

Series on Categorizing Projects and Programs¹

Project Categories

By Alan Stretton

ABSTRACT

This is the first of a series of four working/discussion papers on categorizing projects and programs. The context of these papers is overall categorizations as they have appeared in the literature. These currently vary widely, and this series is concerned with exploring possibilities for bringing them closer together. The aim is to stimulate discussion and to encourage feedback, which might hopefully lead to the development of more widely acceptable and accepted categorizations.

This first paper focuses on project categorizations, most of which are found to be a mixture of industrial/ social sectors (Application Sectors) in which projects are undertaken (e.g. aerospace, defence), and types of projects (Project Types) which are undertaken in many, if not most, of these Application Sectors (e.g. IT, R&D). The components of a recent project categorization are re-allocated into these two categories, and presented as a matrix which illustrates the intersections between Project Types and the various Application Sectors in which they are undertaken. The paper goes on to discuss the five key Project Types which have emerged so far.

INTRODUCTION

Many different generalized categorizations of projects in particular have appeared over the past twenty-five years, yet we still do not have a widely accepted categorization. I have had an interest in this since 1989 when I became Chair of PMI's Standards Committee, during which time we discussed possibilities of developing domain-specific materials in relation to the PMBOK (but did not pursue these at the time). Other early discussions on project categorizations that I came across included Allen 1991, Youker 1992 and Turner 1993.

However, other interests overtook this particular one, and I did not return to this topic until 2009, when I made an initial attempt to categorize programs (Stretton 2009b). I have been further stimulated to return to the subject due to articles by Pells 2011 and Archibald & Prado 2014, whose contributions will be discussed in more detail later.

¹ This series of articles on the categorization of projects and programs is by Alan Stretton, PhD (Hon), Life Fellow of AIPM (Australia), a pioneer in the field of professional project management and one of the most widely recognized voices in the practice of program and project management. Long retired, Alan is still accepting some of the most challenging research and writing assignments; he is a frequent contributor to the *PM World Journal*. See his author profile at the end of the article.

It should be pointed out that the categorizations of projects in these papers are all concerned with stand-alone projects (rather than component projects of programs). In the context of broad categorizations they are on much the same footing as programs. Hence the frequent use of the descriptor *programs/projects* later.

Crawford et al 2006 point out that many various systems for categorizing projects have been proposed in the project management literature. Importantly, they make the point that the attributes that are to be categorized in any such system depend on the purposes of those who are making the categorization.

A PROJECT CATEGORIZATION BY ARCHIBALD & PRADO 2014

A categorization of projects developed by Archibald & Prado 2014 is shown in Figure 1-1 below (their Table 1, excluding examples they give of each project category and sub-category). Archibald & Prado say that the sub-categories within each major category have similar project life cycle phases and project management processes, which evidently reflects the purpose underlying this categorization.

<p>1. Aerospace / defense projects Defence systems; Space; Military operations</p> <p>2. Business & organizational change projects Acquisition / merger; Management process improvement; New business venture; Organization restructuring; Legal proceeding</p> <p>3. Communications systems projects Network communications systems; Switching communications systems</p> <p>4. Event projects International events; National events</p> <p>5. Facilities projects Facility decommissioning; Facility demolition; Facility maintenance & modification Facility design-procurement-construction Civil; Energy; Environment; High-rise; Industrial; Commercial; Residential; Ships</p> <p>6. Information systems (software) projects</p> <p>7. International development projects Agricultural / rural development; Education; Health; Nutrition; Population; Small-scale enterprise; Infrastructure: energy, industrial, telecommunications, transportation, urbanization, water supply and sewerage, irrigation</p> <p>8. Media & entertainment projects Motion picture; TV segment; Live plays or music event</p> <p>9. Product and service development projects Information technology hardware; Industrial product / process; Consumer product / process; Pharmaceutical product / process; Service (financial, other)</p> <p>10. Research & development projects Environmental; Industrial; Economic development; Medical; Scientific</p> <p>11. Healthcare projects</p> <p>12. Other categories</p>

Figure 1-1: From Archibald & Prado 2014 – Table 1. Project categories/sub-categories

This categorization appears to me to be a mixture of two rather different, and often overlapping, entities.

It is further noted here that virtually all project categorizations I have seen have a similar mixture of what I will describe as Application Sectors and Project Types, as now discussed in more detail.

Distinguishing between Application Sectors and Project Types

Starting with the first category in Figure 1-1, namely *1. Aerospace / defense projects*, there are many different types of projects undertaken within these two domains. For example, looking at the *defense* domain, the US DoD undertakes very extensive *Information systems (software) projects*, which are listed as Category 6 above. It also undertakes similarly extensive *Research & development projects*, which are listed as Category 10 in Figure 1-1. Still on *defense*, the sub-category *defense systems* would typically involve *Facilities projects*, which are listed as Category 5. Similar mixtures/overlaps would appear to apply to the *aerospace* component of Category 1.

In these circumstances, it would appear more precise to class *Aerospace / defense* as an application area, in which many different types of projects are undertaken, rather than as a project category. For the purposes of this paper, I propose to describe *Aerospace / defense* as an **Application Sector**, capitalizing the first letters to imply a distinctive meaning, and using the descriptor *sector* rather than *area*, because the latter is often used in a more generalized context.

Looking further down the categorization list in Figure 1-1, I would also nominate Categories 3, 4, 7, 8 & 11 as *Application Sectors*, although some of these nominations are somewhat more straight-forward than others (see below). The following listing of Application Sectors is then derived from Figure 1-1 (dropping “projects” from the descriptors to help avoid confusion).

Application Sectors from Figure 1-1

1. Aerospace / defense
3. Communications systems
4. Events
7. International development
8. Media & entertainment
11. Healthcare

Turning to the other categories in Figure 1-1, starting with Category 2. *Business & organization change projects*, these can be undertaken in a wide variety of Application Sectors. Categories 5, 6, and 10 have already been identified as being undertaken in the *Aerospace / defense* Application Sector(s), and of course are undertaken in many other sectors as well. Category 9. *Product and service development projects*, can similarly be undertaken in many Application Sectors.

I had some problems coming up with an appropriate descriptor for this category, but eventually adopted the simple descriptor **Project Type**, capitalizing the first letters to distinguish this descriptor from more general usage of these words.

Project Types from Figure 1-1

2. Business & organization change projects,
5. Facilities projects
6. Information systems (software) projects
9. Product and service development projects
10. Research & development projects

In relation to these new categorizations, a couple of qualifying remarks are in order. The first is to acknowledge that the descriptor of Project Types as being those that can be undertaken in a variety of Application Sectors is imprecise. I would like to have a better descriptor/definition, but that currently eludes me.

Another challenge is that it is not always easy to distinguish between Application Areas and Project Types. For example, I have categorized Category 8. *Media and entertainment*, as an Application Sector. However, it could perhaps be argued that the nominated sub-categories involve a common distinctive set of project management processes, which might also be applicable in other Application Sectors as well, and, if so, would therefore qualify as a Project Type. But I don't believe this applies, so will stick with my choice of Application Sector for the present.

A PROJECT TYPE / APPLICATION SECTORS MATRIX FROM FIGURE 1-1

We have said that the key attribute of Project Types is that they are undertaken in many, if not most, Application Sectors. It therefore seems natural to depict the intersections of these in matrix format, using the sub-categorizations just identified, as shown in Figure 1-2 on the next page.

It is evident that some of the Project Types are much more immediately relevant to some Application Sectors than they are to others. It would appear to be potentially useful to establish the nature and importance of such relevancies, and thence, hopefully, develop a better understanding of how individual Project Types can benefit through sharing inter-Application-Sector data. This reflects one of my main purposes in investigating broad program/project categorizations.

It is also evident that both the Application Sectors and the Project Types listed are not totally comprehensive. Both will be looked at more closely in later papers.

APPLICATION SECTORS	PROJECT TYPES				
	2. Business & organizational change	5. Facilities projects (engg./construction)	6. Information systems (software)	9. Product and service development	10. Research & development
1. Aerospace / defence					
3. Communications systems					
4. Events					
7. International development					
8. Media & entertainment					
11. Healthcare projects					
12. Other sectors?					

Figure 1-2: Matrix showing intersections between Application Sectors and Project Types, using project categorizations developed by Archibald & Prado 2014

We now return to the Project Types developed from Figure 1-1, and to listings of Project Types from other sources.

GENERALISED LISTINGS OF PROJECT TYPES

Turner 1993

One of the earliest categorizations of projects which identified Project Types that are undertaken in most application areas that I know of is in Turner 1993:458, who says:

Considering projects by 'technology', there are three major groupings of project:

- organizational change
- engineering
- information technology

Maylor et al 2006

Somewhat later, Maylor et al 2006 added to Turner's list when they noted that

The PWC study showed the usage [of projects, from a 200 firm survey] as

- to implement IT change initiatives (73%)
- performance improvement projects (57%)
- software development (49%)
- new product development (45%)
- strategy deployment (43%)
- construction (31%)
- research (15%)

For the sake of simplifying things at this stage, I equate the first and third bullet points from Maylor et al 2006 with Turner's "information technology", their second bullet point with Turner's "organizational change", and "construction" with Turner's "engineering".

A combined generalized listing of Project Types

If these matchings are acceptable (for present purposes), we have three additions to Turner's above list of Project Types, so that the total identified by these two groups of authors now reads as follows:

- organizational change
- engineering/construction
- information technology
- new product development
- research
- strategy deployment

Strategy deployment is not a specific Project Type, but more of a generalized categorization that could include any of the other five Project Types in this listing. I therefore exclude it from this generalized listing.

I also expand *research* into the broader category *research and development (R&D)*.

Comparing the generalized Project Type listing with Archibald & Prado

Putting the Project Types identified from Archibald & Prado alongside the modified generalized listing, they are virtually identical, as can be seen.

Generalized listing of Project Types

Organizational change
Engineering/construction
Information technology
New product development
Research and development

Project Types from Archibald & Prado

Business & organizational change
Facilities
Information systems (software)
Product & service development
Research & development

The only pairing which is not prima facie one-to-one is *engineering/ construction* and *facilities projects*. However, the subcategories of *facilities projects* in Figure 1-1 cover a very wide range of engineering/construction types, so that this pairing appears to be basically one-to-one.

It is therefore proposed to use the above generalized listing of Project Types in discussions in later papers.

The generalized list of project types and Turner & Cochrane's goals-and-methods matrix

As long ago as 1993, Turner & Cochrane proposed a four-type goals-and-methods matrix, which is based on how well the project goals are initially defined, and how well defined are the methods of achieving them.

The four categories deriving from this are summarised as Type 1: both goals and methods are well defined; Type 2: goals are well defined, but methods are not; Type 3: methods are well defined, but goals are not; Type 4: neither goals nor methods are well defined. The basic form of the matrix is indicated in Figure 1-3 on the next page.

However, from the point of view of this enquiry, we find that all five of the generalized list of Project Types listed above are specifically represented in Turner & Cochrane's matrix as being proto-typical examples within their four-type matrix, as indicated in Figure 1-3.

Specifically, Type 1 (both goals and methods well defined) is represented by engineering (which essentially is shorthand for our second bullet point above, namely *engineering/construction*). Type 2 has our fourth bullet point, *product development*, as its proto-typical example. In like vein, Type 3 is represented by the third bullet point, which we have described as *information technology*. And finally, Type 4 has been represented by both *research* (read *R&D*), and *organizational change* projects.

Figure 1-3 then goes on to include two sets of attributes involved in managing each project type listed by Turner & Cochrane, namely start-up techniques, and implementation techniques.

Methods Well Defined	TYPE 2 PROJECT Product development <u>Startup Techniques</u> <ul style="list-style-type: none"> • multi-disciplinary teams • brainstorm • define techniques <u>Implementation Techniques</u> <ul style="list-style-type: none"> • Milestone Planning <ul style="list-style-type: none"> - PBS elements • Configuration Mgt. of <ul style="list-style-type: none"> - WBS (tasks) 	TYPE 4 PROJECT Research & Organizational Change <u>Startup Techniques</u> <ul style="list-style-type: none"> • inspiration/creativity negotiation • strategy definition • communicate <u>Implementation Techniques</u> <ul style="list-style-type: none"> • Milestone Planning <ul style="list-style-type: none"> - life-cycle stages - the PBS elements • Configuration Mgt. of <ul style="list-style-type: none"> - PBS then WBS
	TYPE 1 PROJECT Engineering <u>Startup Techniques</u> <ul style="list-style-type: none"> • specialist implementers • known techniques • defined organization <u>Implementation Techniques</u> <ul style="list-style-type: none"> • Activity Planning • Configuration Mgt. of <ul style="list-style-type: none"> - none 	TYPE 3 PROJECT Applications software development <u>Startup Techniques</u> <ul style="list-style-type: none"> • facilitator • informed negotiation • agree goals <u>Implementation Techniques</u> <ul style="list-style-type: none"> • Milestone Planning <ul style="list-style-type: none"> - life-cycle stages • Configuration Mgt. of <ul style="list-style-type: none"> - PBS - Specification
	Yes	No
	Goals well defined	

Figure 1-3: Partial amalgamation of Turner & Cochrane’s Figures 1, 4 & 7: Goals-&-methods matrix

Two points emerge from this section. The first is that the five generalized Project Types involve very different project management techniques, some guidance to which is given in Figure 1-3. In other words, a one-size-fits-all approach to managing these five different Project-Types simply cannot work.

Second, it appears to be significant that the Turner & Cochrane matrix uses the five generalized Project Types as its prototypical examples.

These five have emerged from the analysis of Archibald & Prado's categorizations, listings from Maylor et al, and now Turner & Cochrane. However, there are obviously other Project Types which have not yet emerged, but which will be discussed later in the series. In the meantime, it appears reasonable to describe these five as "key" Project Types, which they do appear to be.

SUMMARY/CONCLUSIONS

This first paper of the series has been concerned with categorizing projects in a broad overall context. Its initial focus was on a recent categorization by Archibald & Prado 2014, in which we identified two quite different components. These were named Project Types, and Application Sectors, and it was noted that this mixture is typical of most broad project categorizations. This, in turn, suggested the idea of developing a matrix which depicts the intersection of the various Project Types with the numerous Application Sectors in which they are undertaken. I summarised the purpose of doing so thus:

It is evident that some of the Project Types are much more immediately relevant to some Application Sectors than they are to others. It would appear to be potentially useful to establish the nature and importance of such relevancies, and thence, hopefully, develop a better understanding of how individual Project Types can benefit through sharing inter-Application-Sector data.

The second strand of this paper was primarily concerned with Project Types, and the perhaps-not-so-coincidental fact that three major contributors to the project management literature evidently viewed the following five Project Types as particularly important in the broad project management categorization context.

- organizational change
- engineering/construction
- information technology
- new product development
- research and development

It is proposed to refer to these as "key" Project Types in following papers.

The next paper of this series will be primarily concerned with categorizations in program management. It will follow a similar pattern to this article, and identify Program Types that are the program equivalent of Project Types.

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Alan Stretton is one of the pioneers of modern project management. He is currently a member of the Faculty Corps for the University of Management & Technology (UMT), USA. In 2006 he retired from a position as Adjunct Professor of Project Management in the Faculty of Design, Architecture and Building at the University of Technology, Sydney (UTS), Australia, which he joined in 1988 to develop and deliver a Master of Project Management program. Prior to joining UTS, Mr. Stretton worked in the building and construction industries in Australia, New Zealand and the USA for some 38 years, which included the project management of construction, R&D, introduction of information and control systems, internal management education programs and organizational change projects. He has degrees in Civil Engineering (BE, Tasmania) and Mathematics (MA, Oxford), and an honorary PhD in strategy, programme and project management (ESC, Lille, France). Alan was Chairman of the Standards (PMBOK) Committee of the Project Management Institute (PMI®) from late 1989 to early 1992. He held a similar position with the Australian Institute of Project Management (AIPM), and was elected a Life Fellow of AIPM in 1996. He was a member of the Core Working Group in the development of the Australian National Competency Standards for Project Management. He has published over 140 professional articles and papers. Alan can be contacted at alanailene@bigpond.com.au.

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