The Purposes and Methods of Practical Project Categorization[1]

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Abstract

The objectives of this paper are to discuss the purposes of and need for a project categorization system, to present a recommended approach to the systematic definition of project categorization and classification, and to describe the use of a Purposes/Methods Matrix for Project Categorization to facilitate this systematic definition.

What Drives the Need for a Project Categorization System? The fundamental driver for pursuing the design of an effective project categorizing system is the realization that significant differences exist between the large numbers of projects within:

- The total spectrum of actual projects in government, business and industry, and
- The smaller numbers of projects that are being planned and executed within one organizational entity.

Practical experience over many decades in managing the many types (or categories) of projects has led to:

- Recognition, definition and understanding of the project management/PM principles and practices that are *common to all (or at least many) projects* in all types of human endeavors and organizations, as documented in the several PM bodies of knowledge and the PM literature in general; *and also*

- Recognition (more recently) that the *diversity inherent within the many existing and potential projects demands that projects be segregated in several ways for several purposes* to continue to improve the ways in which both the buyers (owners) and sellers (contractors or developers) of projects:
    - Strategically and operationally select and prioritize their projects,
    - Operationally plan and execute their projects:
        - individually,
        - within programs, and

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        - within project portfolios;
    - Educate and train the managers and specialists involved in projects and PM; and
    - Develop and manage the careers of managers and specialists involved in projects.

Beyond Project Buyers and Sellers: In addition to project buyers and sellers there are at least four other major players in the PM industry worldwide:

- PM software application developers and vendors (who are often sellers of IT projects),
- Consultants, educators, and trainers in PM,
- Universities offering courses, certificates, and degrees in PM, and
- Professional associations devoted to or interested in PM.

At least some members of each of these groups have also learned that recognizing the differences between various kinds or types of projects can help them continue to improve their offerings to the PM marketplace.

***Categorization* Versus *Classification* of Projects:** Some dictionaries use these terms interchangeably, but **t**o avoid potential semantic confusion the term *categorization* is used consistently in this paper to identify a set of items with similar characteristics or properties. An item may be placed in more than one category; in other words, categories are not mutually exclusive. A *class* is often used more rigorously to denote a set of items that can only be placed within a given class; classes are therefore mutually exclusive, when used in this sense. In this paper it is suggested that projects be classified within categories using specific classification criteria.

***De Facto* Project Categorization or Specialization:** Today, in August of 2005, within the PM practices of large and small organizations and within some of the recognized PM bodies of knowledge and standards, we can see *de facto* categorization of projects for various purposes. Movement in this direction is demonstrated by the production of various standards in recent years within both PMI® (Project Management Institute) and some of the 36 national associations that are members of IPMA (International Project Management Association). For example, PMI has produced both a government and a construction extension or adaptation of the PMI "Guide to the Project Management Body of Knowledge," and is working on an automotive extension at present. The PM body of knowledge produced by GPM, the German national association member of IPMA, distinguishes between investment projects (construction and systems engineering), research and development/innovation projects, and organizational projects. Many, if not most, of the PMI Special Interest Groups/SIGs, as shown in Table 1, are named for and dedicated to specific project categories of one kind or another. The top five areas of PM application/industries represented by the present 165,000 members of PMI in 120 countries are "computers/software/data processing, information technology, telecommunications, business management, and financial services" (*PMI Corporate Council Update* March 2003, p 3), even though the construction and aerospace/defense industries are the most mature PM areas of application (Archibald 2004, p 2.)

Aerospace & Defense	Automation Systems
Automotive	Design-procurement-construction (across all economic sectors)
Dispute Management	E-Business
Environmental Management (pollution remediation and prevention)	Financial Services (banking, investment)
Government	Healthcare Project Management
Hospitality Management (major events, such as the Olympic Games)	Information Systems (software)
Information Technology and Telecommunications	International Development (infrastructure, agriculture, education, health, etc., in developing countries)
Manufacturing	Marketing and Sales
New Product Development	Oil/Gas/Petrochemical
Pharmaceutical	Retail
Service and Outsourcing	Urban Development (potential SIG)
Utility industry (generation and distribution of electric power, water and gas)	

Table 1. The specific interest groups (SIGs) within PMI® that relate to project categories and specific areas of application of project management.

International Development Projects: Further indication of the specialization of bodies of PM knowledge for specific categories of projects is given by Giammalvo (2005) in "Announcing the 'Soft Launch' of the International Development Project Management Manual of Practice and Glossary Program."

Organization Structures Often Categorize Projects: Many PM practitioners report that "our organization does not categorize our projects in any formal way." However, the structure of their organization itself usually creates *de facto* categorization. For example, it is common for one company, or one division of a larger company, to be devoted only to IT hardware and/or software projects, which are in themselves important project categories. The larger engineering/constructor companies often create operating divisions devoted to sub-categories of projects such as energy plants, commercial structures, and transportation (highways, bridges, etc.) Many companies or government agencies are devoted to only one or a few categories of projects.

Consultants Focus (Should Focus) on Specific Project Categories: Although some useful benefits can be derived from "jack-of-all-trades" project management consultants, many of the highly qualified and experienced consultants have developed specialized practices that focus on specific categories of projects. For example, one large PM consulting organization describes their practice like this:

> "Nationwide, PMA has provided consulting and expert services on architectural, infrastructure, transportation, airport, health care, institutional, water/wastewater,

environmental, power, and manufacturing/process projects exceeding $80 billion. Our experts expedite complex interrelated tasks on tight time frames in a way that minimizes disruption of normal functions and delivers the expected results." (PMA Consultants at http://www.pmaconsultants.com)

Another example can be seen in this statement:

"IT and IS Specific Services

- Business Analysis and Joint Application Design — BMC will provide knowledgeable facilitators and business analysts to design an cross-functional solution or to help a team design it's own cross-functional solution
- Independent Verification and Validation — all aspects from development of validation plans through verification activities and reports
- Quality Assurance and Quality Control of process and products (final and interim products) — design reviews, document reviews, process reviews
- System and Software Development Methodology Support— process development, documentation, review, and auditing
- User Manuals, On-line Help, and User Training — development, documentation, and delivery of user manuals, on-line help, and training; text, audio, on-line/web-based, self-paced, instructor lead — all formats" (Business Management Consultants at http://www.bmc-online.com.)

Ad Hoc versus Systematic Project Categorization

One approach to continued development of the discipline of PM is simply to allow this ad hoc segmentation or categorization to continue as it has for the past several decades. Some will argue that this actually has been going on since the inception of the age of modern project management in the 1960s. This ad hoc approach will no doubt continue to produce some beneficial results, but these results can be predicted to be somewhat uneven, perhaps wasteful of duplicate effort, and certainly un-systematic.

A systematic approach to this question is believed to be more desirable, since this will accelerate the progress and related improvements in the PM discipline, avoid duplicate efforts, and help to assure that all pertinent factors have been considered.

Research to date (see Crawford et al 2002, 2004, 2005 and others; see table 2) shows that there are many characteristics and attributes of projects that can be used, and in fact are being used, to categorize and/or classify projects. There are also many purposes and uses of the various categorizations. Crawford et al also make the point that it is not practical to categorize projects without considering the purpose of such categorization. A systematic approach to this problem requires that the purposes and the methods of project categorization/classification be interrelated.

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

Table 2. Attributes of Projects Used In Various Classification Systems. Source: Crawford et al 2002, 2004

Crawford et al (2004) list these common and specific uses and needs:

Common uses/needs

- A language for naming and discussing
- Facilitating communication
- Storage and retrieval of knowledge

Specific uses/needs

- Research
- Ontological definition
- Comparability
- Building on previous results
- Professional organisations
- Development of BoKs
- Internal organization (SIG structure)
- Market positioning
- Practitioner organisations?

The Purposes/Methods Matrix for Project Categorization: One useful and practical way to initiate such a systematic approach is to construct a two dimensional matrix consisting of the purposes on one axis and the methods (based on specific categorization criteria) on the other axis. Figure 1 illustrates such a matrix. In developing this matrix it is proposed that the purposes be refined and prioritized, while at the same time examining various categorization methods (project characteristics and attributes to be used to define the categories.) Those methods that appear to be the most useful for the highest priority purposes would then be given more rigorous examination and systematic design.

Methods▶ / Purposes▼	**Market Share & Strategic Intent** (Fern 2004)	**Project Product or End Result** (Archibald 2004)	**Development Project versus Deployment Project** (Pfeiffer 2004)	**Other Project Attributes or Characteristics**	
STRATEGIC PM					
Project selection	X	?	X		
Prioritize selected projects	X	?	X		

Define Portfolios		X	X		
Manage project portfolios	X	X			
Allocate resources to portfolios and projects within portfolios	X	X	X		
Other:					
OPERATIONAL PM					
Select/assign project managers	X	X	X		
Design/select best project life cycle models		X	X		
Select/improve project planning, scheduling, executing, and controlling methods		X	X		
Select/develop PM software applications		X	X		
Build knowledge base of best practices		X	X		
Improve risk management methods		X	X		
Evaluate organizational PM maturity	?	X	X		
Link success and failure factors	X	X	X		
Select tools and approach		X	X		
Other:					
PM EDUCATION/TRAINING					
Improve/focus educational and training courses		X	X		
Develop specialized case studies		X	X		
Organize speaker tracks at congresses		X	X		
Other:					
PEOPLE DEVELOPMENT IN PM					
Develop specialized certification of project managers	X	X	X		
Develop specialized certification of PM support positions		X	X		
Develop PM career paths for individuals		X	X		
Other:					
OTHER					

Figure 1. Purposes/Methods Matrix for Project Categorization (draft illustration)

Purposes and Benefits of Systematically Categorizing Projects

Defining the Purposes of Categorizing Projects: The vertical axis of the illustrative matrix in Figure 1 shows a proposed indentured list of possible purposes for the various methods of project categorization. That list is reproduced here with brief comments on each item, including indications of the potential benefits to be derived.

Strategic Project Management Uses: The most effective method of categorizing projects for these strategic management purposes will not be the same as the best categorization method for operational project management purposes. These strategic purposes include:

- **Project selection:** Determining which potential projects are to be funded and executed.
- **Prioritize selected projects:** Determining the relative importance of selected projects to assist in allocating scarce resources.
- **Define Portfolios:** Determining the most effective way of grouping projects within specifically defined project portfolios.
- **Manage project portfolios:** Designing, implementing, and operating the project portfolio management process of the organization.
- **Allocate resources to portfolios and projects within portfolios:** Deciding the best deployment of money and other limited resources across all project portfolios and among the projects within each portfolio.
- **Other:** No doubt other strategic PM uses can be identified.

Operational Project Management: This area of use focuses on the specific practices, systems and methods of authorizing, planning, and controlling projects and multi-project programs. The method used for categorizing projects for these purposes will no doubt be very different from those used for strategic and other purposes. These operational PM purposes include:

- **Select/assign project managers:** Matching the background and experience of available project managers with specific projects is greatly facilitated when the projects are appropriately categorized.
- **Design/select best project life-cycle models:** Determining which of the many currently used project life-cycle models is best for each project demands that each project must be identified within a defined project category.
- **Select/improve project planning, scheduling, executing, and controlling methods:** The 'best practice' for each of these basic PM functions varies considerably for different project categories.
- **Select/develop PM software applications:** The strengths and weaknesses of currently available PM software application packages will vary according to the specific project category. One package that is very strong in the procurement area, important to the 'facilities design/procure/construct' category, may not be very useful to a project in the 'software new product development' category, for example.
- **Build knowledge base of best practices:** As indicated above, what is 'best practice' within one project category is not necessarily the 'best practice' in another category.
- **Improve risk management methods:** At a general level risk management is very much the same across all project categories. However, as one moves into the details significant differences in the sources of risk and methods for mitigating them emerge. The greatest improvements will be made in these detailed areas of risk management.
- **Evaluate organizational PM maturity:** It is obvious from an examination of the PM literature that there are great differences in the basic maturity of the PM discipline itself

when one compares one basic project category with another. The maturity of any organization will likewise vary considerably between one category and another. To assign an overall maturity rating to any organization without specifying which project category is involved has little practical significance. Current research in this area includes a test being conducted in Brazil (a country of 180 million people with significant high-technology industries and 17 PMI chapters) of the Prado/MMGP maturity model using the category list shown later in Table 3. See http://www.maturityresearch.com/# for details of this research. Information on the largest chapter in Sao Paulo can be obtained at http://www.pmisp.org.br/home.asp .

- **Link success and failure factors:** The factors that are important to success or failure in one project category are, in many cases, very different from those in another project category.
- **Select tools and approach:** The PM 'toolbox' is very large and varied. No-one will try to apply each and every PM tool, technique, 'best practice,' method, or system to each and every project for which they hold responsibility. An effective method for categorizing projects, and then classifying them within those categories, will be of great value in deciding which tools and techniques to apply to which projects.
- **Other:** Additional purposes and uses of effective project categorization can surely be identified.

Project Management Education and Training Uses: PM education and training is a very big business throughout the world. However, many of the courses and programs are ineffective in actually developing skilled project managers for specific types or categories of projects. Use of practical project categorization methods in this area include:

- **Improve/focus educational and training courses:** It is obvious that, if the arguments given above are valid, more specific educational and training courses for defined project categories will result in the wider use of 'best practices' developed for those categories.
- **Develop specialized case studies:** Case studies related to each of the agreed project categories will be more effective in the focused educational and training courses and programs.
- **Organize speaker tracks at congresses:** One of the major problems for participants in large congresses on PM is how to choose which speaker track to attend. With tracks focused on specific project categories, this problem will be reduced significantly.
- **Other:** Further investigation will assuredly uncover other important purposes related to PM education and training.

Uses for People Development in Project Management: Some of the uses for systematic definition of project categories in this area include:

- **Develop specialized certification of project managers:** The most popular current PM certification programs (PMI and IPMA) purport to certify individuals in some aspects of PM without regard for any specific project categories.

- **Develop specialized certification of PM support positions:** Certification of project estimators and schedulers, as examples, for large engineering design and construction projects will require proof of very different knowledge, skills and capabilities than the equivalent support positions in research and development, new product development, or software development projects.
- **Develop PM career paths for individuals:** Career planning and development of PM career paths differ widely for many of the basic project categories that can be identified.
- **Other:** Certainly there will be other purposes and uses related to people development of a systematic definition of project categories.

Other Uses: Beyond strategic PM, operational PM, PM education and training, and people development in PM, other purposes and uses will emerge for various methods of categorizing projects and programs.

Prioritizing Purposes and Uses: Each organization will benefit from examining the various purposes and uses that are important to them, and determining which purposes are the most important for their strategic growth. Then they can determine which of the several methods of categorization make the most sense within their political, business and economic environment.

Consolidating and Simplifying Purposes and Uses: Rather than elaborating and making the list of purposes and uses longer and more complex, it is recommended that efforts be directed to consolidating and simplifying them as much as possible.

Project Categorization Methods

Project Attributes: Projects exhibit many attributes (for example those shown in Table 2 above) or characteristics that might be used to define categories, and also to classify projects within a specific category. The challenge here is to select the most appropriate characteristics to define the best categories for a specific purpose. A project categorization method is defined as the procedure to be applied in identifying the set of characteristics (or attributes) that will be used to

- place specific projects within specific categories, and
- classify projects within a category (or sub-category).

Three examples of project categorization methods are given here.

Market Share & Strategic Intent: A method for categorizing projects according to market share and strategic intent has been described briefly by Fern (2004.) In his introduction, Fern says: "To be useful, a project categorization system should achieve all of the following:

- it must provide an appropriate category for any project we may encounter,
- it must permit classifications within each category,
- it must provide useful insight about differences between projects in one category and projects in every other category, and

- its categories must be readily translatable and comprehensible across human cultures.

"If projects are to be categorized according to the products they are intended to produce, a possible alternative categorization scheme might draw on work already done by others who focused on products.

"The products of projects are a set of deliverables intended to be of service to the customer of the project. While the deliverables may include one or more objects, such as an airplane or a highway, they are delivered for the purpose of providing a part of a service, transportation in this case. The objects are not the products. The products are the full set of services required to satisfy the customers stated or implied requirements."

Fern's categorization method combines the Boston Consulting Group's well-known matrix relating market share with market growth (Problem Child, Star, Cash Cow, and Dog) and Hammel and Prahalad's (1989) theory that products are developed to conform to the requirements of one of three strategic intents: technological excellence (TE), operational excellence (OE), or customer intimacy (CI). The Boston Consulting Group matrix is shown in Figure 2.

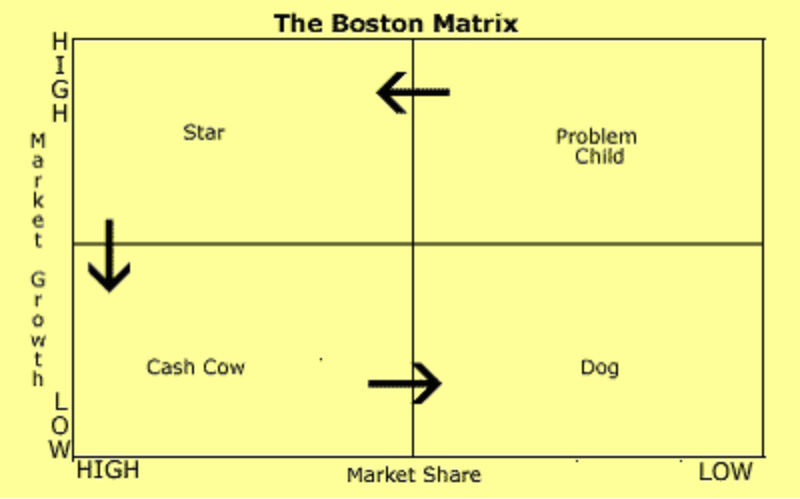

Figure 2, The Boston Matrix.

"Products produced with a TE strategic intent incorporate features and functions that are not available in competing products. The high development costs of these breakthrough products are born by a small customer base who perceive some advantage in having what others do not. TE product development is technology driven and it tends to ignore customer input to the product development process. TE products must produce extremely high gross margins in order to recover not only their own development costs but those of other failed TE development projects carried out by the performing organization.

"Products produced with an OE intent are often reverse engineered from TE products already available. These second entries may offer additional features and functions but will also offer more consistent quality and much lower prices. OE products take advantage of lower development costs, efficient manufacturing or production processes, and economies of scale to achieve lower costs and prices. Customer input is considered only to the extent that large groups of customers share similar requirements. Lower gross margins are offset by higher sales volumes.

"CI products are customized to the specific requirements of specific customers. Product designers endeavor to understand and incorporate the environment of these customers as critical conditions under which their product must function. CI development costs must be absorbed by a single customer, either through high price or high volume.

Project Matrix

"Using the four Boston Matrix classes as rows and the three Strategic Intent classes as columns, we might choose to define projects in terms of their product characteristics. This yields a total of twelve theoretical project categories, as illustrated below.

	TE	OE	CI
PC	PC-TE	PC-OE	PC-CI
S	S-TE	S-OE	S-CI
CC	CC-TE	CC-OE	CC-CI
D	D-TE	D-OE	D-CI

> "PC-TE products are produced for fast growing markets usually associated with emerging technologies and with little attention to customer requirements.
>
> "S-TE products focus on employing emerging technologies and processes to add features and functions in order to increase market share.
>
> "CC-TE products focus on employing emerging technologies and processes to reduce costs.
>
> "D-TE products use emerging technologies to assimilate the products, services, or business processes of merged or acquired competitors.
>
> "PC-OE products imitate existing products while integrating more reliable or cost-effective production processes" (Fern 2004.)

Project Product or End Result: Several authors have described categorization methods that focus primarily on the project product or end results (Youker 1999, Shenhar and Wideman 2002, Archibald 2004 among others.) From the perspective of developing project management, this form of categorization is probably the most significant, because the type of product determines the type of work involved and hence the best mode and methodology for managing the project.

The basic premise is simple - For a project to be successful, different types of project work, associated with different types of product, need to be managed differently.

For example, Shenhar and Dvir proposed a matrix consisting of four project categories based on levels of Technological Uncertainty, set against three levels of Project Management Scope based on level of project management complexity. This arrangement was briefly summarized in a 1996 Shenhar and Wideman paper (Operations Research and Management Science (INFORMS), Washington, DC, May 1996) and is illustrated in Figure 6. This matrix is invaluable in alerting management to the relative risks of different levels of technology in the project and the degree of project management ceremony required.

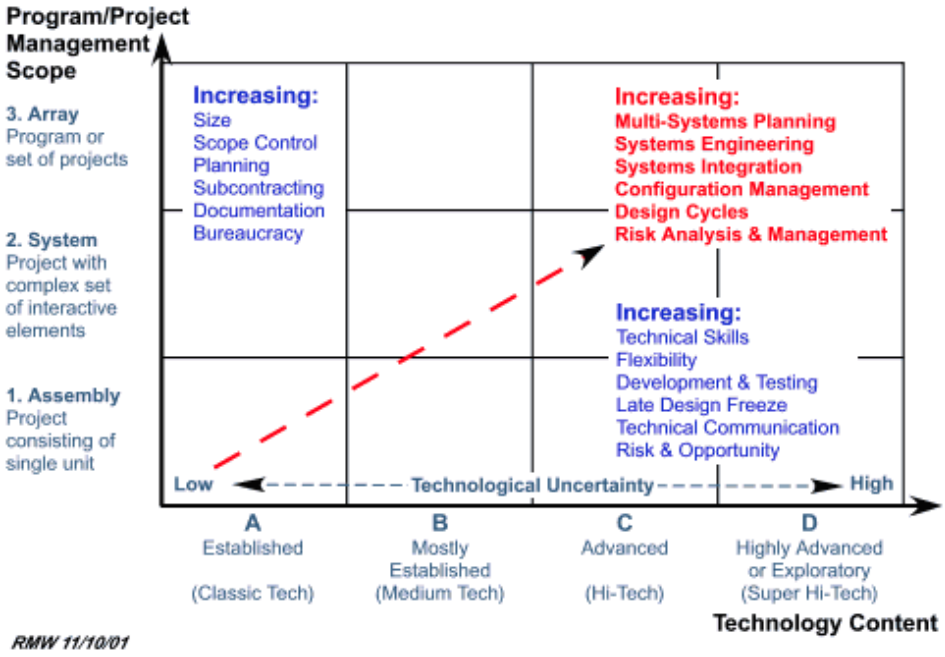

Figure 6: Relation between Project/Program Scope and Technology Content

Shenhar and Wideman then examined the combination of the type of product and the type of work required to produce that product and concluded that this give rise to a basic matrix of four possible categories. This matrix is shown in Figure 7.

Type of Work in the Project	Tangible (Value is in the entity)	Intangible (Value is in the content)
Intellect (Requires education)	**Characteristic:** - Not done before - Subject to linear logic - Requires iterations - Resources less predictable	**Characteristic:** - non-repetitive, first of its kind - Creative effort - Minimal repetition - Resources unpredictable - Exploratory
	Result: Development of new physical artifact	**Result:** Development of new piece of intellectual property
	Examples: New invention, device; All-new "mouse-trap"; New product from R&D	**Examples:** New book, poem, music, movie, etc: New algorithm, theory, idea; New technology process; New software
Craft (Requires training)	**Characteristic:** - Much repetitive effort - Linear logic applies - Learning curve effects - Learn by doing - Resources predictable - Relatively high cost involved	**Characteristic:** - Based on previous model - No iterations, only corrections - Learn by repetition - Physical format required only for distribution - Resources predictable - Relatively low reproduction cost
	Result: Typical physical artifact	**Result:** Typical piece of intellectual property
	Examples: Typical new physical plant, infrastructure, or product, e.g. building; utility; car; appliance	**Examples:** Typical system, software upgrades, etc. Policies, procedures manual; Plan for factory shut-down

Type of Product from the Project

Figure 7: Basic project classification for purposes of management style

Categorization methods that focus primarily on the project product or end results have been described by several authors (Archibald 2004, Youker 1999; see also references in both of these papers.)

Hierarchical and Multi-Dimensional: A practical system for project categorization must be both hierarchical and multi-dimensional. The resulting categories must be based on the same hierarchical approach used in systematically defining a project, as in developing a project/work breakdown structure (P/WBS):

Category level
1 2 3 4
Major category
Sub-category 2
Sub-category 3
Sub-category 4

It is probable that not all major categories will require as many as three additional sub-category breakdowns.

Classifying Projects Within Categories: Within each agreed category and sub-category, the system must allow practitioners to classify their projects according to the attributes that are most useful to the purpose at hand. This further classification could be a sort of multi-dimensional screen that identifies all of the projects that fit a particular set of attributes within a specific category.
(Source: Archibald 2004, p 4 - (http://www.russarchibald.com/AGLOBALSYSTEM1104.pdf .)

One example of the results of the application of a categorization method based primarily on the project end results is shown in Table 3.

Project Categories: Each having similar life cycle phases and a unique project management process	**Examples**
1. Aerospace/Defense Projects	
1.1 Defense systems	New weapon system; major system upgrade.
1.2 Space	Satellite development/launch; space station mod.
1.3 Military operations	Task force invasion
2. Business & Organization Change Projects	
2.1 Acquisition/Merger	Acquire and integrate competing company.
2.2 Management process improvement	Major improvement in project management.
2.3 New business venture	Form and launch new company.
2.4 Organization re-structuring	Consolidate divisions and downsize company.
2.5 Legal proceeding	Major litigation case.
3. Communication Systems Projects	
3.1 Network communications systems	Microwave communications network.
3.2 Switching communications systems	3rd generation wireless communication system.
4. Event Projects	
4.1 International events	2004 Summer Olympics; 2006 World Cup Match.
4.2 National events	2005 U. S. Super Bowl; 2004 Political Conventions.
5. Facilities Projects	
5.1 Facility decommissioning	Closure of nuclear power station.
5.2 Facility demolition	Demolition of high rise building.
5.3 Facility maintenance and modification	Process plant maintenance turnaround.
5.4 Facility design/procurement/construction	Conversion of plant for new products/markets.
Civil	Flood control dam; highway interchange.
Energy	New gas-fired power generation plant; pipeline.
Environmental	Chemical waste cleanup.
High rise	40 story office building.
Industrial	New manufacturing plant.
Commercial	New shopping center; office building.
Residential	New housing sub-division.
Ships	New tanker, container, or passenger ship
6. Information Systems (Software) Projects	New project management information system. (Information system hardware is considered to be in the product development category.)
7. International Development Projects	
7.1 Agriculture/rural development 7.2 Education 7.3 Health 7.4 Nutrition 7.5 Population 7.6 Small-scale enterprise	**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
7.7 **Infrastructure:** energy (oil, gas, coal, power generation and distribution), industrial, telecommunications, transportation, urbanization, water supply and sewage, irrigation)	**Capital/civil works intensive projects—** often somewhat different from *5. Facility Projects* as they may include, as part of the project, creating an organizational entity to operate and maintain the facility, and lending agencies impose their project life cycle and reporting requirements.
8. Media & Entertainment Projects	
8.1 Motion picture	New motion picture (film or digital).
8.2 TV segment	New TV episode.
8.2 Live play or music event	New opera premiere.

9. Product and Service Development Projects	
9.1 Information technology hardware	New desk-top computer.
9.2 Industrial product/process	New earth-moving machine.
9.3 Consumer product/process	New automobile, new food product.
9.4 Pharmaceutical product/process	New cholesterol-lowering drug.
9.5 Service (financial, other)	New life insurance/annuity offering.
10. Research and Development Projects	
10.1 Environmental	Measure changes in the ozone layer.
10.2 Industrial	How to reduce pollutant emission.
10.3 Economic development	Determine best crop for sub-Sahara Africa.
10.4 Medical	Test new treatment for breast cancer.
10.5 Scientific	Determine the possibility of life on Mars.
11. Other Categories?	

Table 3. Recommended project categories/sub-categories, with each category (or subcategory) having similar project life cycle phases and one unique process management process [Archibald 2003, Fig. 2.3, p.35].

Development Project versus Deployment Projects: Pfeiffer (2004) describes an interesting approach to differentiating between 'development' and 'deployment' projects. Table 4 shows his comparison of these two project types.

Basic Differences of Project Types	
Deployment Project	**Development Project**
Civil construction. Installation of a system.	Development of new products. Organization of social change.
Advance measured by products. "Final Product" relatively clear.	Advance aimed at reducing uncertainties, measured by indicators.
Life Cycle generally in form of cascade.	Various life cycles possible.
Leadership style based on command and control.	Leadership style focused on learning.
Highly structured information system.	Less formal communication system.
Task oriented organization of Human Resources.	Human Resources need to adapt and evolve in order to respond to changes.
Progress relatively Linear.	Processes very dynamic.

Table 4. Basic Differences of Project Types. Source: Pfeiffer 2004, p 5.

Pfeiffer describes "Demonstrative Projects", which he characterizes as development projects, that "are the principle means of ProGau action for the transformation of municipal environmental management" (Pfeiffer 2004, p 4.) ProGAU is the Urban Environmental Management Project, which is a part of a Brazil-German Technical Cooperation effort that has been going on for 40 years.

Classifying Projects within Categories and Sub-Categories

There is usually a wide range of projects within each project category or sub-category in large organizations. The project management process for each project category must provide the flexibility to choose the proper level of planning and control for large, complex, high-risk, 'new territory' projects compared to smaller or 'old hat' projects. It is probably desirable for purposes of the proposed system to further classify projects within categories or sub-categories using some

of the attributes identified by Crawford et al (2004) cited earlier, or using some of the following classifying characteristics:

PROJECT SIZE: ….

Major and Minor Projects Within a Category: It is useful to identify at least two classes of projects within each category. For purposes of discussion here we will call these major and minor projects, although each organization can probably define more descriptive names. The distinction between these major and minor classes will be noted in the following definitions:

Major Projects are those whose large size, great complexity and/or high risk require:

- Designation of an executive Project Sponsor.
- Assignment of a full-time Project (or Program) Manager;
- The full application of the project management process specified for the particular project category for major projects (all specified forms, approvals, plans, schedules, budgets, controls, reports, frequent project review meetings, with substantial levels of detail in each.)

Minor Projects are those whose size, simplicity and low risk allow:

- One project manager to manage two or more minor projects simultaneously;
- Less than the full application of the complete project management process for the project category (selected basic forms, approvals, plans, schedules, budgets, controls, reports, less frequent project review meetings, with less detail required in each.)
- No formal assignment of an executive Project Sponsor; sponsor role retained within the line organization.

Project Complexity: The complexity of a project is indicated by the:

- Diversity inherent in the project objectives and scope;
- Number of different internal and external organizations involved, which is usually an indication of the number of required specialized skills;
- Sources of technology; and/or
- Sources of funding….

External or Internal Customer: ….

Degree of Customer Involvement in the Project: ….

Levels of Risk in Projects: ….

"Mega" Projects or Programs ….

"Stand-Alone" Versus "Create Supporting Infrastructure" Projects: ….

"Standard" Versus "Transitional" Projects: ….

The Project Category/Class Matrix: The result of placing projects within the appropriate category (or sub-category) and then classifying them using one or more other attributes will produce an n-dimensional matrix. For practical purposes this will probably most often be displayed in 2 or 3 dimensions. ….
Source: Archibald 2004, p 7-9.

Conclusions

In place of the ad-hoc categorization of projects that is prevalent today, a more systematic approach to this important aspect of the project management discipline must be developed. This systematic approach must:

- Be directly related to the specific needs and purposes of each organization
- Be hierarchical in nature.

The systematic categorization and classification of projects appears to be a fertile field for research by all members of the world of project management, including doctoral research topics.

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