In Response to May Letter to Editor by Piney [1]

LETTER TO THE EDITOR

21 May 2023

Ref: Piney, C. (2023). On the Subject of Earned Value Management and some recently cited examples, Letter to the Editor, *PM World Journal*, Vol. XII, Issue V, May. Available online at https://pmworldlibrary.net/wp-content/uploads/2023/05/pmwj129-May2023-Piney-evm-and-recently-cited-examples-Letter-to-Editor.pdf

Dear David and Subscribers,

I would like to respond to Kik Piney's "LETTER TO THE EDITOR" dated 28 April 2023 Ref: Piney, C. (2023). On the Subject of Earned Value Management and some recently cited examples, Letter to the Editor, *PM World Journal*, Vol. XII, Issue V, May. Available online at https://pmworldlibrary.net/wp-content/uploads/2023/05/pmwj129-May2023-Piney-evm-and-recently-cited-examples-Letter-to-Editor.pdf

Below are my specific responses/clarification to Kik's Letter: **[CKP]** are Kik Piney's comments, **[PDG]** are Dr. Paul Giammalvo's responses.

[CKP] Dear David, I would like to add the following comments on some of the ideas in the article by Dr. Paul Giammalvo (Dr. PDG) on Earned Value Management (EVM) in the April edition of PM World Journal.

[PDG] Many thanks for taking the time to review and respond to my case studies. Consistent with the 5 attributes of the Scientific Method, I appreciate your challenges and providing me with the opportunity to respond, consistent with the tenets of the Scientific Method:

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 those that rely on emotional or other subjective factors.
2) Replicable Experiments Scientific experiments are replicable. **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

[1] How to cite this work: Giammalvo, P. D. (2023). In Response to May Letter to Editor by Piney, Letter to the Editor, *PM World Journal*, Vol. XII, Issue VI, June.

rely on experiences 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 contradicts a theory, that theory must be modified.** For example, the phlogiston theory of fire and combustion was rejected when the evidence against it arose.
4) Objective Approach The scientific method is objective. **It relies on facts and 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 investigates it systematically.

With PMI in the process of rewriting its PMBOK Guide[2], as well as the efforts to create an "EVM Manifesto", I believe it is essential that we all agree that anything being published on "Applied Project Management" should demonstrate the ability to meet the 5 attributes of the Scientific Method.[3]

[CKP] The first issue that he addresses is the existing resistance to the wider adoption of EVM. As he has shown in his multiple references, the foundational concepts of scientific management and "payment for performance" predate EVM's development, which was formalized in 1967.

[PDG] It was formalized by WHOM? As evidenced by Gillette and Dana, from the perspective of "Cost Engineers" or "Engineering Economists" or "Engineers, Contractors, and Superintendents Engaged in the Management of Engineering Construction," it has been in use for at least 120 years and as it probably originated with the craft guilds of 16th Century England and France, meaning it was a "common practice" to pay in full for goods or services rendered upon completion for close to 600 years. I would propose that a more correct statement would be that the US Government "bastardized"[4] a tested and proven approach by eliminating the "pay for performance" connection and breaking the link to "continuous process improvement."

Thus claims that EVM was FORMALIZED is UNSUPPORTED unless it clarifies WHO formalized it. Most likely, the baseline originated from those of us in private-sector construction.

[2] "PMBOK Guide Sunset Plan FAQS" (April, 2022) https://www.pmi.org/-/media/pmi/documents/public/pdf/pmbok-standards/faq-pmbok-guide-sixth-edition-retirement.pdf?v=03823aaf-cb53-403b-9571-c61460a176aa
[3] "Five Characteristics of the Scientific Method" (April 2018) https://sciencing.com/five-characteristics-scientific-method-10010518.html
[4] Merriam-Webster Dictionary- (n.d.) "altered from an original in a way that diminishes quality or legitimacy" - https://www.merriam-webster.com/dictionary/bastardized

[CKP] The goal of EVM is to provide a standardized, objective, action-oriented measure of progress towards well-specified results critical to the success of a project.

[PDG] Your definition is only partially complete or correct. The goal of "earned value management" from the perspective of the "Cost Engineer" or "Engineering Economist" or the "Engineers, Contractors, and Superintendents Engaged in the Management of Engineering Construction" is to OPTIMIZE the trade-offs between TIME and COST by keeping the EFFICIENCIES OF THE WORKFORCE to within +/-5% of the baseline (contract) estimate. It is a DOUBLE-LOOP SYSTEM that starts with the Baseline Schedule and Cost Budget but is designed to enable "real-time" adjustments to the workflows to keep the EFFICIENCIES as close to 1.00 as possible.

These are the two OBJECTIVES as advocated by Gillette et al.

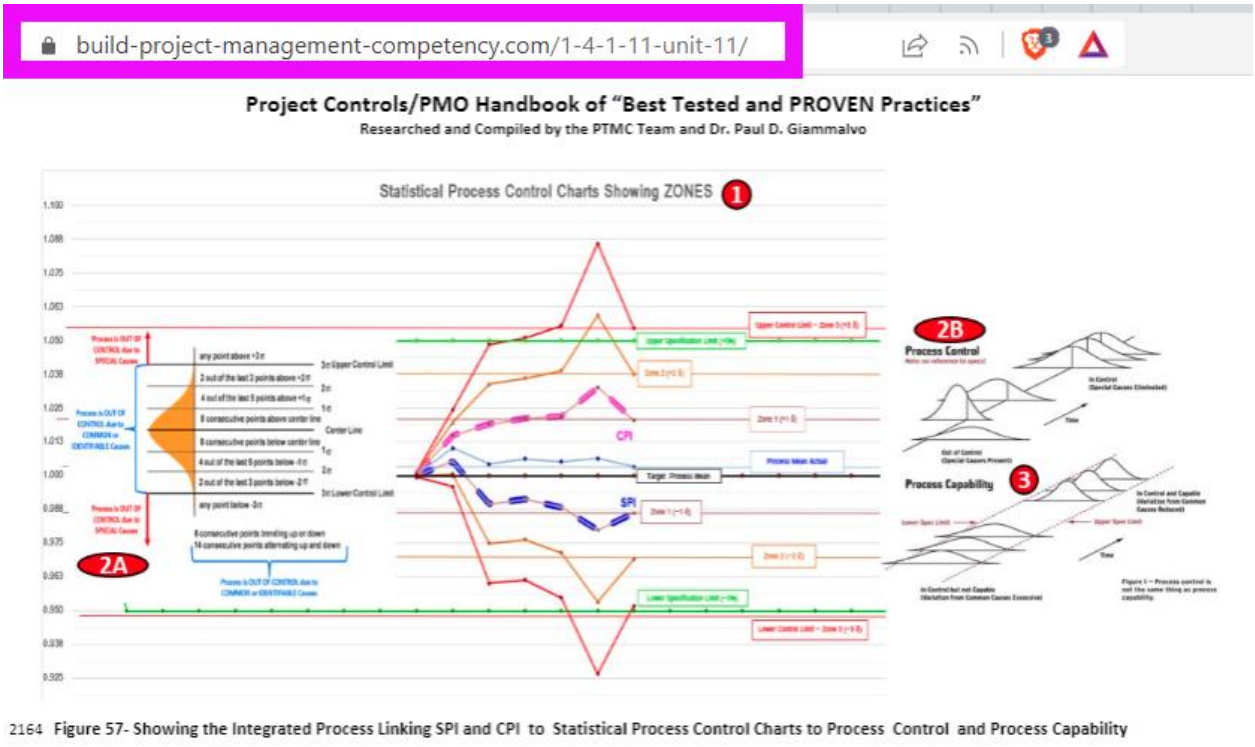

Figure 1- Analyzing the workflow process using 3 Sigma Statistical Process Control Charts

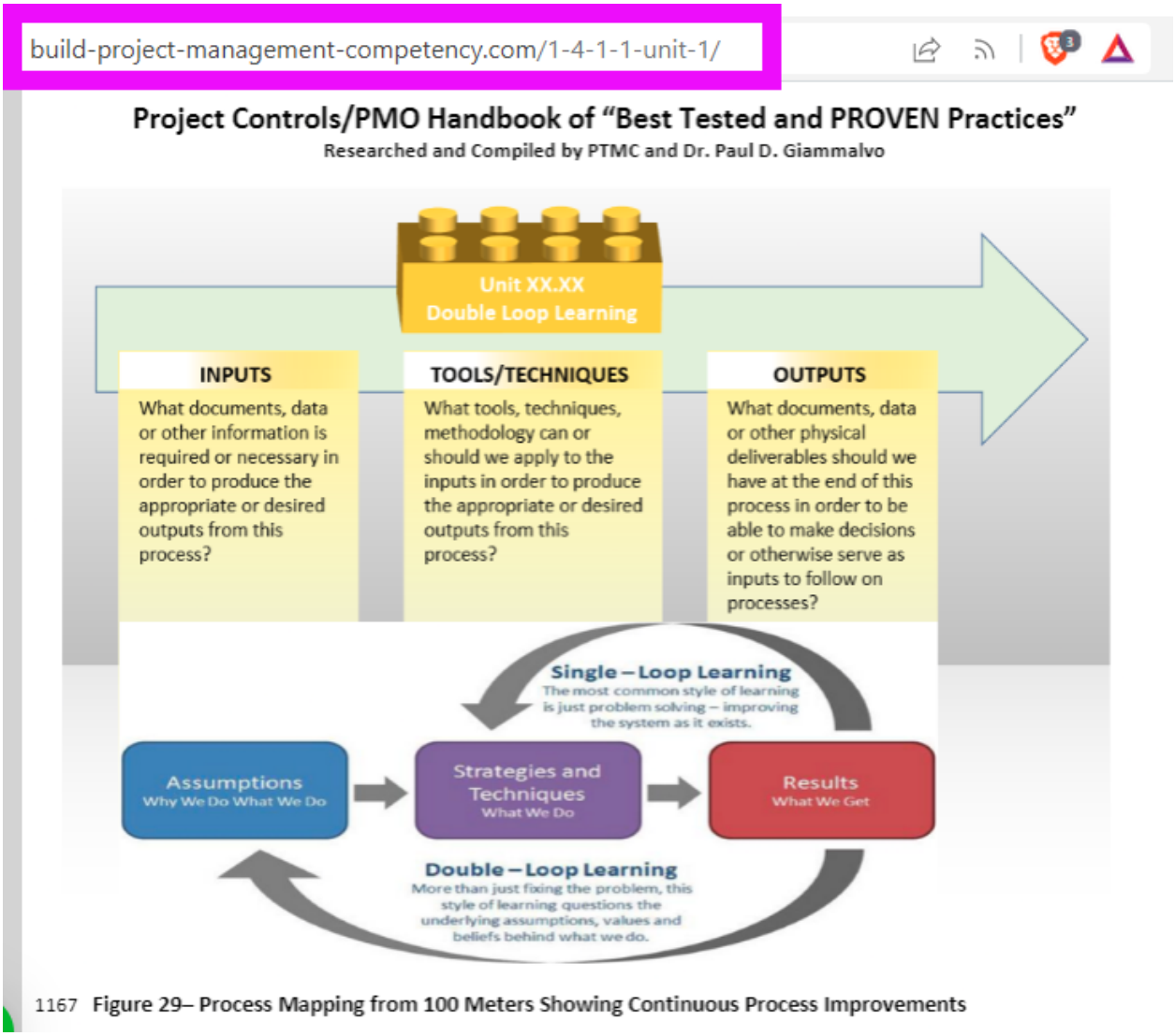

Figure 2- Objective #2- Continuous Process Improvement using Argyris & Schon's Double Loop Learning

[CKP] However, although the techniques and algorithms of EVM can provide the necessary information, there are two major operational challenges to its use.

[CKP] The first challenge requires avoiding excessive administrative overheads, so that the people involved can generate and analyze the relevant data efficiently.

[PDG] For our best-performing case study from Freeport Indonesia, the project documented a savings of USD 65 million over 4 years[5] using only 6 full-time people to report within 4 hours of the previous shift, 3 times per day, 365 days per year. This process lends itself to the application of "Machine Learning" and "Artificial Intelligence." (AI)

[5] Slide #19 - #20 (n.d.) https://build-project-management-competency.com/ptmc-training-standards-and-specifications-individual/

[CKP] The second challenge, as Dr. PDG shows in his introduction, is to ensure that this analysis is action-oriented and that the corresponding actions can be carried out, whatever the political pressures.

[PDG] To clarify, given that project data has a half-life of a ripe banana, the real challenge is to get the EVM data compiled, normalized, and published at MOST 7 days behind the physical progress. Any longer than this, and it is largely useless for management to use in making resource allocations and continuous process improvements. As shown in Figure 3, for the Freeport Case Study, we were able to publish "real-time" progress reports within 4 hours after the close of each shift, 3 X per day, 365 days per year.

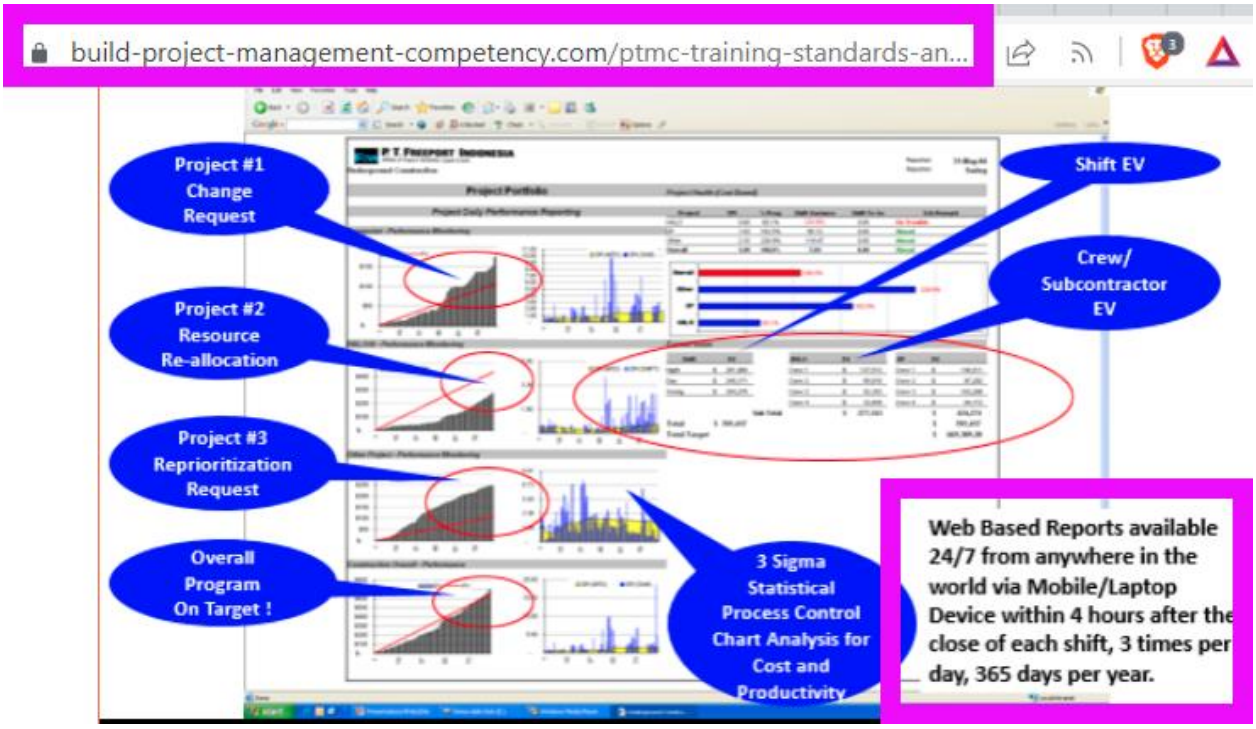

Figure 3- Web Based Report Template from Freeport Indonesia

[CKP] One strength and weakness of EVM is that is that it requires the existence of a formalized project planning process, including such artifacts as a detailed list of tasks with their dates, resource lists, and budgetary information. The adoption of EVM, therefore, has the positive result that it ensures the existence of a broad, effective project management framework in the organization. Therefore, as I explain, two of the three "experiments" that Dr. PDG describes in his article cannot be characterized as valid examples of EVM.

[PDG] Why not? In case Study #1, we are trying to OPTIMIZE A PROCESS. We are trying to learn what combination of VARIABLES will yield the MOST EARNED MINUTES, with the hypothesis being that the more EARNED MINUTES will yield the "BEST" health benefits. To fully appreciate this case study, you must turn to Taylor's "Principle of Scientific Method" in

the "Pig Iron Case Study" pages 21 through 28. This will provide an example supporting the "Fit Bit" case study I have put forward.

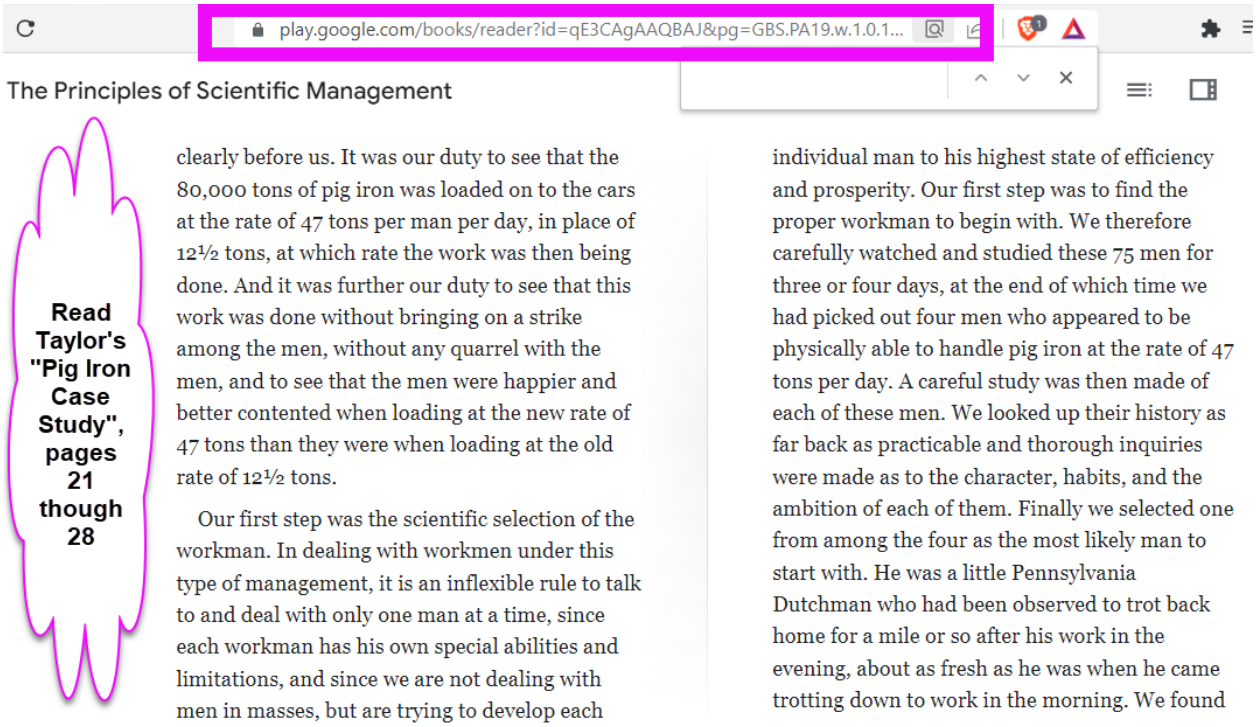

Figure 4- Frederick Taylor's "Pig Iron Case Study."[6]

[CKP] Experiment #1 provides no means of tracking project performance based on time or cost. As such, therefore, there is no means of evaluating any of the standard EVM parameters.

[PDG] Having read Taylor's "Pig Iron" case study, tracking costs is unnecessary. In the Pig iron case study, they tracked tons of pig iron loaded. If you look at the data from case study #1, you can see the actual dates on the left-hand side (5.1). Then in place of money, why can't we use:

(5.2) Total Weight in either Kilos or Lbs.

(5.3) Number of Repetitions

(5.4) "Earned Minutes" (Ref Walt Lipske and PMI's "Earned Time or Earned Schedule?)

(5.5) "Calories Burned."

Keep in mind that we don't know yet which variables will correlate to the OBJECTIVE to lose weight and increase heart health.

[6] Taylor, Frederick 1911 Principle of the Scientific Method Pages 21- 28
https://play.google.com/books/reader?id=qE3CAgAAQBAJ&pg=GBS.PA19.w.1.0.116_31&hl=en

Also, keep in mind that correlation may or may NOT reflect CAUSATION. And the same applies to Case Study #2. We can use ounces of Gold, or if we wish, we can convert it to money.

1	2	3				Input data				4	5			
Date	Total Weight in Kilos	Total Weight in Pounds #	Number of Repetitions (Count)	Rest Time in Minutes	Planned Time in Minutes	Actual Time in Minutes	Zone 1- Fat Burn in Minutes	Zone 2- Cardio in Minutes	Zone 3- Peak in Minutes	TOTAL EARNED Minutes	Earned/ Actual (CPI)	Earned/ Planned (SPI)	Total Calories Burned	Calories Actual Tim (Mins)
09-Jan-23	14,280	31,416	50	3	90	91	46	24	22	92	1.01	1.02	217	2.38
11-Jan-23	14,280	31,416	50	3	90	91	51	39	12	102	1.12	1.13	303	3.33
13-Jan-23	14,280	31,416	50	3	90	91	46	26	20	92	1.01	1.02	207	2.27
16-Jan-23	14,280	31,416	50	3	90	88	62	28	34	124	1.41	1.38	320	3.64
18-Jan-23	14,280	31,416	50	3	90	91	85	35	50	170	1.87	1.89	349	3.84
20-Jan-23	14,280	31,416	50	3	90	91	83	23	60	166	1.82	1.84	379	4.16
23-Jan-23	14,280	31,416	50	3	90	87	66	36	30	132	1.52	1.47	309	3.55
25-Jan-23	14,280	31,416	50	3	90	89	48	24	24	96	1.08	1.07	252	2.83
27-Jan-23	14,280	31,416	50	3	90	88	41	21	20	82	0.93	0.91	186	2.11
30-Jan-23	14,280	31,416	50	3	90	83	59	29	30	118	1.42	1.31	294	3.54
01-Feb-23	14,280	31,416	50	3	90	85	62	26	36	124	1.46	1.38	276	3.25
03-Feb-23	14,280	31,416	50	3	90	69	79	33	46	158	2.29	1.76	362	5.25
06-Feb-23	14,280	31,416	50	3	90	76	67	37	30	134	1.76	1.49	147	1.93
08-Feb-23	14,280	31,416	50	3	90	83	56	32	24	112	1.35	1.24	283	3.41
10-Feb-23	14,280	31,416	50	3	90	91	57	25	32	114	1.25	1.27	254	2.79
13-Feb-23	14,280	31,416	50	3	90	82	64	28	36	128	1.56	1.42	267	3.26
15-Feb-23	14,280	31,416	50	3	90	83	77	35	42	154	1.86	1.71	315	3.80
17-Feb-23	14,280	31,416	50	3	90	82	63	33	30	126	1.54	1.40	305	3.72
20-Feb-23	14,280	31,416	50	3	90	87	83	43	40	166	1.91	1.84	370	4.25
22-Feb-23	14,280	31,416	50	3	90	79	102	38	64	204	2.58	2.27	390	4.94
24-Feb-23	14,280	31,416	50	3	90	71	70	34	36	140	1.97	1.56	325	4.58
27-Feb-23	14,280	31,416	50	3	90	77	100	40	60	200	2.60	2.22	401	5.21
01-Mar-23	14,280	31,416	50	3	90	91	68	34	24	126	1.38	1.40	222	2.44
03-Mar-23	14,280	31,416	50	3	90	84	62	36	26	124	1.48	1.38	303	3.61

Figure 5- "Case Study 1" raw data showing the VARIABLES over time.

[CKP] Dr. PDG also states: "I cannot see how using EVM enables us to track BENEFIT REALIZATION." He is, of course, right, since this is not an objective of EVM. This is the reason why I developed a complementary technique which I have named "Earned Benefits-Value Management" (EBVM). EBVM is designed to be used in conjunction with EVM to provide a set of performance management tools for the complete management of benefits realization.

[PDG] I want to challenge you to demonstrate how applying your EBVM formulas, you can link FUTURE potential benefits using EVM tools when there may or may NOT be any correlation, much less any causal relationship. My position is that you cannot link what MAY or MAY NOT happen in the future to what is happening today.

While there MAY be a correlation between the success or failure of a project and the success or failure of the asset the project was undertaken to create, there is no way we can use the EVM data to predict this. In the Fit Bit Case Study #1, I am HOPING that increasing my cardio and burning calories will result in losing weight and in doing so, I become healthier, but I don't see any way to PROVE that losing weight and increasing cardio "earned minutes" can be DIRECTLY attributed to improved health. I may be able to INFER it reasonably but not PROVE it. (See the 5 attributes of the Scientific Method)

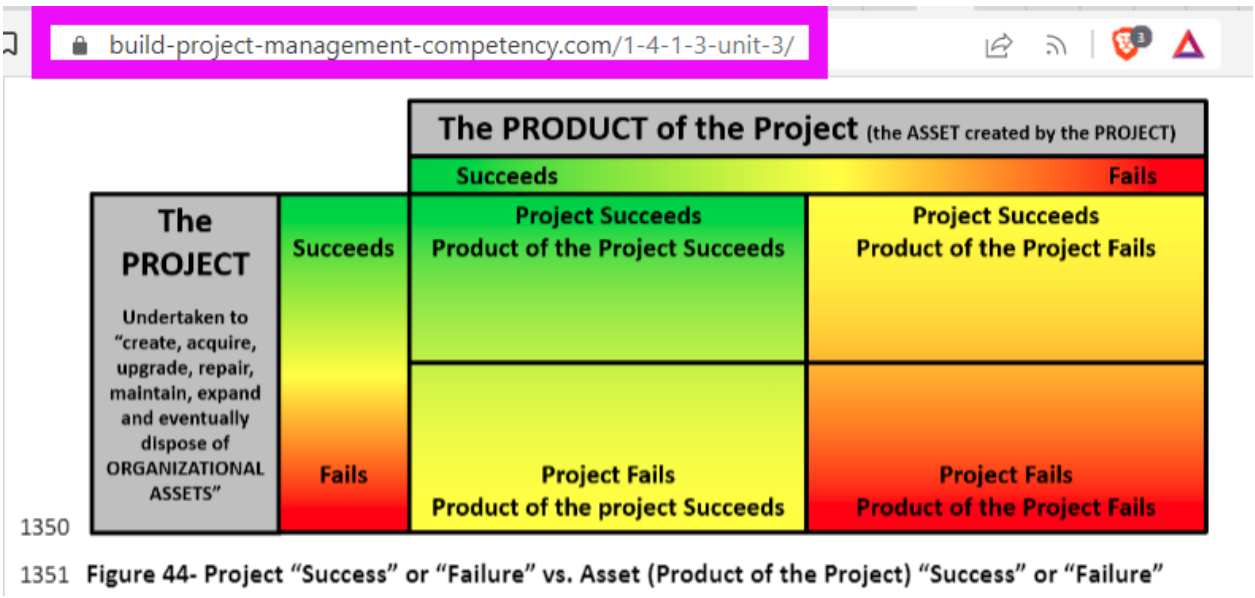

Figure 6 Project Success/Failure vs. Asset (Product) Success/Failure.

[CKP] Experiment 2 describes an ongoing operational environment rather than a running project and, for this reason, is unsuited for EVM.

[PDG] This is a totally false assumption. IF you are willing to accept that "project management" is nothing more (nor nothing less) than an "asset delivery system," you will come to appreciate that there is a SPECTRUM of project delivery options that any organization can choose from to "create, acquire, update, expand, repair, maintain and eventually dispose of organizational assets."

Once people get their heads around this fundamental REALITY, you will see that, by far, the vast majority of projects fall under the category of "PROJECTIZED OPERATIONS." Examples of "Operational Projects" are almost endless. Operational Projects include any professional or tradesperson who quotes prices based on a unit-in-place basis and then bills based on the actual quantity provided, delivered, or installed. This includes lawyers who quote a fixed price for preparing a will, a divorce, property closing (or any other service); a dentist who charges a fixed fee for filling a cavity; an auto repair person who charges a fixed fee for an oil change, a flooring installer who quotes you a fixed unit price to supply & install carpet or tile.

For more evidence, look here to see how many global organizations recognize and use the Integrated Asset, Portfolio, Program, and Project Management Model.[7]

As shown in Figure 7, what is known as "Projectized Operations" is probably by far the most common application of the "project management processes as an asset delivery model." This includes all professions and trades where people either make an appointment in advance

[7] The Institute of Asset Management Corporate Membership Directory (n.d.) https://theiam.org/corporate-directory/

(Doctors, Dentists, Lawyers, Accountants) or simply randomly walk in (Barbers/Beauticians, Auto Repair, Butchers & Bakers) to "realize the benefits" being offered by the professional or tradesperson.

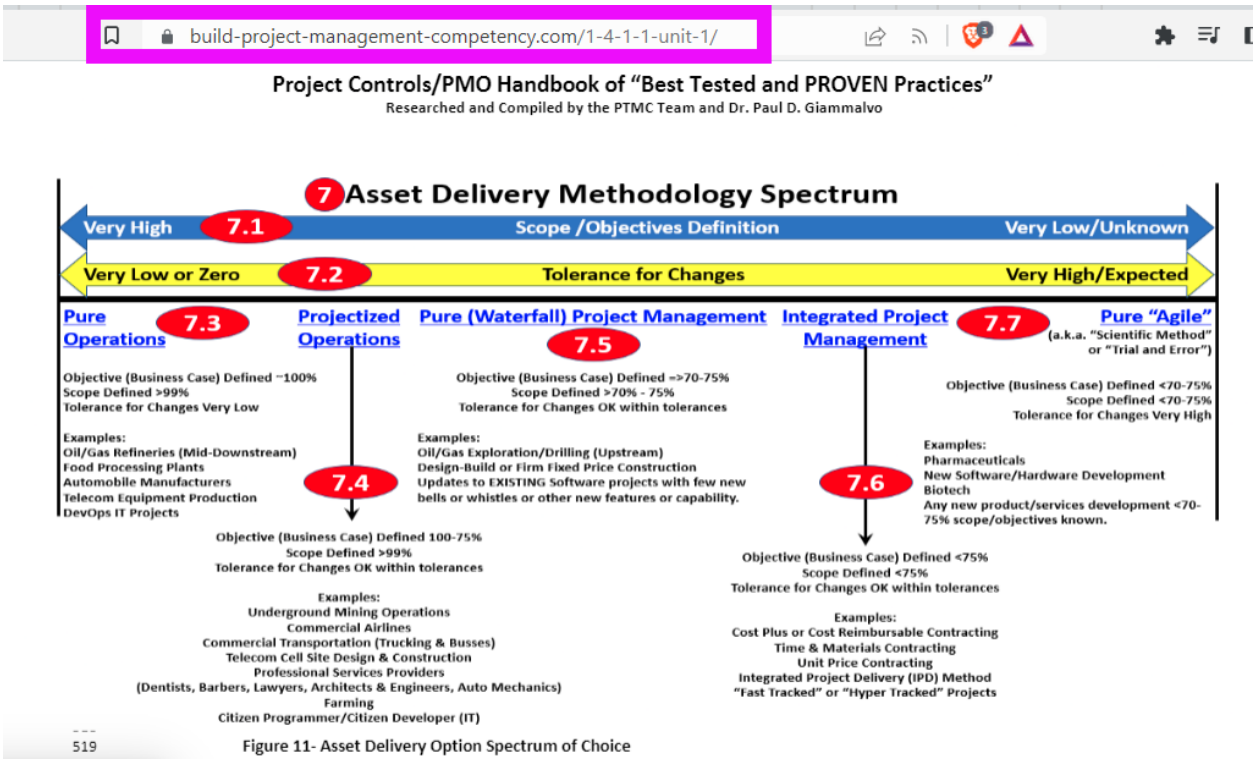

Figure 7 Asset Delivery Options Based on Original Scope Definition and Stakeholder Change Tolerance

[PDG] In the example from Freeport[8], the construction of the draw points (half and full) is essential to the mine's operation.[9] There are literally hundreds of kilometers of these tunnels, some 10 meters long, some 30 meters long, and dozens of them are under construction at any given time. Each draw point is treated as a separate PROJECT as part of the overall underground mining PROGRAM. Also included are SUPPORTING projects such as Grizzlies and Ventilation Systems, along with underground cafeterias and hospitals. Think of this as a huge ANT or TERMITE nest.

[8] https://build-project-management-competency.com/ptmc-training-standards-and-specifications-individual/ Slides #13-21

[9] For more details on this process, see Wibiksana, Ridwan (2012) EVM Adapted for Use in Underground Mining https://pmworldlibrary.net/wp-content/uploads/2013/01/PMWJ2-Sep2012-WIBIKSANA-EVM-Adapted-for-UndergroundMining-StudentPaper.pdf

Figure 8- Freeport "Projects" Essential to "Operations."[10]

[PDG] In this example, "No Projects" translates into "No Gold" (or oil or revenue for the Doctors, Dentists, Lawyers, Roofers, Painters, or anyone else who make their livings from operations that require projects as the basis for their cost estimating, pricing, and billing.) The key is first to recognize how pervasive "projectized operations" or "operational project management" is.

[CKP] I found it confusing that the well-defined names of EVM parameters were reassigned to very different quantities. For example, EV (aka "budgetary cost of work performed") was used to measure the weekly revenue equivalent of extracted gold. Weekly revenue is, of course, very different from a "budgetary cost."

[PDG] What you are doing is allowing "the tail to wag the dog." Stop looking at this in the context of your definitions of EVM and start to look at it the other way around. Forget what people call what they are doing. Just see if what they are doing is consistent with the tools and techniques we use in EVM. The best example is Dave's use of what we know as the To Complete Performance Index. (TCPI) That's not what he called it, but that is EXACTLY the same formula we use- ((Original Budget – Earned Value)/Remaining Duration) = Required Production to meet the original target. (600 OZ BCWS – 463 OZ BCWP)/4 = 34.25 OZ TCPI)

The budgetary cost is not the weekly production but the overall TARGET production. In this example, the BCWP (or EV for the PMI folks) is equal to the actual ounces of gold recovered X the average price of gold on that date. (463 OZ X $1,955 = $905,165) The BCWS EARLY DATE

[10] https://build-project-management-competency.com/ptmc-training-standards-and-specifications-individual/

CURVE (PV for PMI) is the TARGET PRODUCTION (600 ounces) divided by the OPTIMISTIC duration: 600 ounces/20 weeks = 30 ounces per week. For the Late Date, BCWS/PV 600 ounces/30 weeks = 20 ounces per week. Because we are showing TARGET PRODUCTION, we use a STRAIGHT LINE rather than an S Curve for the ED and LD Curves. (Same as we did for Freeport)

Note that we could use EITHER "Ounces of Gold" or the Monetary Equivalent. Because we are capturing the ACWP in terms of dollars per ounce, it makes more sense to also convert the ounces of gold to dollars, but we still could have calculated the SPI and CPI, which are EFFICIENCY FACTORS for our operations, using mixed units of measure.

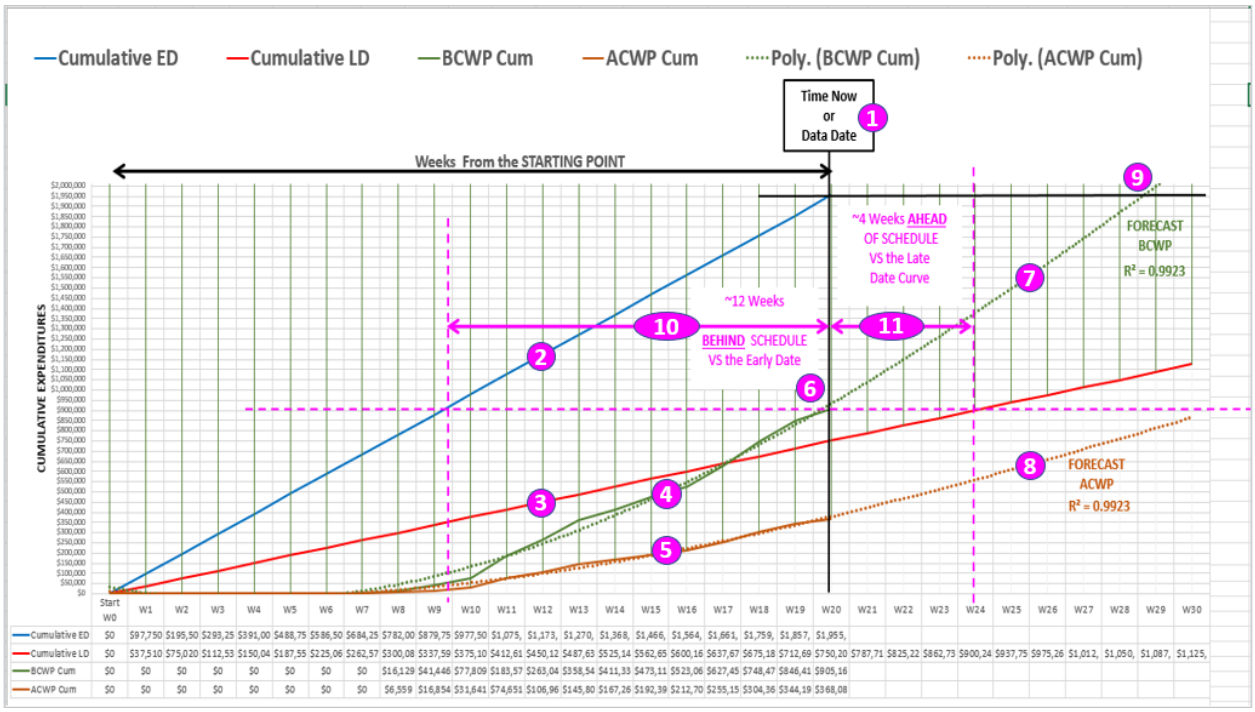

Figure 9- Actual Data from Dave Turin's Mine

[PDG] This is EXACTLY the same approach we took with the Freeport Project, which was our most successful PMO rollout in 30+ years, having documented savings of $65 million over 4 years. From a management perspective, this shows us that IF Dave had started on time (W0), all else remained equal, he most likely would have been able to come close to achieving his 600 oz target. (He would need 22 weeks of 27.3 oz average production) Unfortunately, he told me his show got canceled for this year, so we will never know.

[CPK] By contrast, experiment 3 is a valid EVM example and describes a project that is aimed at obtaining a degree. The budgetary costs are the cost for each module. The addition of a schedule indicating when each module will be studied can be a valuable tool for anyone hoping to follow this course and succeed in obtaining the qualification. I think it is fair to say that, although both experiment 1 and experiment 2 do show applied common sense in that they

track progress with respect to objectives, they are not relevant for showing the practical benefits of adopting the full capabilities of formal Earned Value Management.

[PDG] Keep in mind that my objective in using these examples was not to demonstrate the benefits of Earned Value Management. I hope I was clear that I was trying to provide examples to support my hypothesis that the tools and techniques, formulas, and concepts that we associate with EVM are being used on almost a daily basis by people in their day-to-day personal and professional lives but don't realize that what they are doing is what we know as EVM.

To summarize, given that "formal" EVM hasn't worked, and given we are seeking answers to the following questions:

1) ***"Given so many agree that Earned Value Management is an important and useful tool for both owners and contractors to manage their projects, then WHY is it not enjoying more widespread adoption?"***
2) ***"What changes need to be made to make EVM more acceptable or "user-friendly" to both owners and contractors to make them WANT to adopt it?'***

MAYBE for the EVM Manifesto, we should simplify the JARGON and put it in "common sense" terms, with plenty of examples from different applications.

[PDG] Thanks again Kik, for engaging in a professional-level debate and CHALLENGING my claims. To conclude, let's assess what we have provided for you against the 5 Attributes of the Scientific Method:

1) **Empirical Observation- What we propose here we have been using as a "core business process" that we believe has helped us stay in business for 50+ years under some very tough conditions (recessions, COVID) in several highly competitive, low-margin, and volatile markets. (Property development and management, training, and consulting projects)**

2) **Replicable Experiments- We provided you with the data from several "traditional" and three "non-traditional" "projects" for you to use in validating/repudiating our theories and hypothesis. We also have provided step-by-step instructions. Giammalvo, P. D. (2022). The Origins and History of Earned Value Management – "A Contractor's Perspective"; featured paper, PM World Journal, Vol. XI, Issue IX, September. https://pmworldlibrary.net/wp-content/uploads/2022/09/pmwj121-Sep2022-Giammalvo-origins-and-history-of-evm-a-contractors-perspective.pdf**

3) **Provisional Results- With over 50 years of results using the "Engineering Economics" or "Engineering Economics" based approach we have been using for property development and management, training, and consulting projects we**

can only say for a fact that they work on those projects. You will have to test, validate, and perhaps MODIFY them for use on other types of projects.

4) **Objective Approach- What we advocate and recommend is based on FACTS that have been TESTED and PROVEN to work when applied to property development and management, training, and consulting projects. We have remained in business for 50+ years using the identical processes we not only have incorporated as core business processes but teach to others who have also used them successfully. (Freeport et al.)**

5) **Systematic Observation[11]- What we are sharing with you is based on more than 120 and probably closer to 1000+ years of "Systematic Observation." Consistent with Attributes #1, #2, #3, and #4, it is now up to you to experiment with what we know has been shown to consistently work and adopt or adapt what we advocate for use in other applications.**

Thank you,

Dr. Paul D. Giammalvo

Jakarta, Indonesia

[11] Stanford Encyclopedia of Philosophy- The Scientific Method (2021) https://plato.stanford.edu/entries/scientific-method/