

Project Time Management

مقرر: إداره وقت المشروع

Prepared by Dr. Amira Elfekky

PMG 212

Lecture 9



Agenda

- Top Project Management Cases
 - Case study
 - Acceleration and Schedule Compression
 - Why Schedule Matters
 - Acceleration – Definition & Key Principles
 - Types of Acceleration
 - Actual Acceleration
 - Constructive Acceleration
 - Forced Acceleration
 - Schedule Compression vs. Crash
 - Schedule Compression Techniques
-

Agenda

- **Top Project Management Cases**
 - Case study
 - Acceleration and Schedule Compression
 - Why Schedule Matters
 - Acceleration – Definition & Key Principles
 - Types of Acceleration
 - Actual Acceleration
 - Constructive Acceleration
 - Forced Acceleration
 - Schedule Compression vs. Crash
 - Schedule Compression Techniques
-

Top Project Management Cases

AstraZeneca During Covid 19

AstraZeneca was under pressure during the pandemic to develop and distribute the COVID-19 vaccine as quickly as possible. The company needed to work in collaboration with Oxford University for the research and the clinical trials. AstraZeneca created an effective project management infrastructure to face challenges like establishing an internal government contracting organization, finding personnel for vaccine development, and amping up the manufacturing facility.



Top Project Management Cases

Saudi Aramco

This oil company in Saudi was managing two ambitious oil and gas programs called Marjan and Zuluf. The biggest challenge was to manage multiple contractors working simultaneously on the congested oil fields. Their project team tackled this challenge by simplifying construction, using contracting strategies and marine management techniques.



Top Project Management Cases

Apple iPhone

The project of developing and launching Apple's iPhone is one of the most important ones in history. The company spent \$150 million on this project, which turned out to be its best investment. The main challenges in managing this project were hiring the best talent, maintaining high quality, and keeping the project a secret despite so many people working on it.



Top Project Management Cases

Healthcare.gov

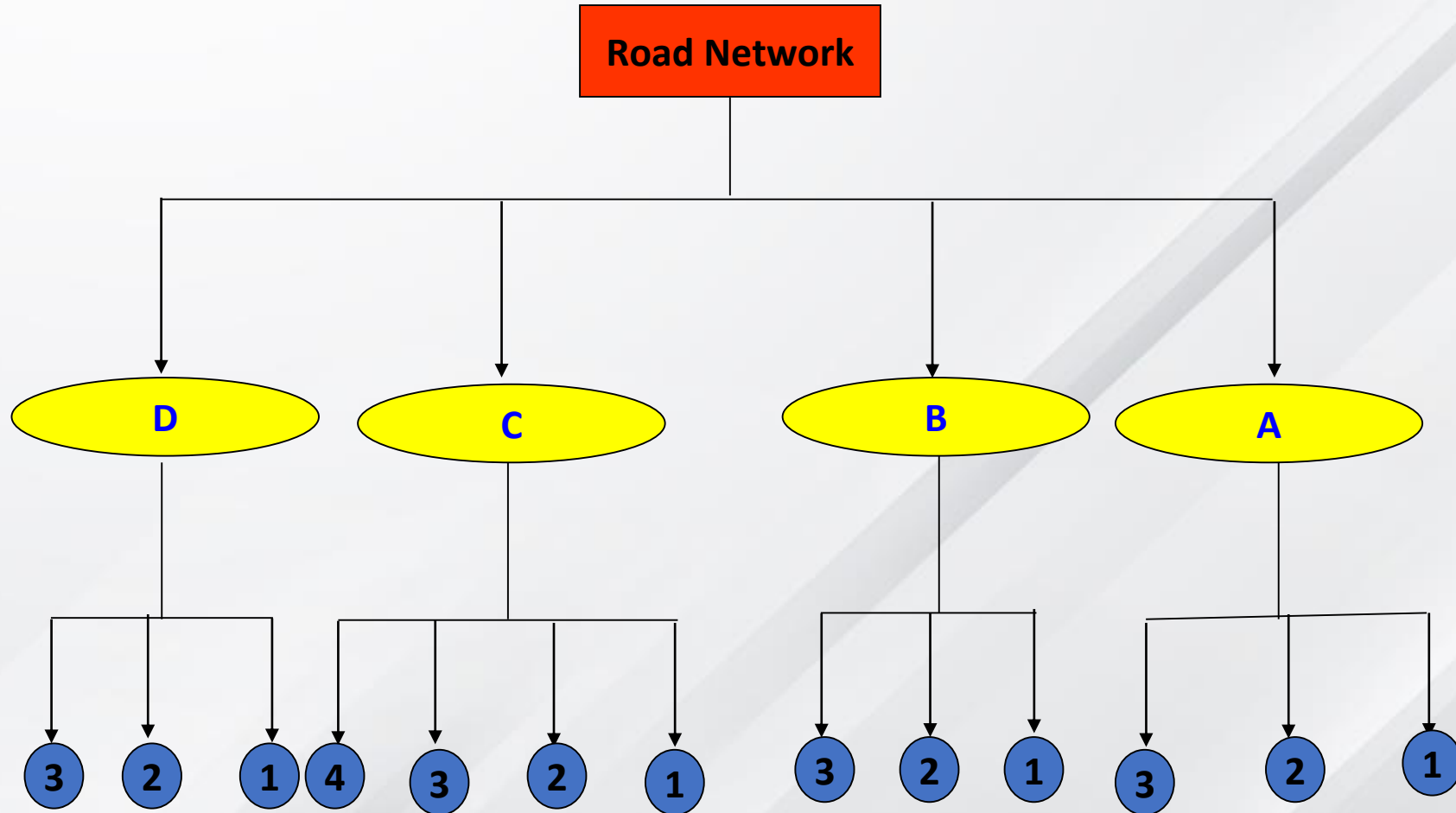
It is an example of the consequences of poor project management. Due to a lack of proper planning and coordination, the website could only register six users out of 4 million on its launch day.



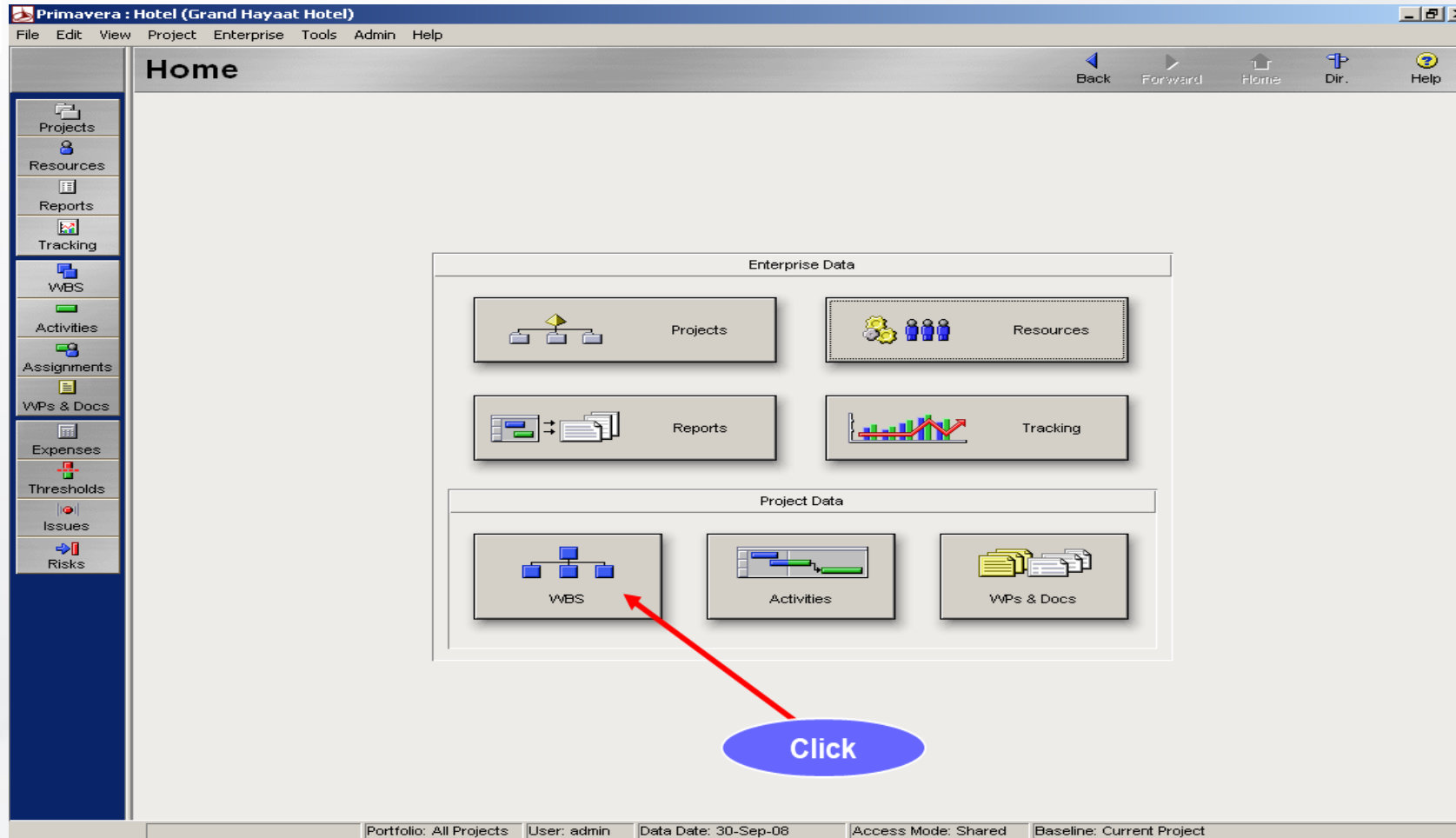
Agenda

- **Top Project Management Cases**
 - **Case study**
 - Acceleration and Schedule Compression
 - Why Schedule Matters
 - Acceleration – Definition & Key Principles
 - Types of Acceleration
 - Actual Acceleration
 - Constructive Acceleration
 - Forced Acceleration
 - Schedule Compression vs. Crash
 - Schedule Compression Techniques
-

Case study



Case study – Create WBS



Case study – Create WBS

Primavera : Hotel, Road (Grand Hayaat Hotel, Road Network in Badr City)

File Edit View Project Enterprise Tools Admin Help

Work Breakdown Structure

Layout: Project Status

WBS Code	WBS Name	Project ID	Project Status
Hotel	Grand Hayaat Hotel	Hotel	Active
Road	Road Network in Badr City	Road	Active

Click

General Notebook Budget Log Spending Plan Budget Summary WBS Milestones WPs & Docs Earned Value

General

WBS Code: Road WBS Name: Road Network in Badr City

Status: Active Responsible Manager: Hosni

Anticipated Dates

Anticipated Start: ...

Anticipated Finish: ...

Portfolio: All Projects User: admin Data Date: 30-Sep-08 Access Mode: Shared Baseline: Current Project

Case study – Create WBS

navera : Hotel, Road (Grand Hayaat Hotel, Road Network in Badr City)

File Edit View Project Enterprise Tools Admin Help

Work Breakdown Structure

Layout: Project Status

WBS Code	WBS Name	Project ID	Project Status
Hotel	Grand Hayaat Hotel	Hotel	Active
Road	Road Network in Badr City	Road	Active
Road.A	Road Type (A)	Road	Active
Road.A.1	Road No. 1	Road	Active
Road.A.2	Road No. 2	Road	Active
Road.A.3	Road No. 3	Road	Active
Road.B	Road Type (B)	Road	Active
Road.B.1	Road No. 1	Road	Active
Road.B.2	Road No. 2	Road	Active
Road.B.3	Road No. 3	Road	Active

General | Notebook | Budget Log | Spending Plan | Budget Summary | WBS Milestones | WPs & Docs | Earned Value

General

WBS Code: B
WBS Name: Road Type (B)
Status: Active
Responsible Manager: Hosni

Anticipated Dates

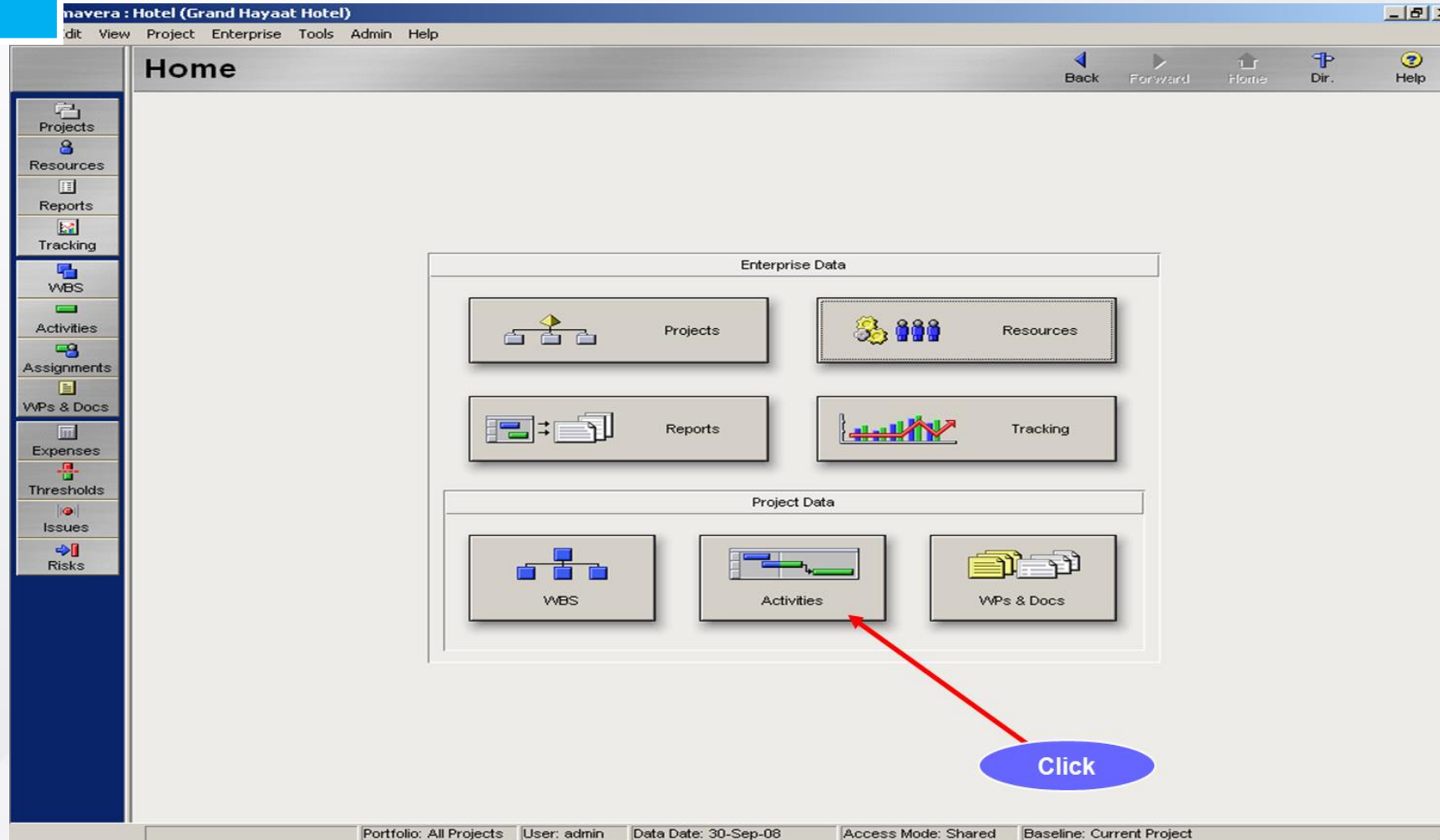
Anticipated Start: ...
Anticipated Finish: ...

Portfolio: All Projects | User: admin | Data Date: 30-Sep-08 | Access Mode: Shared | Baseline: Current Project

Case study – Create activity code

Activity	Code
Excavation	EX
Replacement	RE
Ferma Layer	FR
Base Layer	BA
Prime Coat	PR
Layer Bond	LB
Tack Coat	TA
Asphalt Layer	AS
Curbs	CU
Sign Traffic	ST
Draw Axis	DR
Pavement Layer	PV

Case study – Create activity



Case study – Create activity

Primavera : Hotel, Road (Grand Hayaat Hotel, Road Network in Badr City)

Edit View Project Enterprise Tools Admin Help

Activities

Layout: Classic WBS Layout Filter: All Activities

Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start
Grand Hayaat Hotel					
Road Network in Badr City					
Road Type (A)					
	Road No. 1	0	0	0%	30-Sep-08
	Road No. 2	0	0	0%	
	Road No. 3	0	0	0%	
Road Type (B)					
	Road No. 1	0	0	0%	
	Road No. 2	0	0	0%	
	Road No. 3	0	0	0%	
Road Type (C)					
	Road No. 1	0	0	0%	
	Road No. 2	0	0	0%	
	Road No. 3	0	0	0%	
	Road No. 4	0	0	0%	
Road Type (D)					
	Road No. 1	0	0	0%	

2009 April 2009 May 2009 J

15 22 29 05 12 19 26 03 10 17 24 31 01

Click

Click

Add

Delete

Cut

Copy

Paste

Resources

Rsrc by Role

Roles

Activity Codes

Predecessors

Successors

Steps

General Status Resources Relationships Codes Notebook Steps Feedback VPs & Docs Expenses Summary

Activity

Project

Duration

Original

Actual

Remaining

At Complete

Status

☒ Started

☒ Finished

Exp Finish

Duration %

Suspend

Resume

Constraints

Primary

Secondary

Labor Units

Budgeted

Actual

Remaining

At Complete

Total Float

Portfolio: All Projects User: admin Data Date: 30-Sep-08 Access Mode: Shared Baseline: Current Project

Case study – Create activity

vera : Hotel, Road (Grand Hayaat Hotel, Road Network in Badr City)

View Project Enterprise Tools Admin Help

Activities

Layout: Classic WBS Layout Filter: All Activities

Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start
Grand Hayaat Hotel		318	318	0%	30-9
Road Network in Badr City		1	1	0%	02-0
Road Type (A)					
Road No. 1					
Road No. 2					
Road No. 3					
Road Type (B)					
Road No. 1					
Road No. 2					
Road No. 3					
Road Type (C)					
Road No. 1					
Road No. 2					
Road No. 3					
Road No. 4					

Calendar: 2009 April 2009 May 2009

15 22 29 05 12 19 26 03 10 17 24 31 0

New Activity

Activity Name

Enter an Activity ID and Activity Name. The Activity ID uniquely identifies the activity.

Activity ID: A1000

Activity Name: Excavation Road (A1)

☐ Do not show this wizard again.

Cancel Prev Next Finish

Duration

Original	Actual	Remaining	At Complete
1	0	1	1

Started: 02-Oct-08 Duration %: 0%

Finished: 02-Oct-08

Exp Finish:

Constraints

Primary: < None > Secondary: < None >

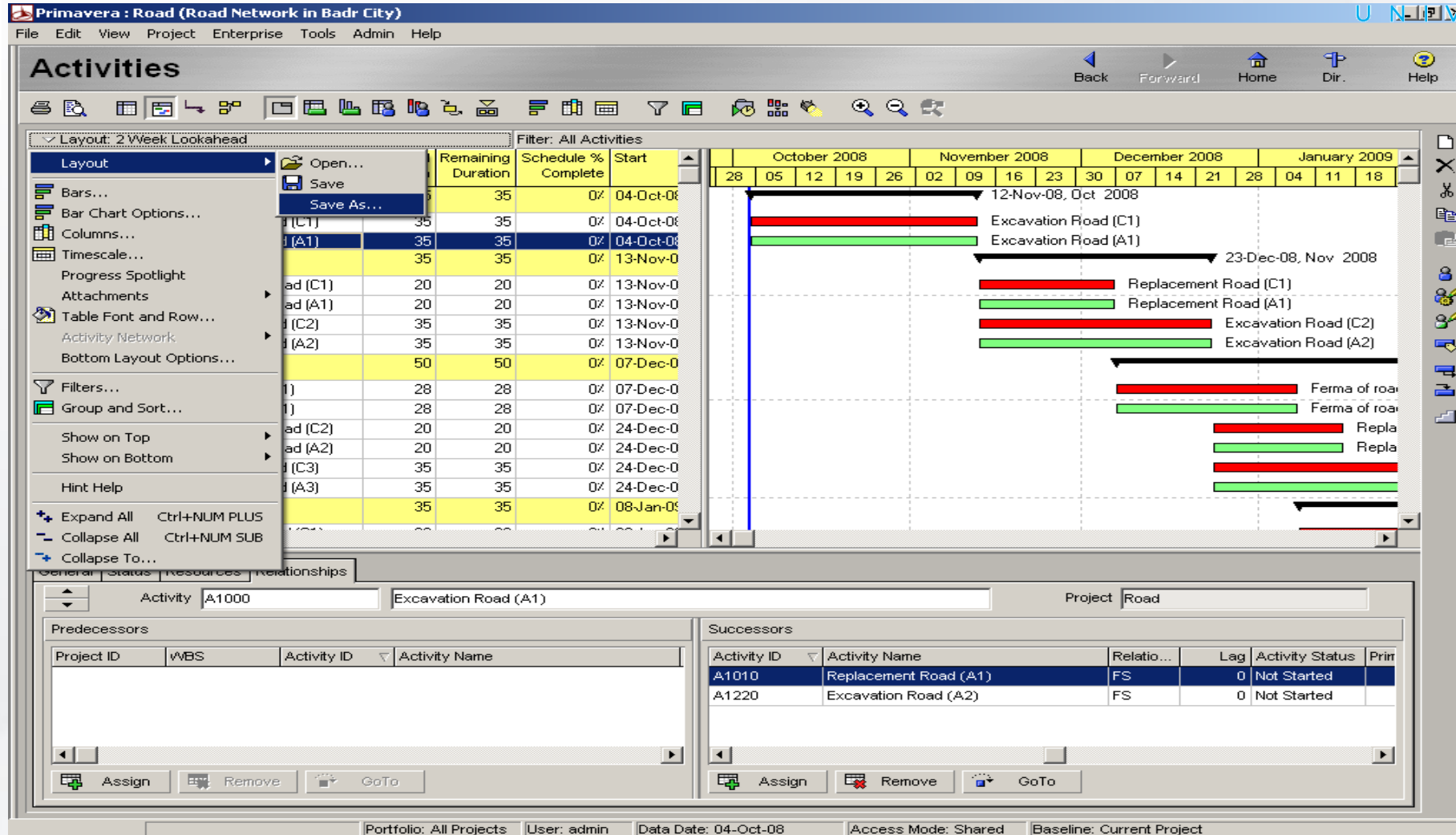
Budgeted: 0 Actual: 0 Remaining: 0 At Complete: 0

Portfolio: All Projects User: admin Data Date: 30-Sep-08 Access Mode: Shared Baseline: Current Project

Edit

Click

Case study – Scheduling



Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- Acceleration and Schedule Compression
- Acceleration – Definition & Key Principles
- Types of Acceleration
- Actual Acceleration
- Constructive Acceleration
- Forced Acceleration
- Schedule Compression Techniques
- Time–Cost Trade-Off Analysis

Project duration versus cost

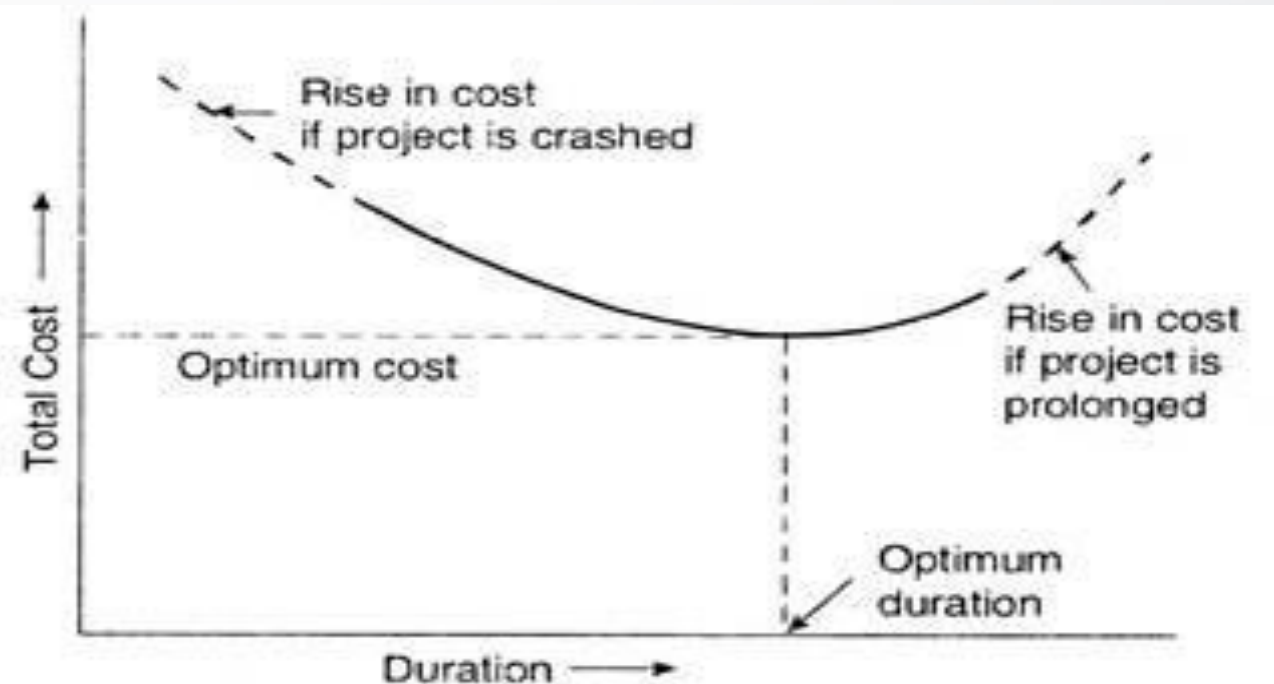


Fig. 29.4. Variation in total project cost due to change in duration.

Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- **Acceleration and Schedule Compression**
- Acceleration – Definition & Key Principles
- Types of Acceleration
- Actual Acceleration
- Constructive Acceleration
- Forced Acceleration
- Schedule Compression Techniques
- Time–Cost Trade-Off Analysis

Acceleration & Schedule Compression – Overview

- ❑ Construction projects require contractual delivery dates for control and accountability
- ❑ “Time is of the essence” highlights economic and operational importance
- ❑ Delays impact revenue, overhead, financing, and stakeholder commitments
- ❑ Acceleration = adding resources/hours to reduce duration
- ❑ Schedule compression = completing the project earlier with optimal cost balance

Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- **Acceleration and Schedule Compression**
- **Acceleration – Definition & Key Principles**
- **Types of Acceleration**
- **Actual Acceleration**
- **Constructive Acceleration**
- **Forced Acceleration**
- **Schedule Compression Techniques**
- **Time–Cost Trade-Off Analysis**

Acceleration – Definition & Key Principles

- ❑ Acceleration = adding labor, shifts, overtime, or resources
 - ❑ Must focus on **critical path tasks** to impact overall duration
 - ❑ Accelerating noncritical tasks has limited benefit
 - ❑ Shortening schedule typically increases direct costs
 - ❑ Requires detailed analysis of remaining duration and resources
-

Acceleration

- ☐ Delivering on time or ahead of schedule is important for all parties, from subcontractors all the way up to the owner.
- ☐ Finishing within or under budget is another important goal.
- ☐ The real achievement, however, is doing both simultaneously. Unfortunately, this may not always be possible.

Acceleration

At the point where an accelerated pace of the work is diagnosed as the cure for delay, the project manager may have to make the decision to spend money.

Acceleration is defined as the addition of resources or work hours to a task or project.

Acceleration results in schedule compression or reducing the duration of the task or shortening the entire project without diminishing the scope of the project.

Acceleration

The acceleration must be applied to the critical path or a critical task. To accelerate a noncritical task rarely benefits the schedule.

There are three different types of acceleration that the average project may potentially encounter.

Acceleration is issued in the form of written direction from the owner to the contractor and can be classified in three categories: actual, constructive, and forced.

Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- **Acceleration and Schedule Compression**
- **Acceleration – Definition & Key Principles**
- **Types of Acceleration**
- Actual Acceleration
- Constructive Acceleration
- Forced Acceleration
- Schedule Compression Techniques
- Time–Cost Trade-Off Analysis

Types of Acceleration

- ☐ Three main types:
 - ☐ **Actual Acceleration**
 - ☐ **Constructive Acceleration**
 - ☐ **Forced Acceleration**
 - ☐ Can occur between owner–contractor or contractor–subcontractor
 - ☐ May be compensable or non-compensable
 - ☐ Requires careful contractual and financial evaluation
-

Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- **Acceleration and Schedule Compression**
- **Acceleration – Definition & Key Principles**
- **Types of Acceleration**
- **Actual Acceleration**
- **Constructive Acceleration**
- **Forced Acceleration**
- **Schedule Compression Techniques**
- **Time–Cost Trade-Off Analysis**

Actual Acceleration

Actual acceleration is the directive to complete the project ahead of the accepted or contractual schedule.

This directive comes from the owner to the contractor through the architect, and is then passed on to the subcontractors.

Actual Acceleration

- ☐ Owner directs early completion via formal change order
- ☐ Costs are compensable
- ☐ Requires modification of Substantial Completion date
- ☐ Typically involves overtime, second shifts, weekend work
- ☐ Requires precise calculation (no second chance after approval)

Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- **Acceleration and Schedule Compression**
- **Acceleration – Definition & Key Principles**
- **Types of Acceleration**
- **Actual Acceleration**
- **Constructive Acceleration**
- **Forced Acceleration**
- **Schedule Compression Techniques**
- **Time–Cost Trade-Off Analysis**

Constructive Acceleration

Constructive acceleration occurs when the contractor requests an extension of time and is denied.

If the delay that resulted in the request for an extension of time is an excusable delay, the extension should be granted.

Constructive Acceleration

Occurs when:

- ☐ There is an excusable delay
- ☐ Contractor requests time extension
- ☐ Extension is denied
- ☐ Contractor is required to meet original completion date
- ☐ Additional costs are incurred
- ☐ → May result in a valid claim for compensation

Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- **Acceleration and Schedule Compression**
- **Acceleration – Definition & Key Principles**
- **Types of Acceleration**
- **Actual Acceleration**
- **Constructive Acceleration**
- **Forced Acceleration**
- **Schedule Compression Techniques**
- **Time–Cost Trade-Off Analysis**

Forced Acceleration

There is also a need for acceleration when delay occurs as a result of nonperformance.

This type of acceleration is sometimes referred to as forced acceleration. This occurs frequently when a subcontractor on the critical path is falling behind.

While this is not acceleration in the truest sense of the definition, it does require an increase in production.

Forced Acceleration

- ❑ Caused by subcontractor nonperformance
- ❑ Requires increased production to recover delay
- ❑ Typically non-compensable
- ❑ May involve workforce supplementation
- ❑ Must be handled carefully to avoid contractual disputes

Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- **Acceleration and Schedule Compression**
- **Acceleration – Definition & Key Principles**
- **Types of Acceleration**
- **Actual Acceleration**
- **Constructive Acceleration**
- **Forced Acceleration**
- **Schedule Compression Techniques**
- **Time–Cost Trade-Off Analysis**

Schedule Compression

The decision to accelerate work and incur costs must have a tangible benefit to the project.

Schedule compression is not always about the shortest duration of the task. It is more about the balance of getting the shortest duration for the least cost.

Schedule Compression

Schedule compression is generally defined as modifying the plan and/or schedule to complete critical tasks or the project early.

Schedule compression is the resequencing or rescheduling of tasks with minimal or no cost impact.

Schedule Compression Techniques

Examples include:

- ☐ Timely review of submittals
- ☐ Improved material procurement
- ☐ Adding shifts or overtime
- ☐ Off-site fabrication
- ☐ Resequencing tasks to utilize float
- ☐ Incentives for performance
- ☐ Application of new technology

Agenda

- **Top Project Management Cases**
- **Case study**
- **Project duration versus cost**
- **Acceleration and Schedule Compression**
- **Acceleration – Definition & Key Principles**
- **Types of Acceleration**
- **Actual Acceleration**
- **Constructive Acceleration**
- **Forced Acceleration**
- **Schedule Compression Techniques**
- **Time–Cost Trade-Off Analysis**

Time–Cost Trade-Off Analysis

Used to determine which tasks to accelerate.

Key Concepts:

- ☐ **Normal Duration vs. Crash Duration**
- ☐ **Normal Cost vs. Crash Cost**
- ☐ Focus on critical path tasks
- ☐ Select tasks with lowest cost per day saved first



Thank You