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# **IT/Software Project Management Core Functions**

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# Copyrights

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- The following references were mostly used in the preparation of the course; the order reflects the intensity of usage:
  - ✚ IT Project Management, Kathy Schwalbe, Course Technology, 2004.
  - ✚ Ghazy Assassa, Software Engineering Course notes, 2007.
  - ✚ Ian Sommerville: Software Engineering, 7th edition, Addison-Wesley, 2005.
  - ✚ PMBOK Guide, 2004.
  - ✚ Roger Pressman: Software Engineering, McGraw-Hill, 2005.
- ✚ Some information were taken from the following sites:
  - The Institute of Electrical and Electronics Engineers (IEEE)
  - The International Organisation for Standardisation (ISO)
  - The Software Engineering Institute (SEI) at Carnegie Mellon University.

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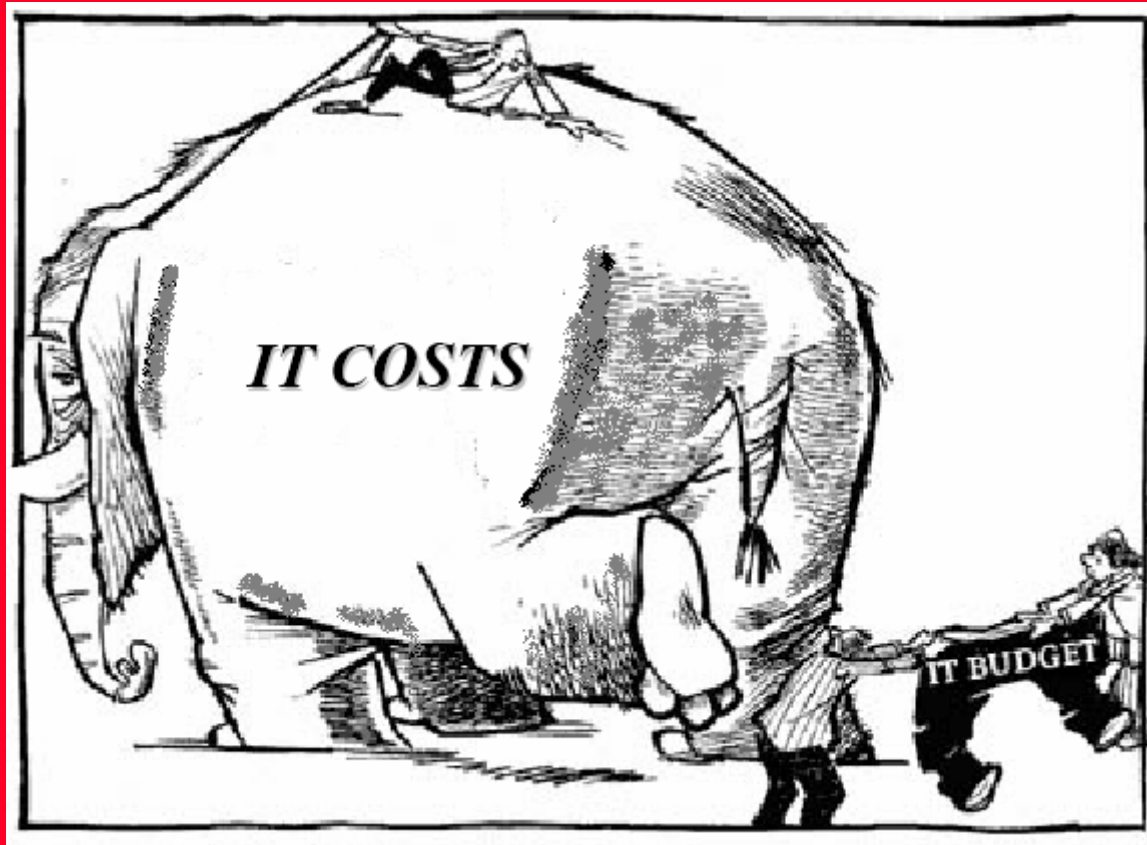
# Project Management Framework

## PM Knowledge Areas

# Objectives

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- To introduce Project Management Framework and its nine knowledge areas
- To explain core and facilitating knowledge areas
- To discuss PDCA (or POMA) Quality Cycles as related to Project Management Framework



# What is Project Management? \*

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- **Project management** is “the application of

- ✚ knowledge,

- ✚ skills,

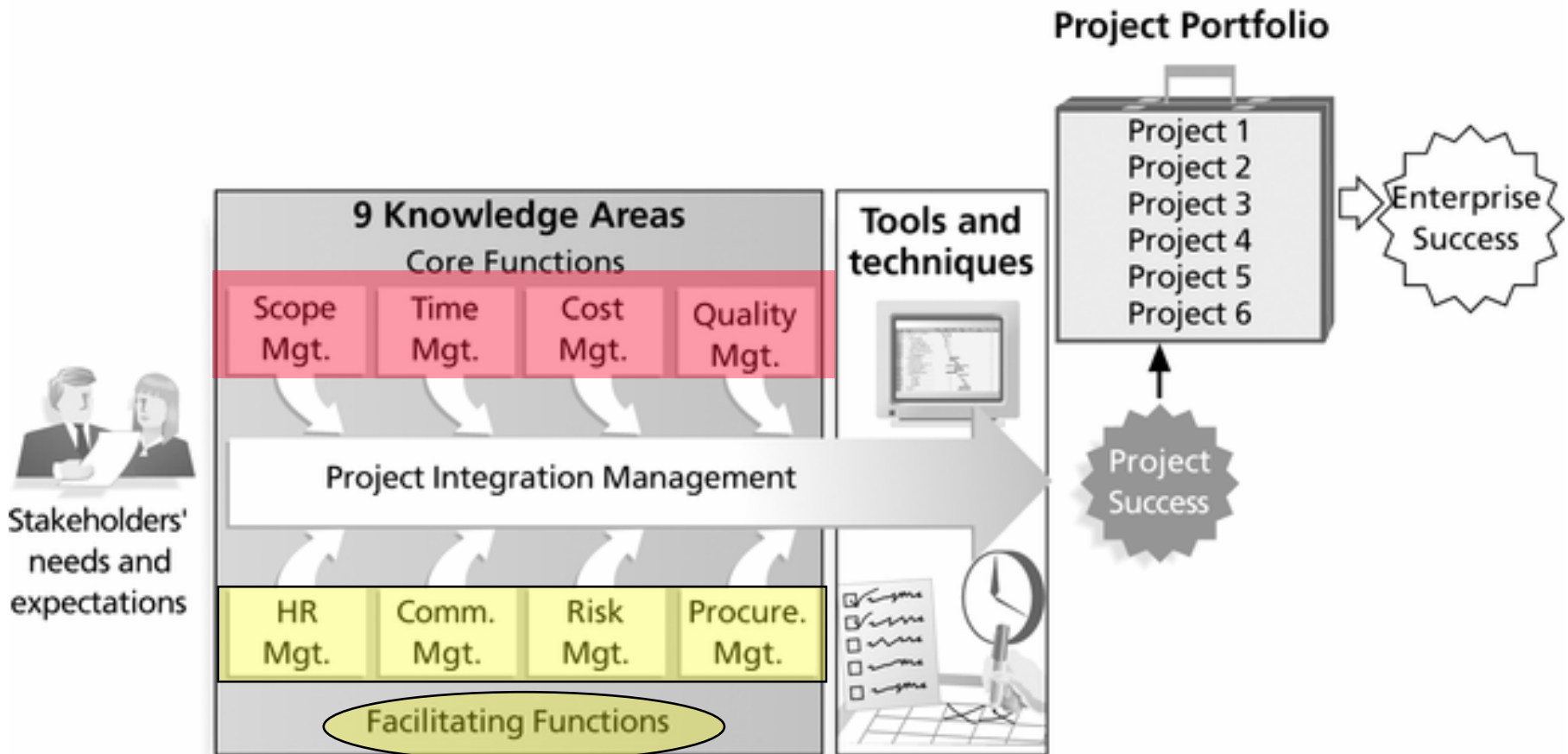
- ✚ tools

- ✚ and techniques

to project activities to meet project requirements.”\*

*\*PMI, A Guide to the Project Management Body of Knowledge (PMBOK® Guide) (2004), p. 8.*

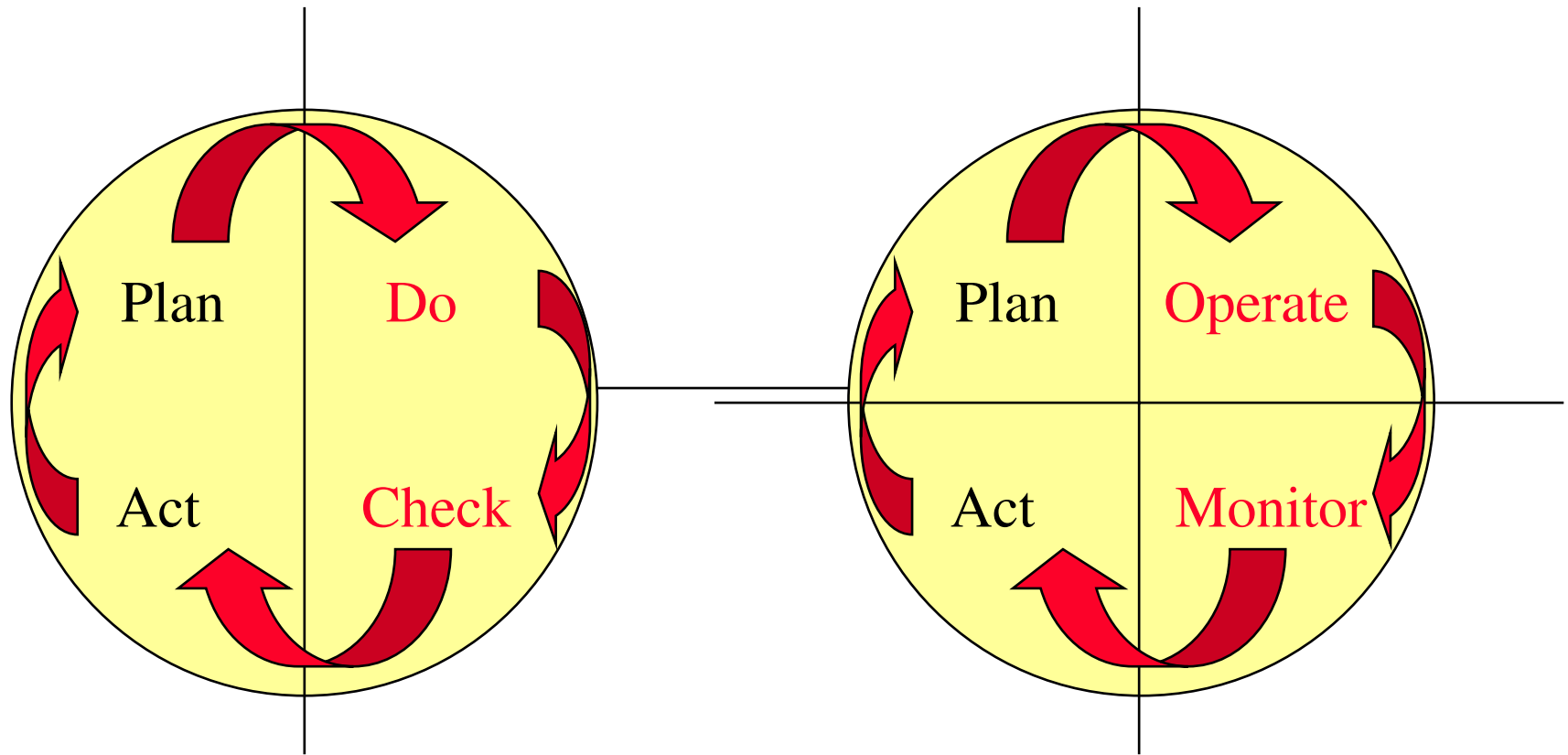
# Project Management Framework



IT Project Management, Kathy Schwalbe, Course Technology, 2004.

# The PDCA (or POMA) Quality Cycle

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# Nine Project Management Knowledge Areas

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- Knowledge areas describe the key competencies that project managers must develop.
- Four **core** knowledge areas
- Four **facilitating** knowledge areas
- Plus one knowledge area: “project integration management”
- All knowledge areas are important!

# Nine Project Management Knowledge Areas

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- Four **core** knowledge areas lead to specific project objectives
  - ✚ (scope, time, cost, and quality).
- Four **facilitating** knowledge areas are the means through which the project objectives are achieved
  - ✚ (human resources, communication, risk, and procurement management).
- One knowledge area
  - ✚ (project integration management) affects and is affected by all of the other knowledge areas.

# Conceptual View of Process Groups and Knowledge Areas

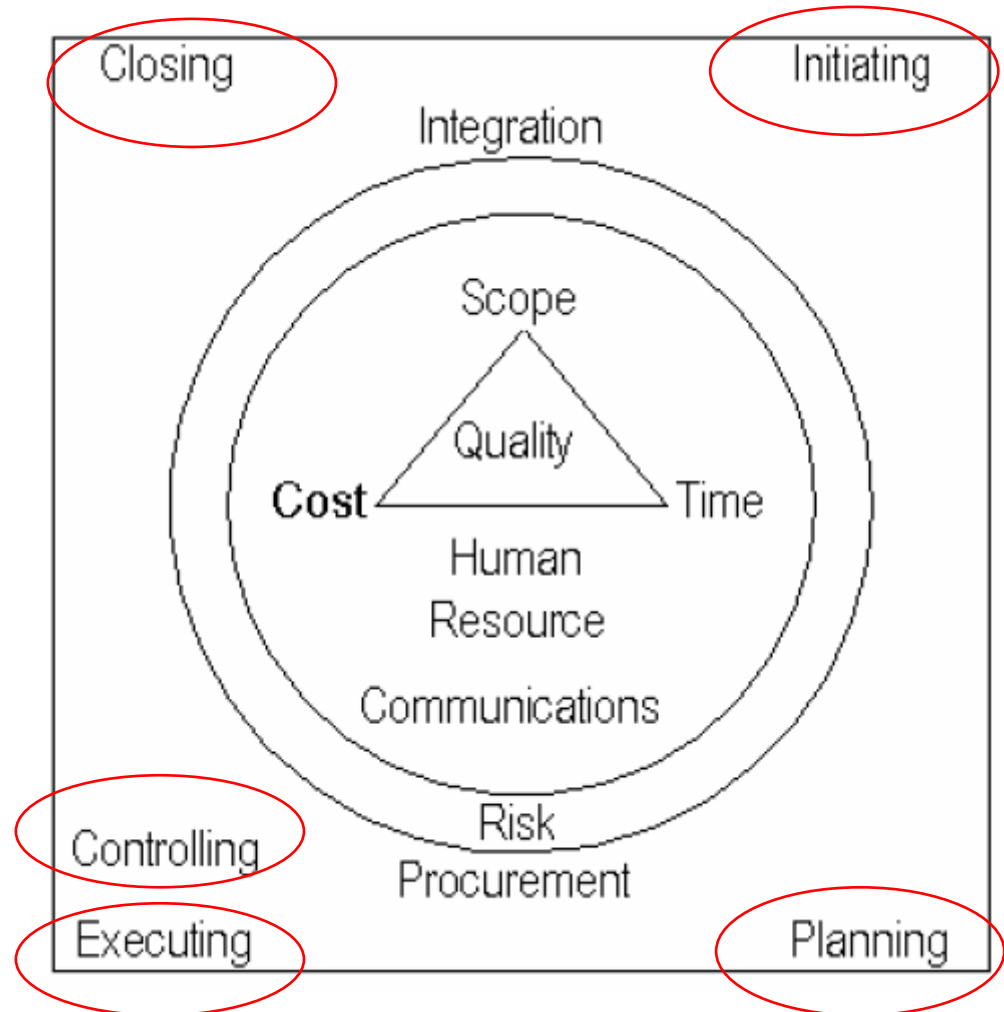
## Process

A process is a collection of actions focused on producing a result.

- Initiating,
- Planning,
- Executing,
- Controlling,
- Closing

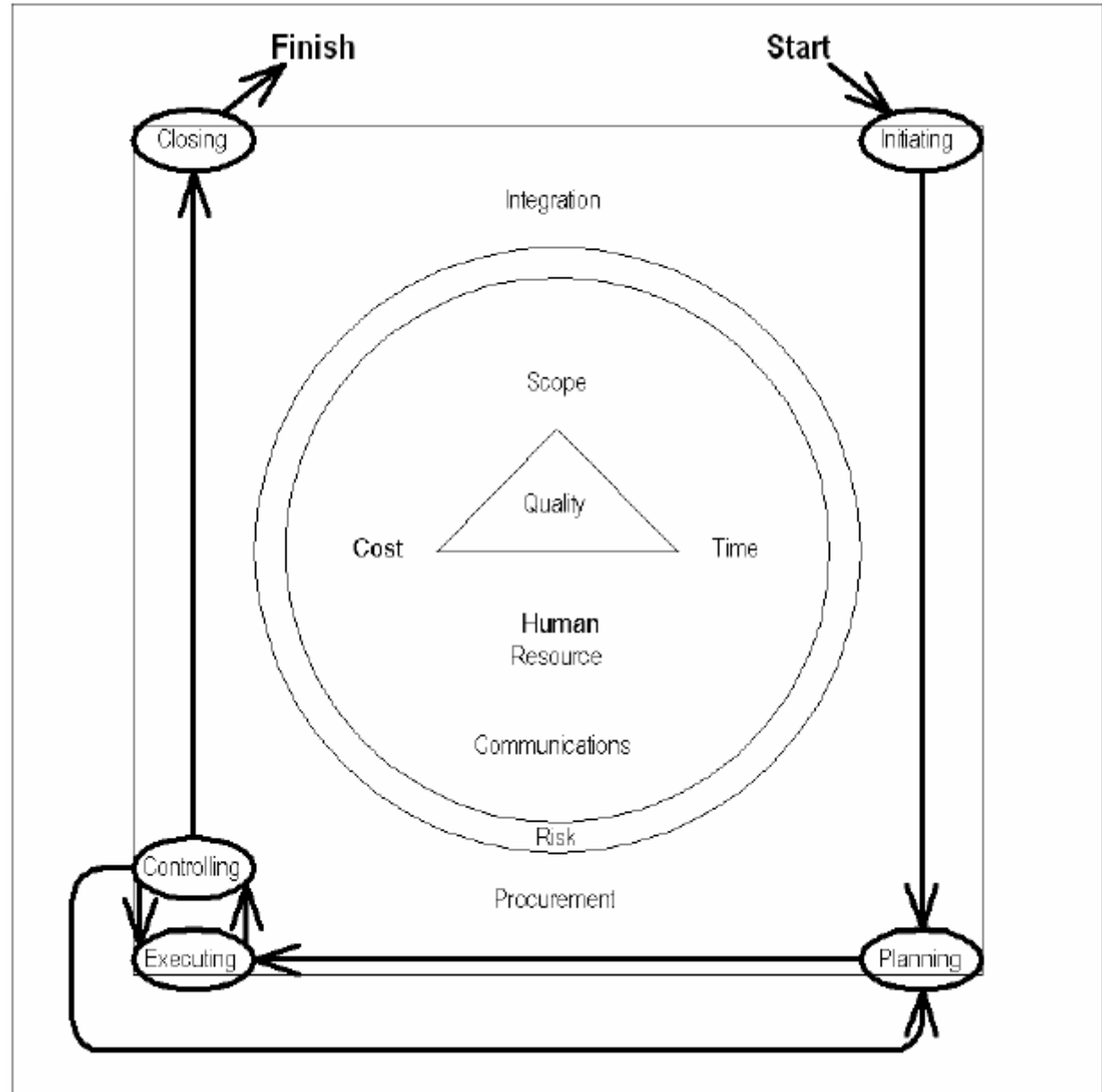
Global knowledge source for software development professionals ISSN 1023-4918 - Winter 2003 (Volume 11 - number 4)

Epoch: Strategy for Success”  
(<http://home.earthlink.net/~salhir>)



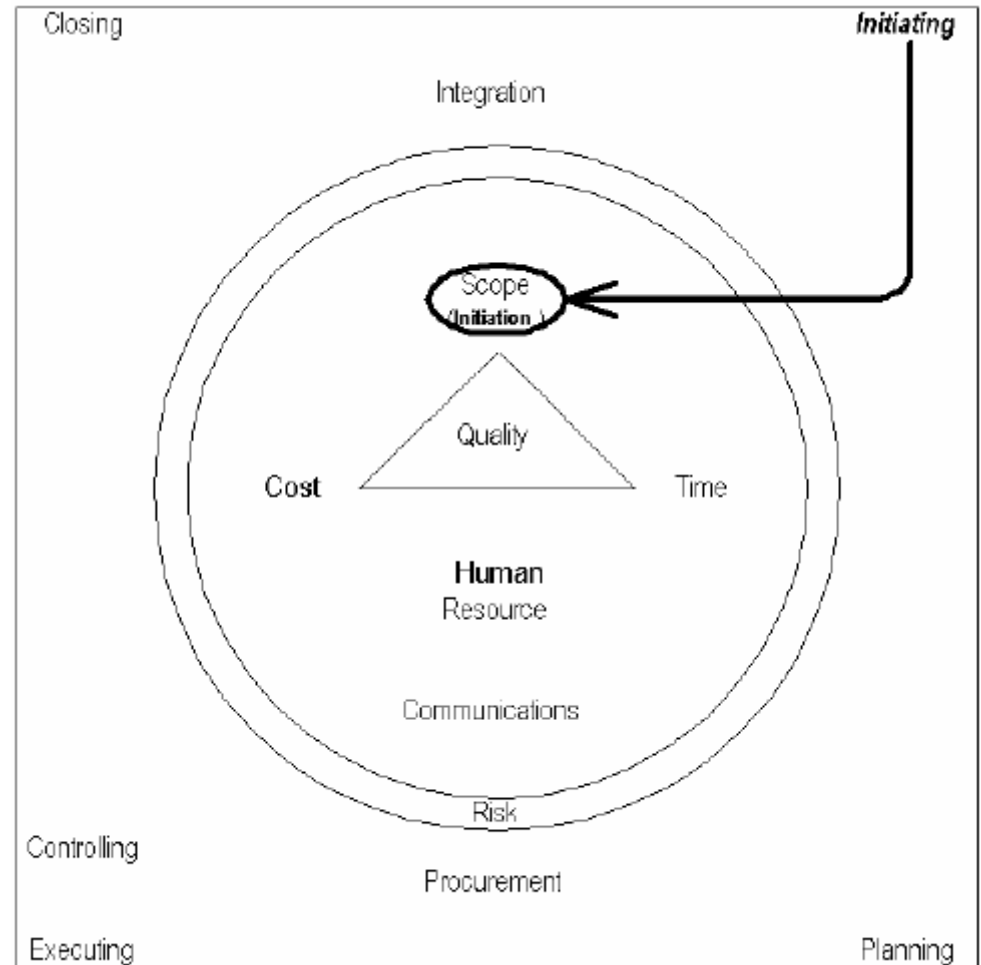
# Process Groups

- Initiating,
- Planning,
- Executing,
- Controlling,
- Closing



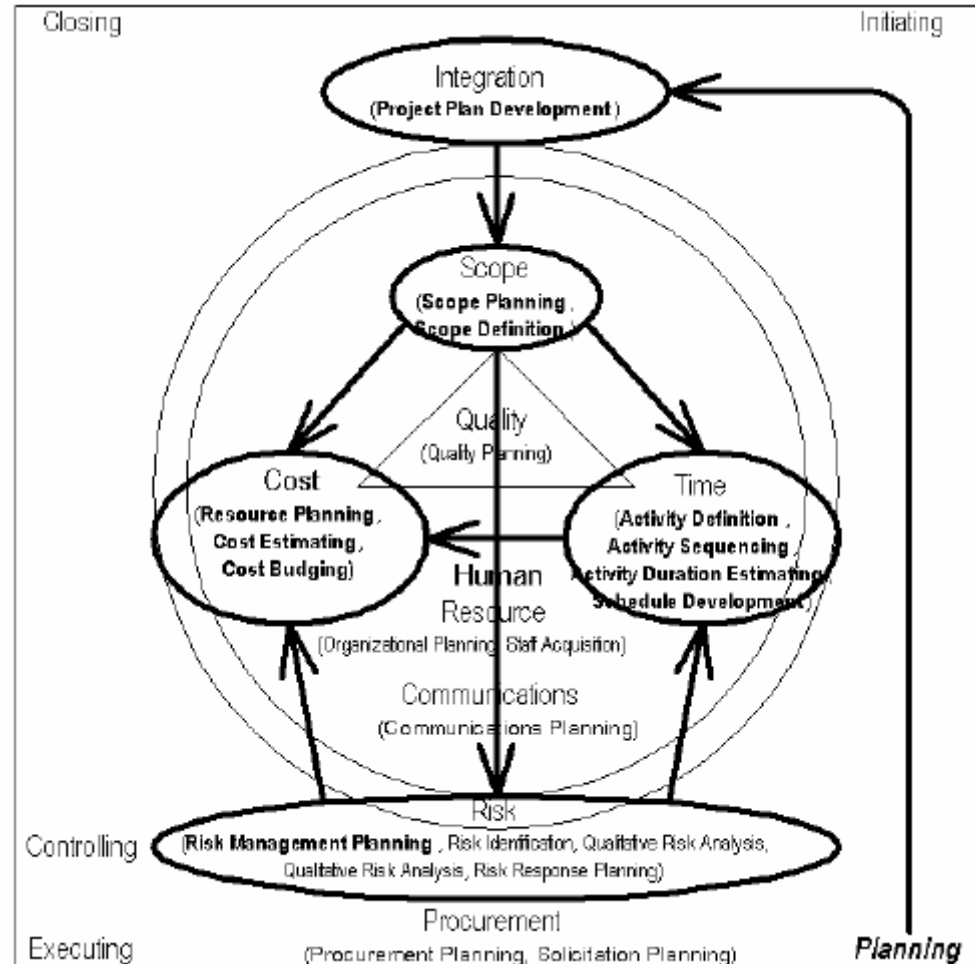
# Initiating Process & Knowledge Areas

- The Initiating process focuses on authorizing a project or phase.
- Generally occurs at the beginning of a project.
- The results from this process become input into the Planning process.
- Slides highlights the Initiating processes organized by knowledge areas.
- The overall theme is **scope**.



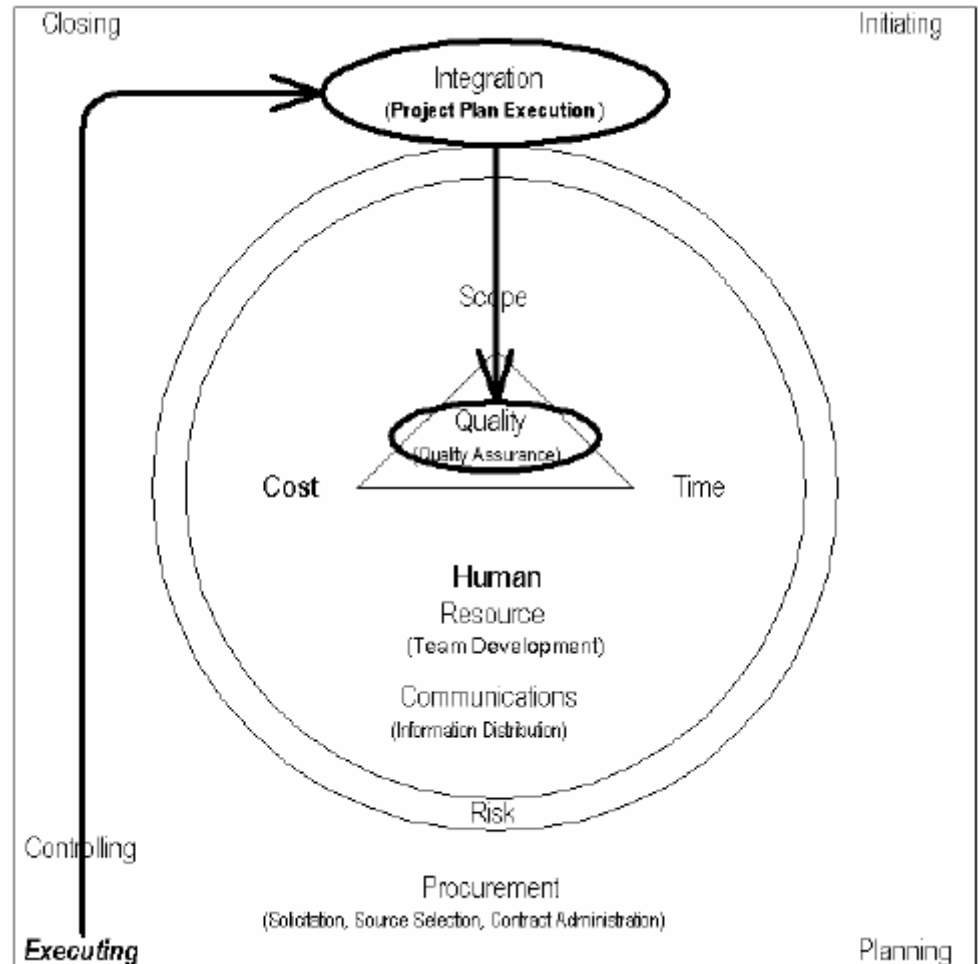
# Planning process & Knowledge Areas

- Peeks early in a project and steadily decreases.
- The results from Planning process become input into the Executing process group.
- Coincides with the **Plan** part of the common “**Plan-Do-Check-Act**” quality cycle.
- Slide highlights the Planning processes organized by knowledge areas with their general ordering.
- The overall theme involves **time and cost** based on **scope and risk**.



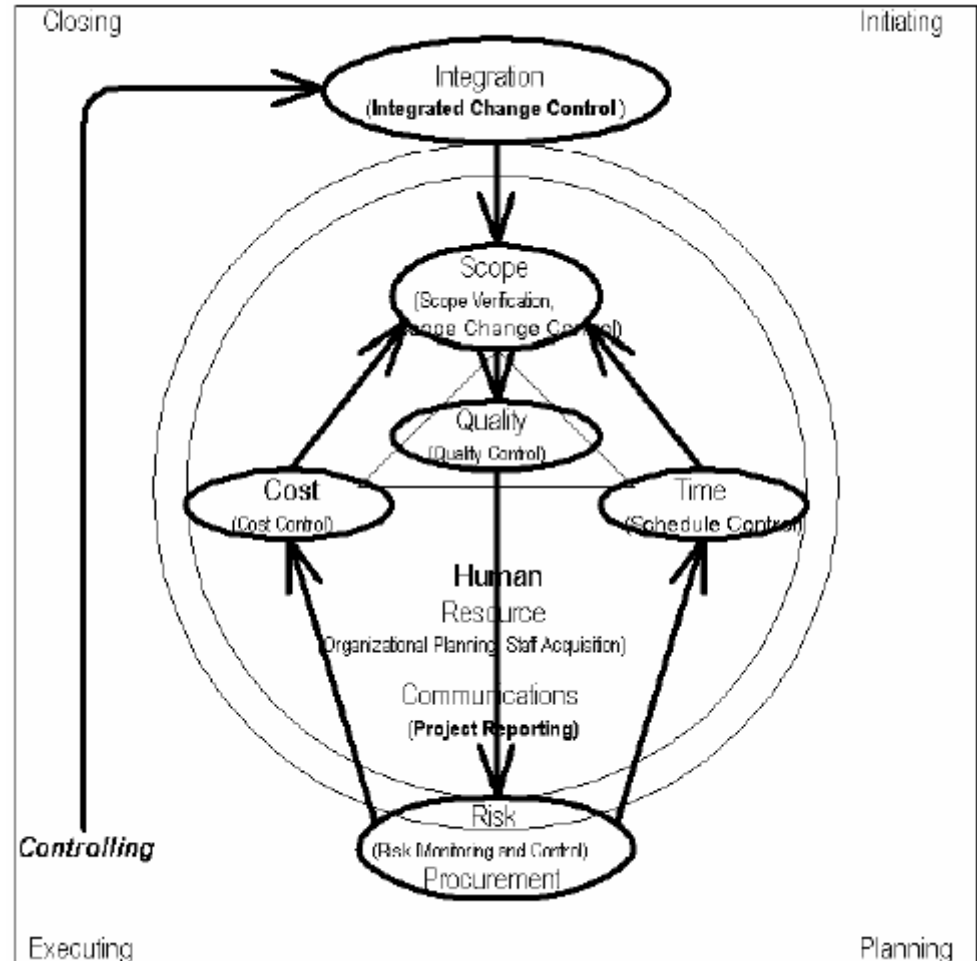
# Executing Process & Knowledge Areas

- Focuses on coordinating resources to perform the best alternative for attaining project or phase objectives.
- Generally steadily increases and peaks later in a project or phase.
- The results from this process become input into the Controlling process.
- Coincides with the **Do part** of the common **Plan-Do-Check-Act** quality cycle.
- Slides highlights the Executing processes organized by knowledge areas.
- Notice that the overall theme is **quality**.



# Controlling process & Knowledge Areas

- Focuses on monitoring and measuring progress to identify variances from the best alternative for attaining project or phase objectives
- Take corrective actions to address the variances and ensure that the objectives are met.
- Coincides with the **Check and Act** parts of the common **Plan-Do-Check-Act** quality cycle.
- Slide highlights the Controlling processes organized by knowledge areas with their general ordering.
- Notice that the overall theme involves **time and cost** based on **quality and risk** to address scope.





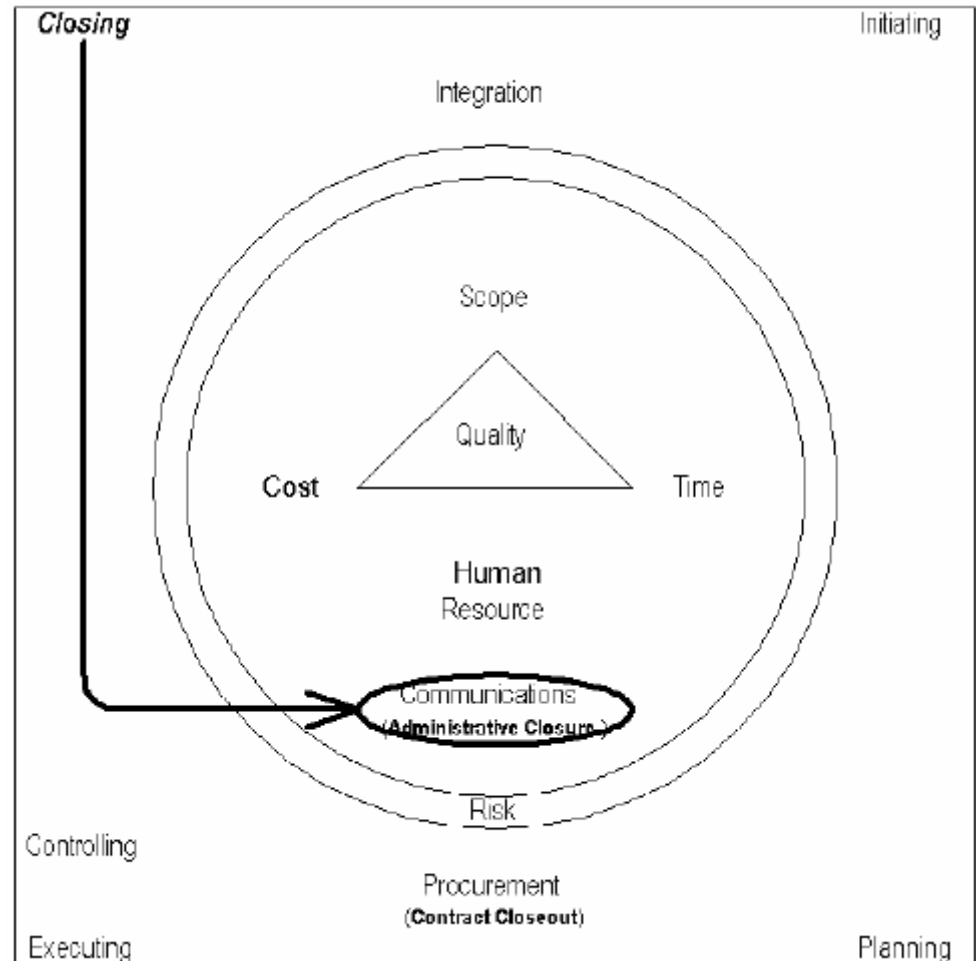
# Controlling process & Knowledge Areas

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- Generally steadily increases and peaks in the middle of a project or phase and steadily decreases.
- The results from this process group become input into the Planning, Executing, and Closing process groups.

# Closing process & Knowledge Areas

- Focus on formalizing acceptance of a project (or phase) and ends the project (or phase).
- Generally occurs at the end of a project or phase.
- The results from this process group become input into the Initiating process group in the next project phase.
- Slides highlights the Closing processes organized by knowledge areas.
- Notice that the overall theme is **communication**.



# Knowledge Areas

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- A knowledge area organizes processes based on their subject or area of concern or focus.
- Knowledge areas are linked by the results they produce where the output from one knowledge area becomes input to other knowledge areas.
- Knowledge areas are not discrete or one-time events but are overlapping activities that are **iterative** in nature such that they may be iterated several times and occur at varying levels of intensity across a project, within and across phases of a project, and are commensurate with the scope of the project and the value the knowledge area adds to the specific project.

# Integration Knowledge Area

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- Focuses on integrating and coordinating the various elements of a project.
- The Project Plan Development core process focuses on developing a project plan. A project plan captures planning assumptions, decisions, approved baselines (scope, schedule, and cost), and facilitates communication and also guides project execution and project control.
- A project plan commonly includes the project charter, project management approach, scope statement, work breakdown structures, performance baseline (schedule, cost estimates, and budget), milestones, other plans, open issues, and pending decisions. The progressive elaboration of a project plan is known as rolling wave planning to emphasize that planning is an iterative and ongoing process. The Project Plan Execution core process focuses on performing the activities in the project plan. The Integrated Change Control core process focuses on addressing changes to the project.

# Scope Knowledge Area

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- Focuses on a project's deliverables.
- The Initiation core process focuses on developing a **project charter**.
- A project charter authorizes a project and provides a project manager with the authority to manage the project. A project charter commonly includes a description of the business needs that the project results are intended to address and a description of the results, a product or service description.
- The Scope Planning core process focuses on developing a scope statement.
- A scope statement captures a common understanding of the project scope and project objectives, which are used to make future decisions.
- A scope statement commonly includes project justification in terms of the business needs summarized from the project charter, project product in terms of the results description summarized from the project charter, project deliverables summarized and known exclusions identified, and project objectives.

# Scope Knowledge Area

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- Project objectives are **quantifiable** success criteria for **time, cost, and quality** and include attributes, metrics, and target absolute or relative values. Any un-quantified objectives such as “customer satisfaction” entail high risk.
- The Scope Definition core process focuses on developing a **work breakdown structure (WBS)**.
- A work breakdown structure captures the work scope of a project as a hierarchical deliverable-oriented grouping of project elements where the lowest level elements are known as work packages and all of the elements are described in a WBS dictionary.
- The Scope Verification facilitating process focuses on formalizing acceptance of the project scope. The Scope Change Control facilitating process focuses on addressing changes to the project scope.

# Time Knowledge Area

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- Focuses on a project's **schedule**.
- The Activity Definition core process focuses on identifying activities in an activity list to produce the project deliverables.
- An activity list is an extension to the work breakdown structure. The Activity Sequencing core process focuses on identifying dependencies among activities. The Activity Duration Estimating core process focuses on estimating the time required for completing activities. The Schedule Development core process focuses on developing a project schedule. A project schedule captures the planned dates for activities and milestones. The Schedule Control facilitating process focuses on addressing changes to the project schedule.

# Cost Knowledge Area

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- Focuses on a project's **budget**.
- The Resource Planning core process focuses on determining the **resources and their quantities** required for performing project activities.
- The Cost Estimating core process focuses on determining an estimate of the cost of the resources.
- The Cost Budgeting core process focuses on determining the cost of project activities and establishing a cost baseline.
- A cost **baseline** captures the **planned cost** for a project or phase.
- The Cost Control facilitating process focuses on addressing changes to the project budget.



# Quality Knowledge Area

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- Focuses on the quality of a project's performance and results.
- The **Quality Planning** facilitating process focuses on identifying quality **standards**.
- The **Quality Assurance** facilitating process focuses on evaluating **project performance**.
- The **Quality Control** facilitating process focuses on evaluating **project results**.

# Human Resource Knowledge Area

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- Focuses on the individual people involved with a project.
- The Organizational Planning facilitating process focuses on identifying roles and responsibilities.
- The Staff Acquisition facilitating process focuses on acquiring humane sources.
- The Team Development facilitating process focuses on enhancing individual and group competencies.

# Communications Knowledge Area

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- Focuses on communicating appropriate project information.
- The Communications Planning facilitating process focuses on determining the communication needs of the stakeholders (who needs what, when, how it will be communicated, and perhaps where and why).
- The Information Distribution facilitating process focuses on distributing information.
- The Performance Reporting core process focuses on capturing and distributing performance information.
- The Administrative Closure core process focuses on distributing information bringing closure to a project or phase.

# Risk Knowledge Area

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- Focuses on **confronting risks** to a project.
- A risk is an uncertain event or condition that may have a positive or negative/adverse effect on project objectives if actualized.
- The Risk Management Planning core process focuses on deterring how to approach risk management.
- The Risk Identification facilitating process focuses on **identifying risks and triggers**. A trigger, also known as a symptom or **warning sign**, is an indicator that a risk has occurred or is about to occur.
- The Qualitative Risk Analysis facilitating process focuses on prioritizing risks based on their impact on project objectives. The Quantitative Risk Analysis facilitating process focuses on determining the **probability of risks** occurring and their **effects** on project objectives.
- The Risk Response Planning facilitating process focuses on determine how to enhance opportunities and reduce threats to project objectives.
- The Risk Monitoring and Control facilitating process focuses on monitoring risks, identifying new risks, responding to risks, and evaluating the effects of responses.

# Procurement Knowledge Area

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- Focuses on **acquiring goods and services external** to the organization performing the project.
- The Procurement Planning facilitating process focuses on determining what to procure.
- The Solicitation Planning facilitating process focuses on determining procurement requirements and identifying potential sources. The Solicitation facilitating process focuses on obtaining responses from potential sources.
- The Source Selection facilitating process focuses on selecting a source.
- The Contract Administration facilitating process focuses on managing the relationship with the source.
- The Contracts Closeout core process focuses on bringing closure to the procurement.

# Conclusion

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- People are and will remain the “original ingredient” necessary for success.
- However, with the project management discipline as a profession and the PMBOK Guide, project managers and teams are further empowered not only to simply address change and complexity, but leverage change and complexity for a competitive advantage by delivering successful projects.
- Furthermore, it is experience, experimentation, and application of the PMBOK Guide that will enable us to realize its benefits.