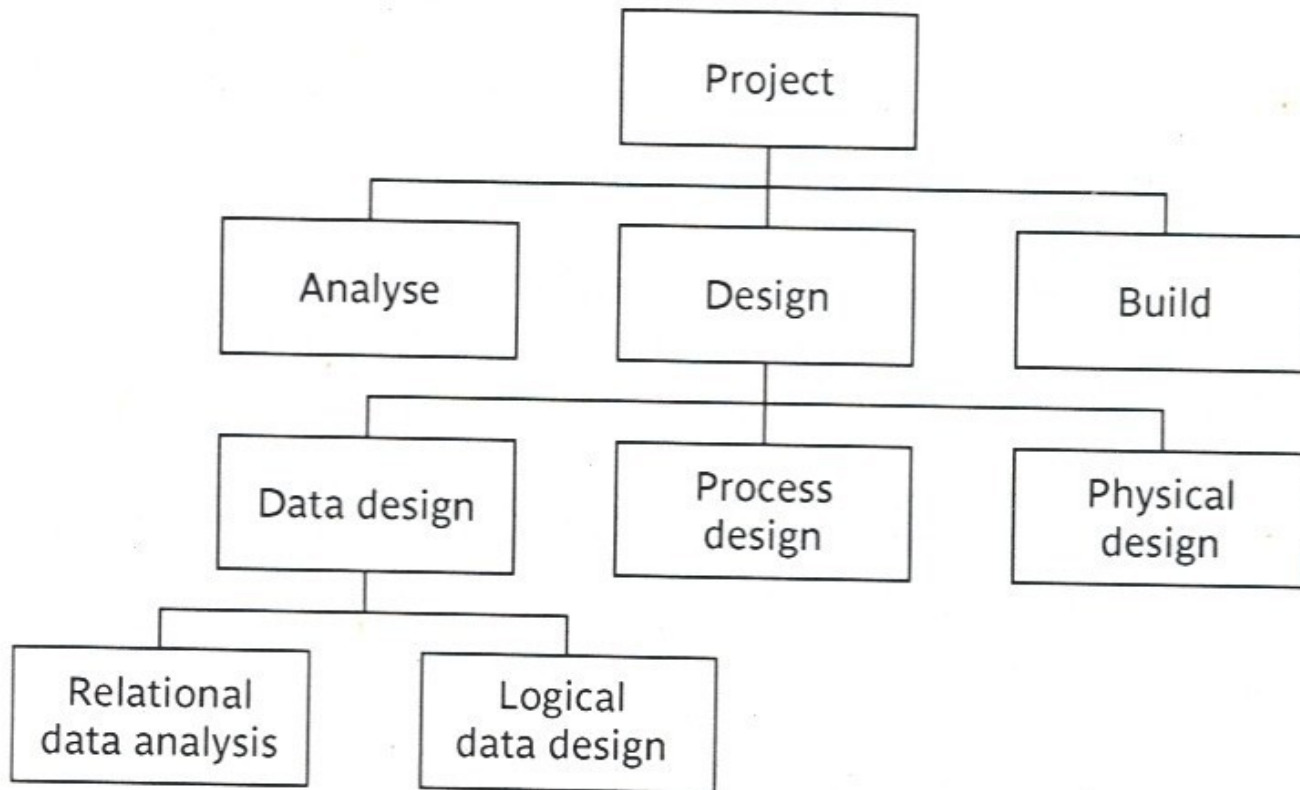
**The activity based approach** consists of creating a list of all activities that the project is thought to involve. How?

- Brainstorming session involving the whole project team
- The analysis of similar past projects.
- One useful way is to divide you projects into stages and think what activities might be required at each stage.

One way of creating the activity or task list is to create

**WBS (Work Breakdown Structure).**

# The activity-based approach (cont'd)



# The activity-based approach (cont'd)

## **In WBS we:**

- ▢ Identify the main (high level) tasks (activities) required to complete a project.
- ▢ Then break each of these down into a set of lower-level tasks.





# The activity-based approach (cont'd)

## When preparing the WBS:

- Too great depth should be avoided. **Why?**
  - Will result in a large number of tasks that will need to be managed.
- Too shallow structure should be avoided. **Why?**
  - This will provide insufficient detail for project control.

# The activity-based approach (cont'd)

## **Advantages (WBS)**

- More likely to obtain a task catalogue that is:
  - Complete
  - Composed of non-overlapping tasks

# The product-based approach

It consists of producing a **product breakdown structure PBS**, and a **product flow diagram PFD**.

- **Product Breakdown Structure (PBS)**

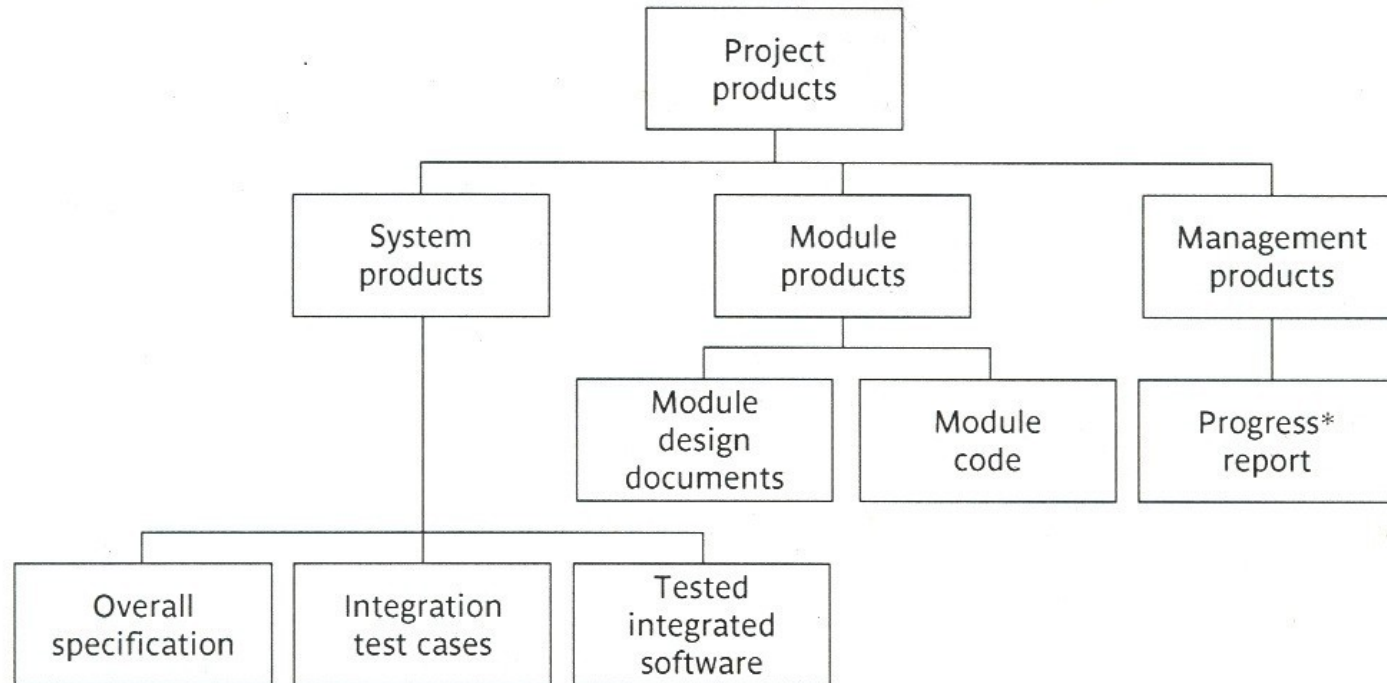
- To show how a system can be broken down into different products for development.
- Advantage: It is less likely to omit a product.

# The product-based approach (cont'd)

- **Product Flow Diagram (PFD)**

- Once a product breakdown structure has been created, work can then begin on creating a product flow diagram which identifies the order of precedence of products and will typically include multiple and complex parallel paths.

# PBS



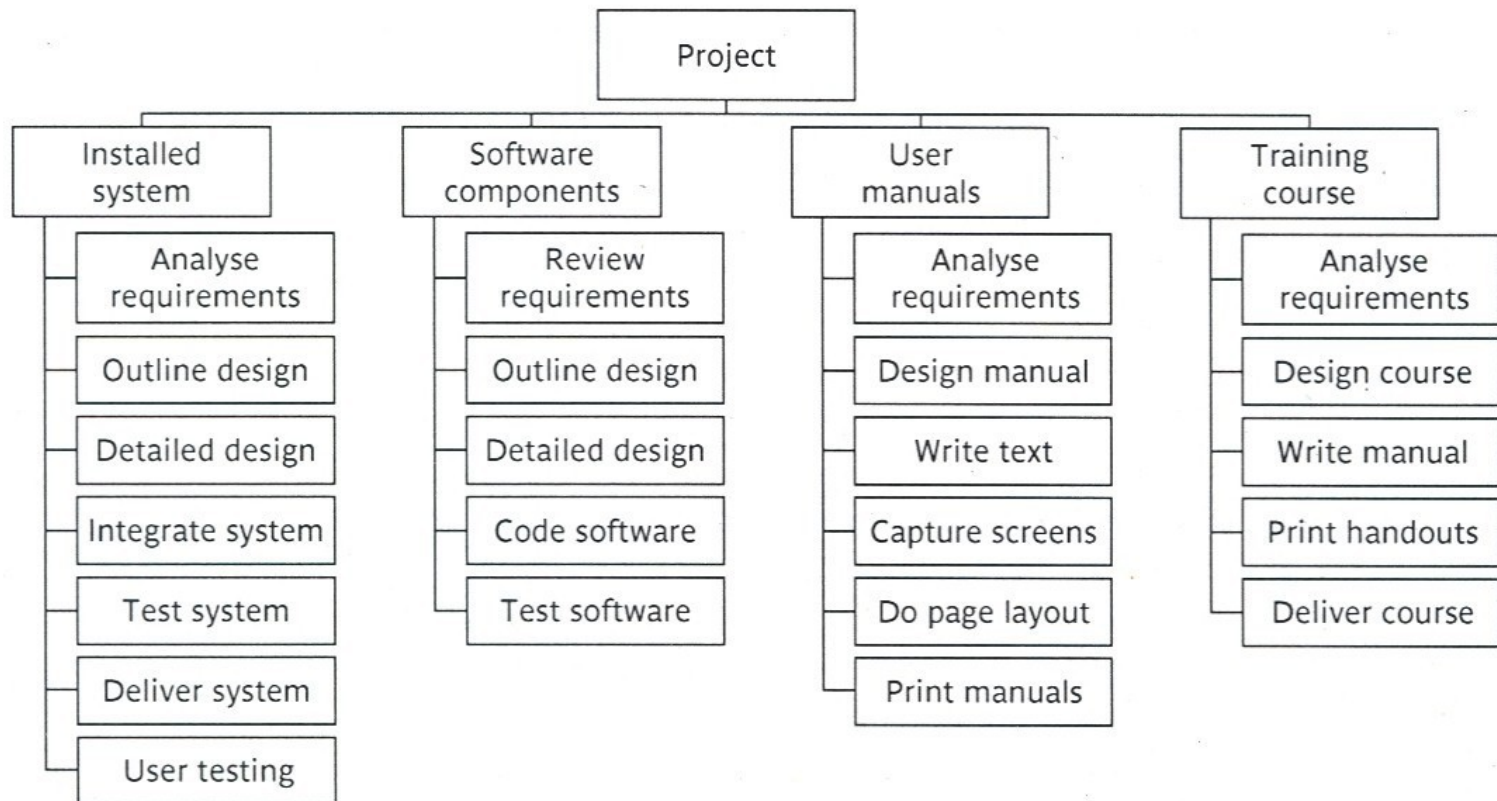
# The hybrid-based approach

- A mix of the activity-based approach and the product-based approach.
- Most commonly used approach.

**The “*WBS*” in the hybrid approach is based on:**

- a list of the deliverable products of the project; and
- a list of activities for producing each product.

# The hybrid-based approach (cont'd)





# Network Planning Models

**Network Planning Models:** are project scheduling techniques that model project activities and their relationships as a network.

- ▮ **Activity-on-Arrow techniques:**

- ▮ CPM (critical path method).
- ▮ PERT (program evaluation review technique).

- ▮ **Activity-on-Node techniques:**

- ▮ Precedence Networks.

These three methods are very similar and many people use **CPM** to refer to all of them.



# Sequencing and Scheduling Activities

- A scheduling clearly indicates when each activities is planned to occur and what resources it will need.
- .
- A sheduling has taken an account of the availability of staff and the ways in which the activities have been allocated to them
- One way to represent it using bar chart

# Sequencing and Scheduling Activities

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13
A : Andy	■												
B : Andy		■											
C : Andy			■										
D : Andy				■									
E : Bill			■	■	■	■							
F : Bill						■	■	■	■				
G : Charlie				■	■	■	■	■					
H : Charlie									■	■			
I : Dave										■	■	■	■

Task - Person	Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13
A : Andy		■												
B : Andy			■											
C : Andy				■										
D : Andy					■									
E : Bill			■	■	■	■								
F : Bill						■	■	■	■					
G : Charlie				■	■	■	■	■	■					
H : Charlie										■	■			
I : Dave											■	■	■	■

Activity key

A : Overall design  
B : Specify module 1  
C : Specify module 2  
D : Specify module 3  
E : Code module 1

F : Code module 3  
G : Code module 2  
H : Integration testing  
I : System testing

# Network Planning Models

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 Activity-on-Arrow techniques:

 CPM (critical path method).

 PERT (program evaluation review technique).

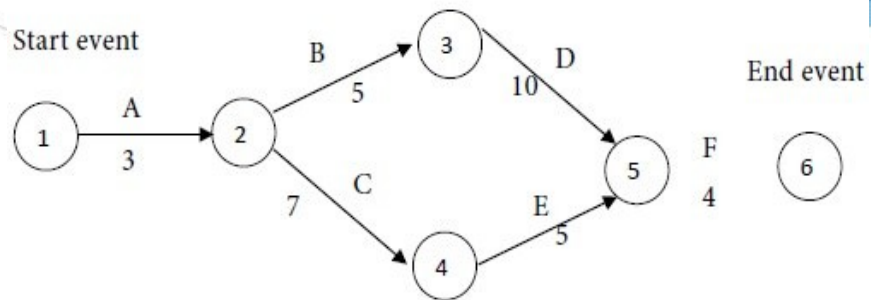
 Activity-on-Node techniques:

 Precedence Networks.

These three methods are very similar and many people use CPM to refer to all of them.

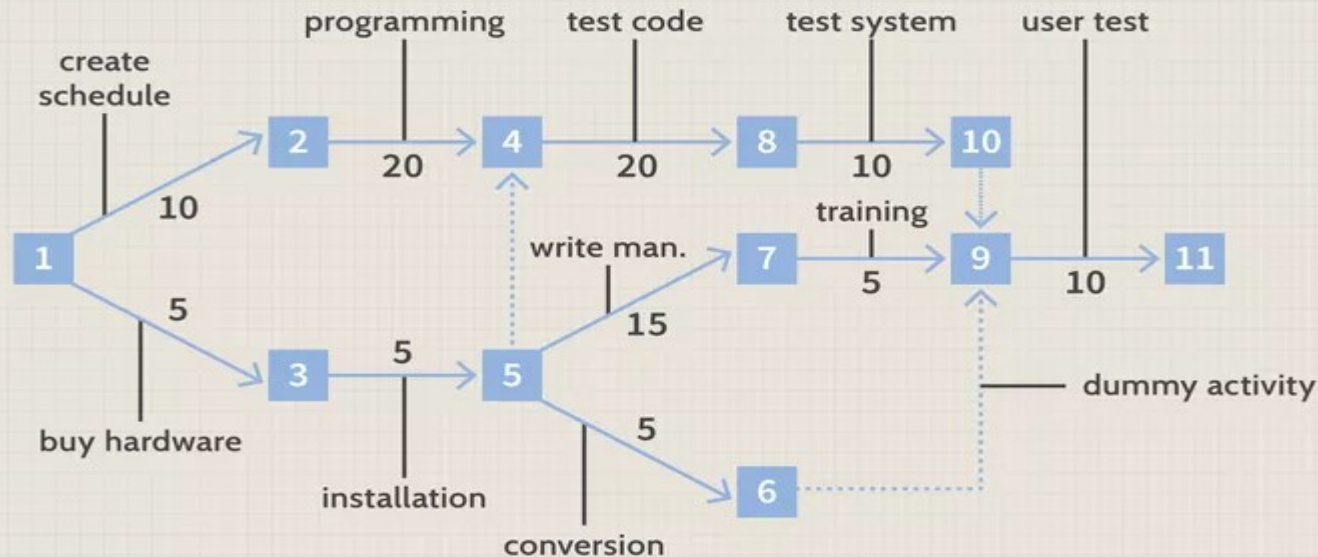


## CPM (critical path method).



Activity	Predecessor Activity	Duration (Weeks)
A	-	3
B	A	5
C	A	7
D	B	10
E	C	5
F	D,E	4

# PERT (program evaluation review technique).



- Numbered rectangles are nodes and represent events or milestones.
- Directional arrows represent dependent tasks that must be completed sequentially.
- Diverging arrow directions (e.g. 1-2 & 1-3) indicate possibly concurrent tasks.
- Dotted lines indicate dependent tasks that do not require resources.

# PERT (program evaluation review technique).

A PERT chart uses circles or rectangles, called nodes, to represent project events or milestones.

The nodes on the PERT chart are linked by vectors or lines that represent various tasks

Dependent tasks are items that must be performed in a specific manner. For example, if an arrow is drawn from Task No. 1 to Task No. 2 on a PERT chart, Task No. 1 must be completed before work on Task No. 2 begins

Items at the same stage of production but on different task lines within a project are referred to as parallel tasks. They're independent of each other and occur at the same time.



# Precedence Networks



Activity-on-Node techniques:



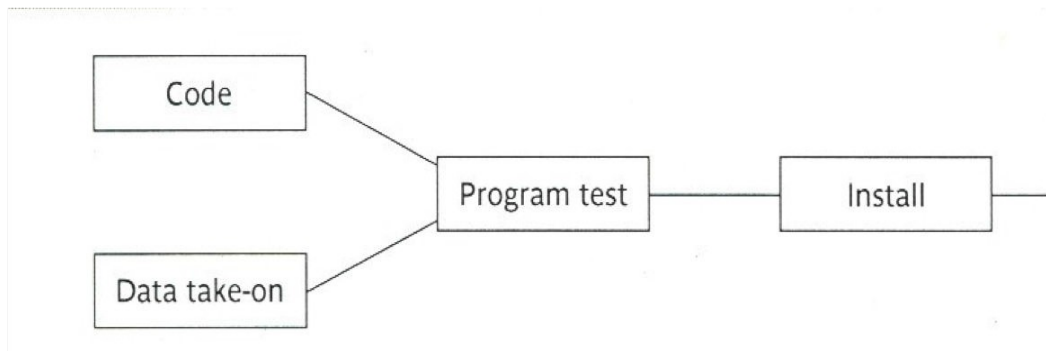
In the precedence networks:



The nodes represent activities.

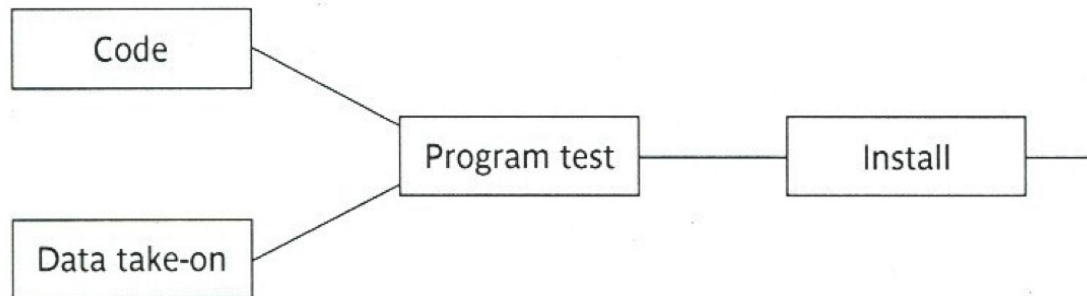


The lines between nodes represent dependencies.



# Precedence Networks

- **In the precedence networks:**
  - The nodes represent activities.
  - The lines between nodes represent dependencies.



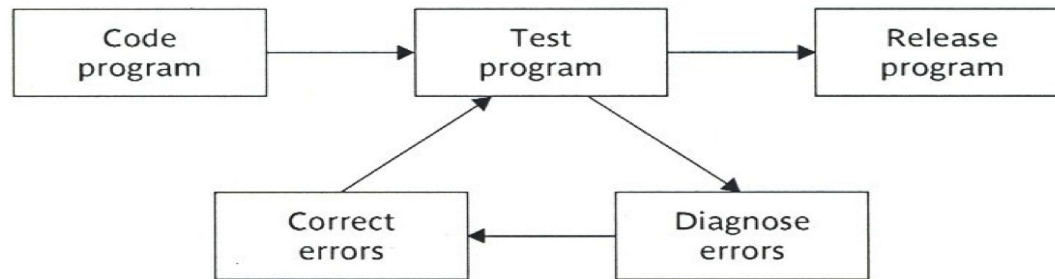


# Precedence Networks (cont'd)

## Rules and Conventions

- A project network should have only one start node.
- A project network should have only one end node.
- A node has duration.
- Links have no duration.
- Precedents are referred to the immediate preceding activities.
- Time moves from left to right.
- A network may not contain loops.
- A network should not contain dangles.

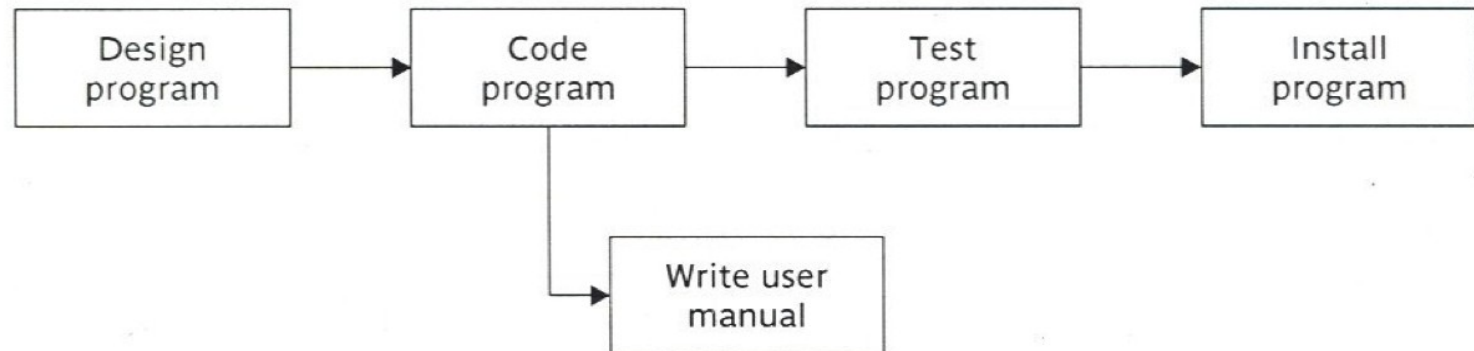
# Precedence Networks (cont'd)



**Loops can't be directly represented in a project network.**

- If you know the number of times we expect to repeat a set of activities, then
- we can draw them in a sequence repeating them for the appropriate number of times.

# Precedence Networks (cont'd)

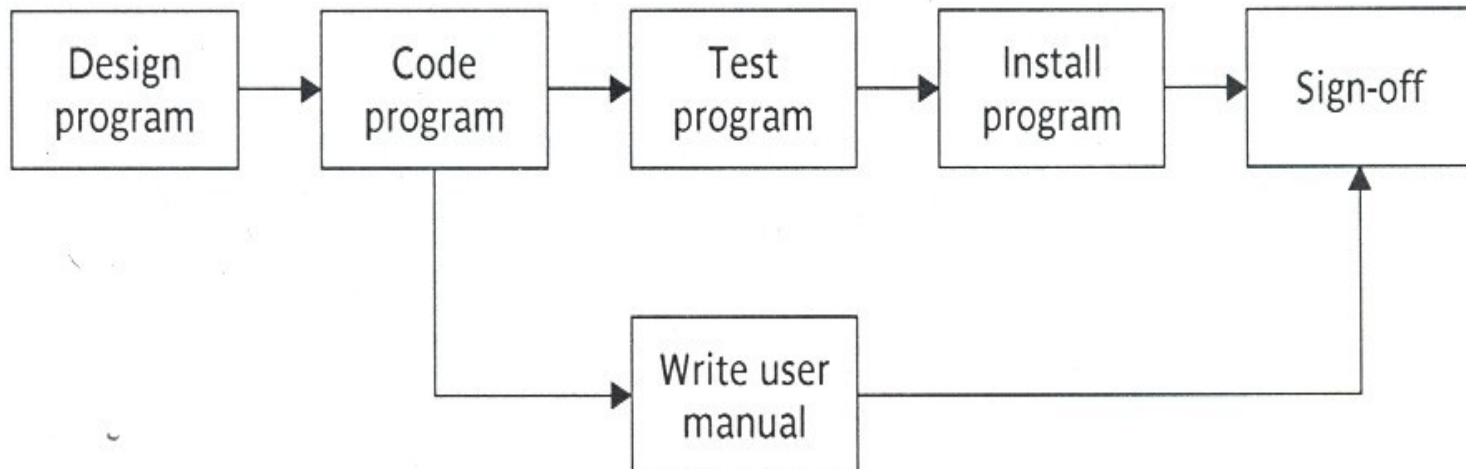


A dangle: Here what is meant by the diagram is: that the project will be finished once we “the program has been installed” and “the user manual is written”.

“Write user manual” is a dangling activity.

# Precedence Networks (cont'd)

## □ resolving the dangle



# Precedence Networks (cont'd)

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