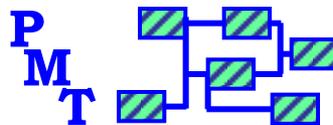




# Rough Order of Magnitude (ROM) Resource Planning

---



# Table of Contents

---

- **Fundamental resource questions that we need to find answers to**
- **Important resource data parameters needed for each activity**
- **From the planning database, very important calculations can be made that define the resource parameters of the project**
- **Detail resource planning requirements**
- **Organizational jurisdiction (who does it?)**

# Resource Questions

---

- **What type of resources are needed to accomplish this project?**
- **How much of each resource is needed to accomplish this project?**
- **When are the resources needed?**
- **How much staff is needed to provide necessary resources to meet the schedule?**
- **How much budget is needed to acquire the necessary resources?**
- **What other considerations need to be made?**

# Issues With Resource Planning

---

- Legacy of top-down planning
- No experience, no history of accomplishment
- Lack of knowledge of how to do it
- Organizational jurisdiction (Who does it?)
- Software is confusing and doesn't seem to work

# Requires Additional Parameters

---

- **OEC (Original Estimate to Complete) – Need to have an estimate of labor hours needed to accomplish each and every task**
  
- **RES – Resource Type (individual or group / pool)**
  
- **ETC (Estimate to Complete)**
  - **In-progress tasks – need an estimate of labor hours to complete the remainder of the task**
  
  - **Near term tasks – Should reassess and revise the OEC values if it is believed that they have changed**

# Define Detail Resource Estimates

---

- **Compute Total Resource Requirement (TRR) in labor-hours for an individual, or a pool / group, or even the project in total**
  - **As a rule, any task that is > 200 hours of estimated work time should be decomposed into more detailed tasks**
  
- **Compute Total Resource Requirement (TRR) in labor-hours**
  - **$\Sigma$  of all task OECs = TRR**

**For an individual, a resource pool, a department, even the project in total**

# Further Compile Resource Requirements

---

## ■ Resource Capacity per Day (DRC)

- $DRC = (\text{No. of resources in group}) \times 6 \text{ hrs / day}$

Note – we use 6 hours / day to take *Effectivity* into account

## ■ Shortest possible Length Of the Project (LOP) in work-days

- $LOP = TRR \div DRC$

## ■ Example:

- $TRR = 10,000 \text{ hrs w/ } 15 \text{ resources in the pool}$   
 $DRC = 15 \text{ res} \times 6 \text{ hrs / day} = 90 \text{ hrs / day}$   
 $LOP = 10,000 \text{ hrs} \div 90 \text{ hrs / day} = 111 \text{ days}$

# Calculating a Project's Finish Date

---

- **Earliest possible completion date of the project**
  - **$(EF \text{ of Project}) = (ES \text{ of Project}) + LOP - 1$**

The easiest way to do this is to create a task in the project file that is assigned the appropriate calendar

- **Example:**

- **Start Date = 14 Feb & the LOP = 111 days**  
 **$EF = 14 \text{ Feb } (31) + 111 - 1 = 141 \text{ (18 Jul)}$**

**Note: This does NOT take work dependencies into account**

# The Most Important Resource Questions

---

## ■ The common project management environment:

- Has a known start date and a desired / required finish date (time bound)
- Must determine and then acquire the resources necessary to meet the schedule requirements

## ■ The essential two questions are:

- How much of each type of resource is needed to meet the project's schedule requirements?
- When are they needed (time-phased need)?

# Calculating a Project's Resource Needs

---

- Calculating a project's resource needs to meet a schedule is a very complex process (time-phased resource needs)
- This process was thoroughly covered in Course #2 (Section 10 – Resource Modeling)
- ROM resource needs analysis can still be done in a simple fashion

**Here is how it works!**

# Calculating a Project's Resource Needs - ROM

---

- We can determine a ROM of a project's total resource need – but it is more practical to calculate:
  - A resource need ROM of a particular type of resource (pool / group) or an individual
  - A relative short span of time (< 6 Months)
  - The total project resource need is the sum of the parts
  
- Calculating resource needs (RN)
  - Required Project Duration (RPD)  
= (LF of Project) – (ES of Project) + 1
  - $RN = (TRR \div RPD) \div 6$

# Calculating a Project's Resource Needs - Example

---

## ■ Example:

- Start Date = 14 Feb (31) – Required Finish Date = 17 Jun (120)

$$\begin{aligned} \text{RPD} &= 17 \text{ Jun} - 14 \text{ Feb} + 1 \\ &= 120 - 31 + 1 \\ &= 90 \text{ days} \end{aligned}$$

- Total Resource Need (RN) to meet schedule

$$\begin{aligned} \text{RN} &= \text{TRR} \div \text{RPD} \div 6 \\ &= 10,000 \div 90 \div 6 \\ &= 18.5 \text{ people} \end{aligned}$$

To accomplish the defined amount of work (10,000 hrs), we will need 18.5 resources working continuously over 90 days – A lesser amount of resources will cause the end date to slip

# An Example Of How This Works In Practice

---

- **Example: Resource plan for one individual – our self or someone else – Next three month window**
  - **Determine available work-hours in the next three months = # of days in window (66) and multiply this by 6 (75% Effectivity) = 396 labor-hours**
  - **If total work hours = 390 labor-hours – OK – However cannot take on additional work without deferring, deleting, or reassigning other work**
  - **If total work hours = 300 labor-hours – OK – Can take on some additional work as long as the total work load does not exceed 396 labor-hours**
  - **If total work hours = 420 labor hours – NOT OK – Must defer, delete, or reassign some of the work until the total does not exceed 396 labor-hours**

# What Is Wrong With This Analysis?

---

- The problem with this analysis is that it 1) does not take into account the dependencies of tasks or 2) specific time constraints on tasks
- It also does not take future requirements into account
- To get better answers requires a very detailed analysis as is presented in PMT's second course



# Calculating a Project's Resource Needs - Detail

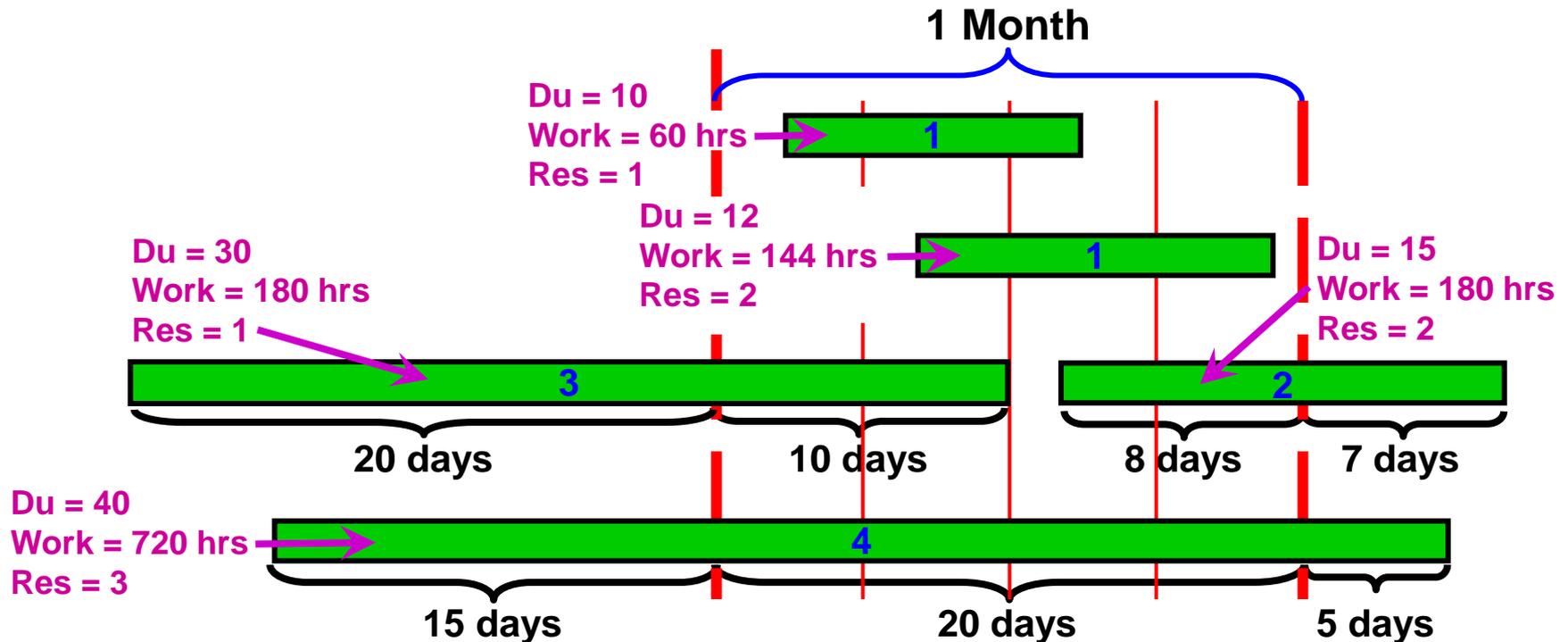
- Detail resource planning requires a very rigorous analysis of all detail tasks that have been scheduled in time



- It can be conducted for an individual resource asset, a pool of like skilled resources, or even the project as a whole
- The detail analysis process first schedules the tasks based on work dependency (relationships) and *initiating* date constraints
- Then task durations and resource assignments have to be defined
- We would then need to examine the resource situation on a week-to-week basis and try to balance each resource's availability with their requirement

# Calculating Resource Needs In a Month – 1

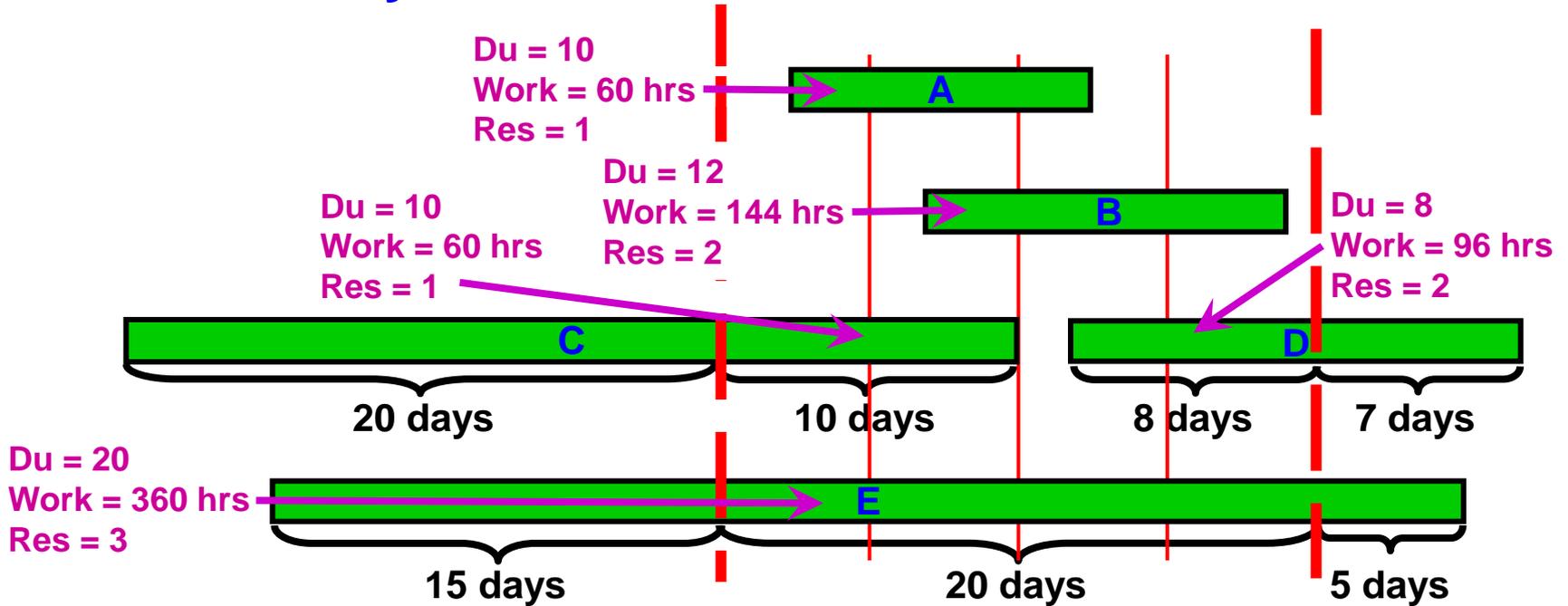
This is where it gets very complicated



- 1 – Task starts & ends in month
- 2 – Task starts but does not end in month
- 3 – Task does not start but ends in month
- 4 – Task does not start or end in month, but spans the month

# Calculating Resource Needs In a Month – 2

How many resources are needed in the month?



## Hours in the month

- A – (All 10 days) = 60 hrs
- B – (All 12 days) = 144 hrs
- C – (10 of 30 days) = 60 hrs
- D – (8 of 15 days) = 96 hrs
- E – (20 of 40 days) = 360 hrs

## Total hrs in month

720 hrs

## Total Resources

720 hrs / 120 = 6 Res

## Another Way

- Wk 1 – 5 Res
- Wk 2 – 7 Res
- Wk 3 – 8 Res
- Wk 4 – 7 Res

# Detail Resource Planning

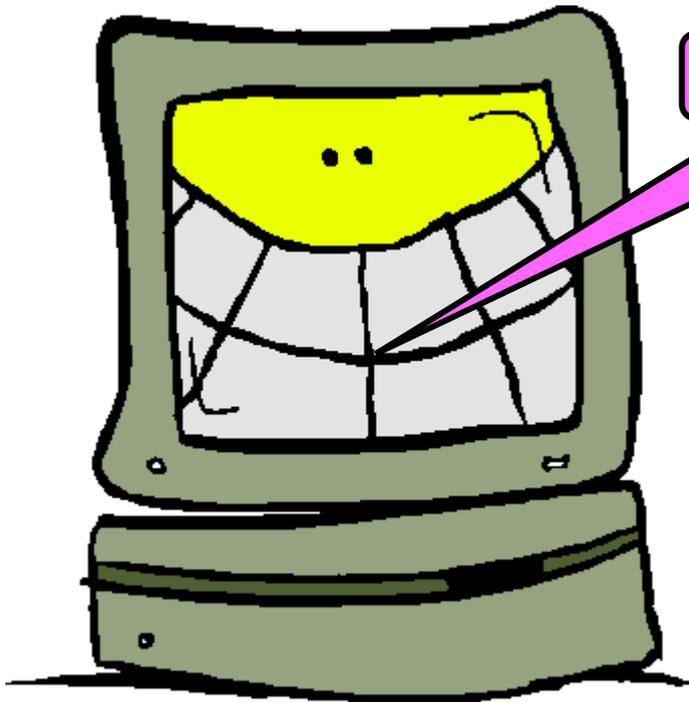
---

Told you it was going  
to get complicated

# Resource Planning Tools

---

- We need a good computer tool to help us with detail resource planning (modeling)



How am I doing?

- We must answer the fundamental resource question
- This tool has very specific requirements with respect to resource planning / modeling
- We must introduce the concepts of *Aggregation* and *Effectivity*

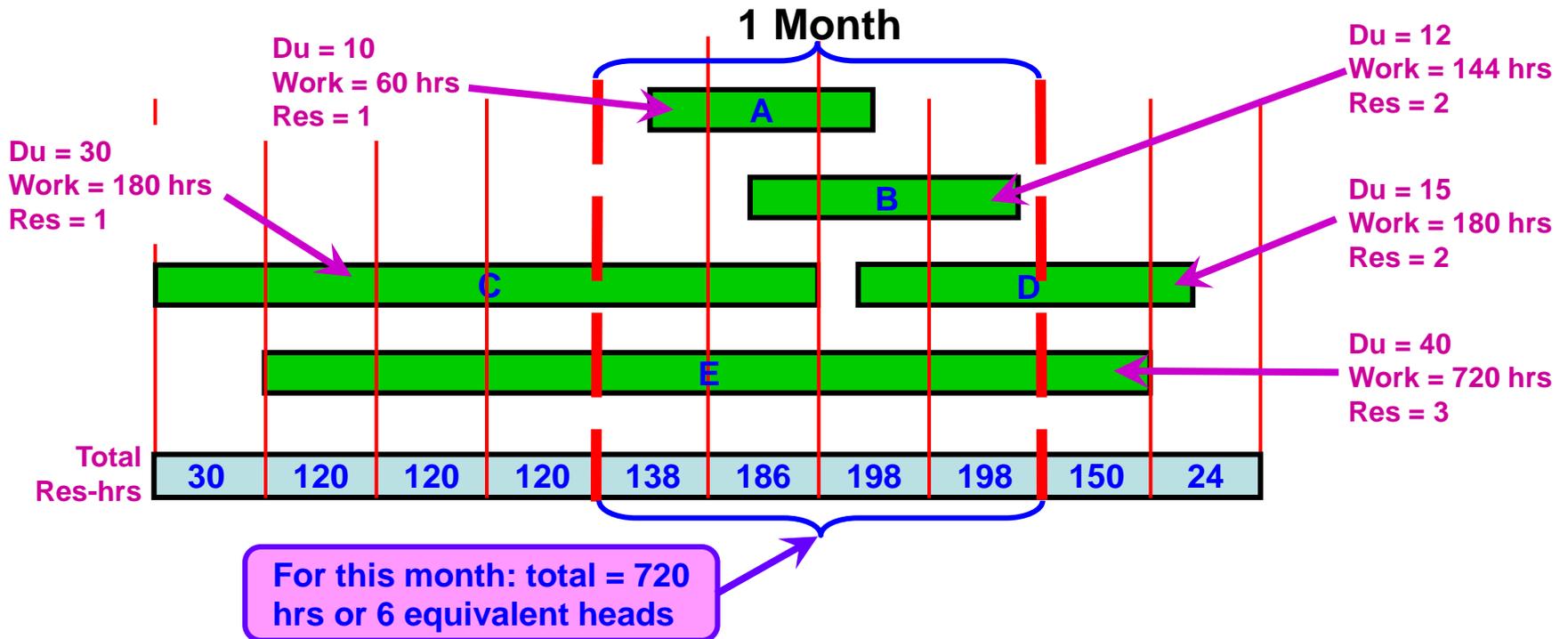
# Resource Planning Tool Requirements

---

- There are several specific requirements of our resource planning / modeling tool
  - Essential resource parameters on each task: Resource ID, quantity (total labor-hrs), & number of resource assets assigned
  - The tool must properly *Aggregate* resource totals for each resource type for each work-week – expressed in labor-hours as well as equivalent *effective* heads or assets
  - It is most useful to display resource aggregation in a Resource Histogram format (weekly periods versus resource needs)
  - Equivalent resource heads are calculated taking into account the *effectivity* of resources – 70% = 28 hrs/wk, 75% = 30 hrs/wk, 80% = 32 hrs/wk, etc.

# Calculating Resource Needs Per Week

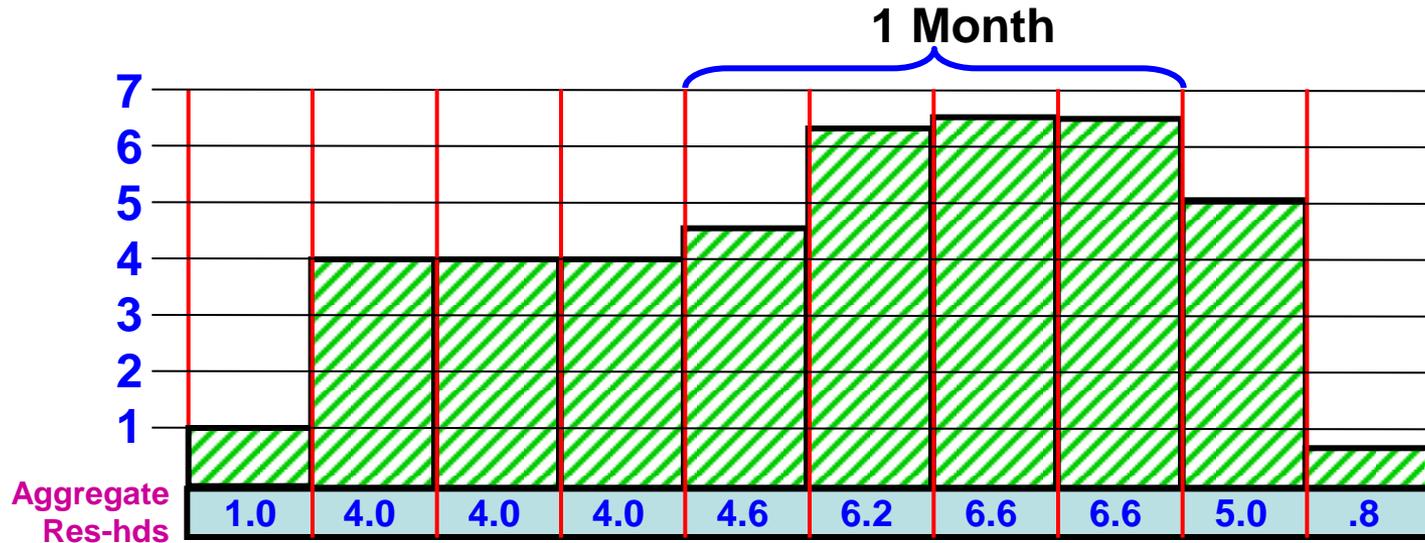
## Aggregation of resources per week



- Per this schedule aggregation calculate the cumulative resource hours for each week
- This is based on resource hours per day for each task

# The Resource Histogram

Resource Histogram displayed in equivalent heads

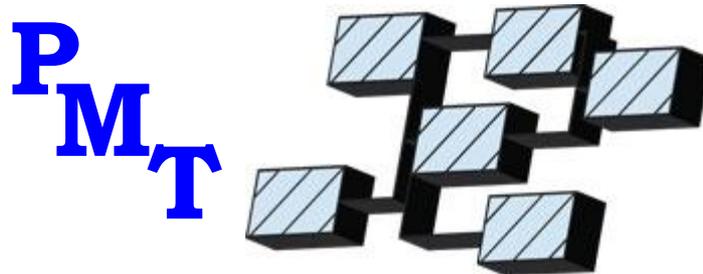


- This shows that resource requirement is a very dynamic variable
- So how do you match a relatively static resource variable (availability) to a very dynamic resource variable (requirement)?

# You Want To Learn More About This

---

- Take PMT's course – There is just not enough time to explain it all here!
- There is a problem with project management tools meeting all of their resource aggregation requirements



**Excellence in the science of project management**

# Conclusion & Wrap-up

---

- Resource planning / modeling is crucial to project schedule and cost success
- There are some simple calculations that can be made for ROM or long range planning
- To actually plan and manage any project successfully – you will have to conduct detail Resource Planning / Modeling

**Good luck and Good Planning!**