Fundamentals of Project Planning and Management

Week 2: Project Planning

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UNIVERSITY of VIRGINIA
DARDEN SCHOOL OF BUSINESS

Fundamentals of Project Planning and Management

Week 1	Week 2		
Define and Organize	*Plan*		
Project Goal The Three Objectives and their Priorities Organization	Project Scoping Dependencies Schedule Trade-Offs		

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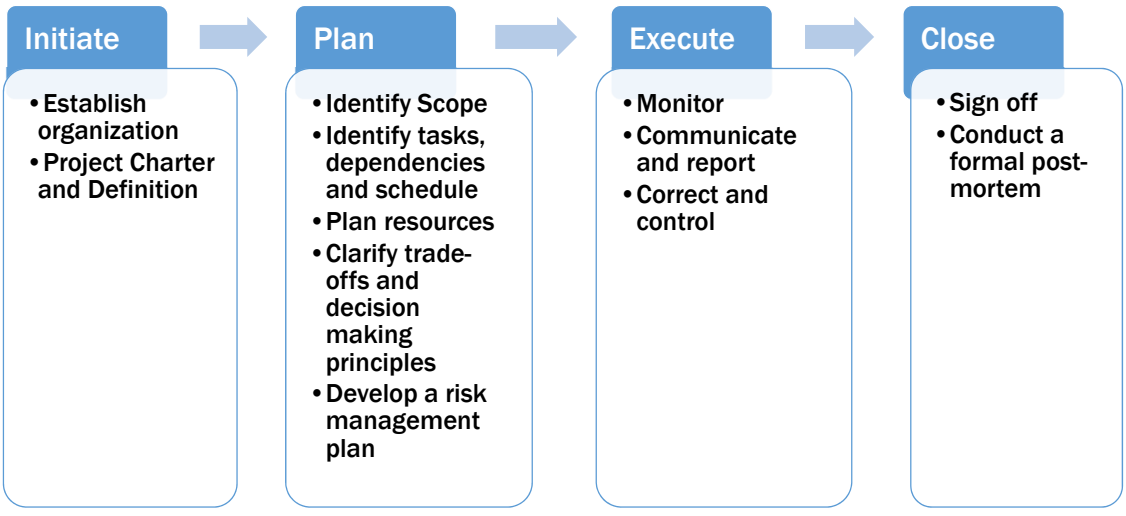
Drucker's *Effective Executive*

An (action) Plan is:

- Statement of intentions ≠Commitment
- Not a straitjacket
- Should be revised often
- Should anticipate the need to be flexible
- Needs a system for checking the results against expectations
- Becomes the basis for executive time management

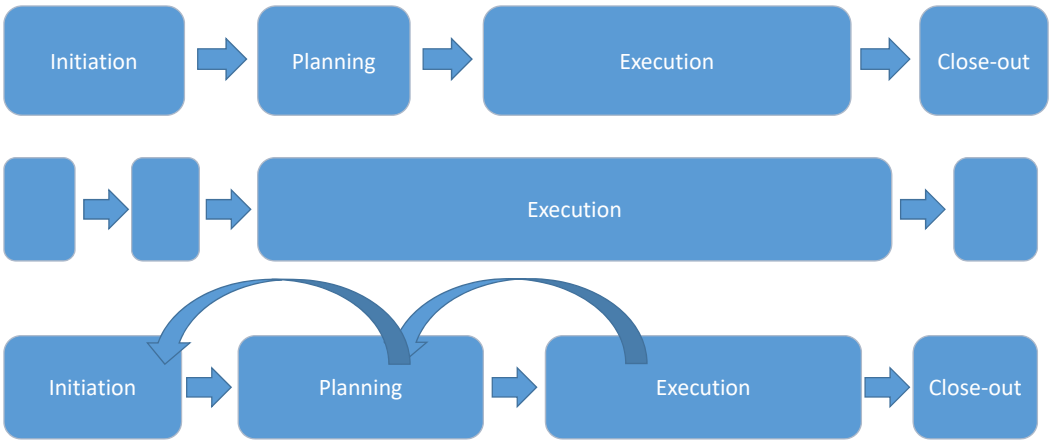
(Drucker 2006)

Project Life-Cycle



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Project Life-Cycle



Work Breakdown Structure

- **Visually breaks down project scope**
  - **Project**
    - **Subprojects**
      - **Work packages**
        - **Activities / Tasks**

It might start messy….

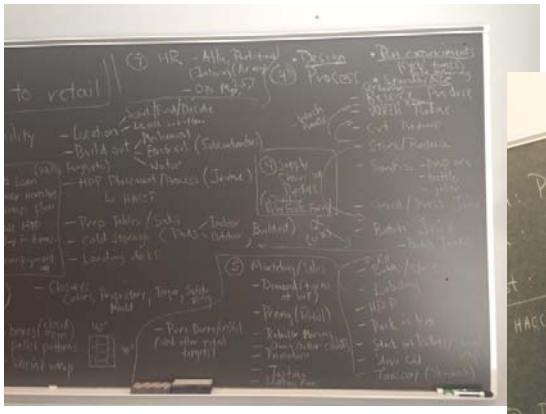
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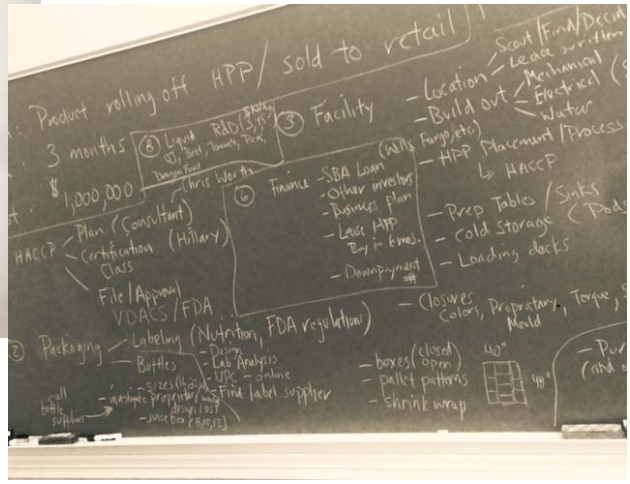
Work Breakdown Structure: Example





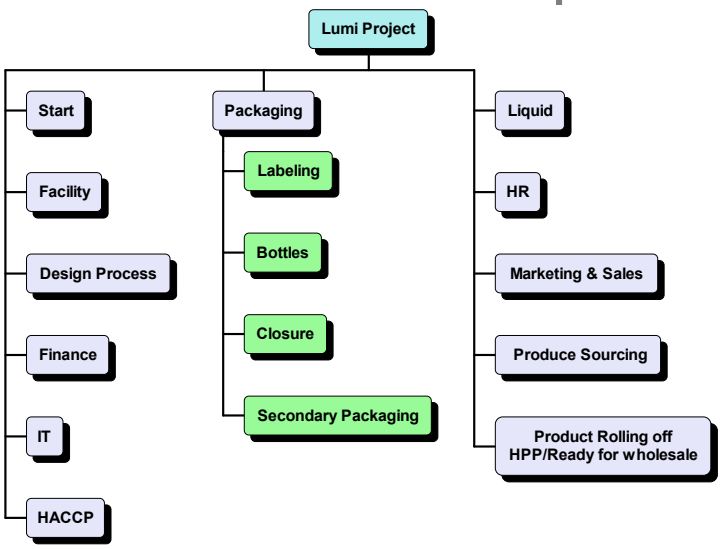
Work Breakdown Structure: Example

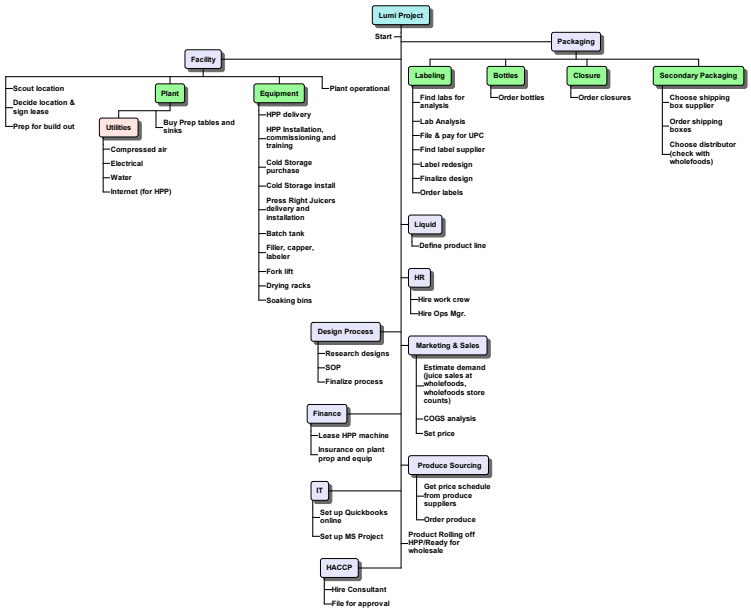




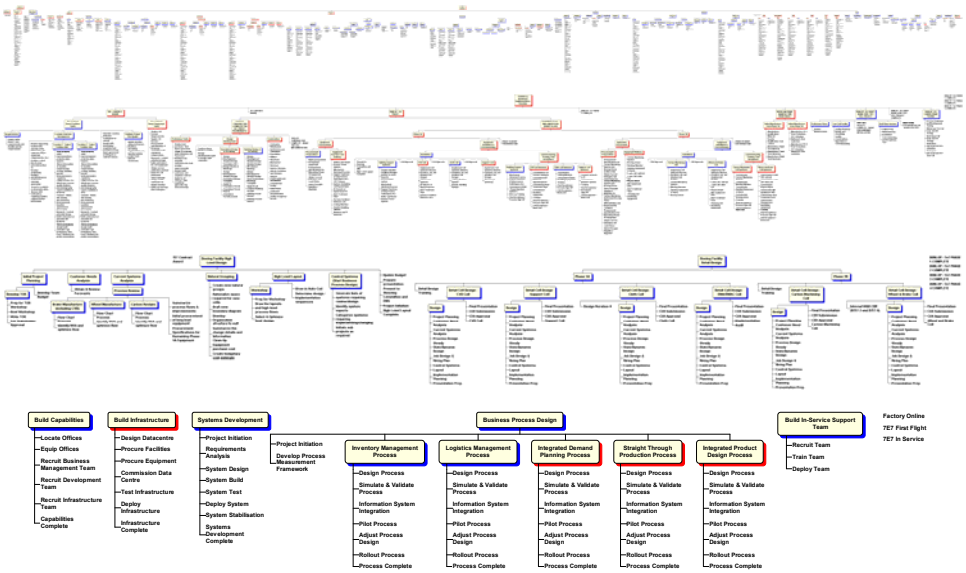
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Work Breakdown Structure: Example





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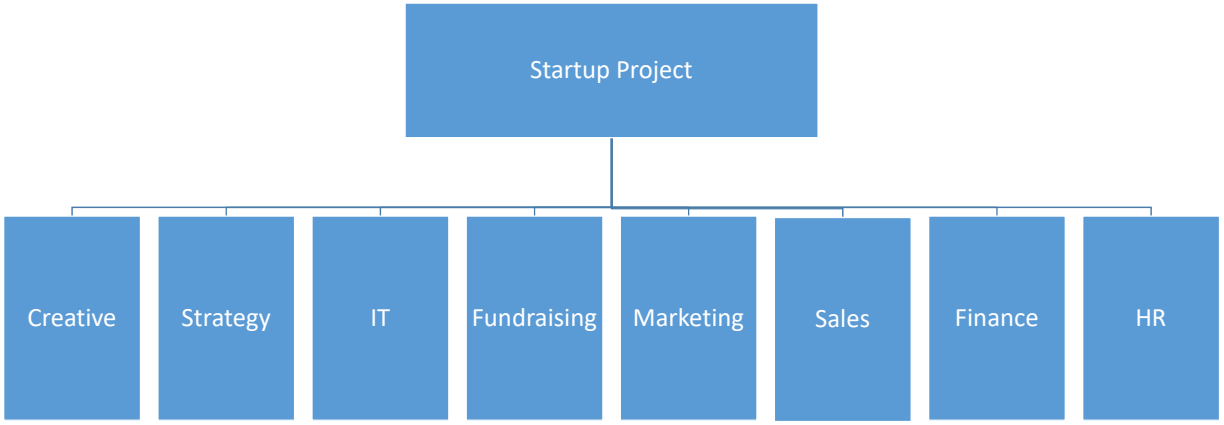


Work Breakdown Structure - Tips

- Use Sticky notes/blackboard/white board
- Team development
- Use automated e.g. MS Project, WBSPro
- Detail down to no less than 5%-10% of the total duration or a single resource

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Work Breakdown Structure



Dependency (Design) Structure Matrix

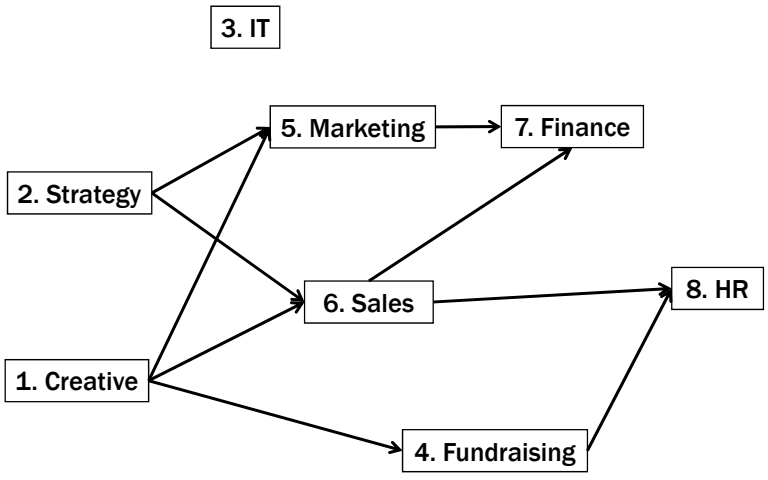
	1	2	3	4	5	6	7	8
1								
2								
3								
4	■							
5	■	■						
6	■	■						
7					■	■		
8				■		■		

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Project Planning: Dependencies

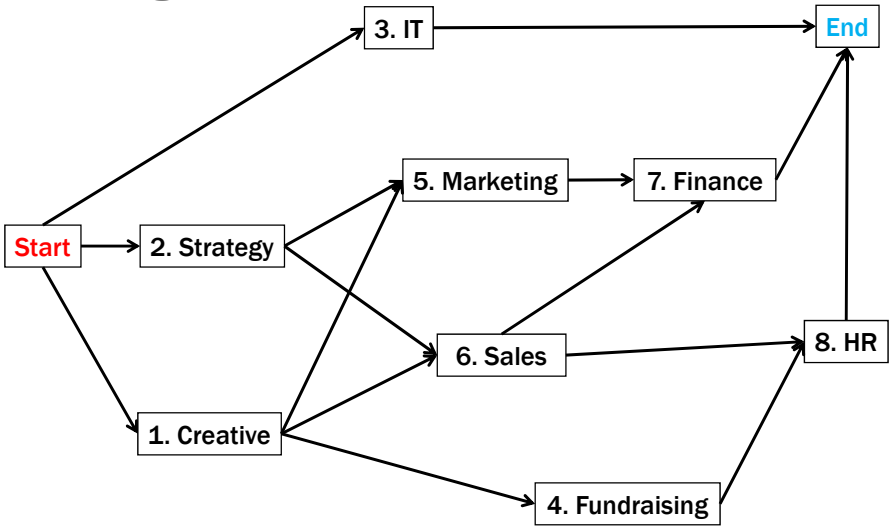
Activity #	Description	Predecessors
1	Creative	-
2	Strategy	-
3	IT	-
4	Fundraising	1
5	Marketing	1,2
6	Sales	1,2
7	Finance	5,6
8	HR	4,6

Network Diagram

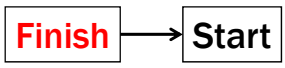


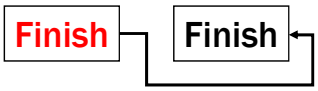
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Network Diagram

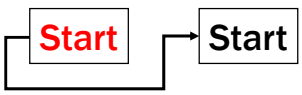


Types of Dependencies









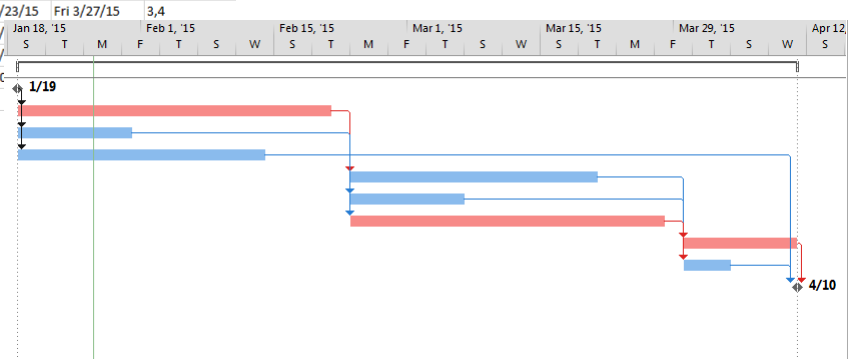
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Project Planning: Durations

Activity #	Description	Predecessors	Duration (Weeks)
1	Creative	-	5
2	Strategy	-	2
3	IT	-	4
4	Fundraising	1	4
5	Marketing	1,2	2
6	Sales	1,2	5
7	Finance	5,6	2
8	HR	4,6	1

Gantt chart: Dependencies and Milestones

	Task Name	Duration	Start	Finish	Predecessors
1	Startup Project	12 wks	Mon 1/19/15	Fri 4/10/15	
2	Startup Project	0 days	Mon 1/19/15	Mon 1/19/15	
3	Creative	5 wks	Mon 1/19/15	Fri 2/20/15	2
4	Strategy	2 wks	Mon 1/19/15	Fri 1/30/15	2
5	IT	4 wks	Mon 1/19/15	Fri 2/13/15	2
6	Fundraising	4 wks	Mon 2/23/15	Fri 3/20/15	3
7	Marketing	2 wks	Mon 2/23/15	Fri 3/6/15	3,4
8	Sales	5 wks	Mon 2/23/15	Fri 3/27/15	3,4
9	Finance	2 wks	Mon 3/		
10	HR	1 wk	Mon 3/		
11	End	0 days	Fri 4/10		

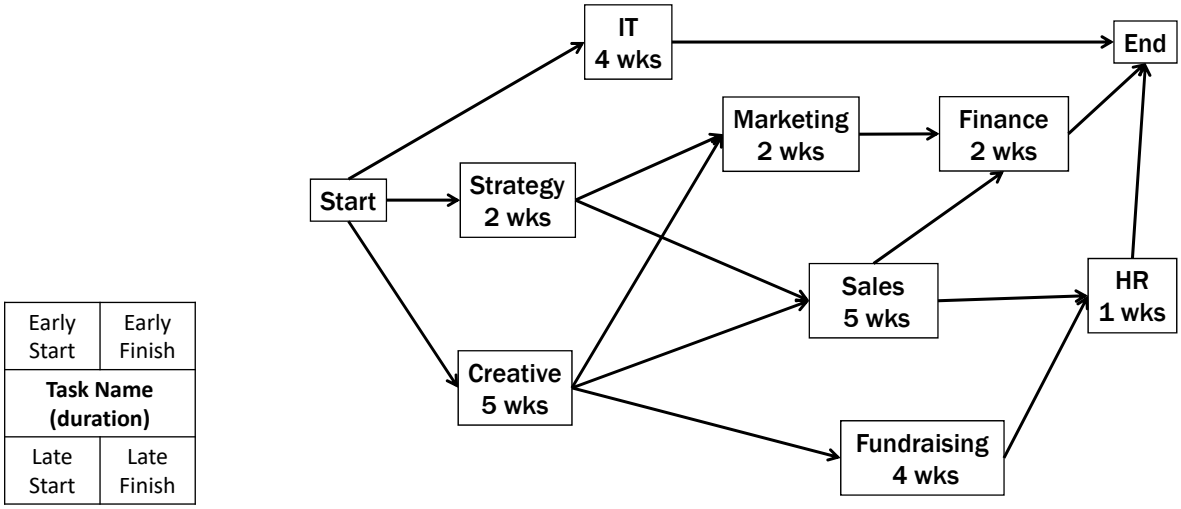


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Estimating Activity Durations can be Tricky!

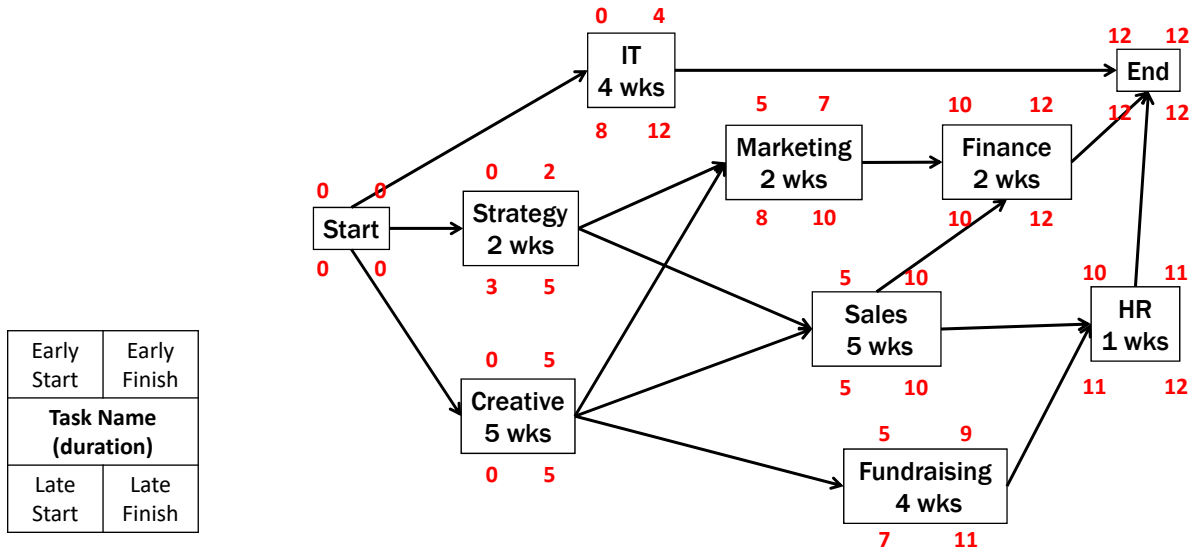
- Parkinson's Law
- Student's Syndrome
- Overconfidence
- Biases
  - Anchoring
  - Confirmation

How Long Will the Project Take?

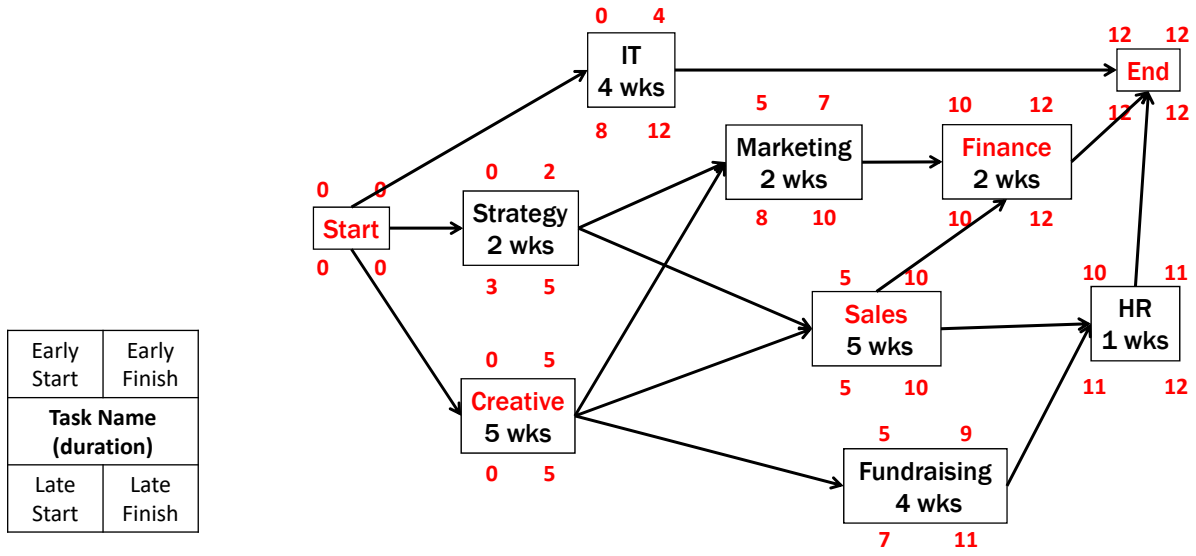


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Critical Path Analysis



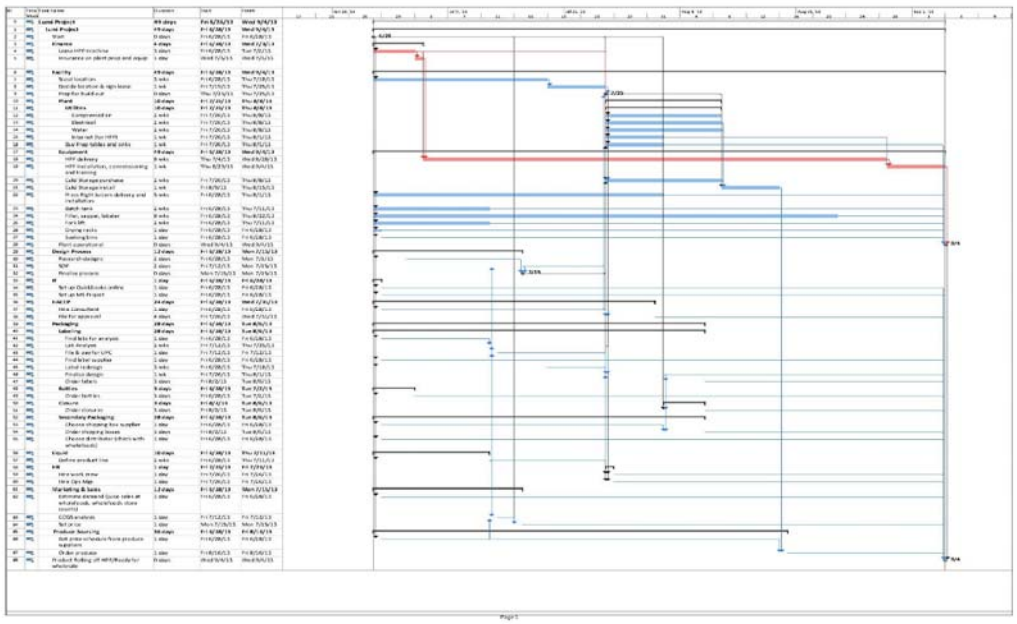
Critical Path Analysis



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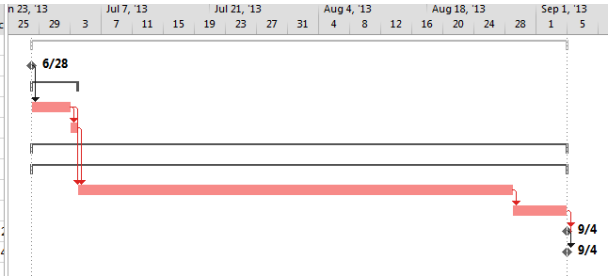
Critical Path

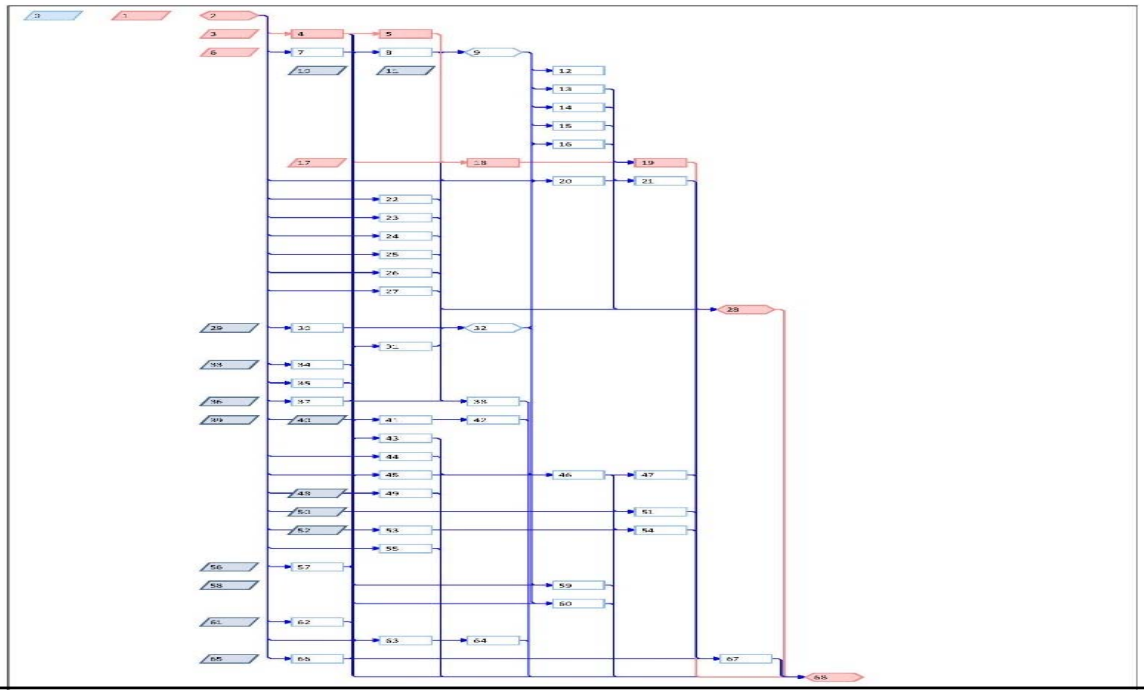
- The longest path in the project/network.
- The project duration, defined by the length of the critical path, is also known as *makespan*.
- A delay in any activity along the critical path will cause a delay in the project.
- The method was developed by Engineers at DuPont Corporation in the 1950s.



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	Task Name	Duratio	Start	Finish	Predec
0	**Lumi Project**	**49 days**	**Fri 6/28/13**	**Wed 9/4/13**	
1	Start	0 days	Fri 6/28/13	Fri 6/28/13	
2	**Finance**	**4 days**	**Fri 6/28/13**	**Wed 7/3/13**	
3	Lease HPP machine	3 days	Fri 6/28/13	Tue 7/2/13	1
4	Insurance on plant prop and equip	1 day	Wed 7/3/13	Wed 7/3/13	3
5	**Facility**	**49 days**	**Fri 6/28/13**	**Wed 9/4/13**	
16	**Equipment**	**49 days**	**Fri 6/28/13**	**Wed 9/4/13**	
17	HPP delivery	8 wks	Thu 7/4/13	Wed 8/28/13	3,4
18	HPP Installation, commissioning and training	1 wk	Thu 8/29/13	Wed 9/4/13	17,14
27	Plant operational	0 days	Wed 9/4/13	Wed 9/4/13	15,21,2
67	Product Rolling off HPP/Ready for wholesale	0 days	Wed 9/4/13	Wed 9/4/13	58,59,4





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ASAP or ALAP?

	Cost	Time
As Soon as Possible		
As Late as Possible		

ASAP or ALAP?

	Cost	Time
As Soon as Possible	✗	✓
As Late as Possible		

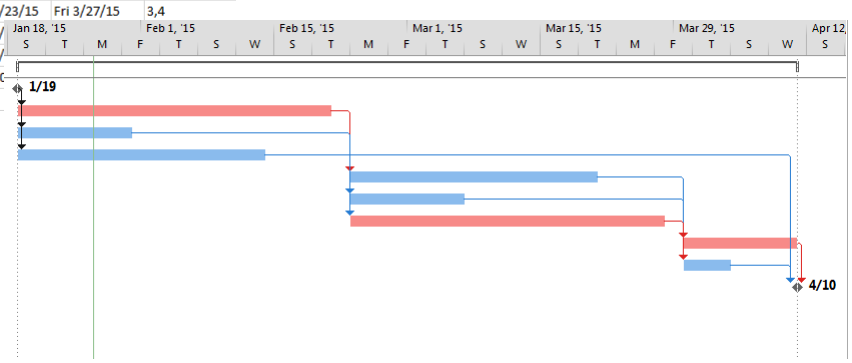
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ASAP or ALAP?

	Cost	Time
As Soon as Possible	✗	✓
As Late as Possible	✓	✗

Project Schedule – too long!

	Task Name	Duration	Start	Finish	Predecessors
1	Startup Project	12 wks	Mon 1/19/15	Fri 4/10/15	
2	Startup Project	0 days	Mon 1/19/15	Mon 1/19/15	
3	Creative	5 wks	Mon 1/19/15	Fri 2/20/15	2
4	Strategy	2 wks	Mon 1/19/15	Fri 1/30/15	2
5	IT	4 wks	Mon 1/19/15	Fri 2/13/15	2
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9	Finance	2 wks	Mon 3/		
10	HR	1 wk	Mon 3/		
11	End	0 days	Fri 4/10		



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Project Crashing

- Project duration can be reduced only by shortening critical activities.
- It may be worth spending money to reduce the length of a project.
  - Select the least expensive to crash
- New critical paths may emerge.
  - reduce all critical paths!

As a Result of Project Crashing

- Critical path
  - Shorter
  - May change
  - More activities may become critical
- Higher risk?

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Reducing Scope

- Eliminate activities
  - Unnecessary
  - Reduce functionality
  - Cut corners
  - Outsource

Common Planning Mistakes

Issue	Consequences	Impact
No WBS	Missing tasks	Incorrect scope No responsibility assigned Incorrect project duration, critical path, cost estimates, and resource loads
Task durations specified in terms of work	Underestimate task durations	Underestimated project duration Incorrect critical path
Excessive task durations	Dominate plan	Incorrect project duration and critical path
No Network diagram	Missing dependencies	Incorrect project duration and critical path

De Reyck 2009

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Common Planning Mistakes

Issue	Consequences	Impact
Tasks without predecessors or successors	Missing dependencies	No project critical path
Fixed start dates to mimic dependencies	Missing dependencies	Plan prone to errors No project critical path
No dependency defined between activities in the correct sequence		Plan update cumbersome and prone to errors
Dependencies between summary tasks	Unnecessary dependencies	Time wasted, unclear network diagram

De Reyck 2009

Plan Checklist

- WBS
  - ✓Available? Complete? Communicated? Agreed-upon?
- Network Diagram
  - ✓One start and one finish?
  - ✓All activities with predecessors or successors?
- Milestones
  - ✓One start milestone and one project completion milestone?
  - ✓Intermediate milestones? Each one has a critical path?
- Gantt-chart
  - ✓No missing dependencies between activities in correct sequence?
  - ✓No summary task links?
  - ✓Tasks with excessive durations?
  - ✓Check generalized dependencies (overlaps, time lags)
  - ✓Check critical path: from project start to finish?

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Planning Wrap Up

- Project planning is crucial for project success.
- A project plan is a guide, not a schedule of what will exactly happen.
- Follow the project planning cycle.
- Make sure the goal of the project is clear to you.
- Ensure project scope is complete (most crucial part of planning).

Planning Wrap Up – Cont.

- Estimate the activity durations
- Decide who owns each activity
- Know which are the critical activities ("critical" ≠ "important")
- Prevent conflicts between activities
- Projects can be accelerated by crashing and/or fast-tracking.

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