

On the Evolution of Project Management

Responding to Pat Weaver's Article "The Evolution of Project Management"¹

LETTER TO THE EDITOR

22 December 2022

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

Dear Editor,

While I am in substantial agreement with much of what Pat has researched and written, having been involved with the late Peter Morris et al on the "Project Management Caught in a 1960's Time Warp" project, I do not now nor ever have agreed with Peter Morris that "People have been managing projects for millennia, whereas project management only started to emerge as a discipline in the 1940s, evolving into modern project management in the 1960s."²

There are two recurring themes in Patrick's papers that I take issue with, and those are:

- 1) There is a DIFFERENCE between "Old" "Project Management" and "Modern" Project Management
- 2) Project management is not now and is unlikely ever to be, recognized or accepted as a "profession," no matter how badly PMI or APM/APMG would like it to become one.

"OLD" vs. "MODERN" Project Management

Having "come of age" during the 1960s and wanting to follow in the footsteps of my father as a "construction superintendent" for Perini Corp (now Tudor-Perini), I joined the carpenters union as soon as I turned 18. Why? Because from the 16th-century Guilds up until pre-WWII, construction project managers came "up through the trades," starting as apprentices, then becoming Journeymen, and finally ending their careers either as master carpenters or master masons and, given becoming a "master builder" was my career path objective, that was the appropriate career path to follow at that time.

¹ How to cite this work: Giammalvo, P. D. (2023). On the Evolution of Project Management, Responding to Pat Weaver's article; Letter to the Editor, *PM World Journal*, Vol. XII, Issue I, January.

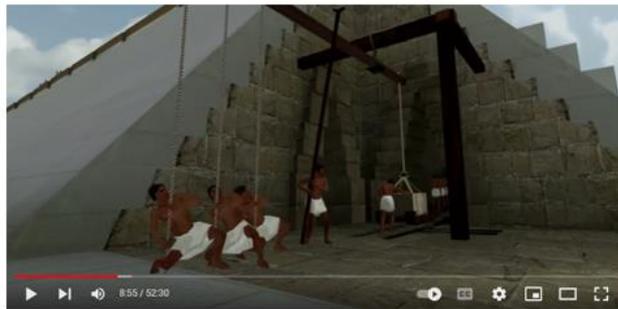
² Morris, P. W. G. *The Management of Projects*. Thomas Telford, London 1994.

Unbeknownst to me at the time, due to a shortage of “qualified” construction professionals required in the “post-WWII” baby boom and given that it took so many years to produce and validate “competent” construction managers through the trade route, the two existing professions of Engineering and Architecture saw an opportunity to “carve out” this “turf” for their own members.³ This gave birth to universities from around the world but starting primarily in the USA and Australia, to offer formal degree programs in “Construction Management.” As I happened to fall into this transitional period, I realized that if I ever expected to get a job as a Construction Project Manager, I had no choice but to augment or supplement my “hands-on” trade experience with a degree in construction management, which I followed, working for 30 years as a Union Carpenter from Apprentice to Journeyman to Master Carpenter to Union General Contractor, while going to school nights to get my Undergraduate and Masters Degrees and then working full time as a competency development trainer and mentor, to get my Ph.D.

Based on the “preponderance of the evidence” or the “center of gravity,” as shown in the light green highlighted items in attached Appendix I- A Selected Timeline of Project Management Tools, Techniques and Philosophies,” I am willing to challenge the thinking of Peter Morris and Pat Weaver that the vast majority of the tools and techniques we use today did NOT originate between 1940 and 1960, but instead between 1844 and 1944, particularly driven by the minds of practitioners like Fayol, the Gilbreath’s, Gillette and Dana, Gant and Frederick Taylor as well as the advice from Helmuth von Moltke, General Dwight Eisenhower and General Omar Bradley that is rarely mentioned in project management literature.

A more detailed look at why I disagree with Pat Weaver and the late Peter G.W. Morris can be seen by comparing these two videos, one showing the latest research on how the [Great Pyramid of Khufu](#) was constructed 4500 years ago and a case study showing an example of extreme building in China – A Time-lapse In Hunan Province, showing the [Changsha Apartment Building and how they built 57 Stories in 19 Days](#).

³ For more on the topic of professional societies being more sanctimonious than trade unions, see Friedson, E. (1988). *Professional powers: A study of the institutionalization of formal knowledge* (reprinted.). Chicago: University of Chicago Press and the published research of Andrew Abbott. Abbott, A. (1988). *The system of profession: An essay on the division of expert labor*. Chicago: University of Chicago Press



Khufu Pyramid Revealed- 2500 BCE

<https://www.youtube.com/watch?v=eGqfdXkAQMk&t=530s>



Extreme Building - 57 Stories in 19 Days! 2015 AD
Hunan Province, Changsha Apartment Building.

<https://www.youtube.com/watch?v=acLSbNxUP3s&t=25s>

Figure 1- 4500 Years of Construction from 2500 BCE compared to 2015 AD

When you compare the difference 4500 years has made you will find out there are more similarities than differences. The only three major differences are:

- 1) A transition from the use of people performing manual labor to machines
- 2) A transition from the use of manual calculations (i.e., the use of water leveling) to using computerized GPR Surveying instruments and related systems
- 3) The introduction of more modern construction products, many if not most of which are petroleum based.

Other than those obvious examples, both projects were built from the ground up, both took advantage of extensive modularization, and both took advantage of both on and offsite fabrication of components. Leading to the conclusion that not all that much has changed, other than those 3 evolutions. And projecting that forward, given the advancements in Artificial Intelligence (AI), what prevents us from forecasting that the same progression will repeat, albeit at an accelerated pace?

Is Project Management a PROFESSION?

Despite the fact that “Construction Project Management” is a direct derivative of two existing, well-established professions, Architecture, and Engineering, and despite the futile efforts of both PMI and APM/APMG to try to make it a profession, the fact remains that, at least in Construction Project Management, there is little or no indication that in the 50+ years I have been in the business that as Construction Project Managers, we come close to having the formal authority much less prestige of being a “Professional Engineer” (PE) or “Registered Architect” (RA).

And why is this? Based on the 2004 work of the late Dr. Bill Zwerman, Dr. Janice Thomas, Susan Haydt, and Terry Williamson, researchers at the University of Calgary and Athabasca University published their research “Professionalization of project management – Exploring the past to map the future” (Zwerman, Thomas, Haydt, & Williamson, 2004) (which was funded in part and

published by PMI). In their research, they concluded, “project management is not now, nor is it likely in the foreseeable future, to be recognized or accepted as a profession.” And the basis for their conclusion was that there has never been a profession that has been built around a PROCESS or series of processes. That all existing professions have been built around a “body of knowledge” (BoK) and not just any old BoK, but one that is somehow “unique,” “esoteric,” “complicated,” or otherwise “secret.” So that not any “ordinary Joe or Josephine off the street” can understand and apply it.

My own Ph.D. dissertation, [“Is Project Management a Profession? And if not, what is it?”](#) was a follow-on to the work of Zwerman et al. While their approach was qualitative and used teaching and medicine as the primary case studies, my research was quantitative and used construction management benchmarked against North American Professional Engineer (PE) and Commercial Airline piloting licensing (ATP) plus the evolution of Chiropractic, Chinese and other “alternate” medicine as the means to create a scoring model.

My research identified some 22 Extrinsic and Intrinsic attributes that are common to all recognized professions. (See Appendix II) and despite the efforts of PMI and APM/APMG in particular, there are 4 sets of “traits” or “attributes” that are ESSENTIAL to any occupation being recognized and accepted as a profession, and those are the **EXTRINSIC attributes**:

- 1) **The ability to OWN and/or CONTROL the body of knowledge**- This is why medicine and law (both long recognized as professions) rely on Greek and Latin as the basis for their respective “Bodies of Knowledge.” (BoK) And conversely, one of the major CONSTRAINTS to “project management” ever becoming a “profession.” Not only are we unable to “own” or “control” the “BoK,” but as the PROCESSES of project management are already embedded into not only all existing professions but also in the trades and even into our day-to-day personal lives, how can anyone even pretend that there can, would, could or even should be a “single” lexicon or “lingua franca.” To see an example of this, turn to R. Max Wideman’s [“Comparative Glossary of Project Management Terms”](#) and look up the definitions for [“Project,”](#) and you will find some 30+ different definitions. And if you do the same for [“Project Manager”](#), you will find 14+ different definitions. Seriously, if we cannot all agree on such fundamental definitions, how can anyone believe we will ever agree on a “common” BoK?

As can be seen in Figure 2, while the PROCESSES required to “initiate, plan, execute, control and close” projects, programs and portfolios are much the same at a high level, at some point in granularity, not only do the projects and the required processes become uniquely different, but the terminology becomes specific to that application.

As an analogy, compare a pilot filing a flight plan to fly from City A to City B, a surgeon removing an inflamed appendix, and an engineer designing and building a bridge. While all three qualify as projects and all three are “initiated, planned, executed, controlled and closed,” the PROCESSES and PROCEDURES they follow and the terminology they use are significantly

different. Even the documents they use are application specific. This is why trying to create a PROFESSION of project management makes little or no sense, and why it has and will continue to fail.

Profession or Trade	Integrated Asset, Portfolio, Program and Project Management Examples			
	Single Project	Program (See GAPPS Definition)	Portfolio	Output Asset Class(es)
Accountant	Each years tax returns or audited financial statements for a single client	Multiple years tax returns or audited financial statements for the same single client	The full suite of professional services offered by the Accountant. (i.e. Tax Filings, Audits, Financial Planning, Succession Planning)	Knowledge- (Metacognitive, Procedural, Conceptual, Factual) Physical (Office and Equipment) Intangible (Reputation)
Architect/ Engineer	Each unique design produced for a single client	More than one project for the same client	The combined work effort showing all the projects done regardless of client	Knowledge- (Metacognitive, Procedural, Conceptual, Factual) Physical (Office and Equipment) Intangible (Reputation)
Commercial Airline Pilot/Bus/ Truck Driver	Each flight or trip between City A and City B or stops on a delivery route	All the flights, stops, or deliveries made in a single day, week or month	All of the aircraft types or classes of vehicles the Pilot in Command or Driver is licensed to operate	Knowledge- (Metacognitive, Procedural, Conceptual, Factual) Physical (Aircraft/Vehicles and support facilities) Information (Safety Record)
Lawyer	Each unique case tried for a single client	More than one case tried for the same client	The full suite of professional services offered by the Lawyer. (i.e. Family Law, Tax Law, Criminal or Construction Law)	Knowledge- (Metacognitive, Procedural, Conceptual, Factual) Physical (Office and Equipment) Intangible (Reputation)
Electrician/ Plumber/ Carpenter	Each contract or work order performed for a single unique client.	More than one contract or work order for the same client	The full suite of professional services offered by the Electrician. (i.e. Residential, Commercial, Industrial, Oil, Gas & Mining)	Knowledge- Metacognitive, Procedural, Conceptual, Factual Physical (Tools and Equipment) Intangible (Reputation)

Figure 2- The Project Management Processes Applied to Existing Professions and Trades

The “semantic trap” that Pat and many others fall into who fervently believe project management to be a profession can be explained with this analogy.

Tiger Woods is unquestionably a talented golfer. One would be very hard put to dispute the obvious, which that he is very competent at what he does, perhaps one of the best ever.

Therefore, he meets the first test of being a *professional* (n) – demonstrated skill and competence. In fact, he is sufficiently competent that he makes a very handsome living performing for pay what most of us consider a hobby; hence, applying the second criterion, he meets the “earnings test” to be considered a *professional* (n). He is not an amateur.

Having met both tests (highly competent and earning a living at what most do for a hobby) entitles him to be termed a *professional* (adj.) golfer.

However, just because Tiger Woods meets the criteria to be called both a *professional* (n) and a professional (adj) golfer, golf does not qualify as **a profession**, although Woods might call it *his profession* (his paid job).

It is no wonder that many in the community of practice of project management confuse what it means to belong to a profession. There is the tendency to make the connection that if they are in fact *professional* (extremely competent) in the way they work, and that they can make a living doing something, then what they do must, by association, be considered a *profession*. This is false logic and a semantic trap easily fallen into.

- 2) **The ability to control or limit who can call themselves a “Project Manager.”** While this should be patently obvious, this Dilbert cartoon from Scott Adams from 10+ years ago sums this up nicely. Speaking as a lifelong construction project manager with 30 years of hands-on field experience plus a Bachelor, Master, and Ph.D. in project management, I am gob-smacked to think that people can study books of sample questions for 35 hours, then take a 4-hour long, multiple guess exam consisting of 200 questions, of which only 175 actually count, then pass said exam with a score of $106/175 = 61\%$ and then honestly believe that qualifies them to be a PROFESSIONAL anything stretches the imagination beyond credibility.

Tuesday November 22, 2011

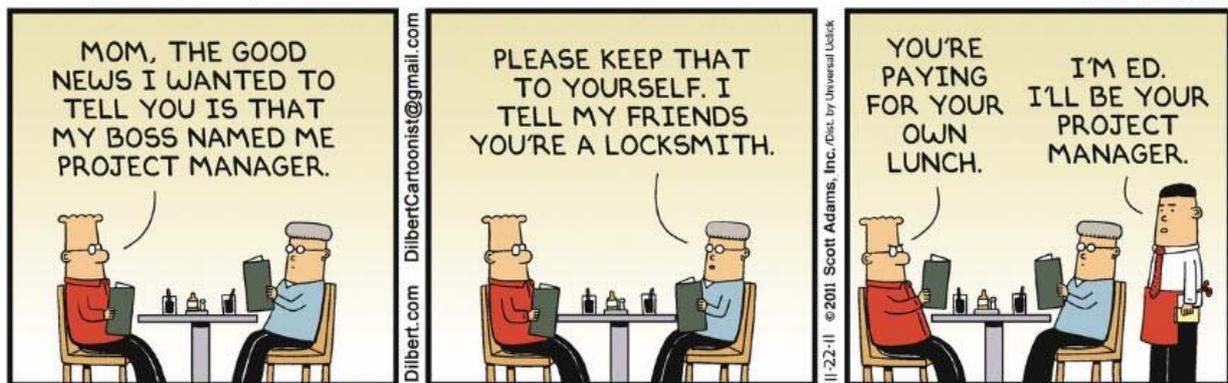


Figure 3- Scott Adam’s Cartoon from Tuesday, Nov 22, 2011⁴

- 3) **Requires a “license” to practice, which implies the autonomy in making decisions requiring the application of “sound professional judgement” with the inherent potential for civil or criminal actions if the decision causes damages, along with the requirement to carry professional liability insurance and fiduciary responsibility to the consuming public to “do no harm.”**- One of the key differentiators between those who practice in a true profession vs. the “ordinary (wo)man” is the legal tests for LIABILITY should anything go wrong. So, one of the “litmus tests” to see if project management is

⁴ Dilbert by Scott Adams Nov 22, 2011

https://dilbert.com/search_results?terms=Tuesday%2C+Nov+22%2C+2011+Project+Manager Used under the “Fair Use” doctrine.

or is not a profession is whether we can or should be sued if the project finishes late and/or over budget due to professional negligence on our part.

Given the [AIPM/KPMG 2020 survey](#) indicates that:

- 52 percent of projects are delivered with stakeholder satisfaction
- 51 percent of projects are likely to meet the original goal and business intent
- 48 percent of respondents feel their organization manages projects and programs effectively or very effectively
- 42 percent of projects are likely to be delivered on time
- 40 percent of projects are likely to be delivered on budget.

Keeping in mind that Australia is a sophisticated, well-developed country, represented by all the major professional societies (AACE, AIPM, APM/APMG, IPMA, PMI et al.), and has a robust and aggressive legal system, opens the door to ask whether anyone was or is being held either civilly or criminally liable for these abysmal results? And if not, then doesn't this provide "prima facie" evidence that, at least in Australia, the rules of [PROFESSIONAL NEGLIGENCE](#)⁵ do NOT apply to project managers? And if they do NOT apply then isn't this recognition that project management is not considered to be a profession, at least in the eyes of the law?

1. INTRINSIC ATTRIBUTES

1.1. Mystique

- 1.1.1. As we know from the Zwerman et al research, no existing professions have been built around a PROCESS, but instead have been built around a "body of knowledge" (BoK). But not just any old BoK, but one that is somehow "unique," "esoteric," "complicated," or otherwise "secret."
- 1.1.2. Limited or Restricted Access to that knowledge- So that not any "ordinary Joe or Josephine off the street" can understand and apply it.
- 1.1.3. And highly ritualistic or standardized operating procedures (SoP's) Think of the checklists that all pilots, private or commercial, follow before and during takeoff, while in flight and prior to landing. Also woe to the pilot who fails to close out his/her flight plan after landing, and the FAA initiates a search and rescue for the "missing" aircraft. Or how about the detailed checklists used by Doctors and Nurses in a medical operating theater to ensure all tools and equipment have been accounted for before sewing up the patient?

1.2. Cruciality

- 1.2.1. Cruciality is broken down into two sub-components
 - 1.2.1.1. Immediacy or urgency of the need.

⁵ CACI No. 600. Standard of Care Judicial Council of California Civil Jury Instructions (2022 edition)
<https://www.justia.com/trials-litigation/docs/caci/600/600/>

1.2.1.2. Importance or proximity of the need.

In the world of project management, we identify the cruciality component by using a matrix showing the Total Float (immediacy or Urgency) vs. the Proximity or Due date.

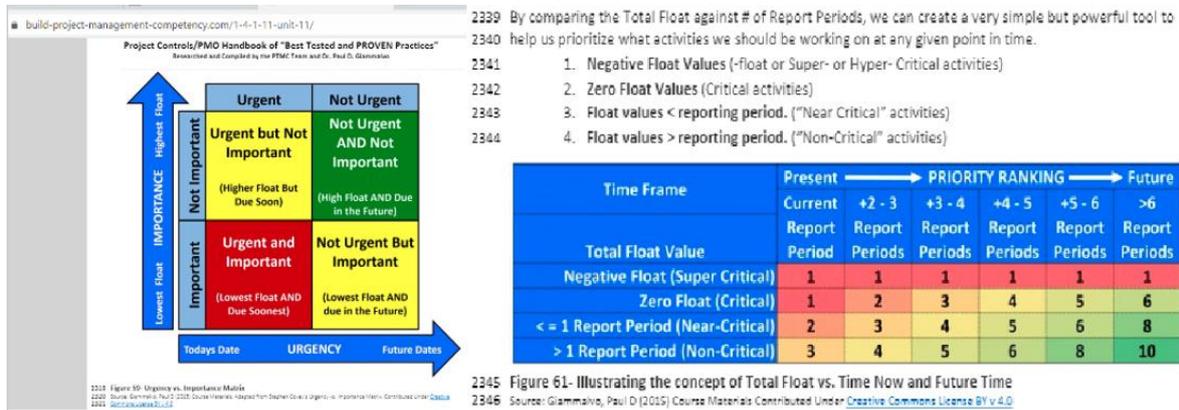


Figure 4- [Measuring Cruciality- Urgency vs Importance](#)

1.3. Dénouement

1.3.1. Dénouement is defined to be “the final outcome of the main dramatic complication in a literary work” or “the outcome of a complex sequence of events”⁶

Going back to the results of the [AIPM/KPMG 2020 survey](#) :

- 52 percent of projects are delivered with stakeholder satisfaction
- 51 percent of projects are likely to meet the original goal and business intent
- 48 percent of respondents feel their organization manages projects and programs effectively or very effectively
- 42 percent of projects are likely to be delivered on time
- 40 percent of projects are likely to be delivered on budget.

Is there anyone willing to argue that project management meets or substantially fulfills the INTRINSIC attributes to qualify as a “PROFESSION?”

The Scientific Method has been around for 1000 years now and during that time, it has created untold numbers of products and services (= ASSETS) that have benefited humankind. And assuming we can all agree that project management is one of the primary delivery systems to “create, acquire, update, expand, repair, maintain, and eventually dispose of “organizational assets” why hasn’t PMI and the other “professional societies” going to recognize and incorporate the [5 attributes of the Scientific Method](#)⁷ into their BoKs?

⁶ Merriam Webster On-line Dictionary- <https://www.merriam-webster.com/dictionary/denouement>

⁷ 5 Attributes of the Scientific Method- <https://sciencing.com/five-characteristics-scientific-method-10010518.html>

1) Empirical Observation

The scientific method is empirical. That is, it relies on direct observation of the world, and disdains hypotheses that run counter to observable fact. This contrasts with methods that rely on pure reason (including that proposed by Plato) and with methods that rely on emotional or other subjective factors.

2) Replicable Experiments

Scientific experiments are replicable. That is, if another person duplicates the experiment, he or she will get the same results. Scientists are supposed to publish enough of their method so that another person, with appropriate training, could replicate the results. This contrasts with methods that rely on experiences that are unique to a particular individual or a small group of individuals.

3) Provisional Results

Results obtained through the scientific method are provisional; they are (or ought to be) open to question and debate. If new data arise that contradict a theory, that theory must be modified. For example, the phlogiston theory of fire and combustion was rejected when evidence against it arose.

4) Objective Approach

The scientific method is objective. It relies on facts and on the world as it is, rather than on beliefs, wishes or desires. Scientists attempt (with varying degrees of success) to remove their biases when making observations.

5) Systematic Observation

Strictly speaking, the scientific method is systematic; that is, it relies on carefully planned studies rather than on random or haphazard observation. Nevertheless, science can begin from some random observation. Isaac Asimov said that the most exciting phrase to hear in science is not "Eureka!" but "That's funny." After the scientist notices something funny, he or she proceeds to investigate it systematically.

We know for a FACT based on 1000 years of experience that this method WORKS.

In Closing...

To quote from the PMI Code of Ethics, paragraph 5.3⁸: Honesty: Mandatory Standards

As practitioners in the global project management community, we require the following of ourselves and our fellow practitioners:

⁸ PMI Code of Ethics- <https://www.pmi.org/-/media/pmi/documents/public/pdf/ethics/pmi-code-of-ethics.pdf>

5.3.1 We do not engage in or condone behavior that is designed to deceive others, including but not limited to, **making misleading or false statements, stating half-truths, providing information out of context or withholding information that, if known, would render our statements as misleading or incomplete.**

5.3.2 We do not engage in dishonest behavior with the **intention of personal gain or at the expense of another.**

Comment: The aspirational standards exhort us to be truthful. **Half-truths and nondisclosures intended to mislead stakeholders are as unprofessional as affirmatively making misrepresentations. We develop credibility by providing complete and accurate information.**

With 1,000,000+ PMP's and clearly being one of the world's largest society purporting to represent the practice of project management, and assuming that other professional societies have comparable Codes of Ethics, is it unreasonable to expect that until or unless someone can provide empirical proof, consistent with the 5 Attributes of the Scientific Method:

- 1) That practitioners and the societies they choose to represent them STOP referring to the practice of project management as being a PROFESSION. It is a PROCESS or series of processes that are UNIQUE to each existing profession, trade and even our personal lives.
- 2) That practitioners and the societies they choose to represent them DEMAND that the Bodies of Knowledge be based on "best tested and **PROVEN** practices" (note that "best practices" is nothing more than an UNSUBSTANTIATED CLAIM. To meet the PMI and comparable Codes of Ethics, they must be backed up with RESEARCH consistent with the [5 attributes of the Scientific Method](#)⁹)
- 3) That practitioners and the societies they choose to represent them STOP pretending that exam-based credentials measure or validate COMPETENCY and start to demand that all professional societies develop COMPETENCY-based standards in lieu of LICENSING and let the free market determine which of those COMPETENCY-based credentials have legitimacy based on MEASURABLE and REPEATABLE RESULTS.
- 4) That practitioners and the societies they choose to represent them STOP making spurious and unsupported claims that links holding their credentials results in higher salaries. Follow the lead of AACE and publish the raw data so independent practitioners can research any statistical correlation or causal relationship that influences salaries.
- 5) That practitioners and the societies they choose to represent them DEMAND that their societies comply with both the letter and intent of the home country's "Truth in

⁹ 5 Attributes of the Scientific Method- <https://sciencing.com/five-characteristics-scientific-method-10010518.html>

Advertising” laws. (For PMI, AACE and IPMA USA et al this is the law- “[Advertising FAQ's: A Guide for Small Business](#)”¹⁰

Until or unless we implement these changes, we will never earn the trust and respect that we seem to crave as PROFESSIONAL PRACTITIONERS.

¹⁰[Advertising FAQ's: A Guide for Small Business](https://www.ftc.gov/business-guidance/resources/advertising-faqs-guide-small-business) <https://www.ftc.gov/business-guidance/resources/advertising-faqs-guide-small-business>

APPENDIX I - A Selected Timeline of Project Management Tools, Techniques and Philosophies

APPENDIX 1- Selected Historical Timeline of Project Management Practices			
DATE(S)	WHAT	WHERE	REFERENCE
5000 BC	Egyptians construct huge pyramids which have lasted for thousands of years. While theories exist that show how they were built, no records show whether they were completed late and/or over budget.	Egypt	Khufu Pyramid Revealed- https://www.youtube.com/watch?v=eGqfDXkAQMk&t=526s
770-470 BC	Great Wall of China constructed. Records do exist indicating that the cost of construction bankrupted more than one Dynasty	China	Great Wall History https://www.travelchinaguide.com/china_great_wall/history/
(544-496 BC)	Chinese strategist Sun Tzu, "The Art of War" on the 4 levels of Strategic Decision Making.	China	https://en.wikipedia.org/wiki/Introduction_to_Strategic_Studies/What_Is_Strategy%3F_Why_Study_Strategy%3F
1000 to 1500	Peak years of Cathedral Construction in Europe	Europe	https://www.cambridge.org/core/journals/journal-of-global-history/article/abs/megastructure-of-the-middle-ages-the-construction-of-millions-building-in-europe-and-asia-/10004500V000F51R08FEF818090063D85051867874
1000 to Present	Evolution of the Scientific Method as an Asset Delivery System	Europe to Global	https://plato.stanford.edu/entry/scientific-method/
1834	Builders Society founded (now CIOB)	London, UK	Code of Practice for Project Management for Construction, 5th Edition
1842	London Provident Society of Builder Foremen and Clerk of the Works founded.	London, UK	Life and Labour of the People in London, Volume 5 https://www.amazon.com/Life-Labour-People-London-5/dp/1271949075
1852	American Society of Civil Engineers founded (ASCE)	USA	The American Civil Engineer, 1852-1974: The History, Traditions, and Development of the American Society of Civil Engineers, Founded 1852
1857	American Institute of Architects founded (AIA)	USA	https://tinyurl.com/2hs2car
1871	Prussian Field Commander Helmuth von Moltke the Elder told us that "no battle plan survives first contact with the enemy"	Russia/Germany	https://en.wikipedia.org/wiki/Helmuth_von_Moltke_the_Elder
1885 to 1918	Railroad Expansion in the USA and UK create a huge demand for COMPETENT construction supervision and tradespeople	USA, UK	https://www.lib.utoronto.edu/ethnolinguistics/ethnolinguistics/
1887	Royal Melbourne Institute of Technology offers a 3 year degree in carpentry, joinery, brick laying and masonry	Melbourne, Australia	https://courses.rmit.edu.au/course/come.vic.gov.au/institution/prsfile.html?institutionid=72225
1792 to 1868	Royal Chartered Institute of Surveyors conceived and founded	London, UK	https://www.rics.org/uk/about-rics/

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APPENDIX I- A Selected Timeline of Project Management Tools, Techniques and Philosophies

1909	Halbert Powers Gillette, Richard Turner Dana published "Cost Keeping and Management Engineering: A Treatise for Engineers, Contractors and Superintendents Engaged in the Management of Engineering Construction", which documented the foundation for what we know today as "Earned Value Management".	USA	https://books.google.com/books/about/About_Cost_Keeping_and_Management_Engineering.html
1911	Frederick Taylor, the Father of Scientific Management, published his theories about "Scientific Management" and "Taylorism".	USA	https://www.goodreads.com/author/list/485537.Frederick_Wilmslow_Taylor
1911	Frank and Lillian Gilbreath Publish their research on Productivity in Construction in their book "Motion Studies", a field known today as "Ergonomics"	USA	https://www.ci.edu/record/INM-AH.AC.0803
1916	In 1916, Henri Fayol Published "Administration Industrielle et Generale" (General and Industrial Management), containing his "14 Principles of management" and the "five functions of management."	France	https://www.goodreads.com/work/editions/5411608-administration-industrielle-et-generale
1916	Henri Gantt Publishes research on Productivity and Incentives- 1916. Work, Wages, and Profits, second edition, Engineering Magazine Co., New York. 1916. Industrial leadership. Yale University Press.	USA	https://www.thriftbooks.com/s/Henri-Gantt/_/3045355/
1920	National Federation of Builder Foremen and Clerks of the Works formed	London, Birmingham, Sheffield UK	Life and Labour of the People in London, Volume 5 https://www.amazon.com/Life-Labour-People-London-5/dp/1171948075
1944	General Dwight Eisenhower reiterates and validates the thinking of Helmuth von Moltke that "plans are are useless but planning is essential."	USA	https://www.brainyquote.com/quotes/dwight_d_eisenhower_154739
1944	General Omar Bradley quoted that "Amateurs study STRATEGY while Professionals study LOGISTICS."	USA	https://www.amquotes.com/quote/1314039
1945	First US University to offer a Construction Project Management Degree- University of Florida, Gainesville	Gainesville, Florida USA	https://www.valuecolleges.com/ranking/best-construction-management-degrees/
1946	John Mansville funds the start up of construction management programs in 20 Universities in anticipation of the demand for COMPETENT Supervisors and Tradespeople post WWII Building Boom	USA	https://www.net.edu/cost/Departments/Built-environment/academic-programs/construction-management/index.php
1949	National Federation of Builder Foremen and Clerks of the Works spreads to all parts of the UK	UK	Life and Labour of the People in London, Volume 5 https://www.amazon.com/Life-Labour-People-London-5/dp/1171948075
1950	Cold War started in 1947, heats up. Military spending on major programs (Nuclear Stockpiles and Missile Delivery Systems)	USA, Canada, UK	https://www.history.com/topics/cold-war/cold-war-history
1956	Association for the Advancement of Cost Engineering (AACE) founded	USA	https://web.aace.org/
1956 - 1957	US Navy and Remington Rand Univac create the first computerized CPM Schedule	USA	https://theconstructor.org/construction/cost-management/cost-construction-chart-project-management/94/

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APPENDIX I - A Selected Timeline of Project Management Tools, Techniques and Philosophies

1957	Russia Launches Sputnik NASA is created by JFK to "Put a Man on the Moon"	USSR/USA	https://history.nasa.gov/sputnik/sputnik1.html
1950 - 1960	PERT, "Flat File" WBS/CBS, Critical Path Methods evolve and grow	USA	https://libr.org/1963/09/the-gbcs-of-the-critical-path-method
1960	Institute of Building Site Management founded	UK	https://www.crouchbase.com/organisation/the-chartered-institute-of-building
1963	Earned Value and Project Life Cycle Costing adopted by the US Air Force. British contractors required to use CPM Scheduling and Earned Value Management on the Polaris Submarine Contracts	USA/UK	https://rolandwymer.com/earned-value-management/history-of-earned-value-management/
1968	Royal Melbourne Institute of Technology offers a 2 year degree in Building Construction	Melbourne, Australia	https://coursesearch.study.melb.cornell.edu.au/institution/profile.html?institutionid=72225
1969	Project Management Institute (PMI) founded	USA	https://www.pmi.org/about/learn-about-pmi/founders
1969 to present	CSI develops multi-dimensional "Object Oriented" or "Relational Database" WBS & CBS coding structures "Uniformat" and "Masterformat" and the Norwegian Government creates 3 dimensional WBS/CBS (Norsk 2-014, now ISO 19008:2016)	USA/Norway	https://www.wbdg.org/resource/s/omniclass AND https://www.standard.no/en/sectors/energi-og-klima/petroleum/norsk-standard-categories/2-stand-cost-coding/2-014/
1974	American Council on Construction Education (ACCE) founded	USA	https://www.acce-hq.org/
1980	American Council on Construction Education (ACCE) accredits Universities offering degrees in Construction Management	USA	https://www.acce-hq.org/
1980	IBM launches the PC	Global	https://www.computerhistory.org/brochures/q-1/international-business-machines-corporation-ibm/
1983	Harvard Graphics and the DOS version of Primavera's Project Planner released	Global	https://www.cominterconnectin.com/The_History_of_Primavera_Scheduling.pdf
1985	Windows version of Primavera's Project Planner Released	USA	https://www.cominterconnectin.com/The_History_of_Primavera_Scheduling.pdf
1987	First PMBOK published by PMI	USA	https://www.linkedin.com/pulse/history-evolutions-pmbok-guide-sulhan-khanna
1992	CIOB publishes the first "Code of Practice"	UK	https://www.cioh.org/who-we-are/history
1996	1996 was the 1st PMBOK Guide published by PMI	Global	https://www.linkedin.com/pulse/history-evolutions-pmbok-guide-sulhan-khanna

APPENDIX II - Attributes Common to ALL Recognized Professions Applied to Project Management¹¹

Item	Attributes of a profession	Average PM	Weighting	Weights adjusted
#	Extrinsic	Score From Survey	Factor From Q 30-31	Value Col. E X Col. G
1	Body of Knowledge (Average of 1a + 1b)	75.6%	707%	53.4%
1a	a. Unique	75.6%	707%	53.4%
1b	b. Esoteric/Complicated/Secret	75.6%	707%	53.4%
2	Long Period of Training (Average of 2A + 2B)	78.3%	53.9%	42.2%
2a	a. Higher Education	74.3%	58.8%	43.7%
2b	b. Apprenticeship/Internship/Residency	82.2%	53.9%	44.3%
3	Life Time Commitment	73.0%	49.6%	36.2%
4	Adhering to a Code of Ethics	65.0%	77.5%	50.4%
5	Fiduciary Obligation to the Public	62.2%	68.2%	42.4%
6	Service to the Public (Pro Bono Work)	20.2%	35.8%	7.2%
7	Professional Association (Average of 7a + 7b)	53.3%	66.3%	35.4%
7a	a. Enforces Code of Ethics	0.0%	63.6%	0.0%
7b	b. Establishes Acceptable Standards			
7bi	i. Performance Standards	80.0%	69.0%	55.2%
7bii	ii. Procedural Standards (Methodology)	80.0%	69.0%	55.2%
8	Publishing in Learned Journals	20.2%	40.8%	8.2%
9	Advertising Not Permitted or Restricted	0.0%	26.1%	0.0%
10	Use of Title Is Restricted by law	0.0%	49.1%	0.0%
11	Symbolic Costume/Uniforms	6.2%	14.3%	0.9%
12	Practice Limited by Govt. License	52.5%	37.8%	19.8%
13	Requires Professional Liability Insurance	73.8%	46.8%	34.5%
14	Autonomy in Decision Making	74.1%	61.8%	45.8%
15	Identity not with Employer but Profession	69.0%	60.3%	41.6%
16	Held in High Esteem by the Community	70.4%	54.7%	38.5%
17	Earn Higher Than Average Compensation	38.2%	55.1%	21.0%
	Intrinsic			
18	Mystique (Average of 18a + 18b + 18c)	46.2%	707%	32.7%
18a	a. Body of Knowledge Is Esoteric/Abstruse/Secret	75.6%	707%	53.4%
18b	b. Highly Ritualistic Procedures	63.0%	707%	44.5%
18c	c. Access to Knowledge Is limited	0.0%	707%	0.0%
19	Cruciality (Average of 19a + 19b)	66.8%	67.8%	45.3%
19a	a. Immediacy of Need	66.8%	67.8%	45.3%
19b	b. Importance of Need	66.8%	67.8%	45.3%
20	Denouement- Quick Solutions to Problems	82.9%	76.4%	63.3%
	TOTAL			33.7%

¹¹ Giammalvo, Paul D (2008) Is Project Management a Profession? And if not, what is it? [https://www.academia.edu/en/63424585/Is Project Management a Profession And if not what is it PhD Dissertation 2008](https://www.academia.edu/en/63424585/Is_Project_Management_a_Profession_And_if_not_what_is_it_PhD_Dissertation_2008)

About the Author



Dr. Paul D. Giammalvo, CDT, CCE, MScPM, MRICS

Jakarta, Indonesia



Dr. Paul D. Giammalvo, CDT, CCE (#1240), MScPM, MRICS, is a Senior Technical Advisor (Project Management) to PT Mitratata Citragraha. (PTMC), Jakarta, Indonesia. www.build-project-management-competency.com. He is noted for the development and delivery of graduate level, blended learning curricula designed for the mid-career path, English as Second Language (ESL) professionals to develop competency in the local practitioner and build capacity for the local organizations. For 25+ years, he has been developing and delivering Project Management training and consulting throughout South and Eastern Asia Pacific, the Middle East, West Africa, and Europe.

He is also active in the Global Project Management Community, by playing a “thought leadership” role for the Association for the Advancement of Cost Engineering International, (AAACEI) <http://www.aacei.org/> since 1991; He has also been active in two IPMA member organizations: The Green Project Management Association (GPM) <http://www.greenprojectmanagement.org/> where he served on the Certification Board of Directors for two years and the American Society for the Advancement of Project Management <http://www.asapm.org/> for which he served for four years on the BoD as Director of Marketing. He also sat on the Board of Directors of the Global Alliance for Project Performance Standards (GAPPS), www.globalpmstandards.org, Sydney, Australia and is active as a regional leader. Currently, he is a compensated consultant to the International Guild of Project Controls. <http://www.planningplanet.com/guild> as the primary author of their “Compendium and Reference” as well as the chief architect of their competency-based credentialing program. <http://www.planningplanet.com/guild/certification>

He has spent 35 of the last 50 years working on large, highly technical international projects, including such prestigious projects as the Alyeska Pipeline and the Distant Early Warning Site (DEW Line), upgrades in Alaska and the Negev Airbase Constructors, Ovda, Israel and the Minas Oil Field in Rumbai, Sumatra. His current client list includes Fortune 500 major telecommunications, oil, gas and mining companies plus the UN Projects Office and many other multi-national companies, NGO organizations and Indonesian Government Agencies.

In addition to 45+ years of hands-on field experience, Dr. Giammalvo holds an undergraduate degree in Construction Management, his Master of Science in Project Management through the George Washington University and was awarded his PhD in Project and Program Management through the Institute Supérieur De Gestion Industrielle (ISGI) and Ecole Supérieure De Commerce De Lille (ESC-Lille) under the supervision of Professor Christophe Bredillet. “Dr. PDG” can be contacted at pauldgphd@gmail.com.

To view other original work by Paul Giammalvo, visit his author showcase in the PM World Library at <http://pmworldlibrary.net/authors/dr-paul-d-giammalvo/>