

Revisiting classifications of types of projects and programs and their application sectors¹

By Alan Stretton

INTRODUCTION

Many of my more recent articles have been concerned with various representations of how project and programs relate to the broader contexts in which they are undertaken. In the course of developing these articles I have revisited some of my earlier articles on classifications of types of projects and programs, and their application areas (Stretton 2014f-I, 2016f, 2017j), and identified an opportunity to expand on, some of these classifications.

This article looks at these classifications in rather more detail than in previous articles, adds some new materials, and presents an overview of its findings in a format which allows interested readers to rapidly back-track to sources, and to re-allocate entities to suit their own situations and/or needs in more specific contexts.

We start with broader classifications of types of projects and/or programs, which I have (rather tentatively) labelled *generic*, as now discussed.

GENERIC TYPES OF PROJECTS/PROGRAMS

I have recently coined the descriptor *generic* for categories of projects/programs that are undertaken in most, or very many, application sectors, but am not particularly happy with this descriptor, and would like to find a better one. In some earlier articles (e.g. Stretton 2016f), I used the descriptor “technological”, following a categorization of major groupings of such projects by Turner 1993:458, who said:

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

- organizational change
- engineering
- information technology

Maylor et al 2006 added to Turner’s list when they showed the results of a (then)

.....recent cross-sectoral survey of 200 firms from thirty countries which examined how companies were using project in their business These 200 companies were running a total of 10,640 projects a year worth in excess of US\$43.5 billion.

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The PWC study showed the usage [of projects – my bullet points] 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%)

I have combined the main elements of these lists into the following listing of generic types of projects (adding provision for other generic types), based on considerations listed there-under.

- Business/organisational change
- ICT systems
- Engineering/construction
- Product/service development
- Research and development
- Other generic project types

The rationale for adopting this particular listing and descriptors is broadly as follows.

- I have equated the second bullet point from Maylor et al 2006 with Turner's "organizational change", which I then generalised slightly to the commonly used descriptor *Business/organisational change*.
- I equated the first and third bullet points from Maylor et al 2006 with Turner's "Information technology", but have adopted the broader descriptor *ICT systems*.
- "Construction" is equated with Turner's "engineering", and I amalgamated the two into the commonly used descriptor *Engineering/construction*.
- I generalised "new product development" to include service as well as product (and also improvements to both), under the heading *Product/service development*.
- I also expanded "research" to the more commonly used descriptor *Research & development*.
- "Strategy deployment" is not necessarily a project type per se, as it may be undertaken by operational management. I therefore excluded it from this listing.
- Finally, as noted above, there is provision for other generic project/program types.

We will now go on to look in more detail at several project/program classifications, in the context of distinguishing between generic project types, and their application sectors.

P2M (PMAJ 2008): PROGRAM TYPES, AND APPLICATION AREAS

P2M's Figure 3-1-1: Types of programs, and Figure 1-6-1: Application areas

I start with the following two tables derived from P2M (PMAJ 2008). These are the most extensive pair of types of programs and applications areas that I know of, and therefore should provide reasonably representative basic heading for each, to which entries from other sources can then (hopefully) be added. I have prefixed the P2M numbering with a "P" for program types, and an "M" for allocation areas, to facilitate later discussions.

Figure 3-1-1: Types of programs

<p>P1. Organization change Corporate M&A; Corporate alliance; Restructuring; Spin-off of a division; Shutdown of factories/branches; Reorganization / privatization of government ministries</p> <p>P2. Resource business Resource exploration, Oil well drilling, LNG chain, Pipeline construction, Mine development/operation</p> <p>P3. Construction Social infrastructure construction (airport & railway etc); large-scale commercial facilities; urban area redevelopment</p> <p>P4. Plant and factory construction Plant construction (petrochemical, steel, semi-conductor atomic power plant; thermal electric power plant)</p> <p>P5. ICT system Bank account system; Production control system; Earth simulator; Communications / broadcasting system</p> <p>P6. Product development High-tech industrial products; Drug development; New variety of seeds, Package software</p> <p>P7. Commercialization of new business model Door-to-door delivery service; Online sale of books; Internet search service; Various online free services</p> <p>P8. Marketing/service (including networking) Affiliated dealership for luxury cars; Franchise networks; Broadband; Theme park</p> <p>P9. Event Olympic games; Soccer world cup; National sports festival; World exposition</p> <p>P10. Large scale research and development Space development; Nuclear fusion research; Human genome research; High-tech military equipment development; Global environmental research</p> <p>P11. Capability development International partnership; Founding of college; In-house education system</p> <p>P12. Creative activities Film making; TV drama</p>
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Figure 1-6-1: Application areas

<p>M1. Social infrastructure projects National traffic & transportation systems Lifeline (electricity, water, gas, info, telecommunications) systems, National security & defence facilities, Urban development, Regional development Private sector buildings Environmental preservation systems</p> <p>M2. Resource development Development of petroleum, natural gas & power resources Oil refining, petrochemical, chemical, metal refining Power plants and storage and delivery systems Energy conservation</p> <p>M3. Production facilities Various production plants and facilities; Logistics systems Innovation of production systems (automation, AI, virtual factories)</p> <p>M4. Product development & manufacture reform Development of new products Production quickly switched by open modular production systems Development of pharmaceuticals</p> <p>M5. Comprehensive engineering Social development, resource development Planning, construction, O&M of production facilities</p> <p>M6. IT, information and telecommunications Systems development, Systems integration, Creating of IT based solutions Business process outsourcing (BPO) Various financial systems</p> <p>M7. International cooperation projects Official development aid (ODA) planning and management Technology transfer; Fostering of human resources Enhancement of organizations Economic & social development through international consortium</p> <p>M8. Business and organizational reform Management reform; Restructuring; Reengineering; Mergers and acquisitions of enterprises Creation of new business models Private finance initiative, venture incubation Strategic partnership development</p> <p>M9. Administrative initiative Government agencies and municipalities - Policy, development strategies and industrial strategies</p> <p>M10a. Education: University reform; education reform</p> <p>M10b. Medical service: Medical and hospital systems; hospital reform</p> <p>M11. Community Various events; Life support projects Operation of volunteer bodies Regional development; Security systems</p>

Figure 1: P2M's Types of programs, and project/program application areas

It is immediately evident that both lists have a mixture of generic project/program types and application areas. For example, *P9. Events* would better qualify as an application area, whilst *M8. Business and organisational reform* is a generic project/program type.

Re-allocating to generic project/program types and application sectors

As can be seen, the following figure comprises first, a *Generic project/program type* listing, whose headings come directly from the listing developed earlier. The adjacent listing has been titled *Allocation sectors: Projects/programs*, in which I have slightly generalised some of the P2M headings to better accommodate entries from the other project/ program categorisations to be discussed shortly.

Some of my allocations were not all that easy to make, and I recognise that others might find alternative allocations more appropriate. (There is also a suspicion that some of the descriptors may have lost something in translation from the original Japanese, which could also be a complicating factor.)

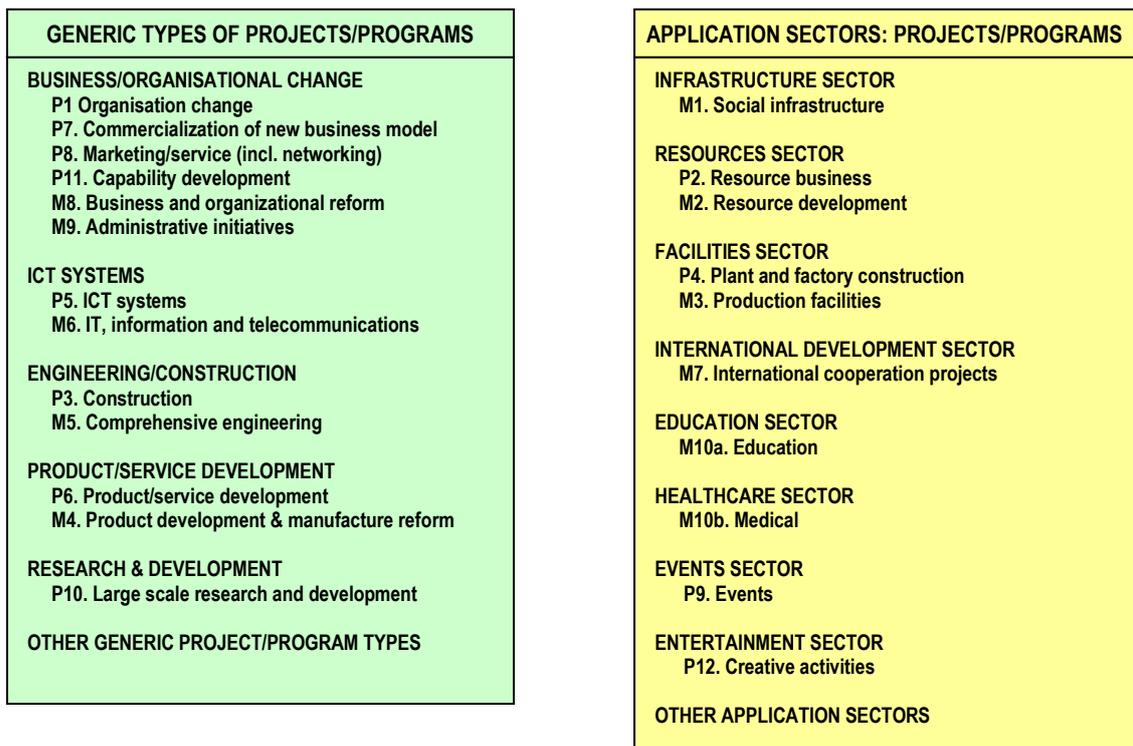


Figure 2: Re-allocating P2M components to generic project/program types and application sectors

We now move on to look at a well-known categorisation by Archibald & Prado 2014 in a similar way to the above.

ARCHIBALD & PRADO 2014: PROJECT CATEGORIES AND SUB-CATEGORIES

The Archibald model: Categorising by a project’s products and/or other results

Figure 3 below summarises a classification of project categories and sub-categories developed by Archibald & Prado 2014. It is derived from their Table 1, but without the examples they give of each sub-category. Their category numbering has been prefixed with “A” to facilitate later discussions.

ARCHIBALD & PRADO 2014 PROJECT CATEGORIES AND SUB-CATEGORIES	
A1. Aerospace / defence projects:	Defence systems; Space; Military operations
A2. Business & organizational change projects:	Acquisition / merger; Management process improvement; New business venture; Organization restructuring; Legal proceeding
A3. Communication systems projects:	Network communications systems; Switching communications systems
A4. Event projects:	International events; National events
A5. Facilities projects:	Facility decommissioning; Facility demolition; Facility maintenance & modification; Facility design-procurement-construction: <i>Civil; Energy; Environment; High-rise; Industrial; Commercial; Residential; Ships</i>
A6. Information systems (software) projects	
A7. International development projects:	Agricultural / rural development; Education; Health; Nutrition; Population; Small-scale enterprise; Infrastructure: <i>Energy (oil, gas, coal, power generation and distribution); Industrial, Telecommunications, Transportation, Urbanization, Water supply & sewerage, Irrigation</i>
A8. Media & entertainment projects:	Motion picture; TV segment; Live plays or music event
A9. Product and service development projects:	Information technology hardware; Industrial product/ process; Consumer product / process; Pharmaceutical product/ process; Service (financial, other)
A10. Research & development projects:	Environmental; Industrial; Economic development; Medical; Scientific
A11. Healthcare projects	
A12. Other categories?	

Figure 3: Project categories and sub-categories, adapted from Archibald & Prado 2014.

Re-allocating project categories to generic project types and application sectors

It can be seen that a substantial number of Archibald & Prado’s project categories have been allocated to various *Application sectors*, and that a new sector, *Aerospace/defence sector*, has been added to those originating with P2M.

GENERIC TYPES OF PROJECTS/PROGRAMS	APPLICATION SECTORS: PROJECTS/PROGRAMS
BUSINESS/ORGANISATIONAL CHANGE A2. Business & organizational change projects	INFRASTRUCTURE SECTOR RESOURCES SECTOR FACILITIES SECTOR A5. Facilities projects
ICT SYSTEMS A3. Communication systems projects A6. Information systems (software) projects	INTERNATIONAL DEVELOPMENT SECTOR A7. International development projects
ENGINEERING/CONSTRUCTION	EDUCATION SECTOR HEALTHCARE SECTOR A11. Healthcare projects
PRODUCT/SERVICE DEVELOPMENT A9. Product and service development projects	EVENTS SECTOR A4. Event projects
RESEARCH & DEVELOPMENT A10. Research & development projects	ENTERTAINMENT SECTOR A8. Media & entertainment projects
OTHER GENERIC PROJECT/PROGRAM TYPES	AEROSPACE/DEFENSE SECTOR A1. Aerospace / defence projects OTHER APPLICATION SECTORS

Figure 4: Re-allocating project categories to generic project types and application sectors

YOUKER 2002: MAJOR TYPES OF PROJECTS

Youker’s major types of projects based on product of project

Youker 2002 listed the following nine different types of major projects “based on the product they produce”. He specifically acknowledges that this is an incomplete list, and urges the project management profession to expand this towards an agreed list.

YOUKER 2002: MAJOR TYPES OF PROJECTS & EXAMPLES	
Y1. Administrative	Installing a new accounting system
Y2. Construction	A building or road
Y3. Computer software development	A new computer program
Y4. Design of plans	Architectural or engineering plans
Y5. Equipment or system installation	A telephone system, or IT system
Y6. Event or relocation	Olympiads, or a move into a new building
Y7. Maintenance of process industries:	Petro-chemical plant or electric generating station
Y8. New product development	A new drug, or aerospace/defence product
Y9. Research	A feasibility study, or investigating a chemical
Y10. Other	

Figure 5: Major types of projects based on product of project – adapted from Youker

Re-allocating Youker’s projects to generic project types and application sectors

It can be seen that three of Youker’s project types have been allocated to what appear to be the most appropriate application sectors.

GENERIC TYPES OF PROJECTS/PROGRAMS	APPLICATION SECTORS: PROJECTS/PROGRAMS
BUSINESS/ORGANISATIONAL CHANGE Y1. Administrative	INFRASTRUCTURE SECTOR RESOURCES SECTOR
ICT SYSTEMS Y3. Computer software development	FACILITIES SECTOR Y5. Equipment or system installation Y7. Maintenance of process industries
ENGINEERING/CONSTRUCTION Y2. Construction Y4. Design of plans	INTERNATIONAL DEVELOPMENT SECTOR EDUCATION SECTOR HEALTHCARE SECTOR
PRODUCT/SERVICE DEVELOPMENT Y8. New product development	EVENTS SECTOR Y6. Event or relocation
RESEARCH & DEVELOPMENT Y9. Research	ENTERTAINMENT SECTOR AEROSPACE/DEFENSE SECTOR OTHER APPLICATION SECTORS
OTHER GENERIC PROJECT/PROGRAM TYPES	

Figure 6: Re-allocating Youker’s projects to generic project types and application sectors

We now move on to aggregate the above three sets of generic project types and application sectors.

AN AGGREGATION OF THE GENERIC TYPES AND APPLICATION SECTORS

At this point it appears appropriate to aggregate Figures 2, 4 and 6 to give an overall picture of the re-allocations into *generic types of projects/programs* on the one hand, and *application sectors* on the other, as shown in Figure 7.

GENERIC TYPES OF PROJECTS/PROGRAMS	APPLICATION SECTORS: PROJECTS/PROGRAMS
<p>BUSINESS/ORGANISATION CHANGE A2. Business & organizational change projects M8. Business and organizational reform M9. Administrative initiatives P1. Organisation change P7. Commercialization of new business model P8. Marketing/service (including networking) P11. Capability development Y1. Administrative</p> <p>ICT SYSTEMS A3. Communication systems projects A6. Information systems (software) projects M6. IT, Information and telecommunications P5. ICT Systems Y3. Computer software development</p> <p>ENGINEERING/CONSTRUCTION M5. Comprehensive engineering P3. Construction Y2. Construction Y4. Design of plans</p> <p>PRODUCT/SERVICE DEVELOPMENT A9. Product and service development projects M4. Product development & manufacture reform P6. Product/service development Y8. New product development</p> <p>RESEARCH & DEVELOPMENT A10. Research & development projects P10. Large scale research & development Y9. Research</p> <p>OTHER GENERIC PROGRAM/PROJECT TYPES</p>	<p>INFRASTRUCTURE SECTOR M1. Social infrastructure</p> <p>RESOURCES SECTOR M2. Resource development P2. Resource business</p> <p>FACILITIES SECTOR A5. Facilities projects M3. Production facilities P4. Plant and factory construction Y5. Equipment or system installation Y7. Maintenance of process industries</p> <p>INTERNATIONAL DEVELOPMENT SECTOR A7. International development projects M7. International cooperation projects</p> <p>EDUCATION SECTOR M10a. Education</p> <p>HEALTHCARE SECTOR A11. Healthcare projects M10b. Medical</p> <p>EVENTS SECTOR A4. Event projects P9. Events Y6. Event or relocation</p> <p>ENTERTAINMENT SECTOR A8. Media & entertainment projects P12. Creative activities</p> <p>AEROSPACE/DEFENSE SECTOR A1. Aerospace / defence projects</p> <p>OTHER APPLICATION SECTORS</p>

Figure 7: An aggregation of re-allocations into generic project/program types and allocation sectors

There are many duplications in this aggregation, particularly among the generic project/program types, which gives some sense of the ubiquitous nature of these types. I have deliberately displayed all my re-allocations, so that readers who may disagree with any of them can trace them back to their source, to help in making their own re-allocations.

A NOTE ON OTHER APPLICATION SECTORS

Aligning the aggregated application sectors with a PM industry classification

It is abundantly clear that the above aggregated application sectors for projects/programs cover only some of the huge number of sectors in which they are undertaken. The extent of the latter is probably best illustrated by a project management industry classification system by Pells 2011, shown in Figure 8, which is the most comprehensive such classification that I know of. (The numbers in parenthesis after most of Pells' entries represent the number of further examples he gives in his industry classification system).

In Figure 8 I have tried to align the aggregated application sectors from Figure 7 against their equivalents in Pells' classification. Some of these align well. However three sectors do not have as precise a match, and I have placed a question mark against these – but they are evidently covered in a more general sense by other sub-groups of Pells' classification.

Overall, Figure 8 should help give some appreciation of the potential range of *Other application sectors* in the above aggregated application sectors for projects/programs.

PROJECT MANAGEMENT INDUSTRY CLASSIFICATION SYSTEM Pells 2011	APPLICATION SECTORS: PROJECTS/ PROGRAMS
<p>1. Human health & well being Food (5); Water (2); Wastewater & sanitation (3); <i>Healthcare</i> (2); Clothing (4); Housing (3); Education (3); Police & security (3)</p> <p>2. Basic industries <i>Mining & natural resources</i> (5); Materials (6); Energy (3); Food & drugs (4); Telecommunications (3); Transportation & logistics (11), Packaging</p> <p>3. Advanced industries - Manufacturing <i>Aerospace</i>; Automobiles; Defence & military (8); Broadcast & news media (4); Capital goods (3); Social goods (2); Consumer goods (5); <i>Entertainment & leisure</i></p> <p>4. Information technology Software & information systems; Hardware & electronic devices (4); Internet & web-based systems & services; Telecommunications systems & equipment (2)</p> <p>5. Professional services Education; Health & medical (5); Engineering & construction (3); Employment & human resources; Accounting & business; IT (3); Financial (8); Management (2); Retail, wholesale & selling; Environmental (3); Security; Other <i>professional services</i></p> <p>6. Emerging/future industries Earth sciences & planetary monitoring; Life sciences & bio-technology; Humans in space; Molecular physics & nano-technology; New materials; New energy: Others</p>	<p><i>Infrastructure sector?</i> <i>Healthcare sector</i> <i>Education sector</i></p> <p><i>Resources sector</i></p> <p><i>Aerospace/defence sector</i> <i>Facilities sector</i> <i>Entertainment sector</i> <i>Events sector?</i></p> <p><i>International development sector?</i></p>

Figure 8: A broad alignment of the aggregated application sectors with those in an adaptation of Pells' project management industry classification system7.

A GENERIC PROJECT/PROGRAM TYPE AND APPLICATION SECTORS MATRIX

Most of my earlier articles of project/program classifications illustrated the potential intersections between project/program types and application sectors in which they may be deployed in the form of a matrix. Figure 9 represents my latest version, showing the basic headings of the aggregated *Generic types of projects/programs* and their potential *Application sectors* in matrix format.

APPLICATION SECTORS: PROGRAMS/PROJECTS	GENERIC TYPES OF PROJECTS/PROGRAMS					
	Business/organisational change	ICT systems	Engineering/construction	Product/service development	Research & development	Other project/program types
Infrastructure sector						
Resources sector						
Facilities sector						
International development sector						
Education sector						
Healthcare sector						
Events sector						
Entertainment sector						
Aerospace/defence sector						
Other application sectors						

Figure 9. Matrix showing intersections between the aggregated Generic project/program types and potential Application sectors

SUMMARY/DISCUSSION

This article first identified five key types of what I described as generic types of projects/programs, meaning those that are undertaken in most, or very many, application sectors, plus provision for other generic types.

The main body of the article then revisited three major project/program classification groups, and re-allocated their components into generic types of projects/programs on the one hand, and application sectors on the other.

These were then aggregated to give an assemblage of generic project/program types, and application sectors. Each detailed component of the assemblage had been allocated an individual alpha-numeric code, to make it easier for interested readers to rapidly back-track to sources, and to re-allocate entities to suit their own situations and/or needs in more specific contexts.

I also recognised that there were very many “other application sectors” not covered in the above, and broadly aligned the latter with a very detailed project management industry classification system from Pells 2011, to give an indicator of possibilities for interested parties.

Finally, I represented potential intersections between the mainstream project/program types, and the application sectors in which they may be deployed, in the form of a matrix, which updates previous similar matrices.

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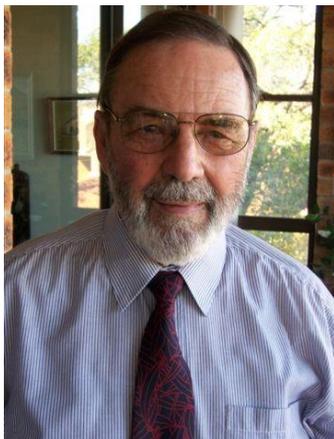
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