

An aggregation of some general management and associated antecedents of modern project management ¹

By Alan Stretton

BACKGROUND

I came to recognise project management as a formal discipline some time after having been introduced to general management as a formal discipline. I have therefore tended to look at project management through something of a general management lens.

In the course of discovering project management in this context, I therefore looked for associations between it and general management, and found a super-abundance. Indeed, I wrote a whole series of seven articles some time ago in this journal on general management functions and activities, and their relevance for the management of projects (starting with Stretton 2015g). At other times I have pushed for more direct materials in the project management literature on its all-important and pervasive general management components.

Another avenue I pursued, which was partly reflected in the above series, was to look back at some of the “popular” history of general management, and look for associations of some of these developments with developments in project management. I found a few relevant antecedents, which are the main topics of this article.

I have also elected to look briefly at a second group of antecedents of modern project management, which were initiated before “systems” approaches began influencing its development – a subject I will look at in a following article. These are a mixture of early initiatives towards coordinating/integrating across functions and/or exercising single responsibility in construction, other industries, and the US Air Force; plus some early planning techniques which were strongly adopted, notably in the construction industry.

I want to emphasise that this article does not aspire to be in any way definitive, and is not to be compared in any way with the several existing in-depth and scholarly works concerned with the history of project management (for example recent articles by Weaver 2022, 2023 and Giammalvo 2023 in this journal). Rather, it is what could be described as a partial investigation by an interested practitioner at the time, which none-the-less helped inform some of his subsequent writings on project management.

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SOME TRADITIONAL GENERAL MANAGEMENT THEORIES

The relevance of general management to building project management skills

General management provides the foundation for building project management skills and is often essential for the project manager. On any given project, skill in any number of general management areas may be required. General management literature documents these skills, and their application is fundamentally the same on a project. (PMI 2004:15)

This quotation headed the first of my series of seven articles in this journal mentioned in the Introduction. That series essentially presented an overview of the evolution and nature of some traditional management theories, and then discussed, in some detail, how various elements of these theories apply in the project management context. We now look at the first of these traditional management schools.

THE “CLASSICAL” OR “FUNCTIONAL” SCHOOLS

Overview

Although they cover only a part of the historical development of the classical or functional traditional management schools, for the purposes of this article I will stick with the examples of these schools used in Stretton 2015g.

These examples started with the “Scientific Management” school, with its focus on efficient task performance. The second cited Bureaucratic Models, with its concerns with authority and structure within organizations. The third was labeled the Management Process school, which broadly espoused universal management principles, and focused on the primary management functions of planning, organizing, leading, controlling, or variation there-of, as discussed in some detail in Stretton 2015g. Amongst the many writers in this school I specifically mentioned Henri Fayol (1916), Irwick (1930s), Allen (1960s) and Koontz & O’Donnell (1970s).

Figure 1, which is adapted from Stretton 2015g, Figure 1-1, summarises the above.

TRADITIONAL GENERAL MANAGEMENT THEORIES – “Classical” or “Functional” schools

- “SCIENTIFIC MANAGEMENT” (Taylor, d. 1915) - Focus on efficient task performance
- BUREAUCRATIC MODEL (Weber, d. 1920): - Focus on authority and structure
- MANAGEMENT PROCESS SCHOOL - Espousing universal management principles: Focus on primary management functions e.g. planning, organizing, leading, controlling. The many writers in this school include:
 1916: Fayol 1930s: Irwick 1960s: Allen 1970s: Koontz & O’Donnell

CRITICISMS: Rather mechanistic view of human behaviour; “Top-down”; “Closed-system” assumptions - e.g. little consideration for environment/ customers;



Figure 1: Three historical traditional management theories – “Classical”/“Functional” schools

It will be noted that I have included some criticisms which have been made of the Management Process School. These include a criticism of a rather mechanistic view of human behaviour, “top-down” representations, and “closed-system” assumptions – for example that there is little consideration for the environment, customers, or similar external influences.

Connections from classical/functional schools to project management?

The series beginning with Stretton 2015g discussed the application of the main elements of the Management Process School to project management in substantial detail, particularly as it was represented by Allen 1964, and (to a lesser extent) Koontz & O'Donnell 1978.

The background to this was that Lend Lease acquired the L. A. Allen Profession of Management program in 1963, and promulgated it throughout all the group companies on a continuing basis for the next decade and beyond. I was initially an active presenter in the subsidiary company Civil & Civic, and then program managed the entire management education program for the whole of Lend Lease from 1965 to 1972.

One very positive outcome for Lend Lease was that it gave us a common management language throughout the group companies. Another was that it highlighted the key importance of the managerial component of people's work in all types of functions, at all levels. Whilst it is difficult to assess how this general management education program influenced our performance in managing our many projects, the feedback from our project managers was overwhelmingly positive. This was certainly reflected in the various project management and more specialist guides which were subsequently developed in Civil & Civic in particular.

How have these forms of traditional management theory affected project management at large? I have no way of knowing. Feedback from my series starting with Stretton 2015g, which was primarily from students in project management, indicated that general management topics were not being adequately covered in their courses.

The amount of general management content in project management bodies of knowledge and similar guidelines vary, but some of them, notably earlier PMBOK Guides, had relatively poor coverage. Our experience in Lend Lease certainly suggests that there are benefits from including general management topics in project management education programs.

However, it should be noted that, whilst these traditional management theories were the only ones around through to the late 1920s, behavioural sciences schools began to develop from that time, as now discussed.

BEHAVIOURAL SCIENCES – HUMAN RELATIONS AND ASSOCIATED SCHOOLS

Overview

One of the criticisms of the Classical or Functions schools of management was that they had rather mechanistic views of human behaviour. This began to change as the results of Elton Mayo’s “Hawthorne Studies” in the 1920s and 1930s became more widely known, and people began to take an increasing interest on the importance of the role of people in the organization.

This interest accelerated after WW2, and the motivation/ satisfaction writers identified in Figure 4-2, namely Maslow 1954, McGregor 1960, and Herzberg 1966, were only three of countless numbers of authors who contributed very important materials to the role of behavioural sciences in management at large.

Topics covered in these contributions included group dynamics, sensitivity training and T-groups, participative management, job enlargement, and job enrichment, to name just a few. These behavioural science contributions are summarized, and added to Figure 1, as shown in Figure 2.

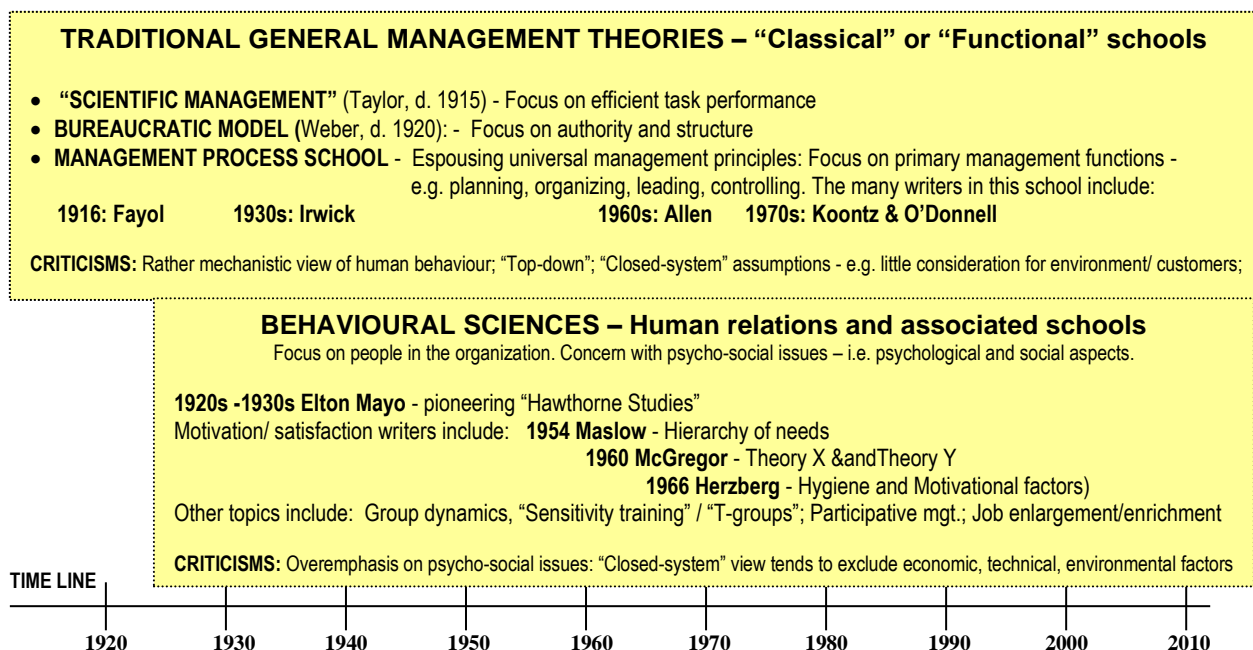


Figure 2: Summary contributions of behavioural sciences added to Figure 1

Connections from human relations schools to project management?

In a way, we had a somewhat similar situation in the early days of project management as happened in “classical” general management. The focus tended to be on project management techniques and processes, and there was comparatively little attention directed towards the people involved in projects and their delivery.

However, as Morris 2013:198 has reminded us, “projects are built by people, for people, through people”. While it appears to be the case that the people side of projects is now receiving more attention than it used to, it also appears to me that behavioural sciences materials still do not feature as prominently in the project management literature as one might reasonably have expected.

I was very conscious of this deficiency when I wrote my 2015 series in this journal on general management functions and activities, and their relevance to the management of projects. In that series I devoted a good deal more space to the behavioural management functions of leading and staffing (Stretton 2015k, 2015l), than I did to the other functions of planning, organizing and controlling. Those articles are quite substantial, so that I have simply referenced them, rather than expanding in them here.

As noted in Figure 2, human relations schools have been criticized for overemphasising psycho-social systems – i.e. encouraging “closed-system” viewpoints which tend to exclude economic, technical and environmental factors. This “closed-system” criticism is virtually identical to that made about the classical/functional schools of management. (The latter also included *customers* amongst factors which tend to be excluded).

Both sets of criticisms point directly to the importance of another school of management thought, namely the systems approach to the management of projects. However, this is a very substantial topic in its own right, and, as indicated earlier, will be discussed separately in my next article in this journal.

But, in the meantime, we will move on to look at the second broad types of antecedents to modern project management. These are rather a mixed bag, as now discussed.

SOME OTHER ANTECEDENTS OF MODERN PROJECT MANAGEMENT

Early initiatives towards coordinating/integrating across functions, and/or exercising single responsibility

As noted in the introduction to this article, the second broad types of antecedents are a mixture of early initiatives towards coordinating across functions and/or exercising single responsibility in construction, other industries, and the US Air Force; plus some early planning techniques which were strongly adopted in the construction industry in particular. The following draws heavily on two classic books by Peter Morris, namely Morris 1994, and Morris 2013. We start with the construction industry.

The construction industry

BuRec: The first entry under the construction industry sub-heading in the following summary in Figure 3 is the US Bureau of Reclamation (BuRec). Morris 2013:21 notes that as early as 1902, BuRec built a control system for its geographically diverse operations around a choke point called “the project office”. Morris goes on to comment on BuRec’s projects as follows:

In establishing administrative control, the Bureau assigned a “project engineer”, the officer in charge in the field on one complete “project”. This surely is one of the earliest examples of the term ‘project’ being used in its modern management meaning – but note that the action was all about monitoring and control, not yet the wider function of coordination (or, taking ‘integration’ to cover both coordination and control, of integration).

DuPont: The second entry against construction, again from Morris 2013:21, relates to E. I. DuPont de Nemours & Company (DuPont), which established a formal system for project accounting from 1911. Morris goes on to say,

Critical to this history, “the system used the term ‘project’ to cover the entirety of the administrative and construction work required to make any addition to DuPont’s fixed assets.

Morris further points out that, by 1920, DuPont was also using project-based accounting for laboratory research, and that this was also being done in other large, research-based firms such as Bell Labs and Arthur D. Little. These really belong in the next category of “Other industries”, and will be included in the summary of that category.

However, staying with the construction industry for the time being, Morris 2013:22 notes that there were quite a few large projects undertaken in the 1930s, such as Hoover Dam (a US BuRec project), but that these did not appear to embody “much more than the beginnings of a formal project management discipline”. This appeared to be the situation until the 1950s, when things began to change.

Bechtel: Stephen Bechtel 1989 records that

Bechtel first used the term Project Manager in our international work beginning in the 1950s. This use didn’t entail a Project Manager operating in a matrix organization as we know it today, but rather the assignment of a great deal of responsibility to an individual operating in a remote, strange and often hostile environment, usually with a self-contained autonomous team.

However, as Bechtel goes on to discuss, it was not until the early 1960s that the whole organization moved to a full project management approach.

Civil & Civic: A somewhat analogous situation occurred in Civil & Civic (C&C) in Australia. In 1954-55, the company project managed the design of a major subdivision it was developing. It is recorded that, "By persistent analysis and investigation of design aspects, a 40% reduction was achieved in site costs [based on consultants' designs and projected capital expenditure] and the project converted from a marginal investment to a successful venture" (Civil & Civic 1969). From that point, C&C appointed its own "project engineers" to manage the design phases of all its own development projects, and the quality control of construction.

In the broader context of the construction sector at large, Morris 2013:33-34 says

By the end of the 1950s, the idea of appointing a 'project manager' either as an individual or as an organisation to take full and undivided responsibility for achieving the construction project objectives had arrived and was starting to spread, ...

Before going on to look at other early initiatives in other industries, we summarise the above discussions of early initiatives towards coordinating/integrating across functions and/or exercising single responsibility in the construction industry, as shown in Figure 3.

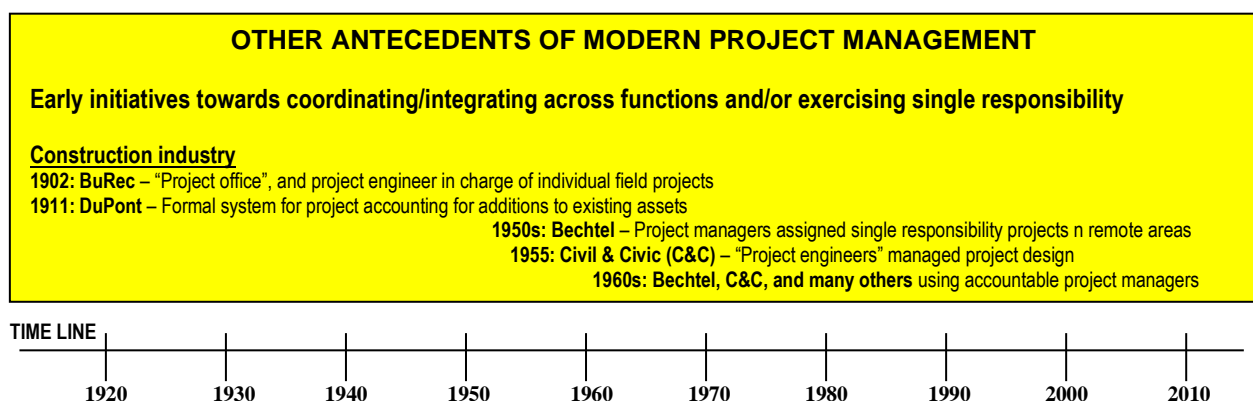


Figure 3. Early initiatives towards coordinating/integrating etc in the construction industry

Other industries

Proctor & Gamble: The first entry under this sub-heading in Figure 4 below is Proctor & Gamble's product management, described by Morris 1994:7 as follows:

An early forerunner of project management was the development in the mid-to-late 1920s by Proctor and Gamble of *product management* (under the term 'brand management'). Product management is the practice of making a manager responsible for the overall marketing, planning and control of a brand or product. Like project management, product management stresses *the integration of those functions influencing the successful outcome of a venture*. It does not have the same implementation or development emphasis as project management; however, the antecedent is a strong one.

Exxon: Morris 1994:8 noted that Exxon and other (comparatively young) process engineering companies began to develop a *Project Engineer* function during the 1930s – i.e. an engineer who could follow a project as it progressed through its various functional departments.

Aircraft production: Morris 2013:21-22 says that formal project coordination (carried out often, but by no means always, through the role of project engineers), became increasingly common in the 1920s, and gives many examples, notably from the aircraft industry. There are examples of project engineers acting as coordinators in both line and staff positions; of project engineers monitoring design and development; project officers focusing on safety and looking for design weaknesses; and in the late 1930s a project officer assigned to each aircraft supported by a project engineer.

However, Morris also cautions that these examples were dealing with the coordination and control of relatively small engineering production orders, which is a long way from the management of large projects.

Morris went on to make the point that

The prevailing pattern of organization at this time [the 1930s], however, was almost without exception along pyramidal or *functional* lines.

This situation continued well into the sixties, and beyond. However, project management in its modern form was being picked up in many industries beyond defence and construction, to the point where Kerzner 1979:1 was able to say:

Twenty years ago project management was confined to the Department of Defense contractors and construction companies. Today, the concept behind project management has spread to virtually all industries, including defense, construction, pharmaceuticals, chemicals, banking, accounting, advertising, law, hospitals, state and government agencies, and the United Nations.

This appears to be an appropriate summary of the emerging place of project management towards the end of the 1970s in what I have called “Other industries”.

US Air Force

We turn next to developments in the US Air Force. Morris 1994:8 records that, during the 1930s, the US Air Corps Materiel Division moved progressively towards a *project office* function to monitor the development and progress of aircraft. Later (p. 19) he says

As the USAF entered the 1950s it was still organizing its defence projects with engineering and production organized by separate project offices.

However, the Korean War brought sharp increases in production orders for the B47, and later the B52 bombers.

This led to an increased need to improve coordination between engineering and production, which, in turn, led to the establishment of ‘joint project offices’, which by early 1952 had become common practice in the USAF. This practice was extended into new commands created in the USAF in 1953-54.

Morris 2013:28 says that, around 1953-54, another milestone in the creation of project management emerged with the Martin (Marietta) and McDonnell Aircraft companies formally creating the project manager position.

McDonnell began using the title of project manager in 1953, the project manager’s prime responsibility being organisation and staffing. More significantly perhaps, Martin has a claim to have established the first matrix organisation, creating in 1953-54 “a number of miniature companies, each concerned with but a single project. The project manager exercises product control”. All functions, from design to manufacturing and distribution, were covered: systems analysis being used to determine requirements, systems engineering on design, and systems management on integration.

As already indicated, we will be discussing the systems approach in the next article in this journal. In the meantime, we add a summary of the above to the construction industry summary shown in Figure 3, plus an entry for early planning techniques. I have included the latter in this *other antecedents* category, as they were to play a very important role in the development of project management in the construction and allied industries, as further discussed below.

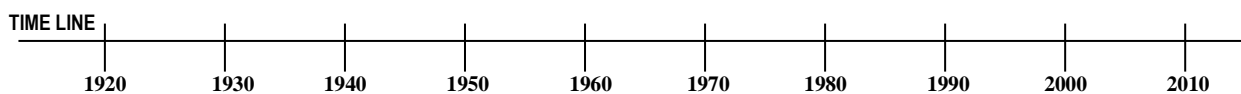
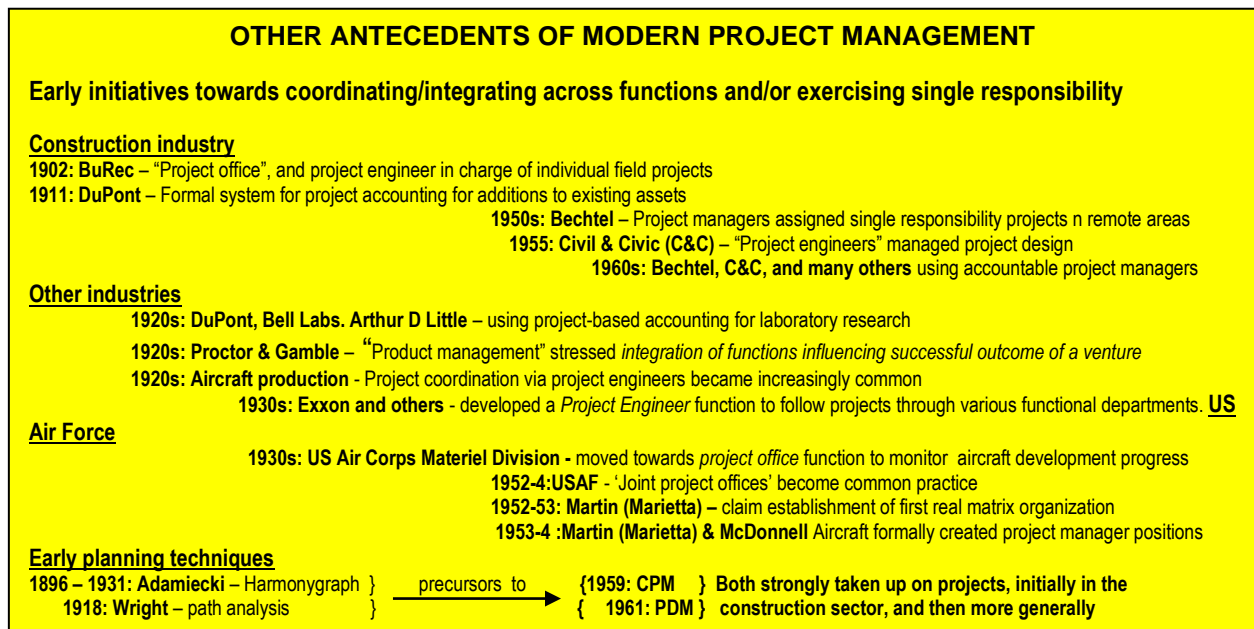


Figure 4. Adding summaries of initiatives in other industries, US Air Force, & planning, to Figure 3

Early planning techniques

The two entries under this sub-heading are Adamiecki's Harmonygraph and Wright's path analysis. Morris 1994:7 identified these as being forerunners to workflow network planning which were developed in the late 1950s with the Critical Path Method (CPM) and Program Evaluation & Review Technique (PERT), and slightly later the Precedence Diagramming Method (PDM).

CPM and PDM were taken up very strongly on projects in the 1960s, particularly in the construction sector initially, and soon more generally. In the construction industry, particularly in Australia, CPM and PDM were regarded as virtually synonymous with project management for a time – but they also helped greatly in ensuing efforts to consolidate project management as a discipline in its own right. The original PERT had somewhat different attributes, to be discussed in a subsequent article.

This concludes this major section on some other antecedents of modern project management, which is broadly summarised in Figure 4 above. These have been mainly concerned with early initiatives towards coordinating across functions in the organization, and/or towards exercising single responsibility, to facilitate a project/product outcome. We have seen how these initiatives were, in various ways, precursors to some of the key attributes of project management as we now know it.

SUMMARY/DISCUSSION

This article is a by-product of my having come to project management as a distinctive discipline some years after a similar exposure to general management. Consequently, I tended to look at project management through a broader management lens. This has been reflected in many of my articles in this journal, including a seven-part series on general management functions and activities, and their relevance for the management of projects (Stretton 2015g – 2016a).

Writing these articles led me to look a little further into some of the “popular” history of general management, and into possible associations of some of these developments with later developments in project management.

The first of the traditional management theories I looked at were the “Classical” or “Functional” schools, which were followed by relevant behavioural sciences – I.e. the human relations and associated schools. Summaries and timing of the emergence of these schools were illustrated in Figure 2. Just how much these traditional management theories have actually influenced general management and project management practices is unknown. However, I have long held the view that general management knowledge is not adequately represented in most project management bodies of knowledge and similar guides, and have made some attempts to alleviate this situation.

We then turned to look at other antecedents of modern project management, and particularly early initiatives towards coordinating/integrating across functions, and/or exercising single responsibility for the entire endeavour or project. We discussed four such initiatives from the construction industry, three from other industries, two from the US Air Force, and a couple from allied efforts in the Martin Marietta company, and McDonnell. Cumulatively, these initiatives have helped establish or consolidate many of the current practices in project management, particularly with coordination/integration across functions, and exercising single responsibility/accountability.

Finally, we briefly discussed early planning techniques, and particularly the development of CPM and the PDM network planning techniques, which were taken up very strongly on projects in the 1960s, particularly in the construction sector initially, and soon more generally. All the above “other antecedents” were summarised in Figure 4.

In conclusion, it is again emphasised that this article should be seen as simply a partial investigation by an interested practitioner, which hopefully may also be of interest to other project management people who may be curious about some of the general management and associated antecedents of modern project management.

REFERENCES

ALLEN Louis A. (1964). *The management profession*. London, McGraw-Hill.

BECHTEL, Stephen D. Jr, (1989). “Project Management – Yesterday, Today and Tomorrow”. *PMNetwork*, Vol III, No 1, January, pp 6-8.

CIVIL & CIVIC (1969). “*Project Engineer Seminar: 18-19 September*”. Notes on Proceedings, Sydney, Civil & Civic Pty Limited (mimeo)

CLELAND, David I. & William R. KING (1968). *Systems Analysis and Project Management*. New York, NY; McGraw-Hill

HERZBERG, F. (1966). *Work and the nature of man*. Cleveland OH, World Publishing.

GIAMMALVO, Paul D. (2023). On the evolution of project management. Responding to Pat Weaver’s November 2022 article. Letter to the editor. *PM World Journal*, Vol. XII, Issue I, January. <https://pmworldlibrary.net/wp-content/uploads/2023/01/pmwj125-Jan2023-Giammalvo-on-evolution-of-project-management-Letter-to-Editor-4.pdf>

KERZNER, Harold (1979). *Project management: A systems approach to planning, scheduling and controlling*. New York, NY; Van Nostrand Reinhold.

KOONTZ H. & C. O’DONNELL (1978). *Essentials of Management*. New Delhi, Tata McGraw-Hill

McGREGOR, Douglas (1960). *The human side of enterprise*. New York, McGraw-Hill

MASLOW, A. H. (1954). *Motivation and personality*. New York, Harper & Row.

MORRIS, Peter W G (2013). *Reconstructing Project Management*. Chichester, West Sussex; Wiley-Blackwell

MORRIS, Peter W G (1994). *The Management of Projects*. London, Thomas Telford

PMI (PROJECT MANAGEMENT INSTITUTE) (2004). *A Guide to the Project Management Body of Knowledge*. 3rd Edition, Newtown Square, PA; Project Management Institute

STRETTON Alan (2016a). Series on general management functions and activities, and their relevance for the management of projects (7): Technical management functions; Summary of series. *PM World Journal*, Vol. V, Issue I, January. <https://pmworldlibrary.net/wp-content/uploads/2016/01/pmwj42-Jan2016-Stretton-technical-management-functions-and-summary-Series-Article7.pdf>

STRETTON Alan (2015m). Series on general management functions and activities, and their relevance for the management of projects (6): Management implementing/ controlling function and activities. *PM World Journal*, Vol. IV, Issue XII, December. <https://pmworldlibrary.net/wp-content/uploads/2015/12/pmwj41-Dec2015-Stretton-management-implementing-controlling-general-management-Series-Article6.pdf>

STRETTON Alan (2015l). Series on general management functions and activities, and their relevance for the management of projects (5): Management staffing function and activities. *PM World Journal*, Vol IV, Issue XI, November. <https://pmworldlibrary.net/wp-content/uploads/2015/11/pmwj40-Nov2015-Stretton-staffing-general-management-Series-Article5.pdf>

STRETTON Alan (2015k). Series on general management functions and activities, and their relevance for the management of projects (4): Management leading function and activities. *PM World Journal*, Vol. IV, Issue X, October. <https://pmworldlibrary.net/wp-content/uploads/2015/10/pmwj39-Oct2015-Stretton-management-leading-general-management-Series-Article4.pdf>

STRETTON Alan (2015i). Series on general management functions and activities, and their relevance for the management of projects (3): Management organizing function and activities". *PM World Journal*, Vol. IV, Issue IX, September. <https://pmworldlibrary.net/wp-content/uploads/2015/09/pmwj38-Sep2015-Stretton-organizing-function-general-management-Series-Article3.pdf>

STRETTON Alan (2015h). Series on general management functions and activities, and their relevance for the management of projects (2): Management planning function and activities. *PM World Journal*, Vol. IV, Issue VIII, August. <https://pmworldlibrary.net/wp-content/uploads/2015/08/pmwj37-Aug2015-Stretton-management-planning-general-management-Series-Article2.pdf>

STRETTON Alan (2015g). Series on general management functions and activities, and their relevance for the management of projects (1): A general management framework, and its relevance to managing the project life cycle. *PM World Journal*, Vol. IV, Issue VII, July.

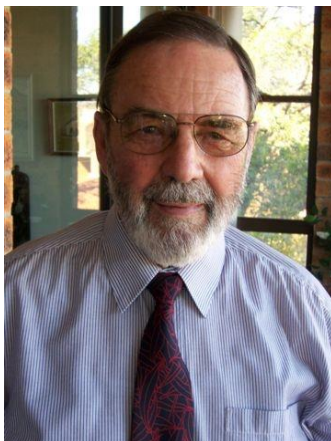
<https://pmworldlibrary.net/wp-content/uploads/2015/07/pmwj36-Jul2015-Stretton-general-management-framework-Series-Article1.pdf>

WEAVER, Patrick (2023). Project management – A historical timeline *PM World Journal*, Vol. XII, Issue I, January. <https://pmworldlibrary.net/wp-content/uploads/2022/12/pmwj125-Jan2023-Weaver-project-management-historical-timeline.pdf>

WEAVER, Patrick (2022). The evolution of project management. *PM World Journal*, Vol. XI, Issue XI, November. <https://pmworldlibrary.net/wp-content/uploads/2022/10/pmwj123-Nov2022-Weaver-the-evolution-of-project-management.pdf>

YEO K. T. (1993). Systems thinking and project management – time to reunite. *International Journal of Project Management*, Vol 11, No 2, May, pp 111-117.

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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 250+ professional articles and papers. Alan can be contacted at alanilene@bigpond.com.au.

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