



Project Management Lecture

Andy Branca, Ph.D.
Director Industry Relations

UWEB

Project Management

- ✓ **What is it?**
- ✓ **Where did it come from?**
- ✓ **Role of Project Manager**
- ✓ **Projects Vs. Programs**



Harold Kerzner, 1992

Brief History

✓ WWII Military Needs

- Procurement
- Manufacture of Ships, Tanks and Planes
- Huge increase in Defense Contracting

✓ Post War Corporate Growth

- Defense Contractors
- High Tech Industries

✓ 1970's

- Defense Contractors
- Construction Industry

Project Oriented Industries Today

- ✓ **Defense**
- ✓ **Construction**
- ✓ **Pharmaceutical**
- ✓ **Chemical**
- ✓ **Banking**
- ✓ **Hospitals**
- ✓ **Accounting**
- ✓ **Advertising**
- ✓ **Law**
- ✓ **State and Local Governments**
- ✓ **United Nations**

A true engineering discipline

- ✓ Prevalence in most engineering oriented industries**
- ✓ Professional certification by PMI**
 - Project Management Institute**
- ✓ Career Development for Engineers**
- ✓ Route to advancement to senior management**

Project Example- Best Stents Inc.

✓ Project conception

- Research has discovered a new RFGD coating
- Decision made to develop and test prototype
- If prototype successful new stent will be developed

✓ Project Goal

- Deliver specifications to Bioengineering group, who will make samples for pre-clinical testing

✓ New Stent Prototype Project

- Start to finish - 3 months

Best Stents Inc.

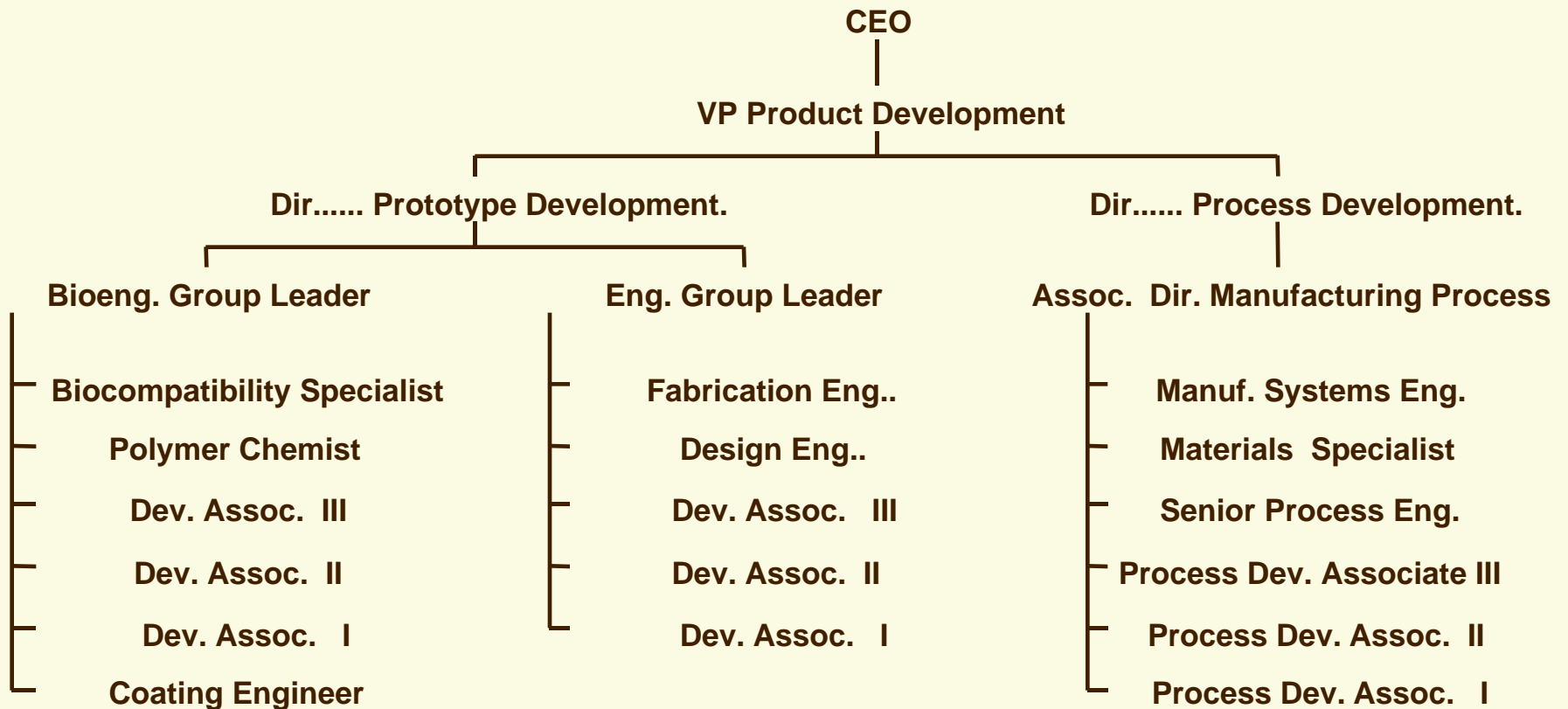
Major Corporate Divisions

CEO



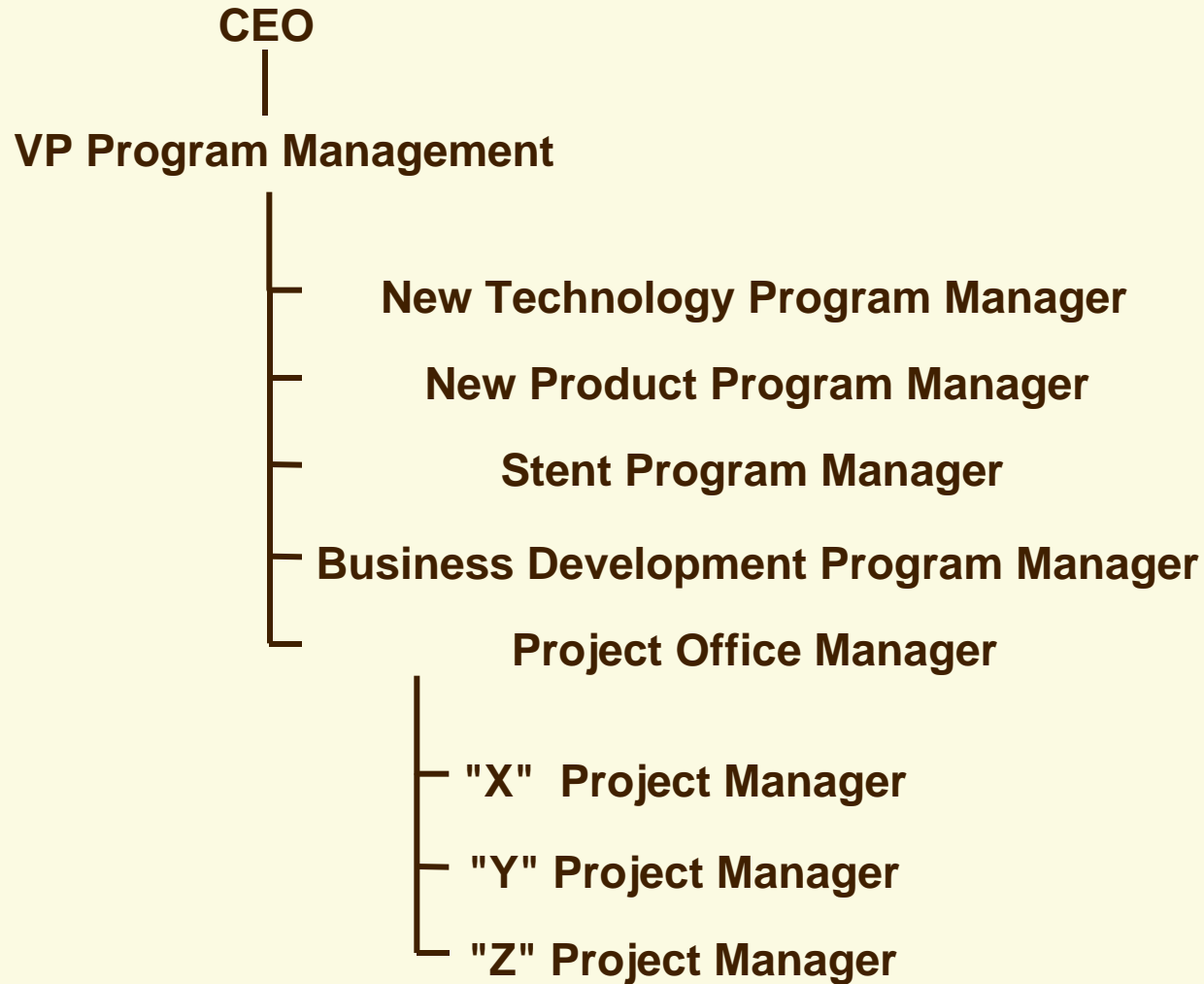
Best Stents Inc.

Organizational Chart for Product Development Division



Best Stents Inc.

Organizational Chart for Program Management



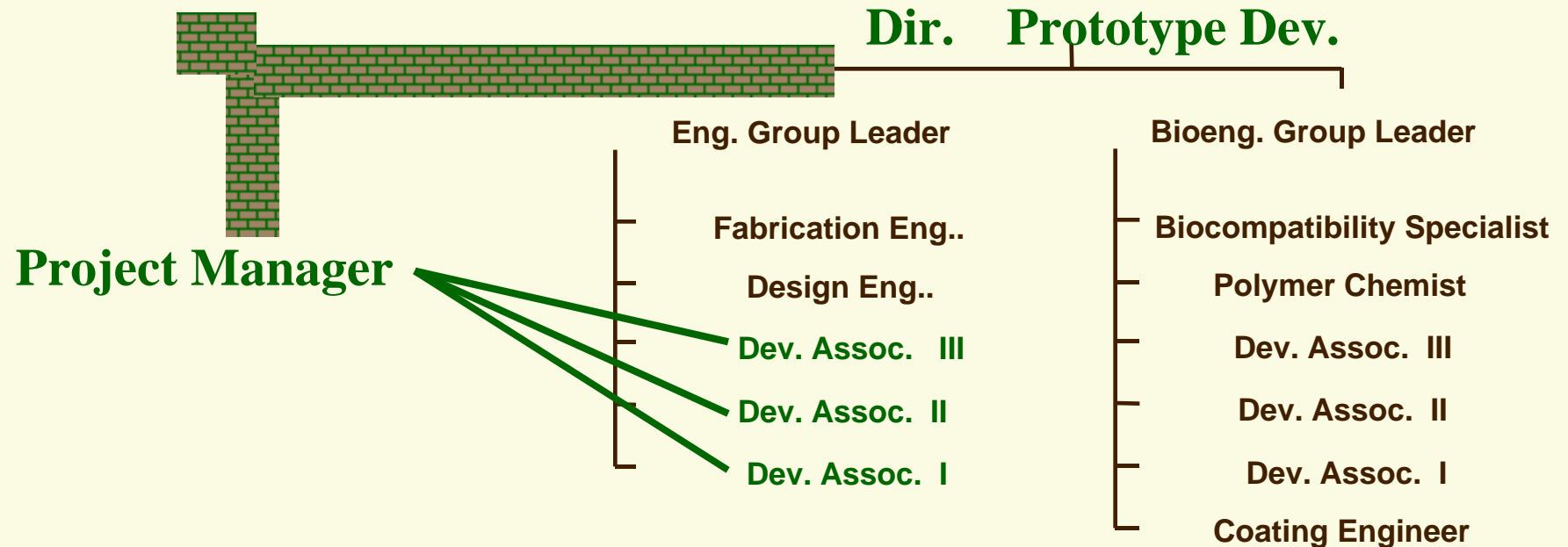
Choosing a project manager

- ✓ **Prototype is made from existing polymers**
- ✓ **Only the coating is new**
- ✓ **Appoint Coating Engineer from Bioengineering group as Project Mgr.**
 - **Track record of trouble shooting**
 - **Persuasive, amicable, trustworthy etc.**
 - **Ready for advancement in company**

Project Team in a Matrix Management System

Stent Program Manager

(Executive *Champion*)



In a matrix management system, the project manager pulls together a project team *across* the vertical line-management organization.

The most important skill of the PM is to manage people who do not *report* directly to you on a permanent basis.

Key is to achieve a good *rhythm* with the line managers.

Authority is derived from executive champion and is *documented*

Communication and *people* skills are more important.

Program Evaluation & Review Technique (PERT) and Critical Path Method (CPM

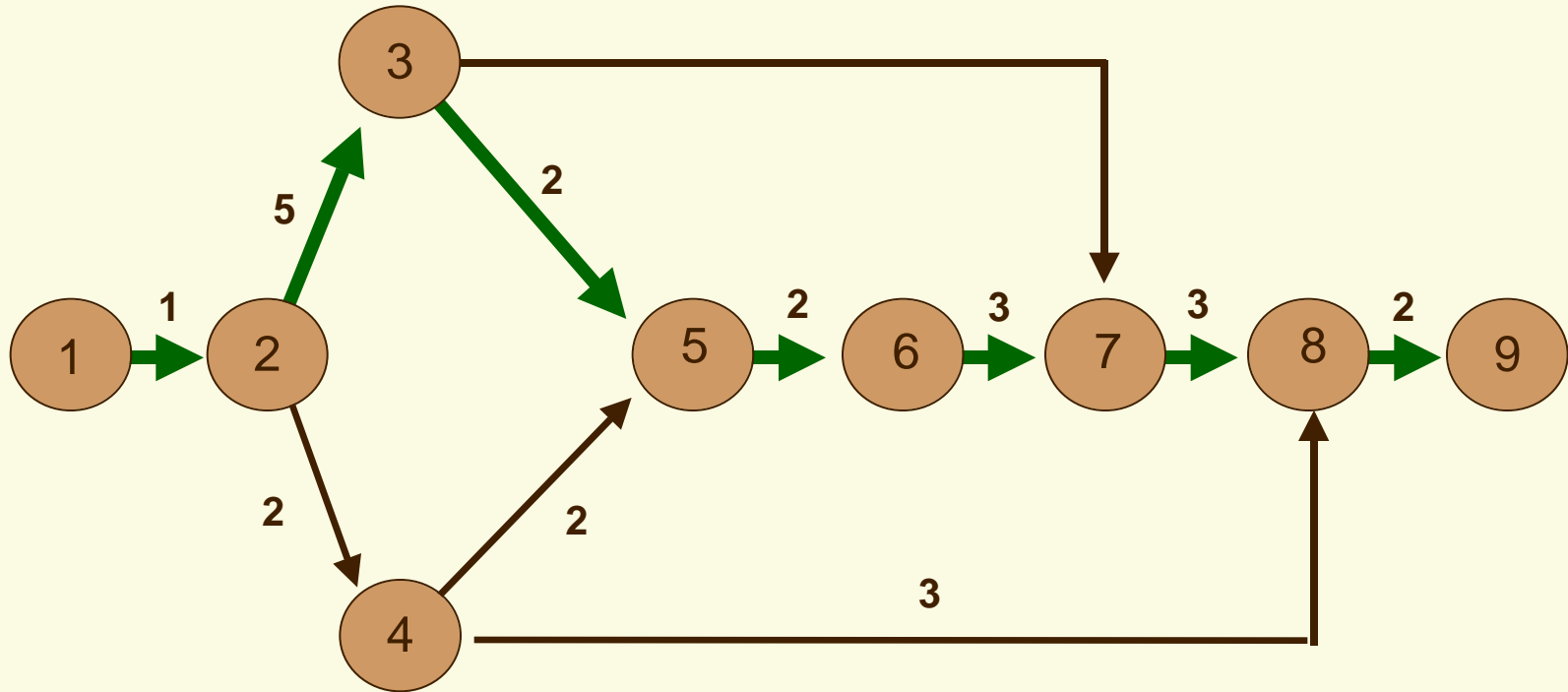
- ✓ **PERT- US Navy, Polaris Missile system, 1958**
- ✓ **CPM- DuPont, 1959**
- ✓ **All tasks, and their relationships are displayed as a network**
- ✓ **Critical Path: The sequence of activities and events which require the most time**
- ✓ **Slack Time- Allows for the adjustment of tasks which are not on the critical path**

PERT/ CPM: Example 1

Sequence of Events

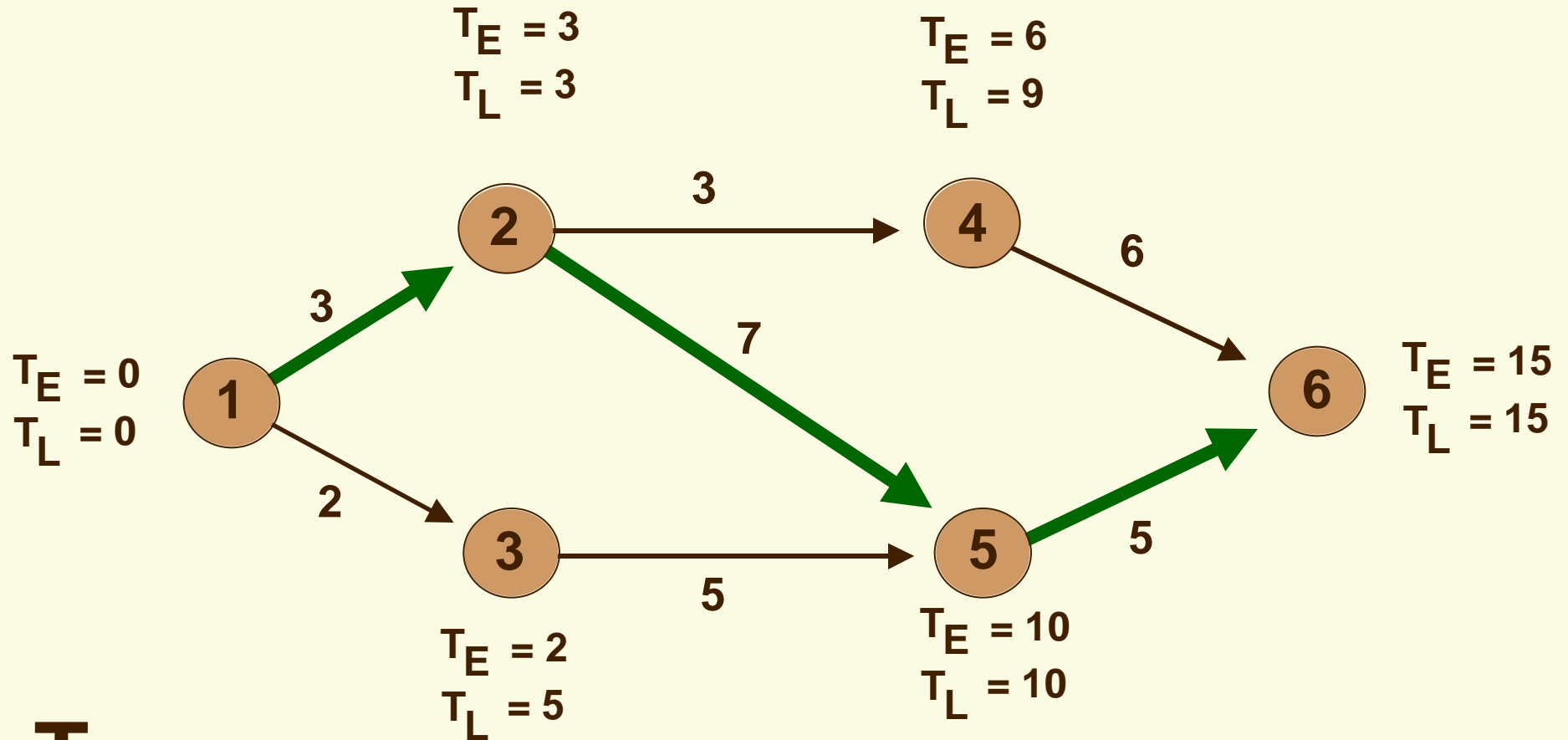
Activity	Title	Immediate Predecessors	Time (weeks)
1-2	A	-	1
2-3	B	A	5
2-4	C	A	2
3-5	D	B	2
3-7	E	B	2
4-5	F	C	2
4-8	G	C	3
5-6	H	D,F	2
6-7	I	H	3
7-8	J	E,I	3
8-9	K	G,J	2

PERT/ CPM: Example 1



Critical Path

PERT/ CPM: Example 2



T_E Earliest possible date for event to take place

T_L Latest date for event to take place, without extending project completion

Slack Time

$$T_L - T_E$$

ID	Task Name	Time	Start	End	Links	Name	January 28	February 4	February 11	February 18	February 25	March 4	March 11	March 18	March 25	April 1	Apr	
							1/28	2/4	2/11	2/18	2/25	3/4	3/11	3/18	3/25	4/1	4/	
1	Investigator Activities	1d	2/1/01	2/1/01														
2	Send Request and formats t	1d	2/1/01	2/1/01														
3																		
4	Report Sections- Preprations	21d	2/2/01	3/2/01														
5	Volume Two	21d	2/2/01	3/2/01														
6	Project Reports	21d	2/2/01	3/2/01		Caren,Judy												
7	Thrust 1	21d	2/2/01	3/2/01	2	Pat & Investigator												
8	Thrust 2	21d	2/2/01	3/2/01	2	Tom & Investigator												
9	Thrust 3	21d	2/2/01	3/2/01	2	Jeff & Investigator												
10	Pubs, biosketch & Pres	21d	2/2/01	3/2/01		Caren,Judy												
11	Thrust 1	21d	2/2/01	3/2/01	2	Pat & Investigator												
12	Thrust 2	21d	2/2/01	3/2/01	2	Tom & Investigator												
13	Thrust 3	21d	2/2/01	3/2/01	2	Jeff & Investigator												
14																		
15	Finalizing Volume 2	20d	3/5/01	3/30/01														
16	Merging,Preparation Vol 2	10d	3/5/01	3/16/01	13	Caren,Judy												
17	send to Printer	1d	3/19/01	3/19/01	16	Staff												
18	Printing Vol 2	7d	3/20/01	3/28/01	17	Print Svc												
19	Vol 2 Received & Ready	2d	3/29/01	3/30/01	18													3/29
20																		
21	Volume One	47d	2/1/01	4/6/01														
22	Research Program	15d	3/5/01	3/23/01														
23	Thrust Leader Summarie	15d	3/5/01	3/23/01	13													
24	Thrust One	15d	3/5/01	3/23/01	13	Pat												
25	Thrust Two	15d	3/5/01	3/23/01	13	Tom												
26	Thrust 3	15d	3/5/01	3/23/01	13	Jeff												
27	Research Project List (Te	15d	3/5/01	3/23/01	13													
28	Testbeds	15d	3/5/01	3/23/01	13	Caren												
29	Indust. Collab & Tech. Trans	37d	2/1/01	3/23/01		Andy												
30	Education & Ouitreach	37d	2/1/01	3/23/01		Fanaye												
31	Appendix 1- Current & Penc	15d	3/5/01	3/23/01	13	Caren,Judy												
32	Appndix 2- Membership Cer	15d	3/5/01	3/23/01	13	Alma,Andy												
33																		
34																		
35																		
36																		
37																		
38																		

Current as of 2/7/01

“PM’s have lots of delegated authority but little formal power” Kerzner, 1992, 254-255

✓ Formal Authority

- PM is officially empowered to give orders

✓ Reward Power

- PM reviews performance during annual review

✓ Penalty Power

- Opposite side of Reward Power

✓ Expert Power

- Project personnel have respect for PM expertise

✓ Referent Power

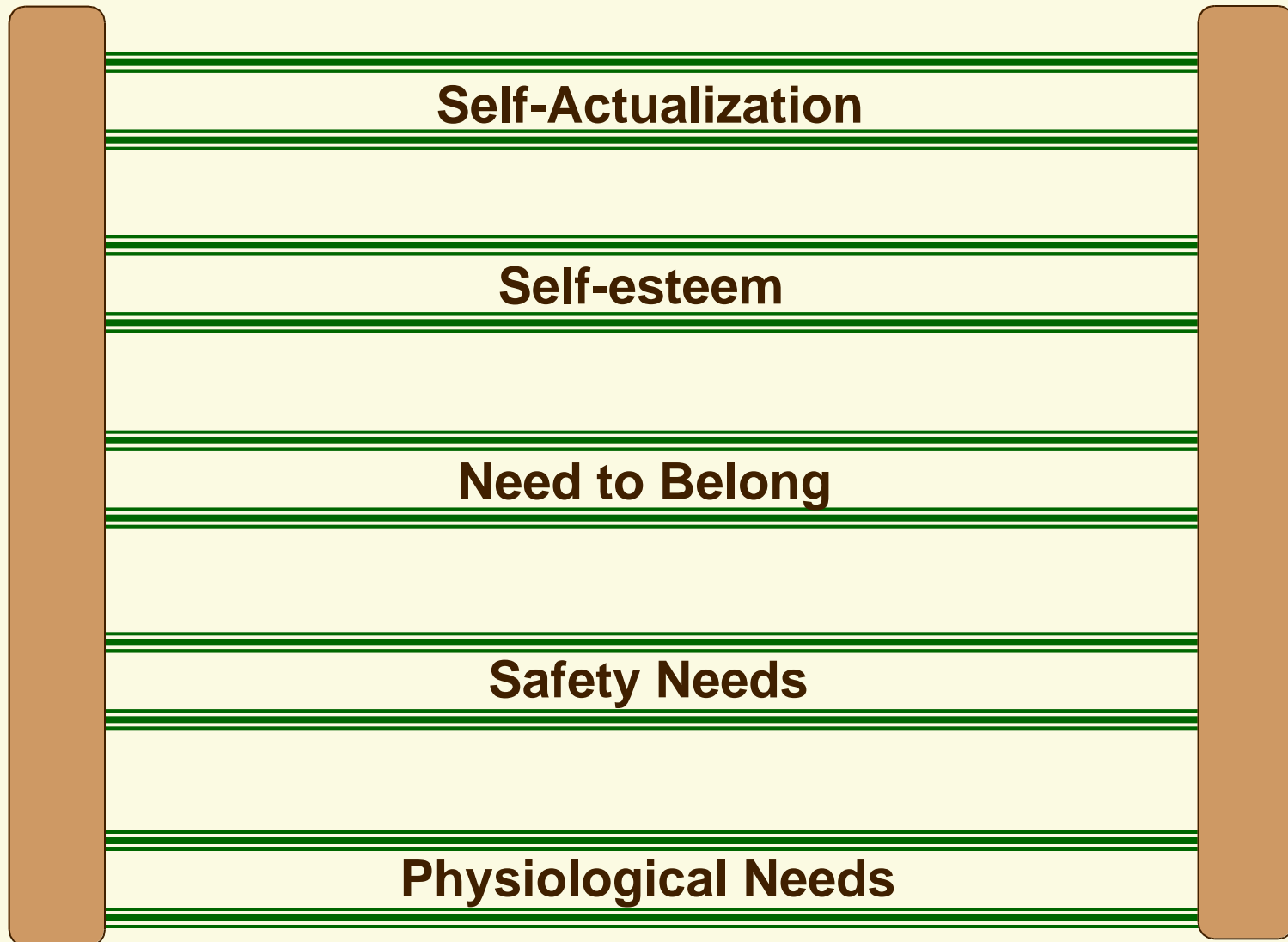
- Project personnel are attracted to good leadership

Barriers to Effective Team Building

Kerzner, 1992,262-263

- ✓ **Differing perspectives, priorities, interests**
- ✓ **Role conflicts**
- ✓ **Objectives are unclear**
- ✓ **Dynamic project environment**
- ✓ **Competition over team leadership**
- ✓ **Lack of team definition and structure**
- ✓ **Project personnel selection**
- ✓ **Credibility of project manager**
- ✓ **Lack of team member commitment**

Hierarchy of human needs



A. Maslow, *in* W.D. Hitt, p. 162

Two approaches to motivation

**Transactional
Leadership**

**Carrot & Stick
Approach**

**Treating People
as Pawns**

**Results in
Adequate Effort**

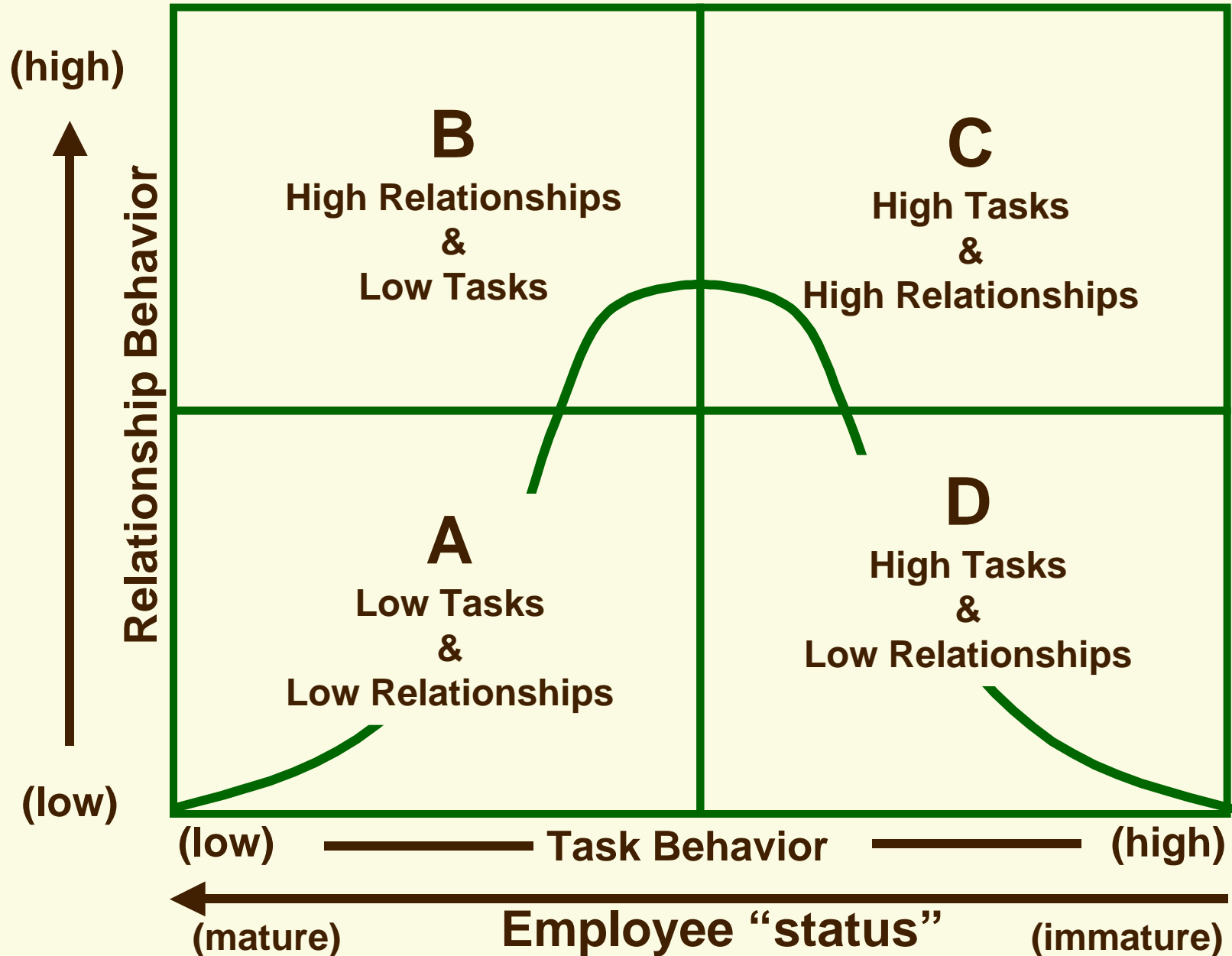
**Transforming
Leadership**

Empowerment

**Treating People
As Persons**

**Results in
Best Effort**

Effective Styles



Andy's methods:

- ✓ Identify the performers and negotiate *hard* get them on your team
- ✓ Design the project *with* the team
- ✓ *Ask* people how long it takes *them* to do things
- ✓ Do *not* change the way people do things
- ✓ *Ask* the line manager for *permission* to work directly with his/her reports even if you don't have to
- ✓ Let the program *breathe*- vary meeting schedule and type

Some Axioms

✓ **One Scientist's View- Loren Pickart**

- People are *stupid*
- People *always* do the same thing

✓ **A Major Industrialist's # 1 Rule- Joe Ashley**

- Never take *yes* for an answer

✓ **A very eloquent leader's wisdom- W. D. Hitt**

- Leadership *can* be learned

✓ **The Workaholic Project Mgr.- H. Kerzner**

- On Friday he thinks there only two more working days 'til Monday
- At 5:00 PM, he considers the day half-over
- He has no time to rest or relax
- He always takes home work from the office
- He takes work with him on vacations

References and other topics

- ✓ **Project Management, A Systems Approach to Planning, Scheduling and Controlling**
 - **Harold Kerzner, Ph.D. ,1992, Van Nostrand Reinhold, New York, NY**
- ✓ **The Leader-Manager: Guidelines for Action**
 - **William D. Hitt, 1988, Battelle Press, Columbus, OH**
- ✓ **Quality Management for Projects and Programs**
 - **L.R. Ireland, 199, Project Management Institute, Drexel Hill PA**
- ✓ **Project and Program Risk Management: A Guide to Managing Risks and Opportunities**
 - **Project Management Institute, Drexel Hill, PA**
- ✓ **Contract Administration for the Project Manager**
 - **Project Management Institute, Drexel Hill, PA**