

Project Management in and for the Twenty-First Century

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Minnesota Society of Professional Engineers
Great River Energy

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Overview

- Welcome and Introductions
- Survey
- Three Big Ideas
 - PM Approach
 - Triple Constraint
 - PM Expertise
- Implications and Applications

Project Management

The application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. PMI-PMBOK, 2008

Project management is an organized common-sense approach that utilizes the appropriate client involvement in order to deliver client requirements that meet expected incremental business value. Wysocki, 2011

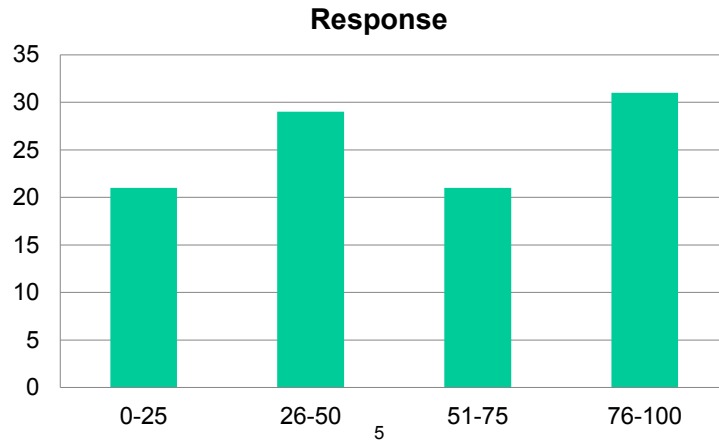
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Project Knowledge Experience

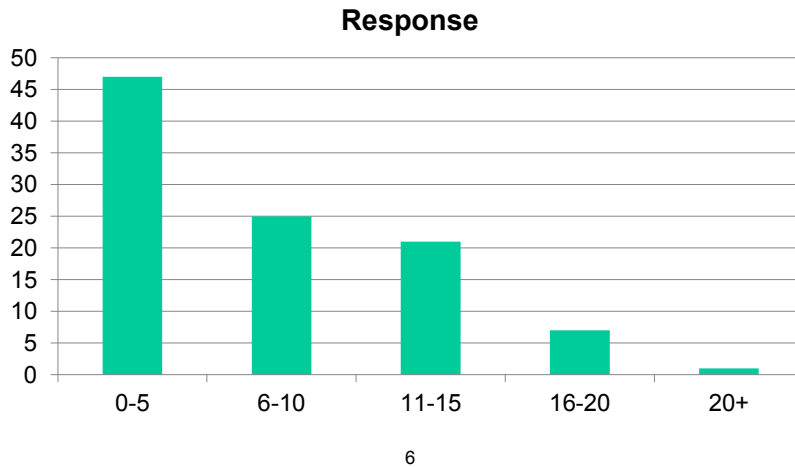
[Background Survey]

- Q1: What percentage of your current work is project work?
 - 0-25
 - 26-50
 - 51-75
 - 76-100
- Q2: How many projects are you currently work on?
 - 0-5
 - 6-10
 - 11-15
 - 16-20
 - 20+
- Record your individual responses on two Post-It notes
- Place Post-It notes on charts

Percentage of Current Work that is Project Work – 102 Engineers



Number of Projects Currently Working On



Top Three Main Engineering Work Activities

Engineering Total

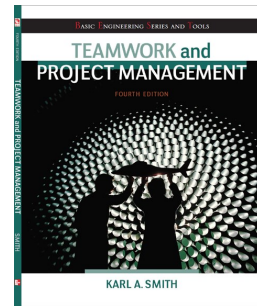
- Design – 36%
- Computer applications – 31%
- Management – 29%

Civil/Architectural

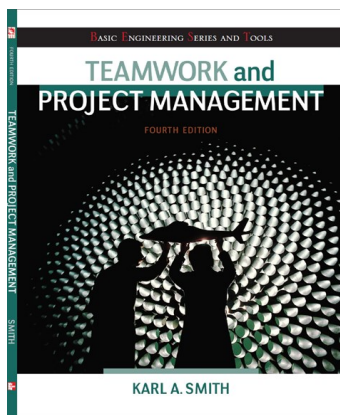
- Management – 45%
- Design – 39%
- Computer applications – 20%

Burton, L., Parker, L., & LeBold, W. 1998.
U.S. engineering career trends. *ASEE Prism*, 7(9), 18-21.

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Teamwork and Project Management



Goals

- To improve your understand of the dynamics of team development and interpersonal problem solving.
- To identify strategies for accelerating the development of true team effectiveness.
- **To help you frame the project and team and identify and use an appropriate project management approach.**
- **To understand the critical dimensions of project scope, time, and cost management.**
- **To understand critical technical competencies in project management.**
- To explore a variety of "best practices" including anticipating, preventing, and overcoming barriers to project success.

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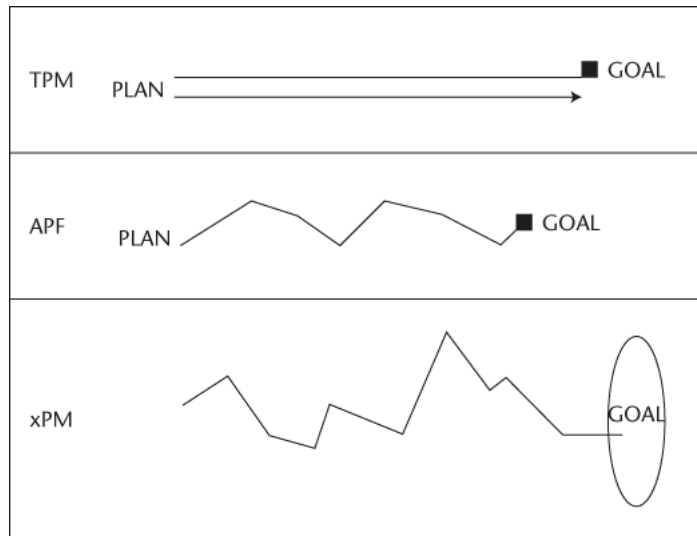
Process Clarity	Goal/Task/Deliverables Clarity	
	Low	High
High		?
Low		

What percentage of the projects you work on fit in the upper right hand quadrant (High Process Clarity AND High Goal/Task/Deliverables Clarity)?

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Process Clarity	Goal/Task/Deliverables Clarity	
	Low	High
High	Adaptive Project Management (APM)?	Traditional Project Management (TPM)
Low	Punt	Adaptive Project Management (APM)

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Types of Projects

- On-going operations – Traditional Project Management – PMBOK
- Innovation – Agile/Adaptive Project Framework – Wysocki

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Types of Projects – Exploitation vs Exploration (March, 1991)

Exploiting Old Ways: Organizing for Routine Work	Exploring New Ways: Organizing for Innovative Work
Drive out variance	Enhance variance
See old things in old ways	See old things in new ways
Replicate the past	Break from the past
Goal: Make money now	Goal: Make money later

March, J.G. 1991. Exploration and exploitation in organizational learning.
Organizational Science, 2, 71-87

Explore - Exploit

- James March (1991) Exploration and exploitation in organizational learning
- Roger Martin (2010) *Design of Business* – Characteristics of exploration and exploitation, Table 1-1, p. 20
- Govindarajan and Trimble (2010) *The Other Side of Innovation*, Key differences between typical planning processes for the Performance Engine and best practices for innovation, Table 4.1, p. 99
- Scott Page (2010) *Understanding Complexity* – Lecture 5 Explore Exploit: The Fundamental Trade-Off

Characteristics of exploration and exploitation

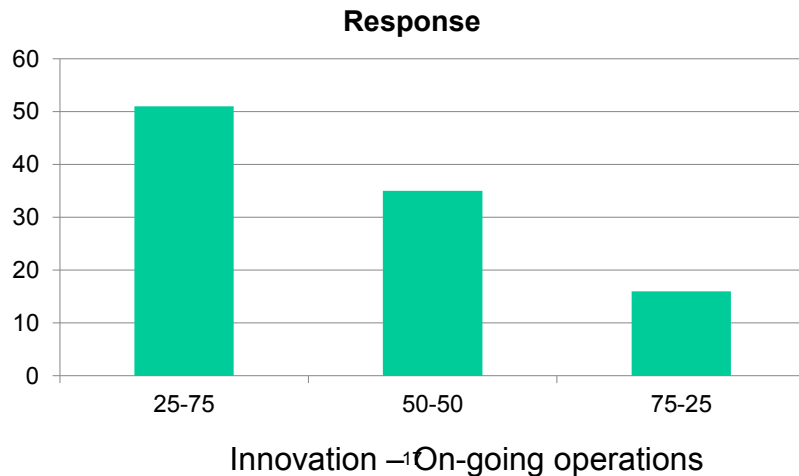
(Martin, R. (2010) *Design of Business*, Table 1.1)

	Exploration	Exploitation
Organizational focus	The invention of business	The administration of business
Overriding goal	Dynamically moving from the current knowledge stage to the next	Systematically honing and refining within the current knowledge stage
Driving forces	Intuition, feeling, hypotheses about the future, originality	Analysis, reasoning, data from the past, mastery
Future orientation	Long-term	Short-term
Progress	Uneven, scattered, characterized by false starts and significant leaps forward	Accomplished by measured, careful incremental steps
Risk and reward	High risk, uncertain but potentially high reward	Minimal risk, predictable but smaller rewards
Challenge	Failure to consolidate and exploit returns	Exhaustion and obsolescence

Typical Planning Processes for the Performance Engine and best practices for Innovation
Govindarajan and Trimble (2010) , Table 4.1

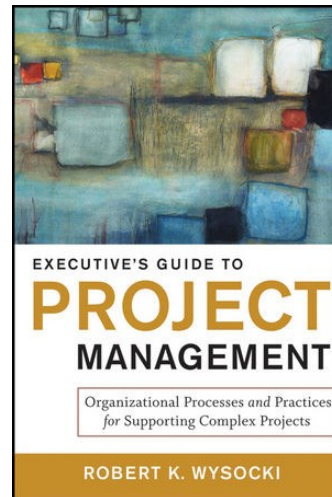
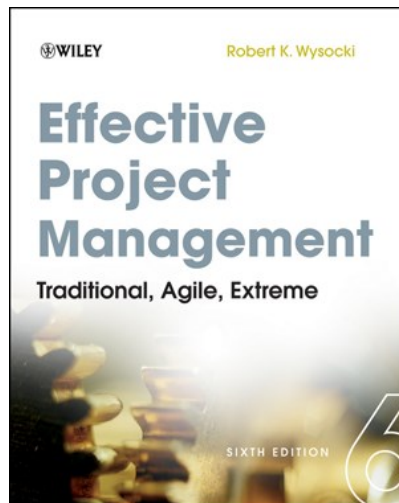
Planning Principles for Innovation	Norm in Performance Engine
Invest heavily in planning	Invest in proportion to budget
Create the plan and the scorecard from scratch	Just modify last year's plan
Discuss data and assumptions	Focus on data
Document a clear hypothesis of record	Document clear expectations
Find ways to spend a little, learn a lot	Be on budget, on time, and on spec
Create a separate forum for discussing results	Separate forums are unnecessary
Frequently reassess the plan	Deliver the results in the plan
Analyze trends	Analyze totals
Allow formal revisions to predictions	Revisions frowned on
Evaluate innovation leaders subjectively	Evaluate based on results

Distribution of PM Activity Between Supporting Innovation and Supporting On-Going Operations



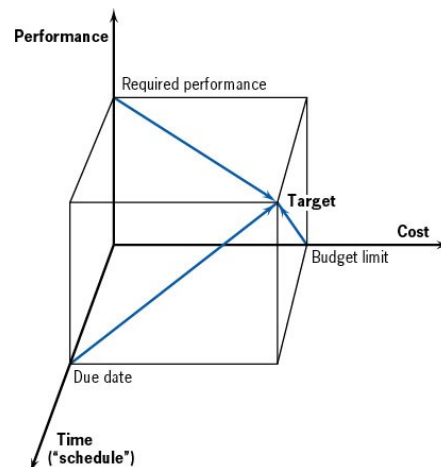
Project: Definition and Triple Constraint

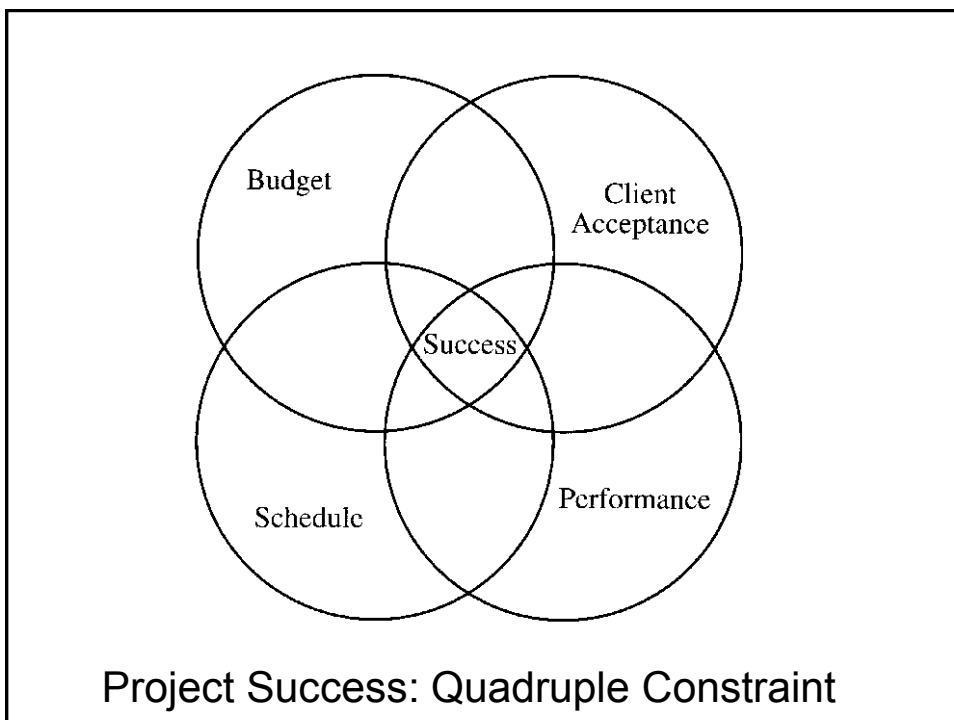
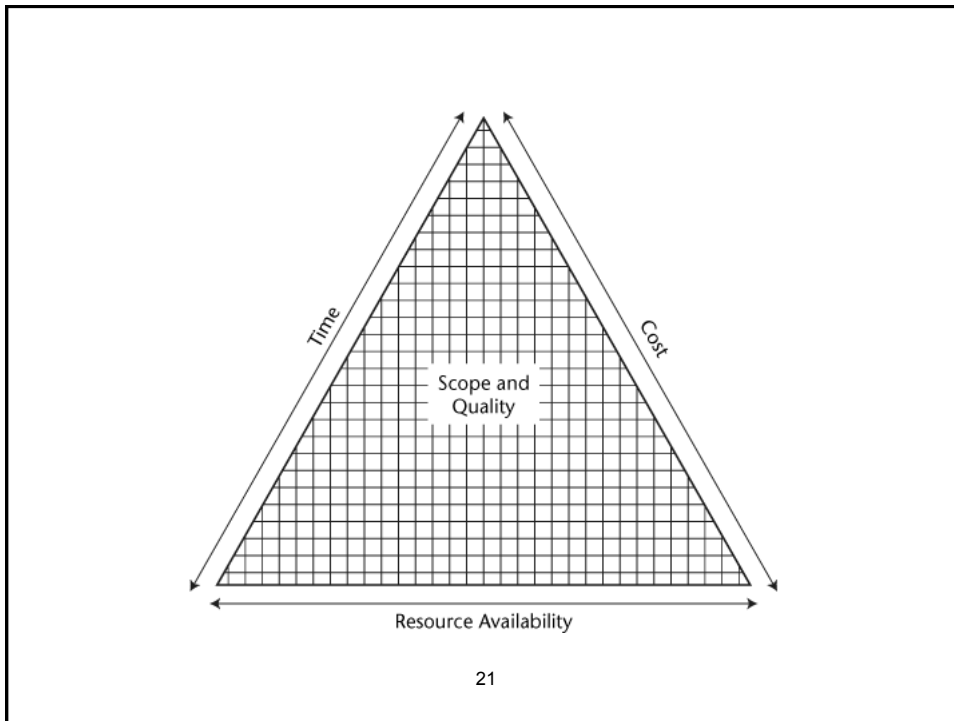
- A project is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification. Wysocki, 2011.
- **Time – Cost - Requirements**

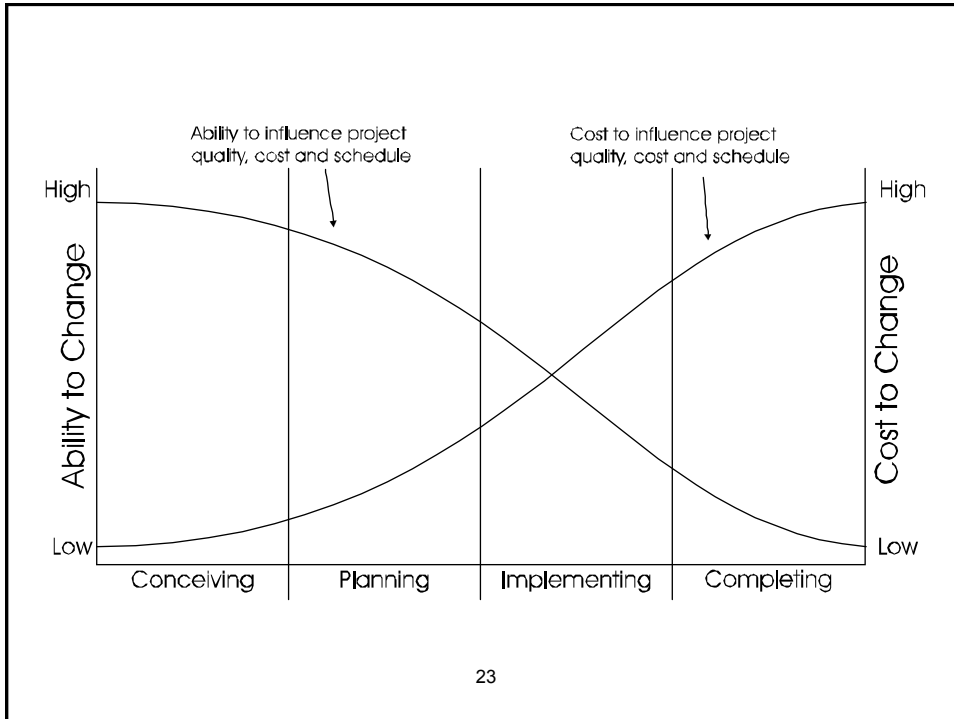


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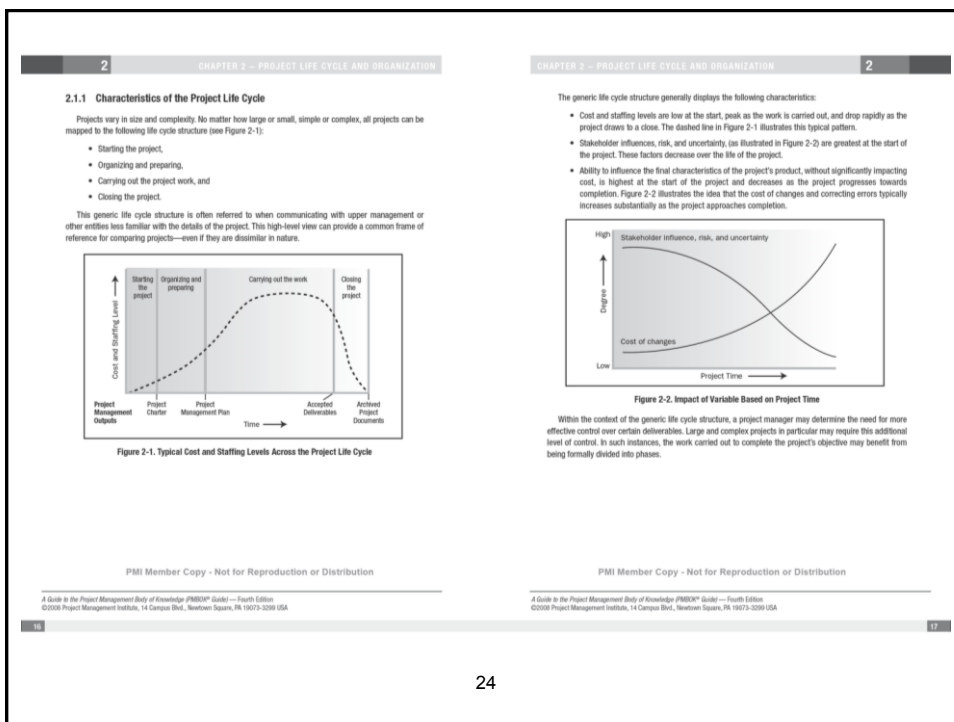
Performance, Cost, and Time Project Targets



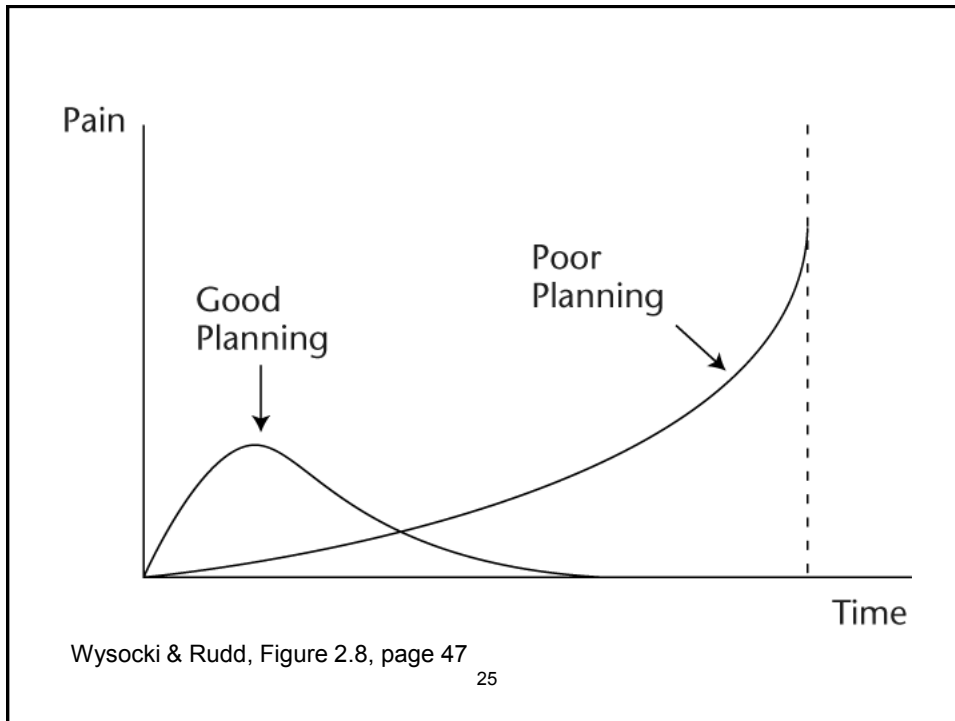




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Project Management is not just scheduling (Lewis, 2007)

It's the intersection of:

Tools
People
Systems

Lewis, James. P. 2007. *Mastering Project Management: Applying Advanced Concepts to Systems Thinking, Control & Evaluation, Resource Allocation*. New York: McGraw-Hill

Fundamental tools for the new generation of engineers and project managers....

- Systems/ systems thinking/ systems engineering
- Models
- Team work
- Quality

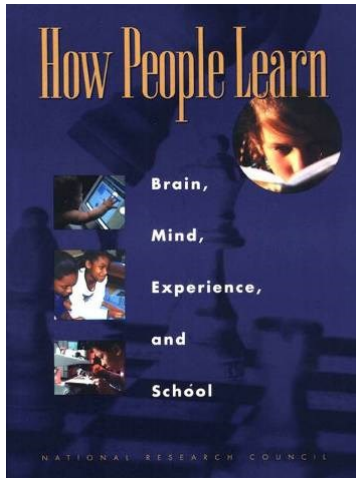
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Characteristics of Expert PMs

- ?
- ?

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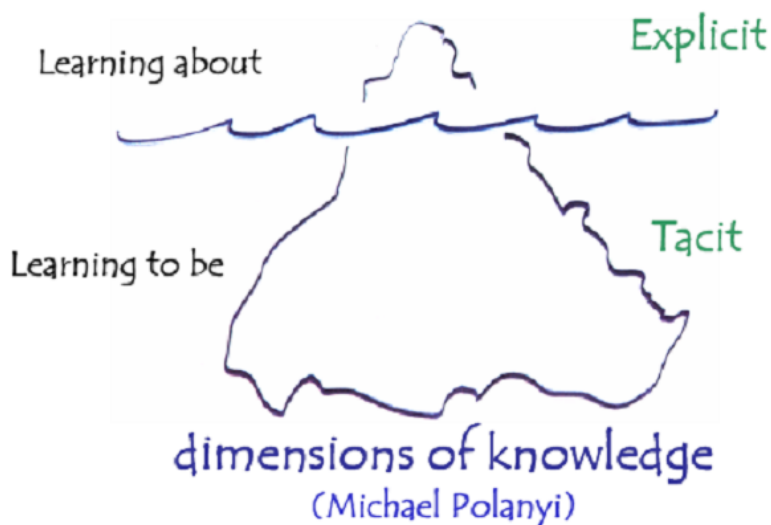
Expertise Implies:

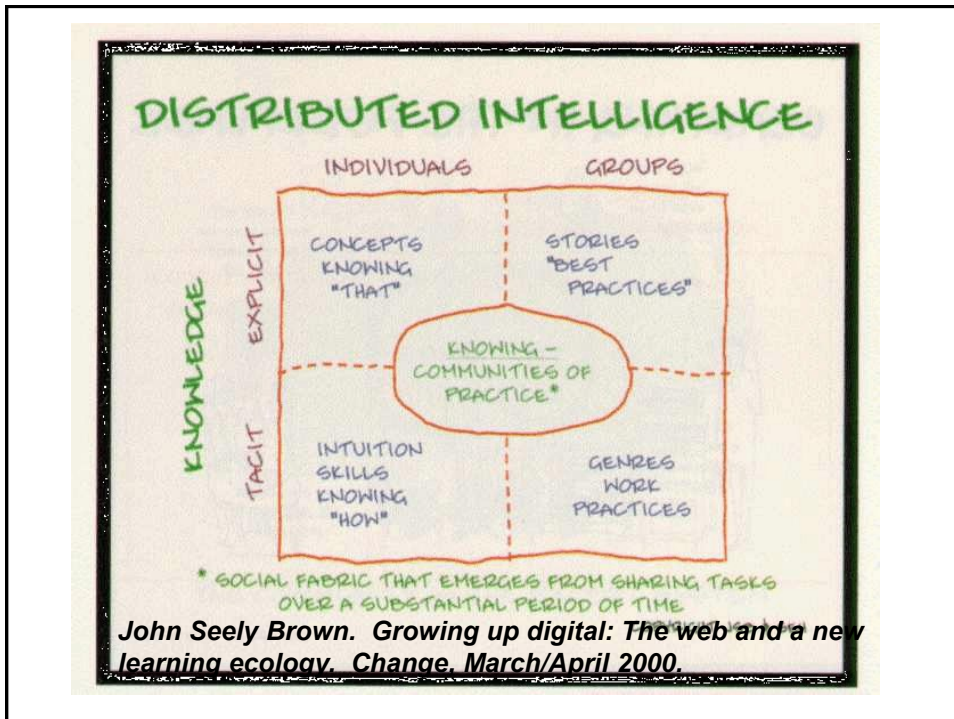


- a set of cognitive and metacognitive skills
- an organized body of knowledge that is deep and contextualized
- an ability to notice patterns of information in a new situation
- flexibility in retrieving and applying that knowledge to a new problem

Bransford, Brown & Cocking. 1999. *How²⁹ people learn*. National Academy Press.

'Learning to be' sooner rather than later!





Critical Success Factors and Their Importance for System Implementation (Listed in decreasing order of correlation)

[Pinto (1986), See Smith (2014), p. 177]

1. **Project mission.** Initial clearly defined goals and general directions.
2. **Top management support.** Willingness of top management to provide the necessary resources and authority/power for implementation success.
3. **Schedule plans.** A detailed specification of the individual action steps for system implementation.
4. **Client consultation.** Communication, consultation, and active listening to all parties impacted by the proposed project.
5. **Personnel.** Recruitment, selection, and training of the necessary personnel for the implantation project team.
6. **Technical tasks.** Availability of the required technology and expertise to accomplish the specific technical action steps to bring the project on-line.
7. **Client acceptance.** The act of "selling" final product to its ultimate intended users.
8. **Monitoring and feedback.** Timely provision of comprehensive control information at each stage in the implementation process.
9. **Communication.** The provision of an appropriate network and necessary data to all key actors in the project implementation process.
10. **Troubleshooting.** Ability to handle unexpected crises and deviations from plan.

Acquisition of Expertise

Fitts P, & Posner MI. Human Performance. Belmont, CA: Brooks/Cole, 1967.

- Cognition: Learn from instruction or observation what knowledge and actions are appropriate
- Associative: Practice (with feedback) allowing smooth and accurate performance
- Automaticity: “Compilation” or performance and associative sequences so that they can be done without large amounts of cognitive resources

“The secret of expertise is that there is no secret. It takes at least 10 years of concentrated effort to develop expertise.” Herbert Simon

Paradox of Expertise

- The very knowledge we wish to teach others (as well as the knowledge we wish to represent in computer programs) often turns out to be the knowledge we are least able to talk about.

70/20/10 Model for Learning and Development

- Lessons learned by successful and effective managers are roughly:
 - 70% from tough jobs
 - 20% from people (mostly the boss)
 - 10% from courses and reading

Lombardo, Michael M; Eichinger, Robert W (1996). *The Career Architect Development Planner* (1st ed.). Minneapolis: Lominger. p. iv.

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Wysocki – Challenges to Supporting Complex Projects

- Details: Number of variables and interfaces
- Ambiguity: Lack of awareness of events and causality
- Uncertainty: Inability to pre-evaluate actions
- Unpredictability: Inability to know what will happen
- Dynamics: Rapid rate of change
- Social Structure: Numbers and types of interactions

Wysocki – p. 9

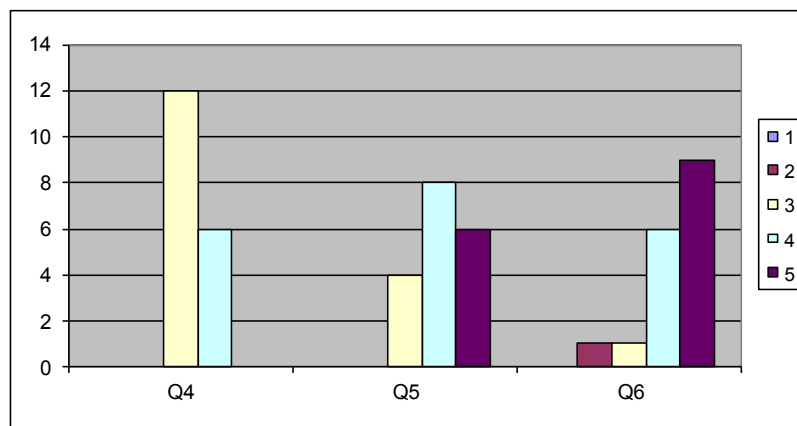
Session Summary (Minute Paper)

Reflect on the session:

1. Most interesting, valuable, useful thing you learned.
2. Things that helped you learn.
3. Comments, suggestions, etc
4. Pace: Too slow 1 5 Too fast
5. Relevance: Little 1 . . . 5 Lots
6. Instructional Format: Ugh 1 . . . 5 Ah

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MOT 8221 – Fall 2014 – Session 1 (9/13/14)



Q4 – Pace: Too slow 1 5 Too fast (3.3)
Q5 – Relevance: Little 1 . . . 5 Lots (4.1)
Q6 – Format: Ugh 1 . . . 5 Ah (4.4)