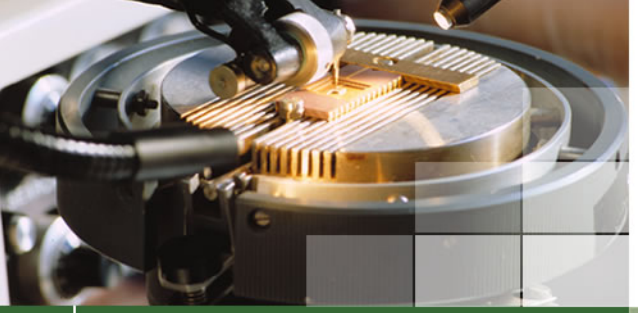

POLITECNICO DI MILANO

Dipartimento di
Elettronica e Informazione

Planning and Managing Software Projects 2014-15

Class 4

Understanding Software Project Management

PMI fundamentals, Project Selection, Initial documents

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Credits

- This slides are largely based on Prof. John Musser class notes on “Principles of Software Project Management”
- Original slides are available at http://www.projectreference.com/
- Reuse and republish permission was granted

Today

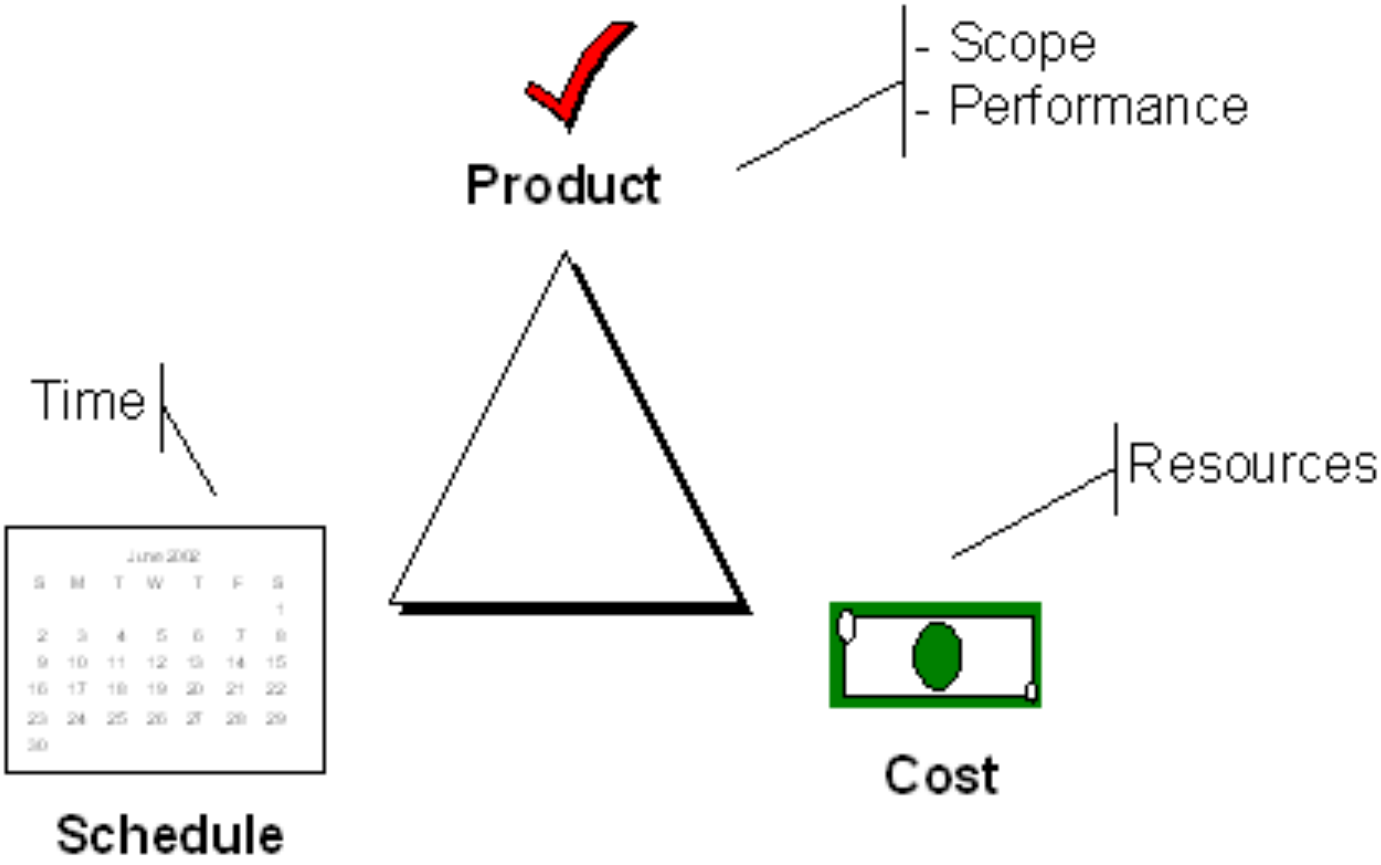
- PMI Fundamentals and Processes
- Project Selection
- Initial documents
  - Statement of Work (SOW)
  - Project Charter

Class 1 and 3 Review

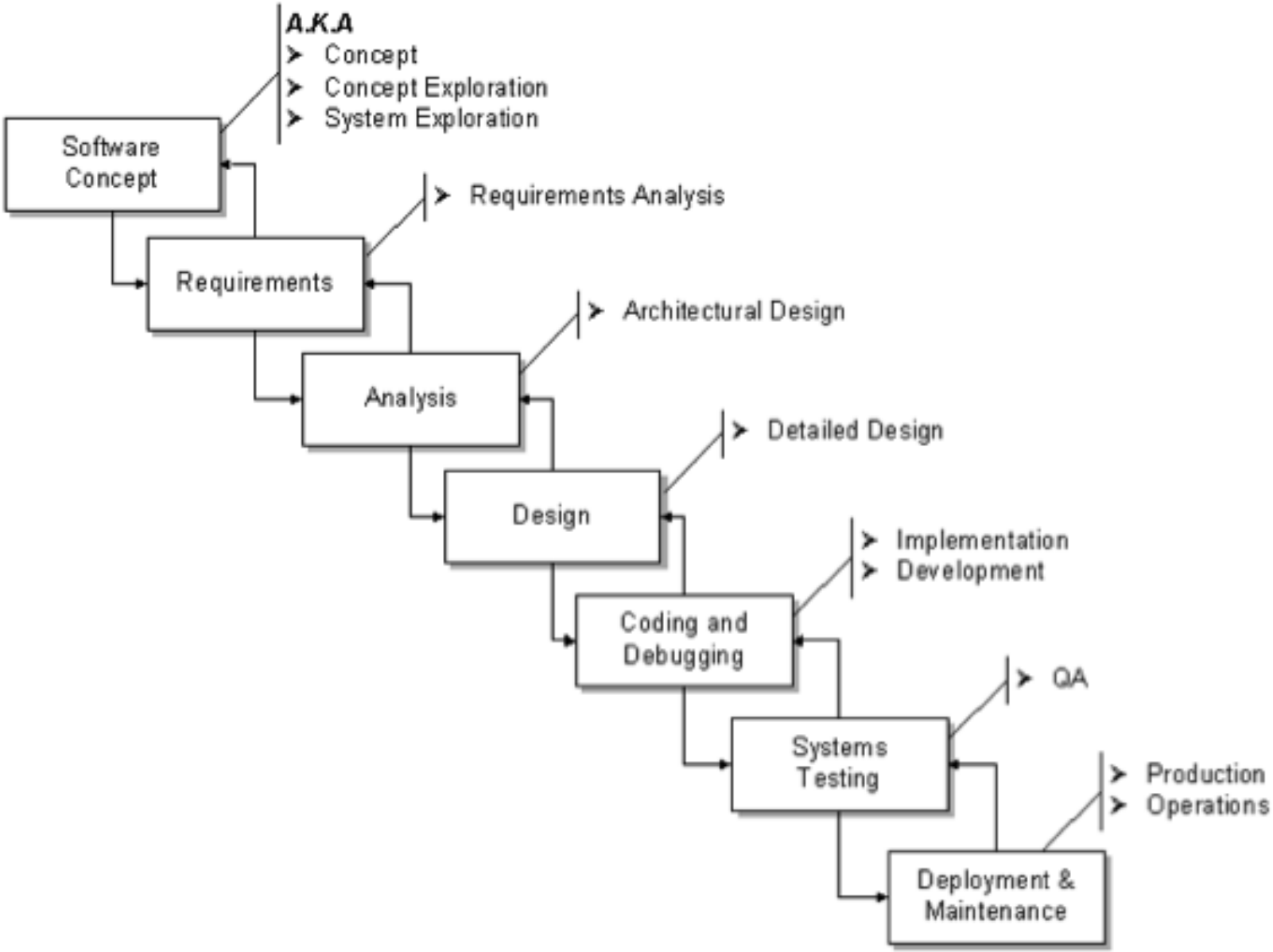
- Project and Program
- The field (more today and later)
- 4 Project Dimensions
  - People, process, product, technology
- Rapid Development Strategy
  - Avoid classic mistakes, development fundamentals, risk management, schedule-oriented practices
- Trade-off Triangle
- Process. One size not fit all.
- Phases (more today and next week)
- 36 Classic Mistakes

Trade-off Triangle

- Know which of these are fixed & variable for every project



Project Phases A.K.A.



Project Success Rates

- The 2001 Standish Group Report Showed Decided Improvement in IT Project Success Rates From the 1995
  - Time overruns: decreased to 63% compared to 222%
  - Cost overruns were down to 45% compared to 189%
  - Required features were up to 67% compared to 61%
  - 78,000 U.S. projects were successful vs. to 28,000
  - 28% of IT projects succeeded compared to 16%
- Why the Improvements?
  - Avg. cost reduced by half
  - Better tools for monitoring and control
  - More skilled PM's, more process, more user involvement
  - And "The fact that there are processes is significant in itself."

Why Do Projects Succeed? 1/2

- How to identify a projects success potential
- What metrics could you look at?
  - Project size
  - Project duration
  - Project team size

Why Do Projects Succeed? 2/2

- Executive support
- User involvement
- Experience project manager
- Clear business objectives
- Minimized scope
- Standard software infrastructure
- Firm basic requirements
- Formal methodology
- Reliable estimates

Standish Group "CHAOS 2001: A Recipe for Success"

Why Executive Support?

- Top management can help to:
  - Secure adequate resources
  - Get approval for unique project needs in a timely manner
  - Receive cooperation from people throughout the organization
  - Provide leadership guidance

Stakeholder Triad

1. Function Representative
   - The 'business person'
   - Or SME: Subject Matter Expert
2. Executive Sponsor
   - Project's visionary & champion
   - Also the 'General', 'Fall Guy' [1], and 'Minesweeper'
   - Not the PM, 'Santa Claus', or the 'Tech Guy'
3. Project Manager
   - The 'Linchpin' [2]
   - Must be 'multi-lingual'

[1] http://en.wikipedia.org/wiki/Fall_guy

[2] http://en.wikipedia.org/wiki/Linchpin

15 PM Job Functions

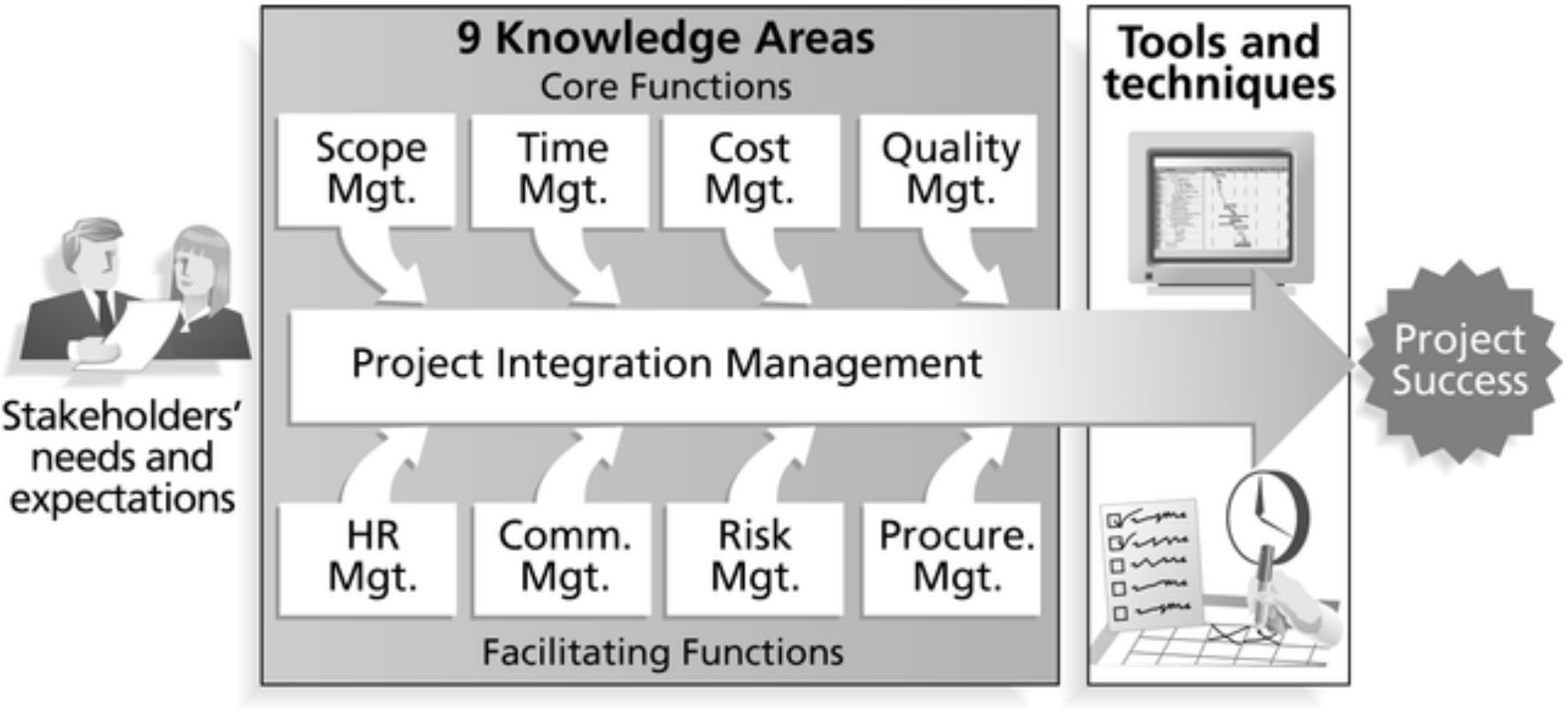
- Define scope of project
- Identify stakeholders, decision-makers, and escalation procedures
- Develop detailed task list (work breakdown structures)
- Estimate time requirements
- Develop initial project management flow chart
- Identify required resources and budget
- Evaluate project requirements
- Identify and evaluate risks
- Prepare contingency plan
- Identify interdependencies
- Identify and track critical milestones
- Participate in project phase review
- Secure needed resources
- Manage the change control process
- Report project status

[source: Northwest Center for Emerging Technologies, "Building a Foundation for Tomorrow: Skills Standards for Information Technology,"Belleview, WA, 1999]

PMBOK

- Available on-line
  http://www.google.com/search?q=PMBOK.pdf
- Structures PM by
  A. Processes
  B. Knowledge Areas
- Processes. 2 types
  1. PM processes: describing and organizing the work of the project
  2. Product-oriented processes: specifying and building the project's product

PMI Framework



Source: Project Management Institute

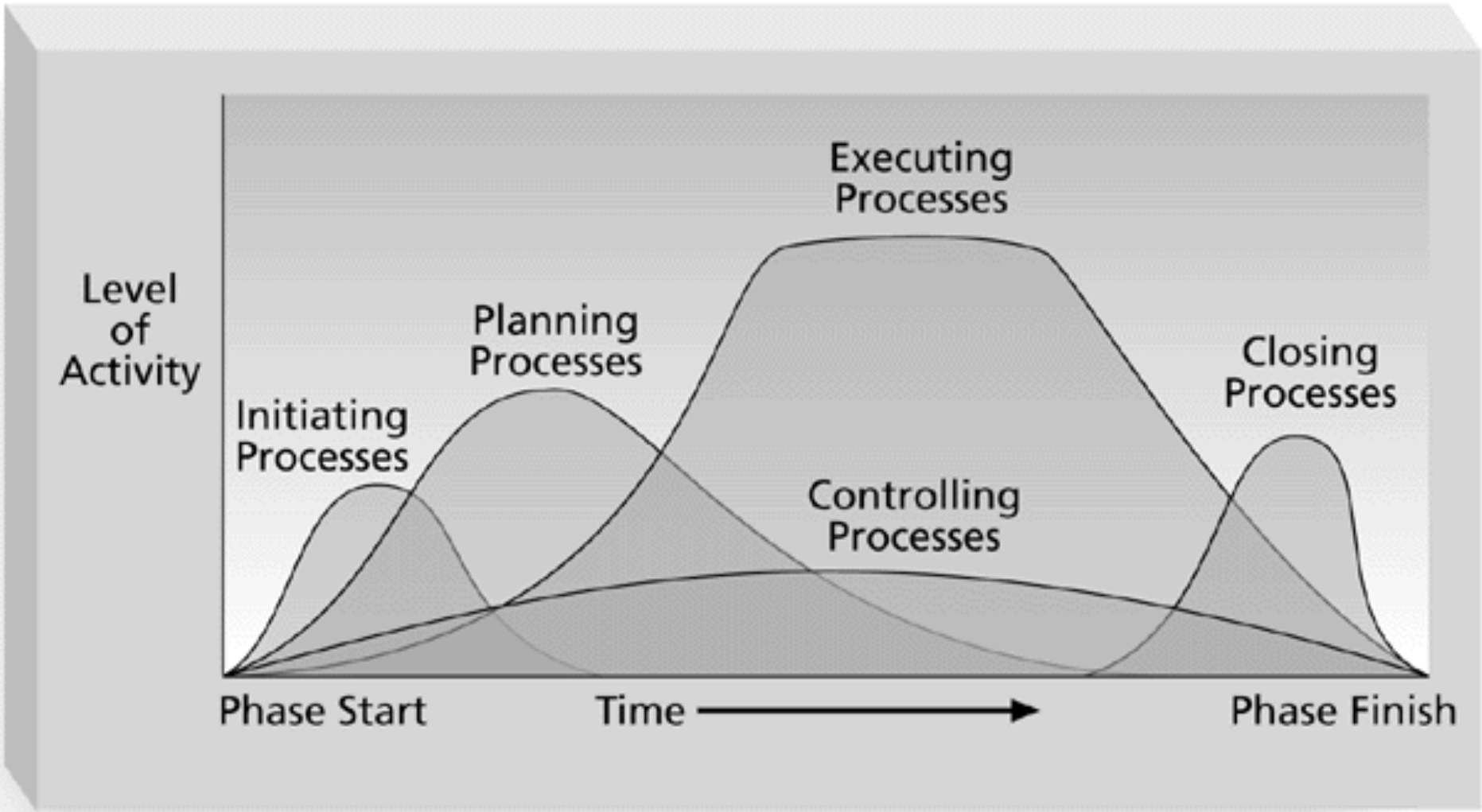
PMI's 9 Knowledge Areas

- Project integration management
- Scope
- Time
- Cost
- Quality
- Human resource
- Communications
- Risk
- Procurement

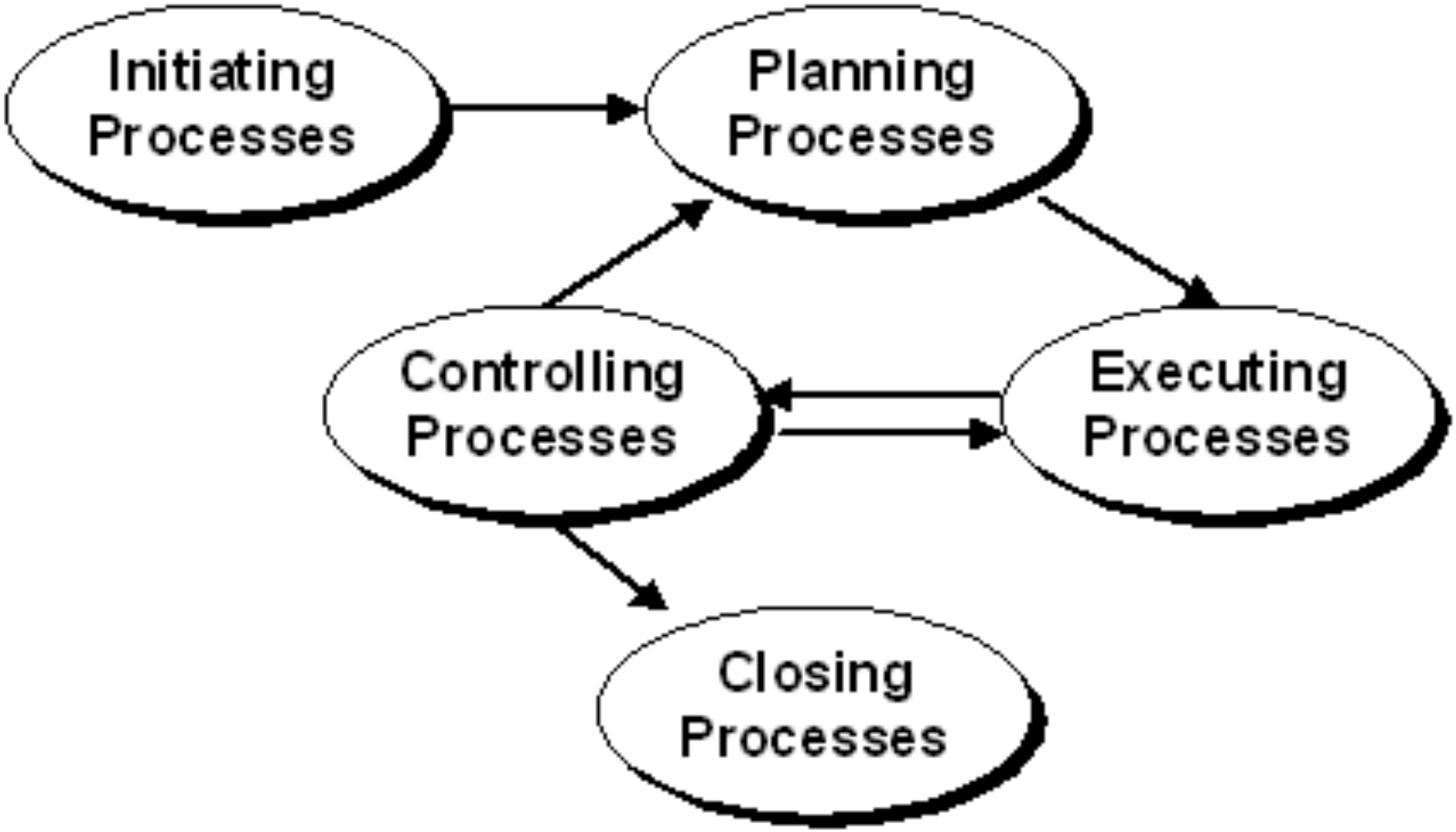
The 5 PMI Process Groups

- Project are composed of process
- Process Groups
  1. Initiating
  2. Planning
  3. Executing
  4. Controlling
  5. Closing
- Each process is described by:
  - Inputs
  - Tools & Techniques
  - Outputs
- Note: process are repeated in each each phase

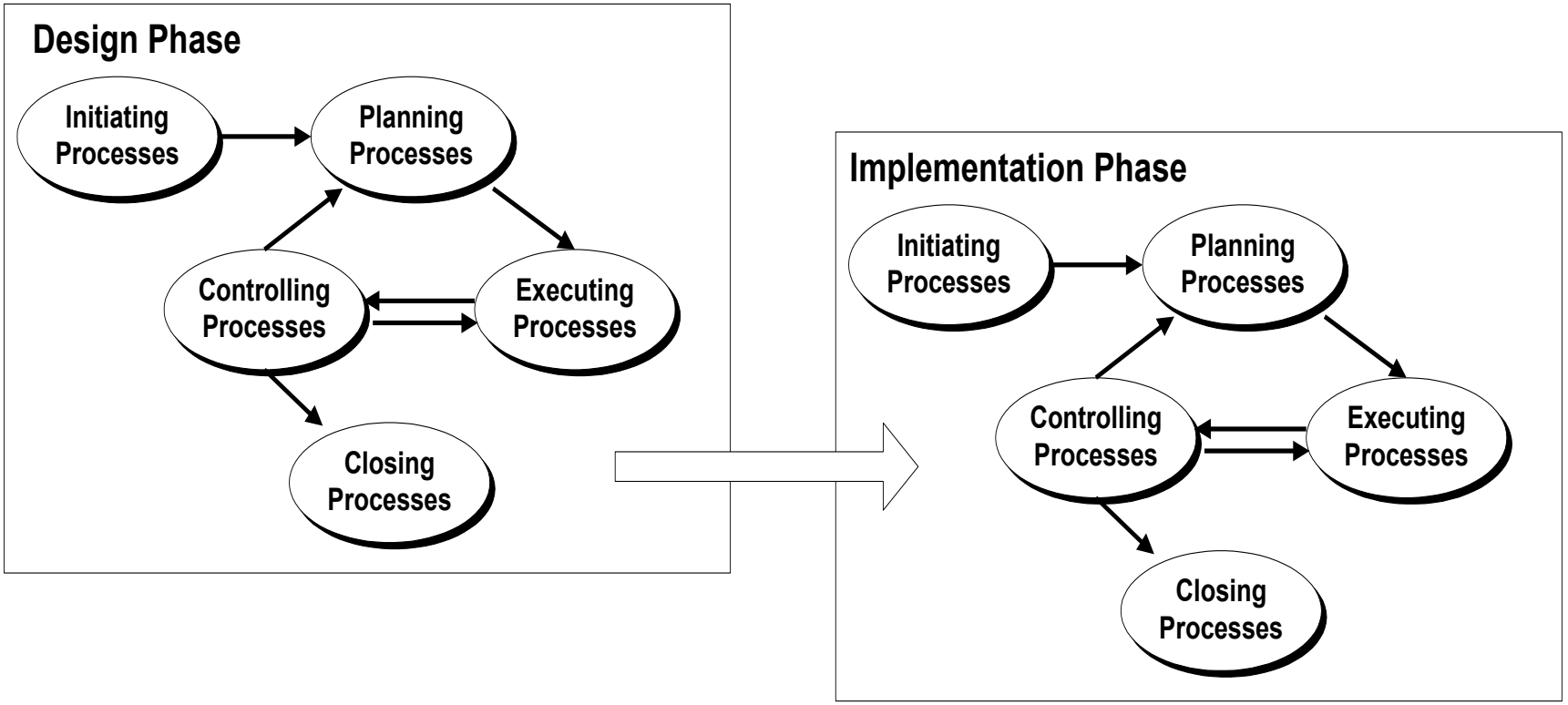
Process & Phases



Process Links



Phase Interactions



Initiating Process, e.g. Software Concept Phase

- Inputs
  - Product Description
  - Strategic plan
  - Selection Criteria
  - Historical Information
- Outputs
  - Charter
  - Manager assigned
  - Constraints
  - Assumptions

Planning Process, e.g. Software Concept Phase

- Devising and maintaining a workable scheme to accomplish the business need that the phase was undertaken to address

- Scope Planning
- Scope Definition
- Activity Definition
- Activity Sequencing
- Activity Duration Estimating
- Resource Planning
- Cost Estimating
- Cost Budgeting
- Risk Planning
- Schedule Development
- Quality Planning
- Communications Planning
- Organization Planning
- Staff Acquisition
- Procurement Planning
- Project Plan Development

Executing Process, e.g. mid of the project

- Coordinating people and other resources to carry out the plan
  - Plan Execution
  - Scope Verification
  - Quality Assurance
  - Team Development
  - Information Distribution
  - Solicitation
  - Source Selection
  - Contract Administration

Controlling Process, e.g. mid of the project

- Ensuring that pahse objectives are met by monitoring and measuring progress and taking corrective measures when necessary
  - Overall Change Control
  - Scope Change Control
  - Schedule Control
  - Cost Control
  - Quality Control
  - Performance Reporting
  - Risk Response Control

Closing Process, e.g. end of the project

- Formalizing acceptance of the phase and bringing it to an orderly end
  - Administrative Closure
  - Contract Close-out

PMI Knowledge Areas

Process Groups / Knowledge Area	Initiating	Planning	Executing	Controlling	Closing
4. Project Integration Management		4.1 Project Plan Development	4.2 Project Plan Execution	4.3 Integrated Change Control	
5. Project Scope Management	5.1 Initiation	5.2 Scope Planning 5.3 Scope Definition		5.4 Scope Verification 5.5 Scope Change Control	
6. Project Time Management		6.1 Activity Definition 6.2 Activity Sequencing 6.3 Activity Duration Estimating 6.4 Schedule Development		6.5 Schedule Control	
7. Project Cost Management		7.1 Resource Planning 7.2 Cost Estimating 7.3 Cost Budgeting		7.4 Cost Control	
8. Project Quality Management		8.1 Quality Planning	8.2 Quality Assurance	8.3 Quality Control	
9. Project Human Resource Management		9.1 Organizational Planning 9.2 Staff Acquisition	9.3 Team Development		
10. Project Communications Management		10.1 Communications Planning	10.2 Information Distribution	10.3 Performance Reporting	10.4 Administrative Closure
11. Risk Project Management		11.1 Risk Management Planning 11.2 Risk Identification 11.3 Qualitative Risk Analysis 11.4 Quantitative Risk Analysis 11.5 Risk Response Planning		11.6 Risk Monitoring and Control	
12. Project Procurement Management		12.1 Procurement Planning 12.2 Solicitation Planning	12.3 Solicitation 12.4 Source Selection 12.5 Contract Administration		12.6 Contract Closeout

Importance of Phases

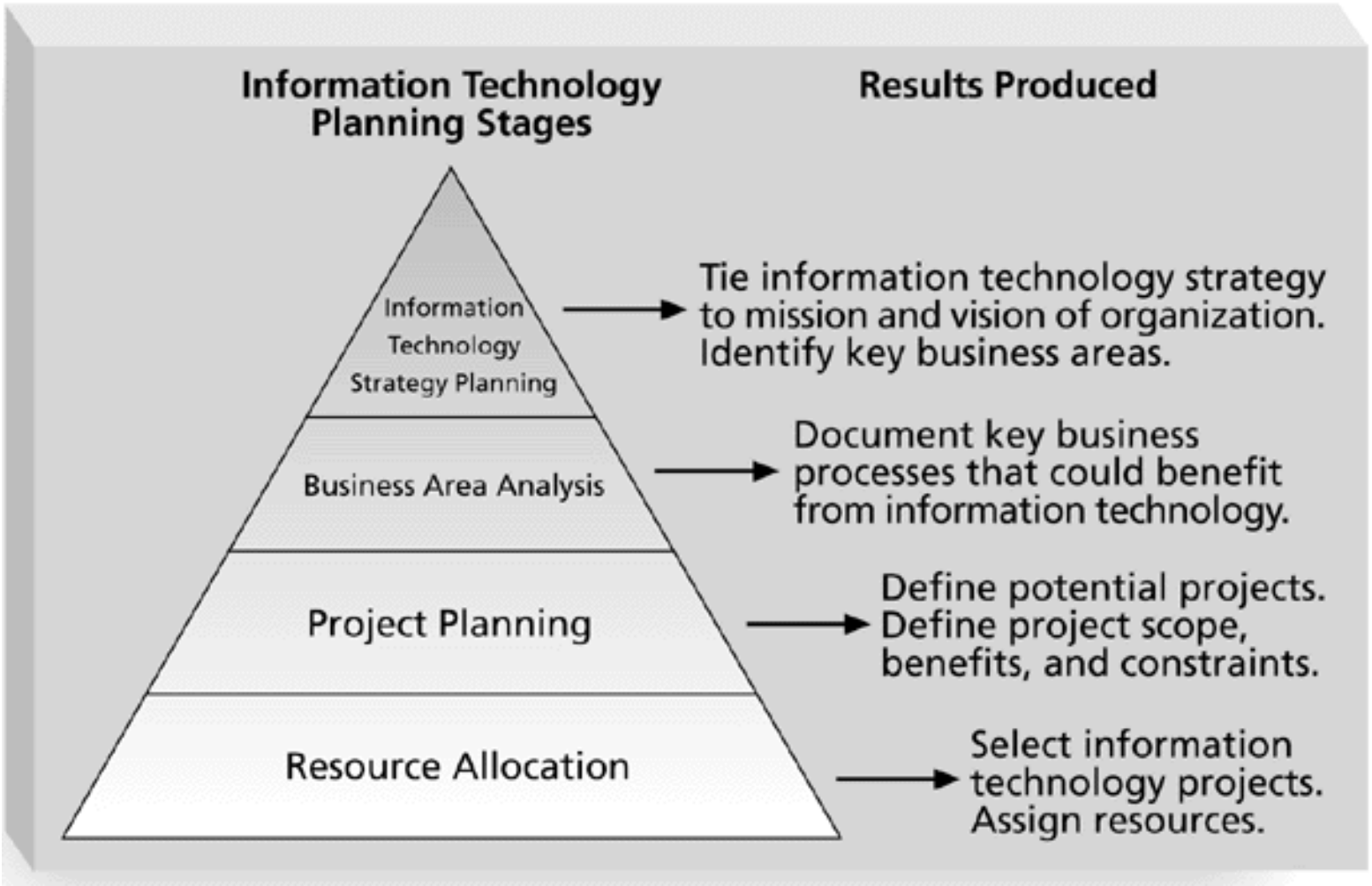
- Define your management review points
  - “Phase exits” or “kill points”
  - Ensure continued alignment with goals
  - Form of Validation & Verification (V&V)
    - More later in term

Why Firms Invest in IT

Reason for Investing in Information Technology Projects	Rank Based on Overall Value of Projects
Supports explicit business objectives	1
Has good internal rate of return (IRR)	2
Supports implicit business objectives	3
Has good net present value (NPV)	4
Has reasonable payback period	5
Used in response to competitive systems	6
Supports management decision making	7
Meets budgetary constraints	8
High probability of achieving benefits	9
Good accounting rate of return	10
High probability of completing project	11
Meets technical/system requirements	12
Supports legal/government requirement	13
Good profitability index	14
Introduces new technology	15

Bacon, James. The Use of Decision Criteria in Selecting Information Systems/Technology Investments, *MIS Quarterly*, Vol. 16, No. 3 (September 1992).

IT Planning Process



Methods for Selecting Projects

- There are usually (always?) more projects than available time and resources to implement them
  - Therefore: It is important to follow a logical process for selecting IT projects to work on
- Methods include
  - Focusing on broad needs
  - Categorizing projects
  - Financial methods
  - Weighted scoring models

Broad Organizational Needs

- It is often difficult to provide strong justification for many IT projects, but everyone agrees they have a high value
  - "It is better to measure gold roughly than to count pennies precisely"
- Three important criteria for projects:
  - There is a need for the project
  - There are funds available
  - There's a strong will to make the project succeed

Categorizing IT Projects

- One categorization: whether project addresses
  - a problem
  - an opportunity
  - a directive
- Another: how long it will take & when it is needed
- Another: overall priority of the project

Statement of Work (SOW)

- A description of the work required for the project
- Sets the “boundary conditions”
- SOW vs. CSOW (Contract SOW)
  - Latter: uses legal language as part of a competitive bidding scenario
- Can be used in the final contract – be careful, be specific, be clear

SOW Continued

- Typically done after approval (after “Go”)
- Can be multiple versions
  - 1. List of deliverables for an Request for Purchase (RFP)
  - 2. More detailed within final RFP
  - 3. Binding version from contract

SOW Template

- **Scope of Work:** Describe the work to be done to detail. Specify the hardware and software involved and the exact nature of the work.
- **Location of Work:** Describe where the work must be performed. Specify the location of hardware and software and where the people must perform the work
- **Period of Performance:** Specify when the work is expected to start and end, working hours, number of hours that can be billed per week, where the work must be performed, and related schedule information. Optional "Compensation" section.
- **Deliverables Schedule:** List specific deliverables, describe them in detail, and specify when they are due.
- **Applicable Standards:** Specify any company or industry-specific standards that are relevant to performing the work. Often an Assumptions section as well.
- **Acceptance Criteria:** Describe how the buyer organization will determine if the work is acceptable.
- **Special Requirements:** Specify any special requirements such as hardware or software certifications, minimum degree or experience level of personnel, travel

Project Charter

- A high-level project description
- Often precedes SOW
- Often 2-4 pages (can be longer)

Project Charter Typical outline

- Overview
  - Business need
  - Objectives
  - Method or approach
- General scope of work
- Rough schedule & budget
- Roles & responsibilities
- Assumptions
- Out of scope items

Homework 1 Assignment

- Write a Project Charter for your project
- 2-3 pages
- Use format of your choice, but outlined as in next slides
- Graded on content, not format

Submitting you Homework

- Decide the title and the team and register your project on this form by Wednesday
- I will create and share with you a dropbox (https://www.dropbox.com/) folder where you will upload the homework assignments.
- You will receive and email from dropbox as soon as the folder will be available.
- Download the word template from
  - http://emanueledellavalle.org/slides/P&MSP2015_03b_template-homework-1.doc
- Prepare your homework assignment according to the following slides
- Upload the document as a pdf in the shared folder. Please name the file, homework-1.pdf
- If you need to contact me, please write an email on emanuele.dellavalle@polimi.it and make sure that in the subject you mention PMSP2015

Assignment Details

- A project Charter includes:
  - Overview (2-4 paragraphs)
    - What the system is (summary)
    - Who will use it
    - What problem is it solving (Objectives)
  - Scope of Work (outline format or text)
    - What the system is (details)
    - Deliverables
  - Rough time estimate (2 months or 2 yrs?) & budget (10K€ or 10M€?)
  - Roles & responsibilities
    - PM (role an
    - Team (required skills)
    - Primary stakeholders
  - Assumptions
  - Out of scope items

Deliverables

- Retail Web Site
  - D1 Full catalog
  - D2 Shopping-cart system
  - D3 Search engine
  - D4 User registration system
- Trading System
  - D1 Equities order entry system
  - D2 Portfolio management
  - D3 Order execution engine
  - D4 Integration with X legacy systems
  - D5 Security infrastructure

Deliverables (cont.)

- Corporate Application
  - D1 Network and hardware
  - D2 Web-based HR portal
  - D3 Connectivity for VPN
  - D4 “Asset Management Viewport” application
  - D5 Customized Reporting Engine
    - Allowing users to data mart
    - Delivery into HTML and Excel
  - D6 User manuals

Charter Examples - Schedule

- Schedule
  - We anticipate an overall 12-14 month development timeframe
  - The project is expected to start in Q1 2010 and complete in Q3 2011
  - The initial release is expect within 10 months with the follow-on delivery within 4-6 months

Charter Examples – Costs/Price (in Europe) 1/2

- Classes of Personnel
  - **Junior** Developer/Quality Assurer/Document Writer
  - **Senior** developer/Quality Assurer/Document Writer
  - **S**ubject **M**atter **E**xpert (business analyst, software architect, information architect, built engineers):
  - **T**echnical **M**anager
  - **P**roject **M**anager
- Personnel Costs and Prices (Person Month Rate)

	Net Salary	Gross Salary	Industrial Cost	Standard Price
PM	4500	7500	12000	15600
SMA/TM	3000	5000	8000	10400
senior	2250	3750	6000	7800
junior	1500	2500	4000	5200

- Other costs
  - Hardware, software, etc.
  - Travels and Accommodations

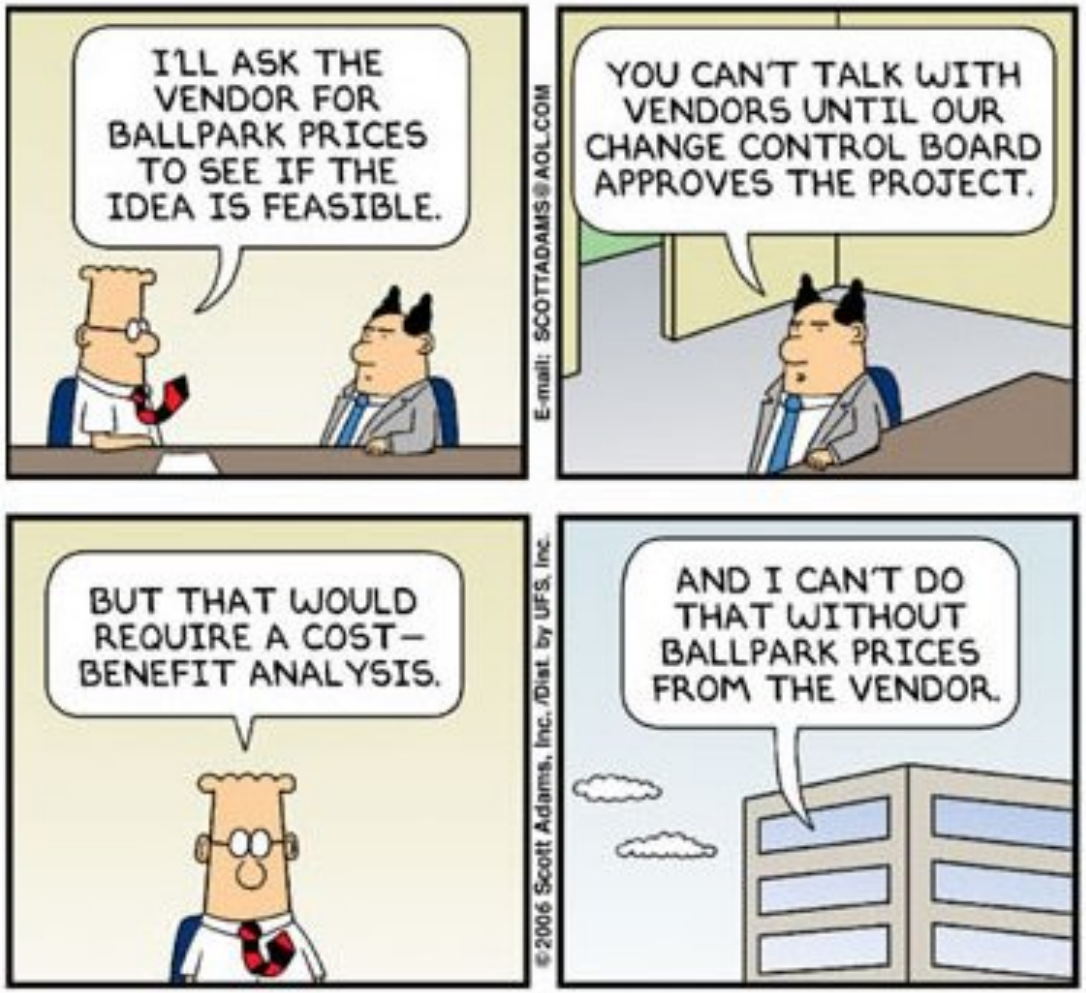
Charter Examples – Costs/Price (in Europe) 2/2

- Example for a project lasting 3 months

Who	Number	Effort	Industrial Cost	Cost
PM	1	1.5	12,000	18,000
SMA	3	0.5	8,000	12,000
senior	2	3	6,000	36,000
junior	4	3	4,000	48,000
				114,000

- Other costs
  - Hardware, software: 10,000
  - Travels and Accommodations: 10,000
- Total costs
  - 134,000

Rough schedule & budget



Primary Stakeholders

- Sponsor:
  - VP of Marketing
  - Five Star Brokerage Consortium
  - Bill Smith, CEO
- Users:
  - Call center operators
  - Our partner banks
- Customers:
  - Attorneys from small-to-mid size law firms
  - Males 30-45 earning $75K or more

Assumptions

- We will reuse the architecture from the previous ordering system
- The system will be built using an ASP model
- Customer will provide necessary business experts as needed during development
- System will run on existing networking and computer resources
- Customer will sign-off on interim deliverables within one week of each delivery
- All import data will be available in XML format
- This will be a web-based application
- Our in-house development team will do the work
- The rendering engine will be licensed from a third party
- We will partner with an overseas development firm to create the security systems

Out of Scope

- News feeds
- Dynamic pricing
- Jazzy color picker
- Auction engine
- EDI support
- Legacy integration
- Help system

Optional Reading

- Review projectreference.com: “Sample SOW and Project Charter Docs”
  - http://www.projectreference.com/#SOWs