PROJECT MANAGEMENT

LECTURE MODULE-8

Topic : Gantt Chart

Gantt chart

A Gantt chart is a type of bar chart that illustrates a project schedule. This chart lists the tasks to be performed on the vertical axis, and time intervals on the horizontal axis.

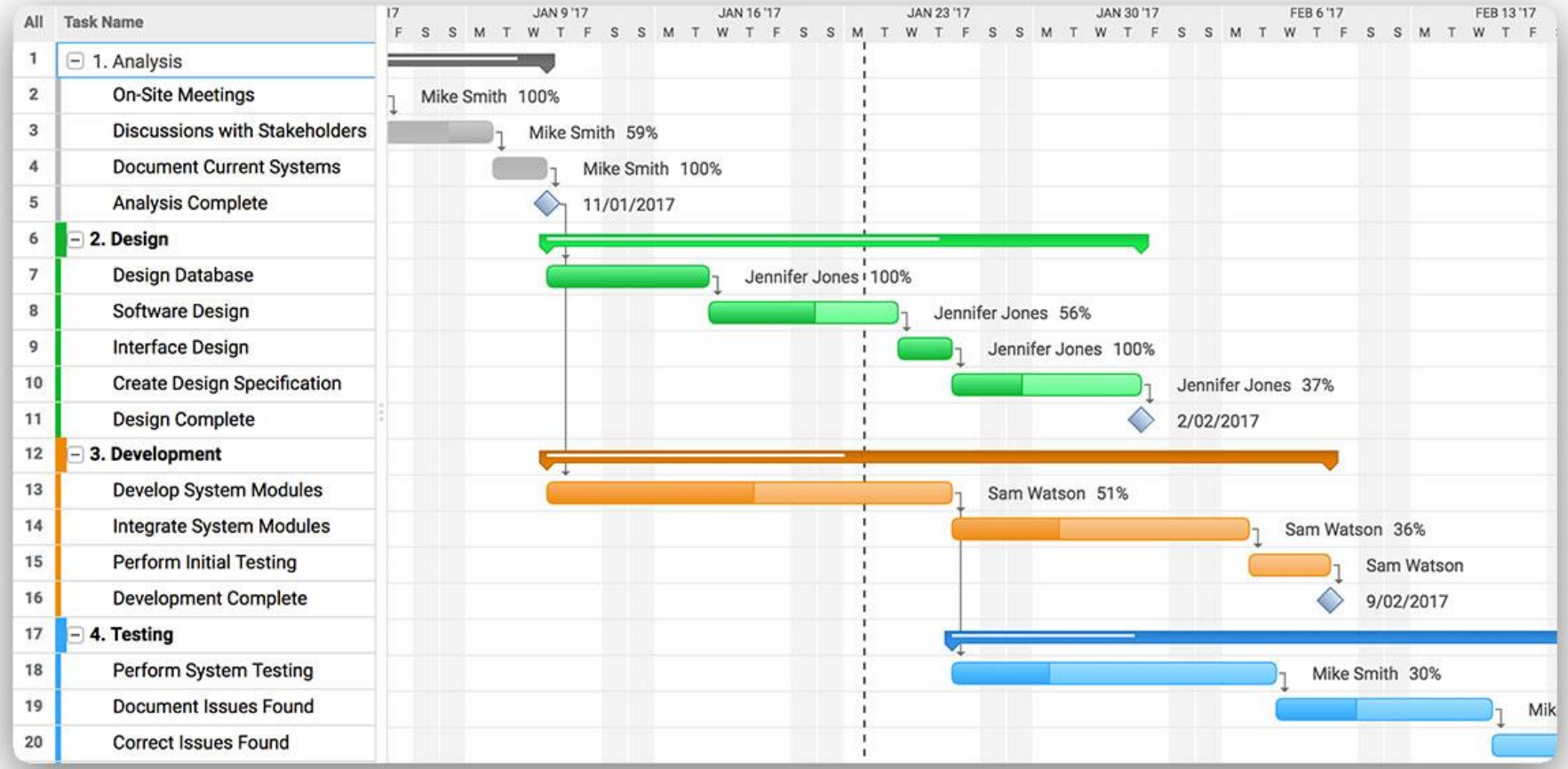
The width of the horizontal bars in the graph show the duration of each activity.
Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project.

Gantt chart

Terminal elements and summary elements constitute the work breakdown structure of the project.

Modern Gantt charts also show the dependency (i.e., precedence network) relationships between activities.
Gantt charts can be used to show current schedule status using percent-complete shadings and a vertical "TODAY" line as shown here.

Gantt chart


All
Task Name
JAN 9 '17
JAN 16 '17
JAN 23 '17
JAN 30 '17
FEB 6 '17
FEB 13 '17
1. Analysis
On-Site Meetings
Mike Smith 100%
Discussions with Stakeholders
Mike Smith 59%
Document Current Systems
Mike Smith 100%
Analysis Complete
11/01/2017
2. Design
Design Database
Jennifer Jones 100%
Software Design
Jennifer Jones 56%
Interface Design
Jennifer Jones 100%
Create Design Specification
Jennifer Jones 37%
Design Complete
2/02/2017
3. Development
Develop System Modules
Sam Watson 51%
Integrate System Modules
Sam Watson 36%
Perform Initial Testing
Sam Watson
Development Complete
9/02/2017
4. Testing
Perform System Testing
Mike Smith 30%
Document Issues Found
Correct Issues Found

Gantt chart

Gantt charts are sometimes equated with bar charts.

Gantt charts are usually created initially using an *early start* *time approach*, where each task is scheduled to start immediately when its prerequisites are complete.

This method maximizes the float time available for all tasks.

Historical development of Gantt chart

Although now regarded as a common charting technique, Gantt charts were considered revolutionary when first introduced.

The first known tool of this type was developed in 1896 by Karol Adamiecki, who called it a *harmonogram*.

Adamiecki did not publish his chart until 1931, however, and only in Polish, which limited both its adoption and recognition of his authorship.

Historical development of Gantt chart

In 1912, Hermann Schürch (de) published what would be consider Gantt charts while discussing a construction project.
It appears that Schürch's charts were not notable but rather routine in Germany at the time they were published.
The prior development leading to Schürch's work is unknown.
Unlike later Gantt charts, Schürch's charts did not display interdependencies, leaving them to be inferred by the reader.

Historical development of Gantt chart

These were also static representations of a planned schedule.

The chart is named after Henry Gantt (1861-1919), who designed his chart around the years 1910–1915.

One of the first major applications of Gantt charts was by the United States during World War I, at the instigation of General William Crozier.

Historical development of Gantt chart

The earliest Gantt charts were drawn on paper and therefore had to be redrawn entirely in order to adjust to schedule changes.

For many years, project managers used pieces of paper or blocks for Gantt chart bars so they could be adjusted as needed.

In the 1980s, personal computers allowed widespread creation of complex and elaborate Gantt charts.

Historical development of Gantt chart

The first desktop applications were intended mainly for project managers and project schedulers.

With the advent of the Internet and increased collaboration over networks at the end of the 1990s, Gantt charts became a common feature of web-based applications, including collaborative groupware. By 2012, almost all Gantt charts were made by software which can easily adjust to schedule changes.

Historical development of Gantt chart

In 1999, Gantt charts were identified as "one of the most widely used management tools for project scheduling and control".

Elements of Project Management
Project Scheduling

- Project schedule evolves from planning documents, with focus on timely completion.
- Critical element in project management – source of most conflicts and problems.
- Schedule development steps:
  1. Define activities,
  2. Sequence activities,
  3. Estimate activity times,
  4. Develop schedule.
- ***Gantt chart*** and ***CPM/PERT*** techniques can be useful.
- Computer software packages available, e.g. QM for Windows, Microsoft Project.

Elements of Project Management
Gantt Chart

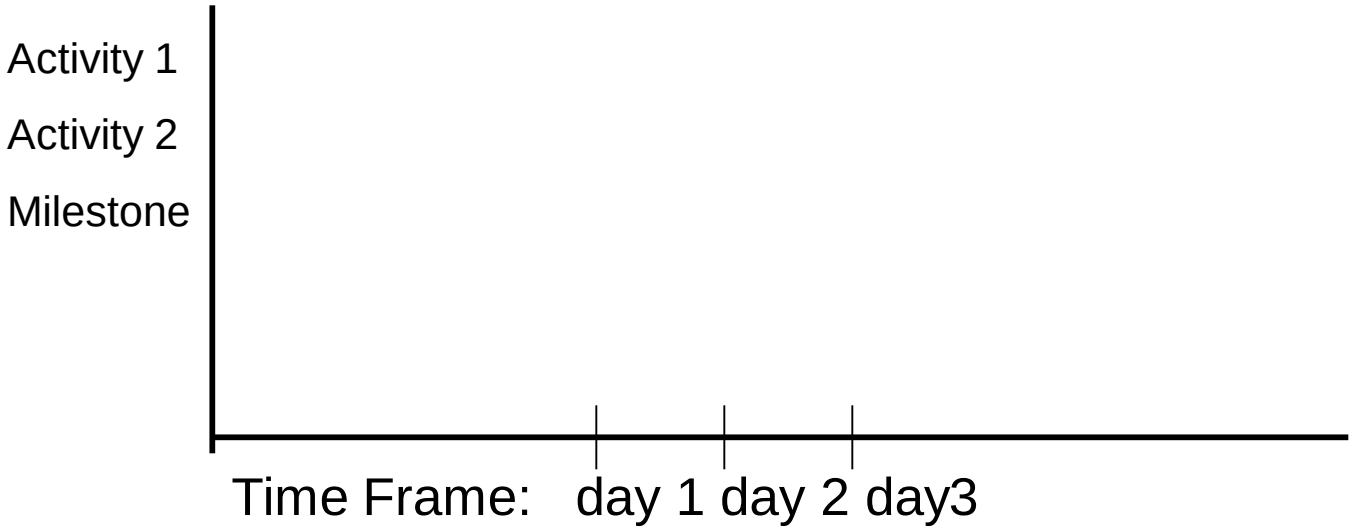
- Popular, traditional technique, also known as a ***bar chart*** - developed by Henry Gantt (1914).
- Direct precursor of CPM/PERT for monitoring work progress.
- A ***visual display of project schedule*** showing activity start and finish times and where extra time is available.
- Suitable for projects with few activities and precedence relationships.
- Drawback: precedence relationships are not always discernible which limits chart's use for smaller projects

Gantt Chart

- Visual scheduling tool
- Graphical representation of information
- Show dependencies between tasks, personnel, and other resources allocations
- Track progress towards completion

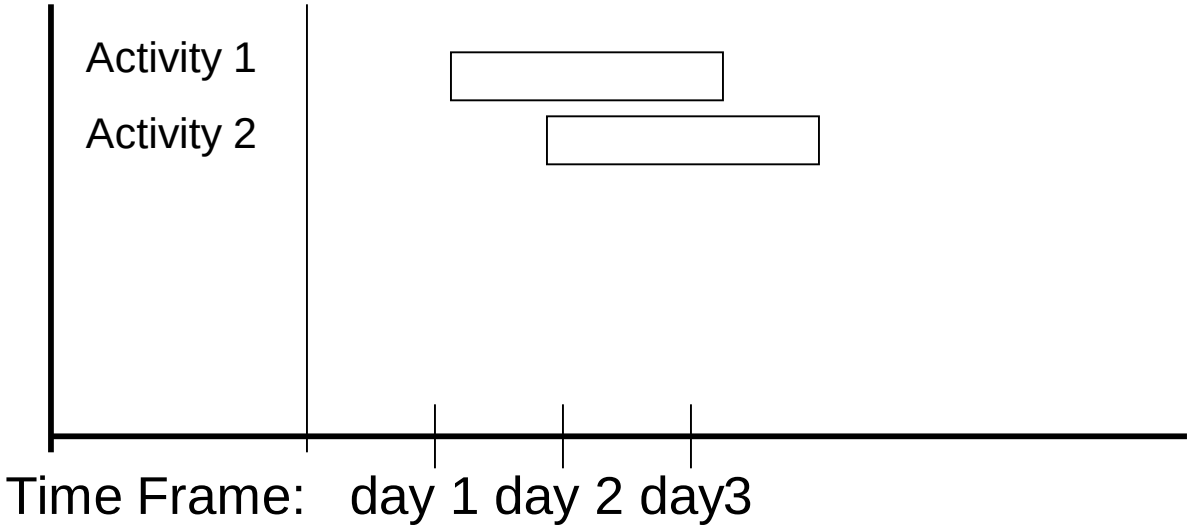
Building a Gantt Chart

- List all tasks and milestones from the project along the vertical axis
- List time frame along the horizontal axis



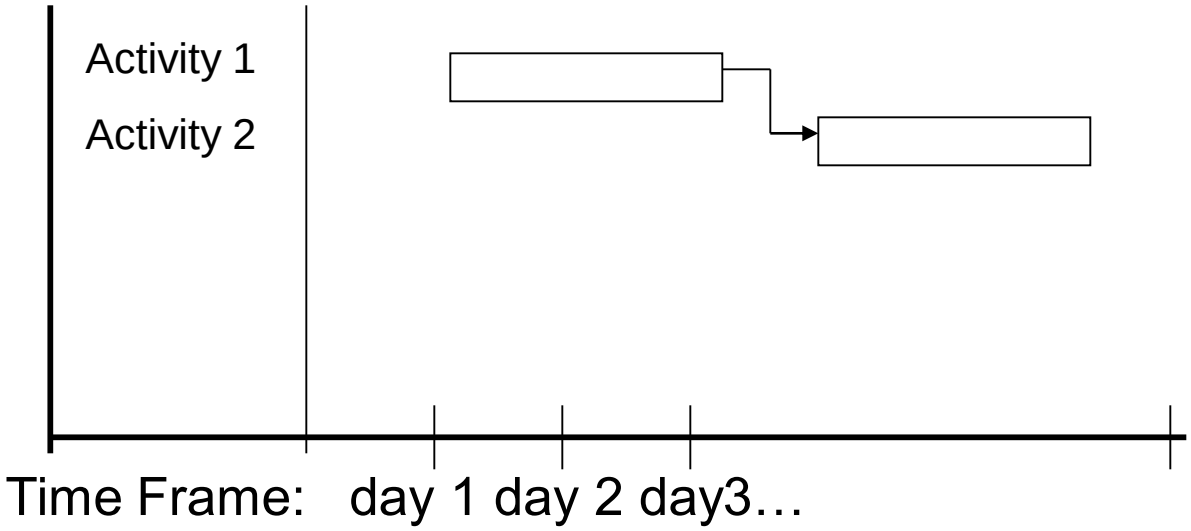
Building a Gantt Chart

- Activities: Create box the length of each activity time duration
  - E.g., activity one is scheduled from day1-day3



Building a Gantt Chart

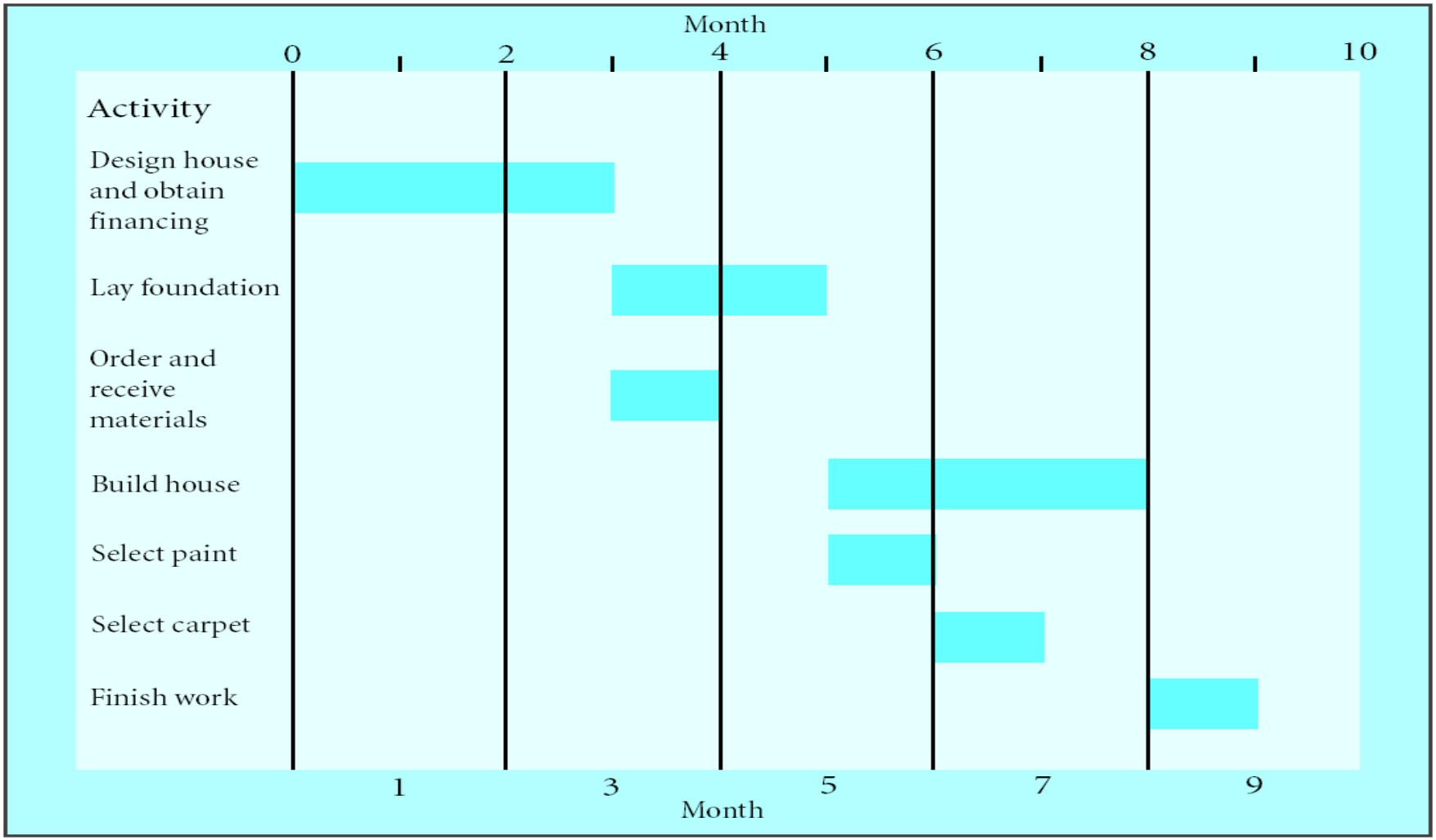
- Dependencies: Show dependencies between activities with arrows
  - E.g., activity 2 cannot start until activity 1 is complete



Sequence of Activities of The Project - House Building

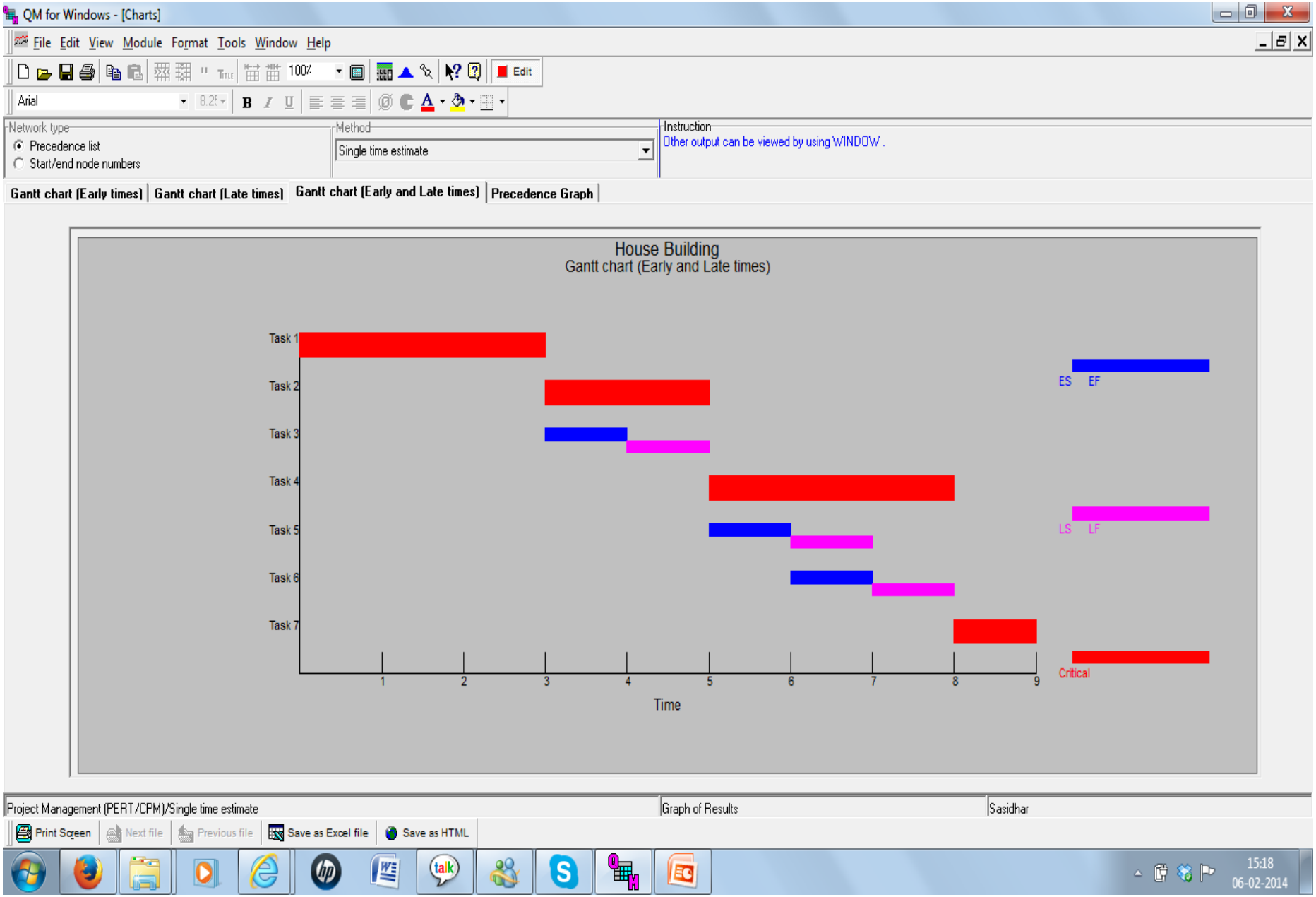
Number	Activity	Predecessor	Duration
1	Design house and obtain financing	--	3 months
2	Lay foundation	1	2 months
3	Order and receive materials	1	1 month
4	Build house	2,3	3 months
5	Select paint	2, 3	1 month
6	Select carper	5	1 month
7	Finish work	4, 6	1 month

Gantt Chart for House Building Project



A Gantt chart

Gantt Chart for House Building Project using QM for Windows



Gantt Charts

- ✓ Establish a ***time-phased network***
- ✓ Can be used as a ***tracking tool***

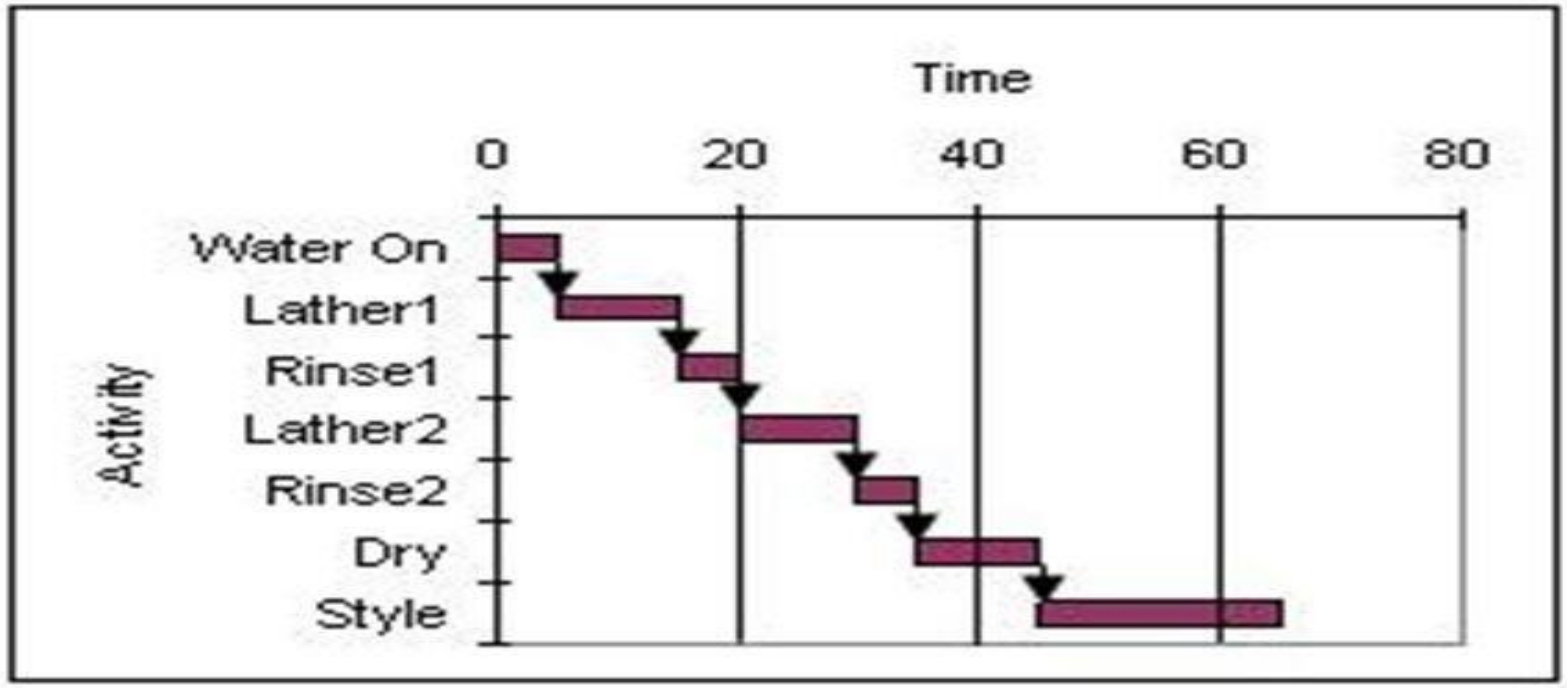
<u>Benefits of Gantt charts</u>

1. Easy to ***create*** and ***comprehend***
2. Identify the schedule ***baseline*** network
3. Allow for ***updating*** and ***control***
4. Identify ***resource needs***

Gantt Charts – Example

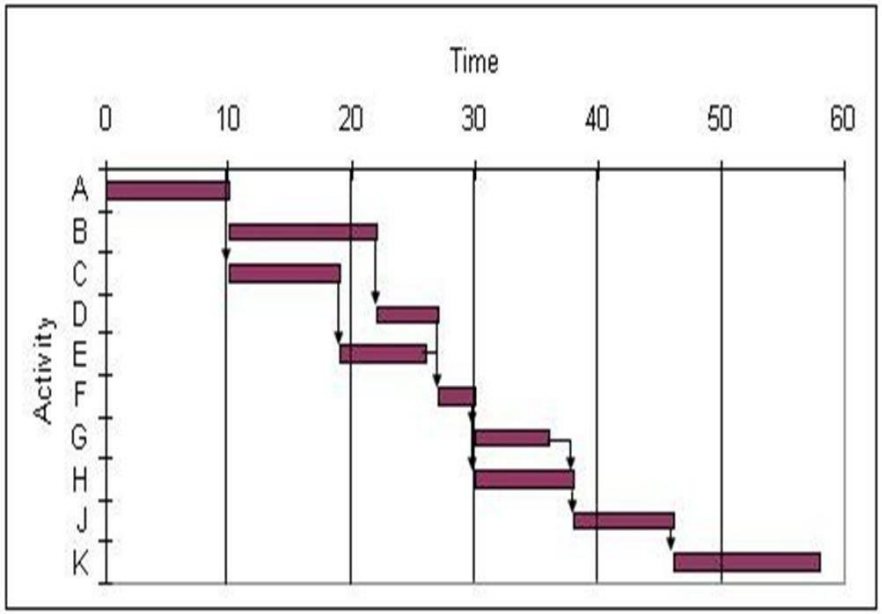
Consider the Gantt chart shown below where the time scale is in minutes and all activities are performed on an early start basis. How much slack is available in the project?

- Answer: Nil



Gantt Charts – Resource Allocation Example

Use the Gantt chart and the activity list to determine when resource 5 is free.

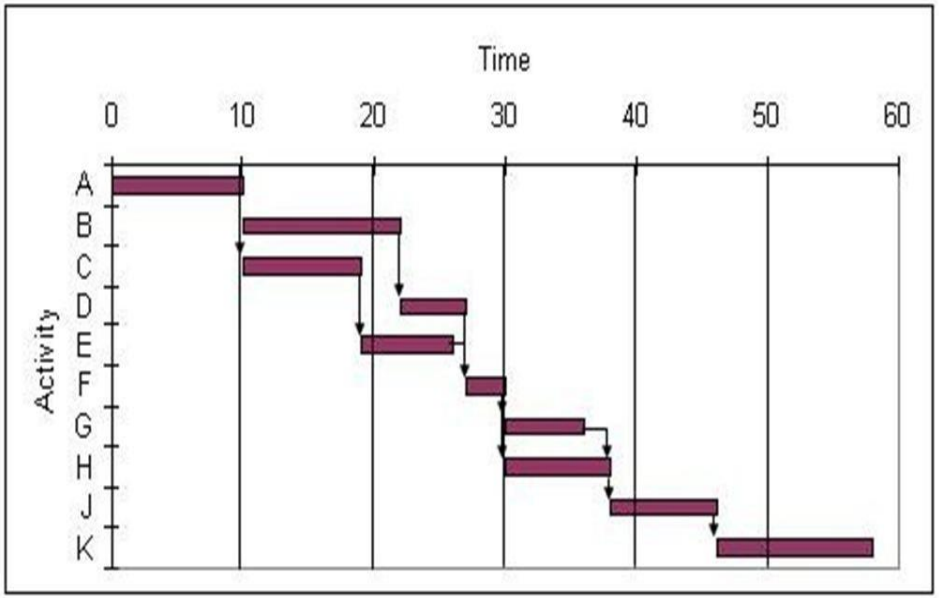


Activity	Resources	Activity	Resources
A	1	F	1
B	5	G	2
C	4	H	5
D	3	J	3
E	2	K	4

A) between 0 and 15
B) between 15 and 30
C) between 30 and 45
D) between 45 and 60
Answer: D

Gantt Charts – Resource Allocation Example

Use the Gantt chart and the activity list to determine when resource 2 is free.



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D	3	J	3
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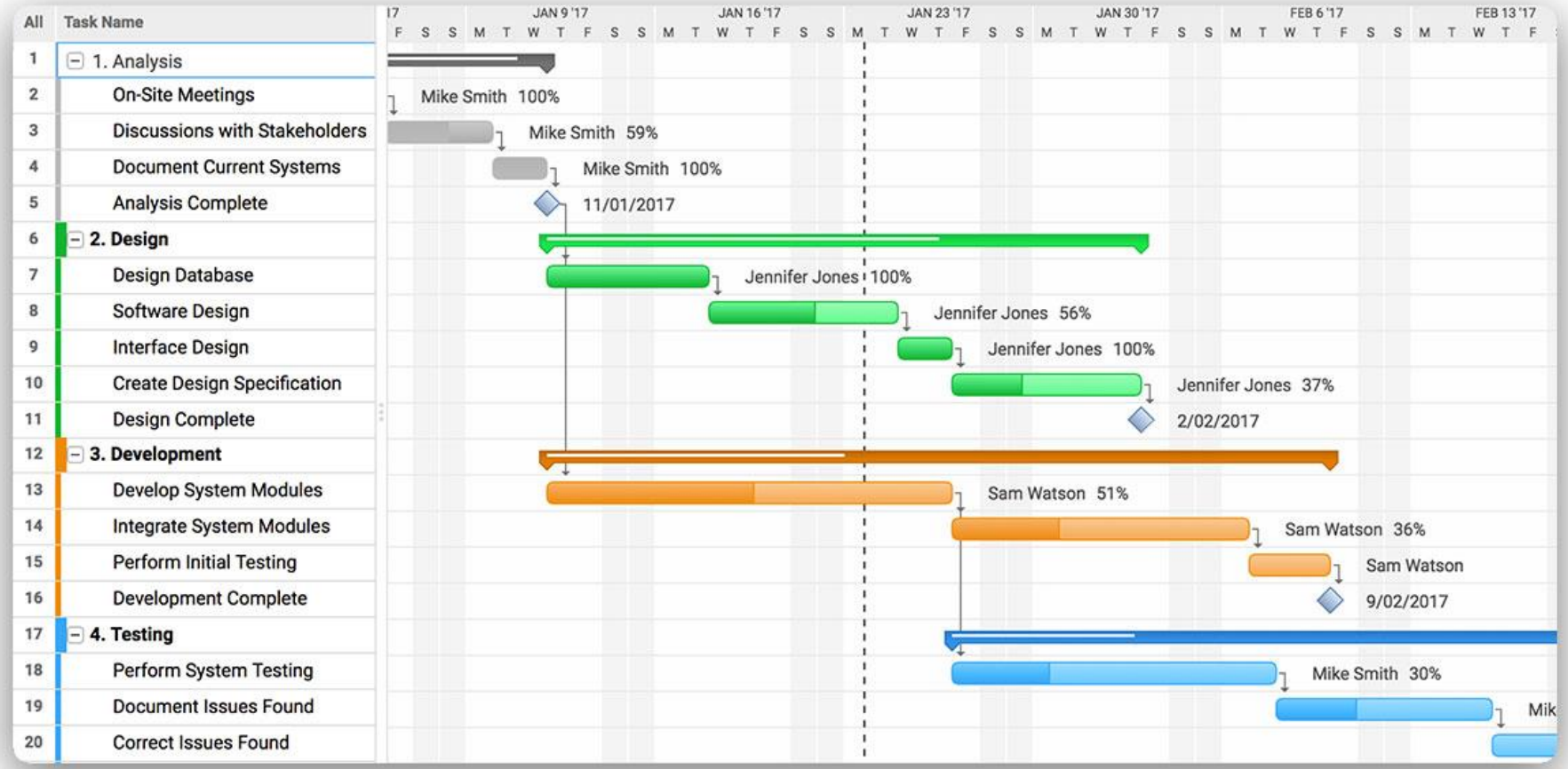
C) between 30 and 45
D) between 45 and 60
Answer: A

Gantt chart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