

A Global System for Categorizing Projects

The Need for, Recommended Approach
to, and Practical Uses of the System

Revised Oct. 11 2004

Russell D. Archibald

Fellow, PMI & APM/IPMA, PMP, MSc



Presentation Outline

1. Need for project categorizing system
2. Project characteristics & attributes
3. Categorization system characteristics
4. Recommended Categories
5. Classifying projects within categories
6. Project life cycles within categories
7. Maturity: Categories versus organizations
8. Conclusions
9. Project Categorization Project

1. *Need for Project Categorization*

- i We research, study, and standardize “project management,” not much on *projects*
- i Not enough is known about the *projects* themselves:
 - | How do they differ? How are they similar?
 - | What are the “best” life cycle models?
 - | What aspects of *projects* can be “standardized” for *all projects* versus by *project category*?
- i How can *projects* best be categorized for practical purposes?

Recent PMI Funded Research Concluded That:

- i Categorization is pervasive
- i Two issues:
 - | Organizational purposes served
 - | Attributes used to categorize
- i Dysfunctional to examine only one

(Crawford, Hobbs, Turner 2004)

Not Why, but How to Best Categorize Projects for Practical Purposes?

- i **What are the purposes of project categorization?**
- i **What criteria or project attributes are best used to categorize projects?**

Classification or Categorization?

- i **Classification**
 - | Mutually exclusive sets
- i **Categorization**
 - | Sets of items with similar properties
 - | Multiple categories
- i **Organizations categorize projects**
(Crawford, Hobbs, Turner 2004)
- i **Need to classify projects within categories**

Many uses of such a system include, for each category/sub-category:

- i Define & align portfolios with strategies
- i Select/develop best life cycle models
- i Identify and apply best practices for project:
 - | Selection and prioritization
 - | Planning, executing and control methods, templates
 - | Risk management methods
- i Governance policies and procedures
 - | Developing specialized software applications
- i Build specialized libraries of knowledge
- i Focus and improve education, certification, career planning
- i Provide research direction
- i Organize tracks at congresses
- i Other:

Research Results

(Crawford, Hobbs, Turner 2002)

Primary drivers include:

- i Allocation of project to responsible department
- i Strategic positioning including profit and funding issues
- i Matching of project manager to project
- i Specialization/discipline
- i Resource allocation
- i Management needs of different contract types
- i Marketing including credibility with clients.

Secondary needs:

- i Reporting—including dissections for multiple purposes
- i Benchmarking, performance evaluation and improvement
- i Knowledge capture, transfer, retrieval
- i Common/shared language
- i Definition and management of interfaces
- i Aligning to and tracking of contribution to achievement of business goals (including prioritization)
- i Budget allocation
- i Basis for adaptation of processes and tools to projects.

Some Current Trends

- i PMI PMBOK extensions to 'Government', 'Construction', and 'Automotive'
- i GPM (Germany)/IPMA BOK: 'Investment', R&D, 'Organization' projects
- i Many PMI SIGS relate to project categories

Many PMI Specific Interest Groups/SIGS Relate to Categories

- i Aerospace/Defense
- i Automation
- i Automotive
- i E-business
- i Environmental
- i Financial Services
- i Government
- i Healthcare
- i Hospitality Events
- i Information Systems
- i Information
Tech'n'gy/Telecom
- i Int'n'l Development
- i Manufacturing
- i New Product Develop.
- i Oil/Gas/Petrochemical
- i Pharmaceutical
- i Retail
- i Service & Outsourcing
- i Utility Industry

2. Project Characteristics/Attributes

- i System must reflect how organizations actually view and manage their projects
- i Best (?) breakdown is based first on *results (products)* of each project

Various Categorization Parameters

(Crawford, Hobbs, Turner 2002)

1. **Size, Complexity and Familiarity**

- | Size
- | Size & groupings
- | Goals & methods
- | Familiarity
- | Maturity
- | Technical uncertainty
- | System scope
- | **Product & work**

2. **Life Cycle or Sector**

- | Corporate strategic development
- | Strategic importance
- | Stage of the project (and product) life cycle
- | Industry sector
- | Resource type
- | Geography
- | International

Various Categorization Parameters

(Crawford, Hobbs, Turner 2002) (Cont'd)

3. **Contract Type and Payment Terms**

- | **Contract terms and payment**
- | **Contract forms**
- | **Type of risk**
- | **Who controls the risk**
- | **Complexity**

Attributes of Projects

(Crawford, Hobbs, Turner 2004)

- i Application area or *product*
- i Stage of life-cycle
- i Grouped or single
- i Strategic importance
- i Strategic driver
- i Geography
- i Scope
- i Timing
- i Uncertainty
- i Risk
- i Complexity
- i Customer
- i Ownership
- i Contractual

Alternative Categories Possible

- i Four best alternatives (Youker 1999):
 - | Geographic location
 - | Std Industrial Classification System/SICS
 - | Project life cycle stage
 - | Product (end results)
- i Conclusion:
 - | Most useful first level is by product

3. Project Categorization System Characteristics

- i **Hierarchical**
 - | Level by level indentured breakdown

- i **Multi-Dimensional**
 - | Classification within categories

4. Recommended Project Categories

1. Aerospace/Defense
2. Business & Organizational Change
3. Communication Systems
4. Events
5. Facilities
6. Information Systems
7. International Development
8. Media & Entertainment
9. Product/Service Development
10. Research & Dev.

Is this the Best First Level Breakdown of Project Categories?

- i Focuses first on end results or products
- i Further breakdown is required
- i Terms & semantics important; must be translatable into many languages
- i Proposed list is a starting point
- i Not 'consistent' -- but practical, & reflects how many organizations manage their projects

What Is this List Based On?

- i ***Not*** based on extensive formal research
- i Few PMI or other papers exist
 - | Youker, "The Difference Between Different Types of Projects," PMI 1999
 - | Crawford et al 2002, 2004 (already cited)
- i The list is based on my own direct experience in several companies & projects, plus my consultations on many projects & with many agencies & companies since 1960 (in 16 countries on 4 continents)

Sub-Categories Are Required

- i Each major category is further divided into appropriate sub-categories
- i Product or results are still the primary attribute used for this next breakdown of categories
- i See Table 2 in full paper for detail

Example: Category 2. Business and Organization Change Projects

1. Acquisition/merger
2. Legal proceeding
3. Management process improvement
("Six Sigma" projects)
4. New business venture
5. Organization re-structuring
6. Other: ?



Example:
Category 5. Facilities Projects

1. Facility decommissioning
2. Facility demolition
3. Facility maintenance & modification
4. Facility design/procure/construct
1.Civil 2.Energy 3.Environmental 4.Industrial 5.Commercial
6.Residential 7.Ships 8.Other:
5. Other: ?

Each of these demand somewhat different methods of planning, authorizing, & executing

5.4. Facility design/procure/construct

- 1. Civil
 - 2. Energy
 - 3. Environmental
 - 4. Industrial
 - 5. Commercial
 - 6. Residential
 - 7. Ships
 - 8. Other:
- i *These projects are often lumped together as 'capital', 'investment', 'construction', 'brick & mortar', etc.*
 - i *Each of these sub-categories require different life cycle models for best planning, scheduling and control*

Example:

Category 9 - Product & Service Development Projects

1. IT hardware
2. Industrial product/process
3. Consumer product/process
4. Pharmaceutical product/process
5. Service (financial, other)
6. _____

<p>3. Communication Systems Projects</p> <p>3.1 Network communications systems</p> <p>3.2 Switching communications systems</p>	<p>Microwave communications network.</p> <p>3rd generation wireless communication system.</p>
<p>4. Event Projects</p> <p>4.1 International events</p> <p>4.2 National events</p>	<p>2004 Summer Olympics; 2006 World Cup Match.</p> <p>2005 U. S. Super Bowl; 2004 Political Conventions.</p>
<p>5. Facilities Projects</p> <p>5.1 Facility decommissioning</p> <p>5.2 Facility demolition</p> <p>5.3 Facility maintenance and modification</p> <p>5.4 Facility design/procurement/construction</p> <p>Civil, Energy, Environmental, High rise, Industrial, Commercial, Residential, Ships</p>	<p>Closure of nuclear power station.</p> <p>Demolition of high rise building.</p> <p>Process plant maintenance turnaround.</p> <p>Flood control dam; highway interchange.</p> <p>New gas-fired power generation plant; pipeline.</p> <p>Chemical waste cleanup. 40 story office building.</p> <p>New manufacturing plant. New shopping center</p> <p>New housing sub-division. New tanker, container, or passenger ship</p>
<p>6. Information Systems (Software) Projects</p>	<p>New project management information system.</p> <p>(Information system hardware is considered to be in the product development category.)</p>
<p>7. International Development Projects</p> <p>7.1 Agriculture/rural development, 7.2 Education, 7.3 Health, 7.4 Nutrition, 7.5 Population, 7.6 Small-scale enterprise</p> <p>7.7 Infrastructure: energy, industrial, telecomm., transportation, urbanization, water supply and sewage, irrigation</p>	<p>People and process intensive projects in developing countries funded by The World Bank, regional development banks, US AID, UNIDO, other UN, and government agencies; and</p> <p>Capital/civil works intensive projects—often somewhat different from 5. <i>Facility Projects</i> as they may include creating an organizational entity to operate the facility,</p>
<p>8. Media & Entertainment Projects</p> <p>8.1 Motion picture</p> <p>8.2 TV segment</p> <p>8.2 Live play or music event</p>	<p>New motion picture (film or digital).</p> <p>New TV episode.</p> <p>New opera premiere.</p>

Categories Are Not Mutually Exclusive

- i Programs and large projects usually involve more than one category or sub-category
- i These projects are placed in their predominate category
- i Must “Mega” projects be treated separately? Yes

5. Classifying Within Sub-Categories: Many possible Criteria

- i Project size
- i Major & minor projects
- i Project complexity
- i External or internal customer
- i Degree of customer involvement
- i Levels of risk, who takes responsibility
- i Stand-alone versus create supporting infrastructure
- i Standard versus transitional
- i Mega projects: not categorizable
- i Other: ? (See Crawford, Hobbs and Turner, 2002 and 2004)

Project Category/Class Matrix

- i Classifying projects within each category/sub-category produces a matrix
- i Classification criteria will vary considerably for each organization

Simple Example: Category/Class Matrix

Classifying Projects within Project Categories & Sub-Categories			Project Size: \$M	Major Project: Yes or No	Complexity: 1 to 10	Customer: Int or Ext	Customer Involvement: Hi or Low	Risk Level: 1 to 10		
Category	Level 2	Level 3								
5. Physical Facilities										
	5.1 Decommissioning									
	5.2 Demolition									
	5.3 Maint & Modification									
	5.4 Design/proc/const									
		5.4.1 Civil								
		5.4.2 Energy								
		5.4.3 Environmental								
		5.4.4 Industrial								
		5.4.5 Commercial								
		5.4.6 Residential								
		5.4.7 Ships								
		5.4.8 Other								
	5.5 Other									

6. Project Life Cycles: Searching for Common Processes

- i Life cycle definition enables:
 - | All involved persons to understand the processes to be used
 - | Capture of best experience
 - | Assignment of responsibilities
 - | Repetition of success
- i Important starting point in our search for common processes

Generic Life Cycle Phases

- i General agreement on four generic life cycle phases:
 1. Concept
 2. Definition
 3. Execution
 4. Closeout

However these are too broad for our purposes

Designing Life Cycles: Phases and Decision Points

- i **Three basic design parameters:**
 - l Number and definitions of phases/sub-phases
 - l Whether sequential or overlapping, once-through or re-cycling, predictive or adaptive
 - l Number and placement of decision points (approvals, go/kill, go/hold, go back)

Basic Life Cycle Model Types

- i **Predictive**
 - | Most common
 - | Generic, waterfall, other
- i **Adaptive/heuristic**
 - | Incremental build
 - | Short-term cycles
 - | Evolutionary

Life Cycle Models Differ by Category

- i Different project categories (and sub-categories) often require very different life cycle designs
- i Incomplete literature search produced list shown in Table 4 of the paper
- i Many references are also given in the paper

Examples of Predictive Life Cycles

- i **Generic/Standard:**
 - | Concept, definition, execution, closeout
- i **Waterfall:**
 - | Generic with overlapping, more detailed phases
- i **Cyclical**
- i **Spiral**

Examples of Adaptive Life Cycle Models

- i **Adaptive Software Development/ASD:**
 - | Component based, iterative time-boxed cycles, risk-driven, change tolerant
- i **Extreme Programming/XP:**
 - | Programming in pairs, teams include managers & users, each team codes & tests, fluid cost & schedule
- i **SCRUM:**
 - | Iterative 30 day sprints, short daily meetings (scrums), several small teams

Source: Desaulniers & Anderson 2002

7. Maturity of Project Management

- i Organizational maturity in PM
 - | PMI's OPM3 (*For a critical review see <http://www.pmforum.org/pmwt04/viewpoints04-910more.htm>)*
 - | UK's PRINCE2
 - | Japan's P2M (Project & Program Management)
<http://pmcc.or.jp/www/english/p2m.html>
 - | Many other PM maturity models
- i Maturity of PM discipline itself within each category and sub-category

Maturity of Project Management Itself Within a Category

- i Different perspective from **organizational PM maturity**
- i Maturity must be viewed by project class or category
- i The most mature categories are:
 - | Aerospace/Defense
 - | Facilities

PM Maturity by Project Category

Project Category	Very Mature	Fairly Mature	Still Maturing
1. Aerospace/Defense	X		
2. Business & Organizational Change			X
3. Communication Systems		X	
4. Events			X
5. Facilities	X		
6. Information Systems			X
7. International Development		X?	X?
8. Media & Entertainment			X
9. Product/Service Development		X	
10. Research & Development		X	

General Uncertainty by Project Category

Project Category	Low	Medium	High
1. Aerospace/Defense		X	
2. Business & Organizational Change			X
3. Communication Systems		X	
4. Events			X
5. Facilities	X		
6. Information Systems			X
7. International Development		X	
8. Media & Entertainment	X		
9. Product/Service Development			X
10. Research & Development			X

8. Conclusions

1. Different Categories Require Different Governance Practices
2. Each project category differs in:
 - Maturity** in pm practices
 - Methods** of planning, authorizing, scheduling, contracting, and controlling the work
 - Most effective **life cycle models**
 - Once-through versus repetitive models
 - Predictive versus adaptive (agile)
 - Degree of uncertainty**: technology, funding, environmental, political, other
 - How the **project manager** role is assigned and conducted
 - Plus others....*

8. Conclusions (Cont'd)

3. A globally agreed project categorization system is urgently needed & will have many practical uses:
- | Selecting **best PM methodologies & life cycle models**
 - | Defining **project management systems & developing systematic methodology** for their creation
 - | Tailoring **education & training curricula**
 - | Developing specialized **PM software applications**
 - | **Certifying** project managers & PM specialists
 - | Other:

8. Conclusions (Cont'd)

4. Application of “One-Size-Fits-All” PM methods causes many project failures

- ; “Best practices” must be identified for each agreed project category
- ; In the absence of agreed categories, the wrong PM methods are often applied
- ; This is a root cause for many project failures

For example: software development projects using ‘standard’ life cycle models

8. Conclusions (Cont'd)

5. Development of a global project categorizing system is a major, multinational project

*This requires a global team
with global sponsorship*

9. Description of the International Project Categorization Project/PCP

i Background:

- | Presentations by the author at IPMA Congresses in Moscow (2003) & Budapest (2004), plus other PMI venues
- | Following presentation in Brasilia, Brazil, Sept. 21 2004, Peter Mello volunteered to build web site for PCP

PCP Objectives (Draft)

- i Define need for project categorization
- i Identify specific, practical uses
- i Develop agreed categorization system
- i Apply system on test basis
- i Continuously improve the system

PCP Scope Statement (Draft)

- i Applicable to all project types, areas of PM application, countries and languages
- i Defined and developed by a virtual team in many countries
- i Translatable into all major languages of importance to the global PM community

Objectives and Scope: Team Consensus

- i These drafts will be reviewed and revised as required to develop an agreed consensus with all members of the Virtual PCP Team

PCP Status: October 11 2004

- i Entering its Planning/Definition Phase
- i Now have 36 Virtual Team members from 10 countries speaking 7 languages
- i English is common language, inputs in other languages are welcomed
- i Year-End Targets: 100 team members, 20 countries, 15 languages

Responsibilities of PCP Virtual Team Members

- i **Project Gurus:** Experienced, authoritative members will share their ideas and comments on all aspects
- i **Project Leaders:** Responsible for a specific country, region, language, category, sub-category, technical area, etc.
- i **Project Specialists:** Work with one or more Project Leaders on their assigned responsibilities

You Are Invited to Join the PCP Team

- i Anyone working in PM field who is interested is welcome to join the team
- i Visit the PCP web site at <http://www.projectcategories.org>
- i Review information available there and register on the “Join the Team” page