1 UNIT 1- GOVERNANCE AND INTEGRATION

2 Figure 1- High-Level Process Map Showing Progress

3 HOW IS THIS BOOK SET UP AND ORGANIZED?

Project Controls/PMO Handbook of "Best Tested and PROVEN Practices" ❶
Researched and Compiled by PTMC and Dr. Paul D. Giammalvo

❷

1	HIGH LEVEL PROCESS ROADMAP SHOWING GENERIC SEQUENCING OF THE UNITS ❸
2	RECAP OF PRECEDING UNITS ❹
3	ROADMAP SHOWING THE PROCESSES FOR EACH UNIT
4	5000 Meter View
5	1000 Meter View
6	100 Meter View
7	Ground Level View
8	INPUTS ❻
9	TOOLS & TECHNIQUES ❼
10	OUTPUTS ❽
11	REFERENCES SUPPORTING EACH UNIT ❾
12	TEMPLATES SUPPORTING EACH UNIT ❿
13	PRINCIPLES, PHILOSOPHIES, BELIEFS OR TENETS ⓫
14	REFERENCES ON HOW ARTIFICIAL INTELLIGENCE OR MACHINE LEARNING IS LIKELY TO IMPACT ⓬
15	"IA3PM"
16	COPYRIGHT ⓭

❺ (bracketing items 3–8)

17   1 of 67

❷

5 Figure 2- How This Book Is Structured

6 As all graphics that are not self-explanatory will be explained below, the convention we have
7 adopted is to label the GRAPHIC or FIGURE with the first value **(2)** (the number of the FIGURE) and
8 the item it explains or refers to in the second number. **(2.1)** We follow this convention throughout
9 the book.

10 ✓ **(2.1)** This book is based on 100+ years of combined "hands-on" experience doing projects
11 where our own money is on the line if the projects "succeed" or "fail" and growing frustration
12 with what appears to be a focus by professional societies and even individuals on generating
13 revenues from creating books not designed to help improve the "success" rates of project
14 delivery, but on providing the base for yet another exam-based certification. This book is the
15 opposite. A selected group of EXPERIENCED practitioners who, like us, have "skin in the game"
16 if our projects succeed or fail, have RESEARCHED "best tested and PROVEN" practices, tools,
17 and techniques based on our first-hand experience, have proven to CONSISTENTLY produce
18 superior results.

19 ✓ **(2.2)** Because this is a "Living Document," we fully expect and, in fact, encourage other like-
20 minded practitioners, who, through their personal experiences, know of "best tested and
21 proven" practices and are willing to share them, to do so. To make this easy to do, we have
22 provided line-item numbers to help you identify where any changes, additions, or modifications
23 you are proposing should appear.

24 ✓ **(2.3)** Somehow, it appears as though many people seem to have forgotten or never fully
25 realized that "integrated asset, portfolio, program, and project management" is nothing more
26 than a series of PROCESSES. And that those processes, when integrated, are nothing more than
27 a DELIVERY SYSTEM to "create, acquire, expand, upgrade, repair, maintain and eventually
28 dispose of ORGANIZATIONAL ASSETS. Neither projects nor the people who manage them lie at
29 the "center of the universe." We are just another "cog in the wheel."

30 ✓ **(2.4)** Because project management is a SYSTEM, and the PROCESSES that go into this system are
31 all linked to one another, a major focus in this book is going to be on HOW and WHY the
32 processes are linked to one another. Very few of the books on project management talk about
33 HOW or WHY we execute the processes in any sequence or order, and we will try to explain that
34 to you. However, we also advocate for a "Lego Block" approach providing SCALABILITY,
35 ADAPTABILITY, and FLEXIBILITY in how and when the processes and the associated tools &
36 techniques are implemented.

37 ✓ **(2.5)** One of the reasons we believe PMI's PMBOK Guide failed is the processes were of such a
38 high level that they were, for all intents and purposes, worthless to try to apply, which many
39 people tried, despite PMI's claims that the PMBOK is not a process roadmap, but a Body of
40 Knowledge, but have tried to use it as one anyway. This book addresses the need for a "how to
41 do it" "process road map." Having been in the training and consulting business for going on 30
42 years, the one question our clients have all asked is, "HOW DO WE DO THIS?" While this book
43 focuses on the processes, the primary focus is on **HOW TO SELECT AND USE THE TOOLS AND**
44 **TECHNIQUES OF OUR CRAFT OR TRADE**. If you know which tool or technique to use and are
45 COMPETENT at using that tool or technique, how much does it matter on what project you use
46 that tool or technique? To address this need, we take the level of granularity down to "where
47 the rubber meets the road, where we actually apply the tools and techniques to accomplish
48 work. As our background is in engineering and construction, we will use examples from
49 engineering and construction intending to provide you with enough knowledge and
50 understanding that you can ADAPT or ADOPT what we are showing to your specific application.
51 Each tool and technique has been shown as a LEGO BLOCK to provide FLEXIBILITY, SCALABILITY,
52 and ADAPTABILITY. Using this analogy, we encourage people that once you have learned HOW
53 and WHEN to use each tool and technique, it is up to your imagination to INNOVATE, figuring
54 out how BEST or BETTER to use them for YOUR projects.

55 ✓ **(2.6)** As this is a process-based model, we provide you with a checklist of what our 100+ years of
56 experience have shown us are necessary to execute each process successfully. Because the
57 CONTEXT is so important, your inputs may or may not be the same, but it at least gives you a

58		STARTING POINT. Think of this book as a COOKBOOK with RECIPES that you can ADAPT to your
59		own tastes and the size of your family or clients.
60	✓	**(2.7)** The heart of this book revolves around how to use the Tools and Techniques. Unlike most
61		books being published, the focus is on which tools and techniques have been proven to work for
62		each PROCESS and how to USE them appropriately and correctly. Having come up through the
63		trades, if a carpenter knows WHEN and HOW to use the tools in his/her toolbox, does it really
64		matter if he/she is building a birdhouse, a doghouse, a mansion, or the Burj Khalifa? We believe
65		this is where PMI's PMBOK has FAILED, with too much focus on the PROCESSES (ITTOs) but at
66		too high a level to be useful and not enough focus on **WHAT** Tools & Techniques to use, **WHEN,**
67		and **HOW** to use each of them.
68	✓	**(2.8)** As Stephen Covey told us to "begin with the end in mind," we've spent a lot of time and
69		effort RESEARCHING what really WORKS, and just like in the cookbooks, we have provided "best
70		in class" examples of what your OUTPUTS should look like IF you have done a good job
71		demonstrating that you KNOW and UNDERSTAND HOW and WHEN to use those Tools and
72		Techniques.
73	✓	**(2.9)** Because there is no shortage of what we call "Bloviating Poohbahs," especially on Linked
74		In, who have no shortage of OPINIONS with nothing to back them up, what we have written
75		represents not only what we have learned in the "School of Hard Knocks" about what works and
76		what doesn't but, consistent with the "Scientific Method" we have provided supporting
77		evidence that not only have these "best tested and proven" approaches worked for us, but also
78		have worked for others.
79	✓	**(2.10)** While there are no shortages of templates floating around the internet when doing our
80		research, we chose COMPLETE SETS of fully integrated templates that have been tested in the
81		marketplace, including in courts of law. Selecting "ad hoc" templates that look nice but have
82		never been used and tested in the marketplace is foolish.
83	✓	**(2.11)** As a little bit of a "poke in the eye" to PMI and their move towards a PRINCIPAL-based
84		PMBOK Guide 7th Edition, we have included a section showing just how futile and useless this
85		approach is. Not only do most of the "principals, philosophies, beliefs and tenets" associated
86		with Integrated Asset, Portfolio, Program, and Project Management apply to general or
87		operations management, but many of them only serve to highlight the weaknesses underlying
88		so many project "failures."
89	✓	**(2.12)** Whether we like it or not, artificial intelligence and machine learning are already starting
90		to impact the practice of Integrated Asset, Portfolio, Program, and Project Management
91		(IA3PM), and we need to start preparing NOW for this inevitability and for those who truly are
92		"LEADERS," (rather than merely "Bloviating Poohbah's) need to shape how it evolves.
93	✓	**(2.13)** Lastly, as all the research for this book came off the internet, neither we (nor anyone
94		else) have any rights to claim OWNERSHIP for any of it. All of what we share came from "open-
95		source" publications, or we received permission from the owner to publish. Therefore, neither
96		we nor anyone else SHOULD be charging for what is, in effect, COMMON KNOWLEDGE. This is
97		why we are publishing the CONTENT we have compiled AT NO COST under Creative Commons

98 License BY (Attribution) and SA (Share Alike). Our "added value" contribution will remain to
99 continue researching, compiling, and keeping the CONTENT updated and current.
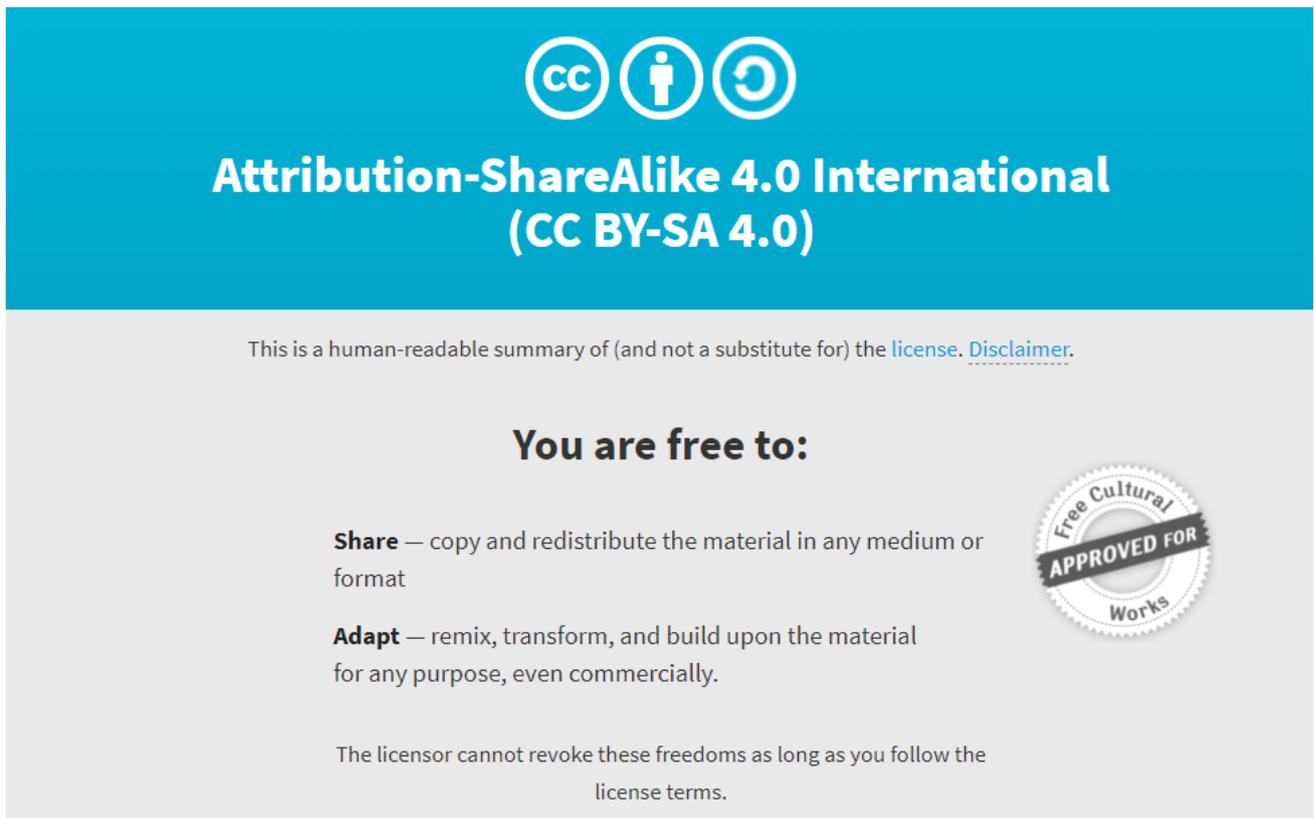
100 **Figure 3- Creative Commons License BY SA**

101 To cite anything you like from this book properly using APA format:
102 "Giammalvo, Paul D., and PTMC, (2021) Identify Unit, Line Items, Figure Number(s) Under
103 Creative Commons License BY SA v 4.0." We recommend that anyone writing papers learn how
104 to use the CITEFAST app to cite anything from this book (or any other source).

105 ✓ **What is PTMC's Business Model?**

106 So, what is our business model? We do not believe we need yet ANOTHER exam-based
107 certification. Our primary interest lies in DEVELOPING and ASSESSING COMPETENT
108 practitioners. This book EVOLVED from the workshops we have developed over the past 30+
109 years and now serves as the primary textbook for our 6-month-long graduate-level
110 COMPETENCY DEVELOPMENT courses. Suppose you want to learn WHEN and HOW to use
111 these tools and techniques and need a MENTOR to help you develop or adapt them for use in
112 YOUR industry or business. In that case, we are available as MENTORS and CONSULTANTS to
113 help you become MASTER PRACTITIONERS, evidenced by what you can and have done, not just
114 by the ability to pass multiple-choice exams.

115   While we provide access to and the ability to READ and USE this document free of charge
116   because it costs money to create and maintain this website and keep the content updated, if
117   you want to DOWNLOAD the document and be able to PRINT IT, COPY IT, and PASTE all or part
118   of it, then you need to SUBSCRIBE.

119

120   As noted above, while this book is the CORE TEXTBOOK for our 6-month graduate-level
121   COMPETENCY DEVELOPMENT COURSES, we can also provide a course on a single unit. Since we
122   are focused on COMPETENCY DEVELOPMENT, we do not believe 2-, 3-, or 4-day courses are an
123   effective means of transferring technology. For more information and pricing, contact Ms. Yani
124   Suratman at yanisuratman@gmail.com or WhatsApp her at +6281-6187-3992.

125   **INTRODUCTION TO UNIT 1- GOVERNANCE AND INTEGRATION:**

126   There is no shortage of research showing that project management is not working the way it
127   could or should. All one has to do is read the morning paper or watch CNN to see examples of
128   yet another project running late and/or over budget.

129

130   Likewise, there is no shortage of evidence that for well over 6000 years, humans have been
131   "initiating, planning, executing, controlling and closing projects" in construction, medicine,
132   entertainment, and new product development, so wouldn't you think that in 6000+ years, we
133   should have learned enough lessons to know how to prevent project failures?

134

135   So what can or should we do to fix what is broken? The first step is to admit to the facts:

136   o The propensity for humans to "initiate, plan, execute, control, and close" projects is part of
137   the human psyche- something that sets us apart from the lesser animals. Humans have
138   always been doing projects; we do projects now, and there is no reason to believe we will
139   not continue to do projects well into the future.
140   o IF we would take the time to STUDY and UNDERSTAND the LONG history of project
141   management in general but more specifically, "Agile," whether disciplined, agnostic, or any
142   other combination or permutation, is nothing more than the same "trial and error" method
143   used by our Neanderthal ancestors 300,000 years ago to tame fire and the same way used
144   6000 years ago to invent the wheel, and the same method given the name of the "Scientific
145   Method" around the 11th Century and which for the past 1000 or so years, has brought us
146   hundreds of thousands of new products and services, including the telephone (Bell), the
147   lightbulb (Edison) and penicillin (Fleming).
148   o Projects are nothing more than a DELIVERY system designed to "create, acquire, expand,
149   update, repair, maintain and eventually dispose of ORGANIZATIONAL ASSETS.
150   o Project Management is PROCESS-based, and those processes are unique to the specific type
151   of project and the sector they are being applied to. For example, assuming we can all agree
152   that flying a commercial jet from City A to City B, removing an inflamed appendix, and

153   designing and constructing a bridge are all projects. At the very highest levels, they are

154   "initiated, planned, executed, controlled, and closed," but the deeper we drill down into the

155   processes, the more unique and application-specific the processes become.

156 o There are no "tools or techniques" that are "unique" only to project management. All the

157   tools and techniques used in project management originated hundreds, if not thousands, of

158   years ago. Most of them evolved and were documented during the 17th and 18th century

159 o The same truth applies to the principles. The fundamental principles or tenets applicable to

160   General, Asset, and Operations Management also apply to Project Management. The ONLY

161   meaningful differentiator between PROJECTS, PROGRAMS, and OPERATIONS is that projects

162   have a defined finish at the outset. Programs and Operations have NO PREDETERMINED

163   FINISH date.

164 o The "root cause" reasons for continually failing projects have been well researched and

165   documented by many credible sources quoted in this book, yet we continue to ignore them.

166

167 ✓ **Purpose/Objective of the book**

168 As this book is designed to support YOUR EFFORTS in developing and assessing YOUR

169 COMPETENCY or the competency of those in your team or organization, in APPLIED "Integrated

170 Asset, Portfolio, Program and Project Management, (IA3PM), the layout and the structure is

171 based on research done to identify the "best tested and PROVEN PRACTICES," meaning that

172 unlike PMI's PMBOK Guide (that advocates those processes used on "most projects most of the

173 time" or "average" practices) or AACE's RECOMMENDED Practices, this book focuses less on the

174 PROCESSES (which we already know are context or application-specific) and more on the "Tools

175 and Techniques."

176 The thinking behind this focus on "HOW to Do It" is based on the primary author's 30 years as a

177 Union tradesman, from apprentice to journeyman to master builder, before becoming an

178 academic. Think about it. IF a carpenter (or any other tradesperson) knows which tool to use

179 and how to use it, does it matter if he/she is building a house, a fine piece of furniture, a bridge,

180 or the Burj Khalifa? If you can master HOW and WHEN to use the tool or technique, does it

181 matter what you use that tool to accomplish

182 Thus, this book will focus on what tools/techniques are used as part of each process and HOW

183 TO USE THAT TOOL, as it is normally and customarily applied for that process.

184 This book includes a complete literature review of:

185 o Association for the Advancement of Cost Engineers (AACE) Total Cost Management

186   Framework (TCMF)[1]

187 o Guild of Project Controls Competency-Based Certification Program (GPC)[2]

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[1] AACE's Total Cost Management Framework- https://web.aacei.org/resources/publications/tcm

[2] Guild of Project Controls 5 Level, 4 Track Certification- http://www.planningplanet.com/guild/certification

188   o   Global Alliance for Program and Project Standards (GAPPS)3
189   o   International Labor Organizations (ILO) "Regional Competency Standards"4
190   o   PMI's 2015 version of the "PMP Exam Content Outline" (PMI)5
191   o   PMI's 2020 version of the PMP Exam Content Outline."6
192   o   PRAXIS Framework7
193   o   The Institute of Asset Management (PAS 55 and ISO 55000)8
194   o   Our company's in-house Competency Assessment Program (PTMC-CAP) is a derivative that
195   evolved from the Guilds and Trade Unions, so we rely heavily on the International Labor
196   Organization's (ILO) "Model Regional Competency Assessment" when designing our
197   programs.

198 Given that Integrated Asset, Portfolio, Program, and Project Management is PROCESS BASED and
199 given that many of the "Best Tested and Proven" TOOLS and TECHNIQUES apply to more than one
200 process, we will present the tool and technique used by the PROCESS it is most often associated
201 with and shows how to use it for that purpose, but at the same time, will note the same
202 tool/technique can be and often is used for other processes. OTHER processes. This is especially
203 true of the tools & techniques shown in **Unit 5- Managing QA-QC** and **Unit 6- Managing Risk &**
204 **Opportunity**.

205 Figure 6 below provides this book's "big picture" perspective. Unit 1—Governance and Integration
206 focuses on the process maps and takes a "top-down" approach.

207

208 Once we have developed an understanding of the processes, including where to find more
209 information on them, as we get into each of the remaining units, the focus will change from
210 learning "what the process is" to "how to use the tools and techniques to support or execute that
211 process."

212

213 Another driver behind the importance of this book is to understand and appreciate that as we
214 move towards the application of Artificial Intelligence (AI), Automation, and Modularization to all
215 aspects of project management, the more we are going to require STANDARDIZATION not only in
216 terminology but more importantly, in the various processes and coding structures. Without
217 standardization, both the process and the codes, the different "Apps" will be unable to exchange
218 data.

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3 Global Alliance for Program and Project Standards "Tools for Assessment" https://globalpmstandards.org/tools/tools-for-assessment/

4 NOTE from Author- Before you start reading this Unit, you would be advised to watch this 10 minute video-https://www.youtube.com/watch?v=pLuMX_9WVFg

5 PMI 2015 Exam Content Outline is No longer available

6 PMI 2020 Exam Content Outline https://www.pmi.org/-/media/pmi/documents/public/pdf/certifications/pmp-examination-content-outline.pdf was not used as PMI has switched from a PROCESS to a PRINCIPLE based BoK.

7 PRAXIS Framework- https://www.praxisframework.org/en/method/process

8 The Institute of Asset Management https://theiam.org/about-us/

219 ✓ **A Brief History-**

220 As we can see in Figure 13, this is an ASSET CENTRIC model, first popularized by Esso or Diamond
221 Shamrock Oil around the mid-1950s (based on verbal statements from credible "old-timers") and
222 attesting to the fact it WORKS is still in use today, 65+ years later, by all the major International and
223 nearly all National Oil companies. However, the concept of PROJECTS as a DELIVERY SYSTEM to
224 "create, acquire, update, expand, repair, maintain and eventually dispose of ORGANIZATIONAL
225 ASSETS almost surely dates back hundreds if not thousands of years.

226

227 This model focuses on creating ASSETS to solve problems or exploit opportunities, with PROJECTS
228 being nothing more than a DELIVERY SYSTEM designed to "create, update, expand, upgrade,
229 upgrade, repair, maintain and eventually dispose of ORGANIZATIONAL ASSETS. Thus, the ASSET
230 solves the problem or creates value, not the project.

231 To help communicate as clearly and effectively as possible, the numbers shown below in RED
232 TYPEFACE (N) correspond to the graphic by referencing the GRAPHIC NUMBER (1) followed by the
233 Number from that graphic explaining that component. (Graphic number (i.e. **(1)** followed by the
234 COMPONENT or ELEMENT number **(1.1), (1,2), (1.3),** etc.

235

236 This convention applies to all future graphics that contain components that require further
237 narrative explanation. Supplemental or supporting graphics may well explain the tool/technique
238 and how to use or apply it in the unit's context and the processes associated with that unit.
239 Remember that the same tool or method can be (and often is) used on more than techniques while
240 producing different outputs or results.

241 One final cautionary note: as we start to get into ever more complex relationships, we want to
242 remind you that because projects are "complex, dynamic, adaptive" systems, what these
243 relationships between the different Units look like what is shown in Figure 4, appreciating that what
244 we are showing is a simplified version of the real or true interactions between these units.

245
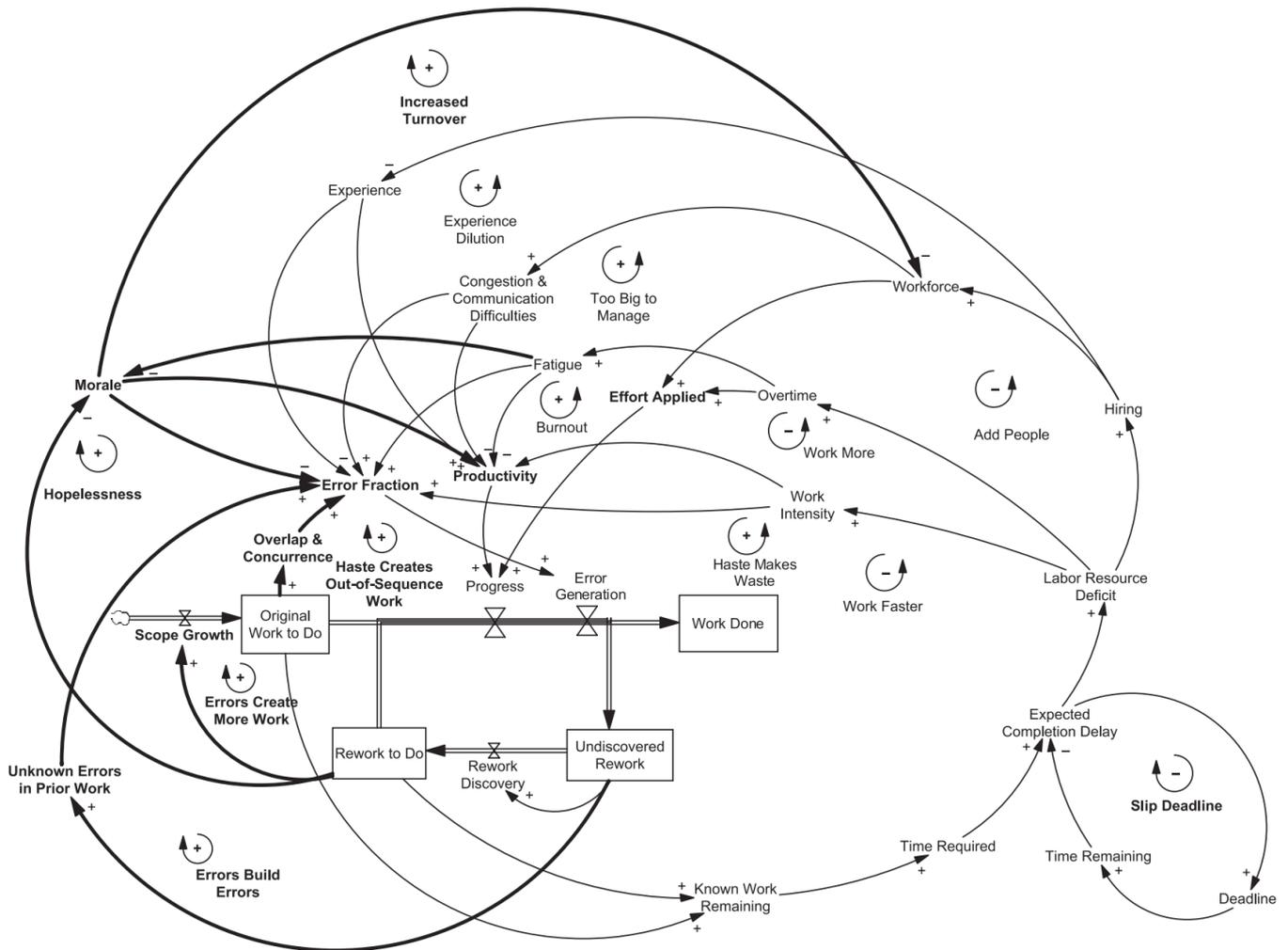
Figure 4- Systems Dynamics Model Showing the TRUE or REAL "Logic" in Project Management

Figure 4 has been shown as a reminder that the logic illustrated here is only a fraction of the real or true logical relationships, which helps explain one of the limitations of popular software such as MS Project or Oracle's Primavera P6 to portray the workflow realistically and that is none of those programs allow the use of those pesky FEEDBACK LOOPS which we show in all our graphics but only conceptually. What we fail to show but remain there nonetheless are the facts that these feedback loops can have both a compounding effect (making the impact greater than the sum of the parts or may have a dampening effect, hiding or masking the impacts. For more on this, see Simpson's Paradox, which we cover in **Unit 13- Managing Databases**.

255   ✓ **The Four Levels of Strategic Decision Making Defined**

Given the confusion caused by many who claim that project managers make strategic decisions, this book is based on research that originated with Sun Tzu 2500 years ago and has been reaffirmed over the years by Field Marshal Carl von Clausewitz and Helmuth von Moltke. It shows that in any

259 organization, there are four levels of strategic decision-making.

260

261 This model was recognized for project management around 1985 by R. Max Wideman, and informal
262 research done by our company over the past 30 years on our Fortune 500 clients indicates that this
263 model remains just as valid today as it was 2500 years ago when Sun Tzu first published it, validated
264 again in 1985 by Max and still useful today in most organizations. All we can do is urge you to look
265 at your organization to see if this is or is not valid, and if not, what strategic decision-making model
266 are you using?

267 This will be explored in more detail when we get into —Managing People, but as we progress through
268 the process maps, we must understand who these 4 "actors" or "actresses" are and what roles and
269 responsibilities they have in our story. It also raises the question of those who claim that project
270 managers make strategic decisions consistent with the "scientific method" tenets to prove these
271 claims. Consistent with the tenets of the "Scientific Method," where is your proof to support your
272 claims?

273   o   **(5.1)- GRAND STRATEGY-**

274   At the 15,000-meter view, we can see that the "C-Level" actors are responsible for establishing
275   the organization's "Grand Strategy. "Black's Law Dictionary defines "Grand Strategy" as "Entity
276   planning of major goals and objectives. Essential corporate actions mapped to a comprehensive,
277   long-term plan. Market, product, and organizational development tied to the acquisition,
278   divestiture, diversification, joint ventures, and strategic alliances are all key factors in the
279   objectives and the planning."[9] For more on the topic of "Grand Strategy," we recommend this
280   2017 paper by Nina Silove, "Beyond the Buzzword: The Three Meanings of "Grand Strategy."

281   o   **(5.2)- STRATEGY-**

282   Investopedia defines "Strategic Management" as "the management of an organization's
283   RESOURCES (logistics) (Unit 7) to achieve its goals and objectives. Strategic management
284   involves setting objectives, analyzing the competitive environment, analyzing the internal
285   organization, evaluating strategies, and ensuring that management rolls out the
286   strategies across the organization."[10] Note that in this document, the terms "RESOURCES" and
287   "ASSETS" are used synonymously, understanding the fundamental principle that it "takes assets
288   to "create, acquire, update, expand, repair, and maintain new or existing assets"? Also,
289   appreciate that what we refer to as "Asset Managers" are almost always FUNCTIONAL
290   managers? i.e., HR manages/controls Human Assets? Is finance responsible for the allocation of
291   Financial Assets? Engineering and IT manage Knowledge Assets? Keep that in the back of your
292   mind as you read this book.

293   o   **(5.3)- GRAND TACTICS or OPERATIONS-**

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[9] Black's Law Dictionary Online (N.D.) https://thelawdictionary.org/grand-strategy/
[10] Investopedia Definition of "Strategic Management" (2020) https://www.investopedia.com/terms/s/strategic-management.asp

294   Investopedia defines Operating activities as "the functions of a business causally related to
295   providing its goods or services to the market. These are the company's core business activities,
296   such as manufacturing, distributing, marketing, and selling a product or service. Operating
297   activities will generally provide the majority of a company's cash flow and largely determine
298   whether it is profitable."[11] In OWNER organizations, Operations Managers are genuinely the
299   "stars" of the show. Why? Because it is operations that produce whatever products or services
300   the company is in business to provide. IF you are a PROJECT MANAGER and want to be the
301   "star" of the show, then you need to join a CONTRACTOR organization, where projects are
302   PROFIT centers.[12]

303   o **(5.4)-TACTICS-**

304   "Short-term, easily identifiable objectives. With simple goals set by the Operational or Asset
305   Management level of management, the tactical goals are all bite-sized parts and parcels of the
306   higher-level game plan. This level is primarily concerned with IMPLEMENTATION, and the
307   personnel and other resources or assets employed here are technically proficient and capable.
308   Junior officers and senior Non-Commissioned Officers manage combat. Securing and defending
309   geographic points and persons or denying the same to the enemy are easily identifiable tactical
310   goals. This level takes objectives within a battle."[13] Doesn't this describe EXACTLY what project
311   managers are responsible for? Deliver on time? Within Budget? No lost time injuries? No
312   environmental or OSHA citations?

313 Consistent with the Scientific Method, until or unless someone can provide PROOF showing how
314 project managers are empowered to make STRATEGIC decisions, anyone trying to claim that project
315 managers are STRATEGIC is nothing more than "frauds, charlatans, or snake oil sales(wo)men."
316 People use buzzwords to sell their books with no grounding in reality.

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[11] Investopedia Definition of "Operations" (2020) https://www.investopedia.com/terms/o/operating-activities.asp
[12] Sauer Chris, Li Liu and Kim Johnston (2001) "Where Project Managers are Kings"
https://csbweb01.uncw.edu/people/rosenl/classes/OPS100/Where%20Project%20Managers%20are%20Kings.pdf
[13] An Introduction to Strategic Studies (N.D.)
https://en.m.wikiversity.org/wiki/What_Is_Strategy%3F_Why_Study_Strategy%3F
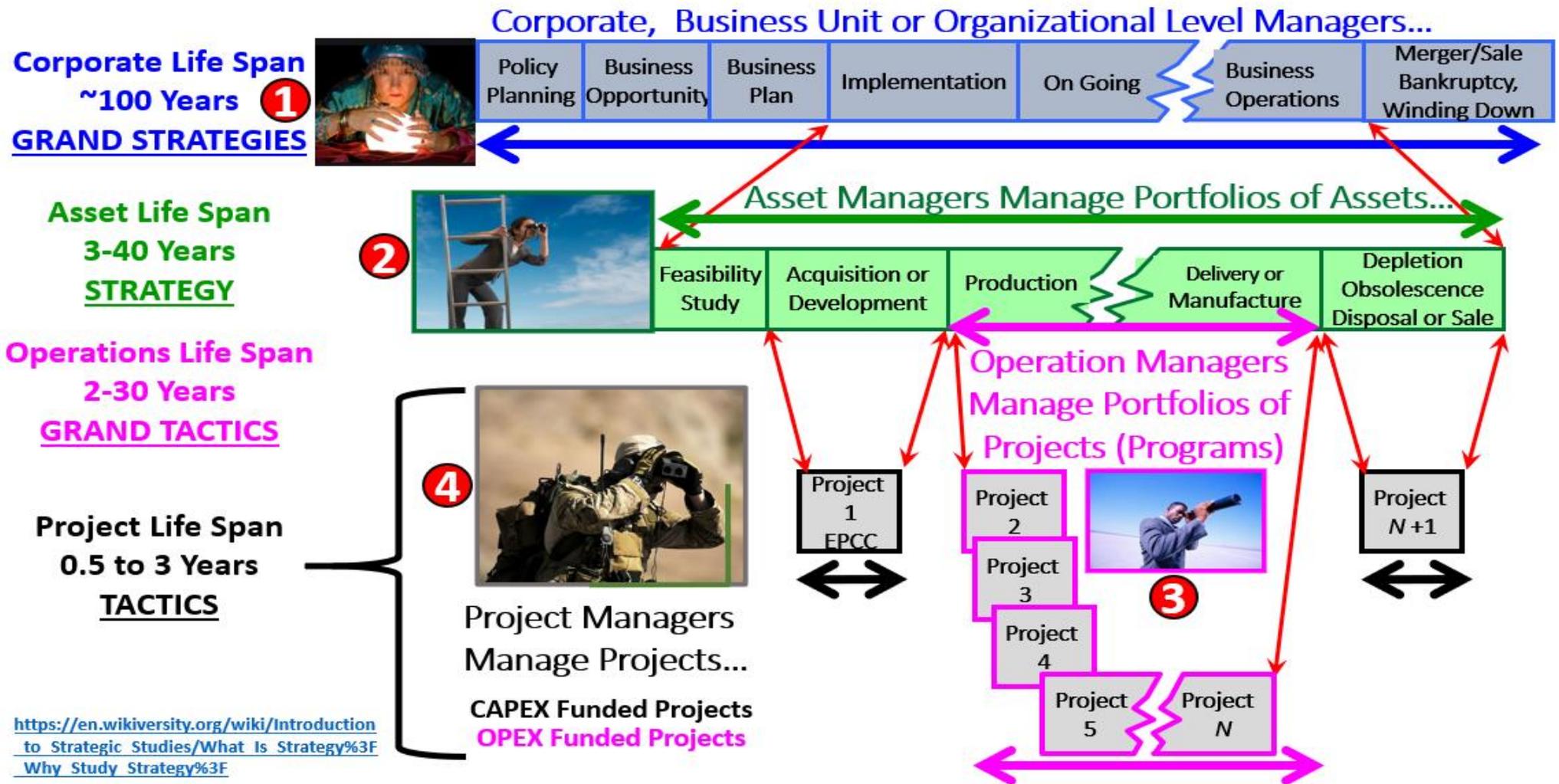
Figure 5- Introducing the Four "Actors" for Integrated Asset, Portfolio, Program, and Project Management and their Roles- 15,000 Meter View. (Adapted from published work of Max Wideman, circa 1985, Used with permission
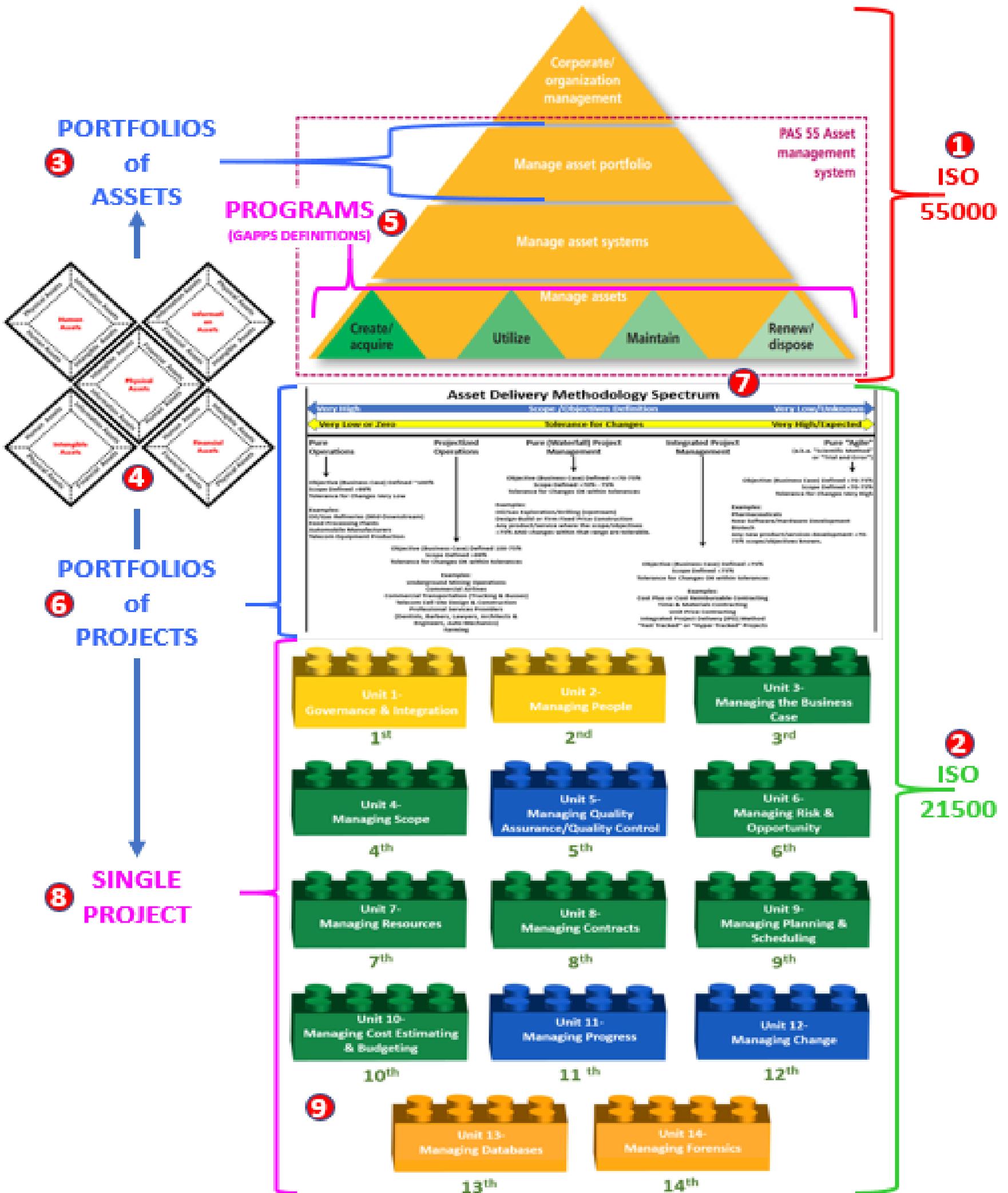
319 **Figure 6- Fully Integrated Asset, Portfolio, Program, and Project Management Process Map: 10,000 Meter View**

320 **NOTE: This graphic has been set up for printing/plotting on B3 paper (364 mm X 514 mm or 14.33 inches X 20.24 inches)**

321

322 The numbers are shown below in **RED TYPEFACE (*N*),** corresponding to the graphic shown in **Figure**
323 **(6.1) ISO 5500:2018**-

324 ISO 55000 evolved from British Standards PAS 55.1 and PAS 55.2. The PAS Asset Standards were
325 developed by a consortium of 50 organizations from 15 different industry sectors in 10 countries.
326 They have been adopted and applied in most industries, public and private sectors, and different
327 regulatory regimes, cultures, and environments. Benefits from these implementations range from
328 "it provided a structured basis for coordinating all our efforts into a common, business-prioritized
329 direction" to very substantial bottom-line performance gains.
330
331 Because PAS 55 is publicly available and because PAS 55 and ISO 55000 cover the same topics,
332 consistent with the principles underlying this publication by selecting only those "best tested and
333 proven" practices freely available on the internet, these are the graphics we have incorporated into
334 this document- **PAS 55 Part 1- Specification for the optimized management of physical assets**-
335 and **PAS 55 Part 2- Guidelines for the Implementation of PAS 55**- ISO 55000:2014 and 55000:2018
336 provides an overview of asset management, its principles and terminology, and the expected
337 benefits from adopting asset management. ISO evolved from British Standards PAS 55.1 and PAS
338 55.2

339 ISO 55000:2014, the "2nd Generation" of PAS 55, can be applied to all types of assets and by all
340 types and sizes of organizations.

341 "The ISO 55000 series comprises the three standards in asset management—ISO 55000, ISO 55001,
342 and ISO 55002. When used together, the three standards provide a framework and guidelines for
343 developing an integrated and effective asset management system. Such a system includes both
344 tangible and intangible assets. These standards were developed over several years to create a
345 universal standard in asset management systems." For a 10-minute video explaining the asset
346 management process, go HERE.
347

348 ✓ **(6.2) ISO 21500:2012**

349 ISO 21500:2012 guides project management and can be used by any organization, including public, private,
350 or community organizations, and for any type of project, irrespective of complexity, size, or duration.

351 ISO 21500:2012 provides a high-level description of concepts and processes considered to form
352 good project management practice. Projects are placed in the context of programs and project
353 portfolios; however, ISO 21500:2012 does not provide detailed guidance on managing programs
354 and project portfolios. Topics about general management are addressed only within the context of
355 project management.
356
357 ISO 21500:2012 was just replaced with ISO 21502:2020 and is even worse than 21500, which was

358 not widely accepted or adopted by project managers. This article by Dr. Paul D. Giammalvo explains
359 why it is flawed and should be replaced

360 ✓ **(6.3) and (6.4) Portfolios of ASSETS- 5.000 Meter Perspective**

361 The Business Dictionary defines an "Asset" to be: **Figure 7 (6.3 and 6.4)- Portfolios of Assets**

362 o "1. Something valuable that an
363 entity owns, benefits from, or uses
364 in generating income. 2.
365 Accounting: Something that an
366 entity has acquired or purchased,
367 and that has monetary value (its
368 cost, book value, market value, or
369 residual value)."

370 o An asset can be (1) something
371 physical, (TANGIBLE) such as cash,
372 tools, machinery, inventory, land,
373 and buildings, (2) or INTANGIBLE
374 like an enforceable claim against
375 others, such as accounts
376 receivable, (3) a right, such as a
377 copyright, patent, trademark, lease
378 or (4) an assumption, such as
379 goodwill. Assets can also be alive,
380 like humans, livestock, or pets.
381 o Assets are shown on their owners'
382 balance sheets and are usually classified according to the ease with which they can be
383 converted into cash.
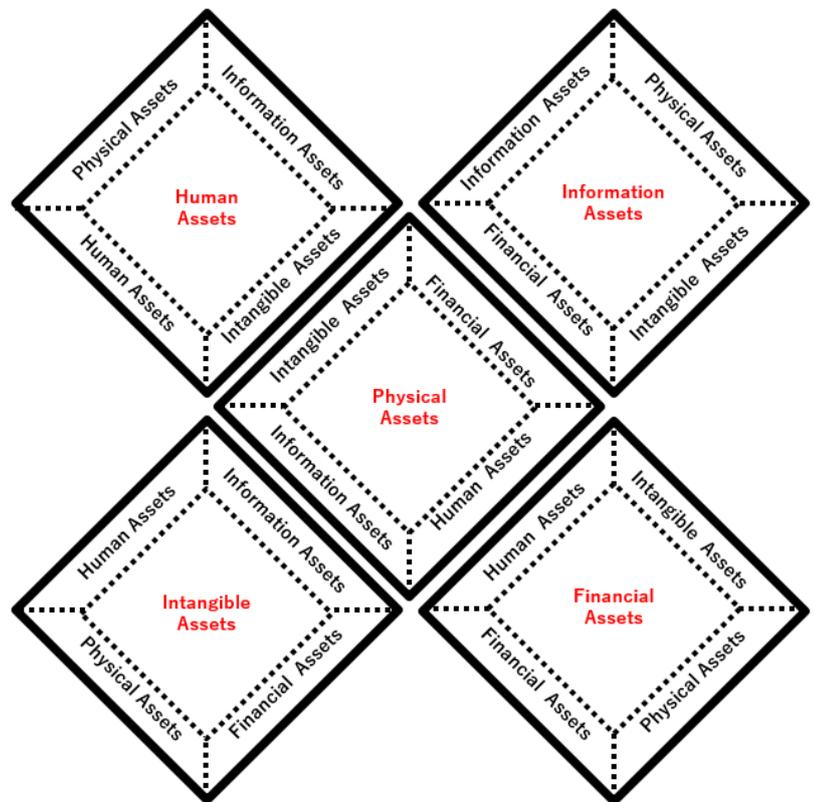
384 We will explore this in more detail later, but notice that these ASSETS are owned and controlled by
385 "Line" or "Functional" managers? This becomes important when we understand the potential
386 impact the control and allocation of these usually scarce or limited ASSETS have on PROJECT
387 portfolios. Note that the term RESOURCES is also synonymous with ASSETS when used in this
388 context.

389 Lastly, the Business Dictionary defines "Asset Management" as "Prudent administration of
390 investable (liquid) assets, aimed at achieving an optimum risk-reward ratio." We will delve into this
391 in greater detail, especially in Unit 2—.

392 ✓ **(6.5) PROGRAMS- 1,000 Meter Level Perspective (Operational Level)**

393 Programs represent a thorny problem not uncommon in project management, trying to establish a
394 common LEXICON or VERNACULAR for Integrated Asset, Portfolio, Program, and Project
395 Management (IA3PM). This can be illustrated by visiting Max Wideman's Comparative Glossary of
396 Project Management Terms, where you will find 13 definitions for "Program" or "Programme."

397 Based on the research of Sergio Pelligrinelli, the Global Alliance for Project Performance Standards
398 (GAPPS) reaffirmed his research showing that there are four very different definitions for
399 "Program" and that not only did everyone swear their definition was the correct one, no one was
400 even willing to consider changing. Thus, we ended up with four generic descriptions.

Program Characteristic	Type of Program			
	Strategic Program	**Operational Program**	**Multi-Project Program**	**Mega-Project**
General Purpose	Deliver assets and benefits that are directly linked to attaining the sponsoring organization's future state	Deliver assets and benefits that are critical to the sponsoring organization's day to day operations	Achieve synergies from projects with common traits such as shared resources, similar clients or product technology	Deliver a specific asset to the sponsoring organization
Examples	New Oil, Gas or Mining Lease Development, New Software Program, Pilot TV Show, New Vaccine Development, Capacity Building, Sustainability	Scheduled/Preventive Maintenance, Shut Downs, Turn Arounds, Enhanced Oil Recovery, Software Updates & Patches, Health, Safety & Environmental Initiatives	Space Station, Oil Field or Mining Operations, TV Series after the pilot, Farming, Auto Repair Shop, Doctor/Dentist/Law Office, Any "Projectized Operations"	Anything NASA does, Most Infrastructure Projects, Disaster Recovery/Rebuilding, Mining Asteroids, Autonomous Machines
Key Differentiating Feature	Link to a specific business goal or strategic initiative	Relative interdependence of constituent projects	Relative interdependence of constituent projects	Significantly larger than the sponsoring organization's typical projects
Reason for Grouping Projects	Early results influence decisions about later projects	Minimize negative impact to ongoing operations	Benefits expected from synergy	So much larger than the organization's typical projects.

401 **Figure 8–** Definitions of "Program" from GAPPS with Examples

402 Notice in Figure 8 that the demarcation lines between the definitions are porous and expansive
403 with grey fill. This indicates that other definitions are in use by some organizations that don't fit
404 neatly into any single existing category but cross boundaries and make things even more
405 complicated. The context or perspective may impact the terminology one might use. We may label
406 a much larger project for a CONTRACTOR as a MEGA-PROJECT, yet from the OWNER'S perspective,
407 he/she may mark it as a Strategic Program. So context and perspective matter, as do the relative
408 size and complexity. For this reason, given that project management is a BUSINESS undertaking, we
409 rely on credible Business Dictionaries whenever possible to define the terms we use in this book.

410 ✓ **(6.6) and (6.7) Portfolios of PROJECTS**

411 Portfolios of Projects are the summation of 100% of the projects that any organization is "initiating,
412 planning, executing, controlling, or closing" at any given point in time. This portfolio may or may
413 not be part of a program, so be sure to be clear on those definitions.

414   o   For owners, projects fall into four generic categories, and all of them compete for scarce or
415   limited resources (assets) that any organization has available.

416   •   Revenue Generating or "Top Line" Projects - Sales and Marketing Initiatives, New
417   Plant Construction (Capital Investment), or Mergers/Acquisitions/IPOs (New Market
418   Penetration)

419   •   Cost Containment or "Bottom Line" Projects - Reorganizations, Outsourcing,
420   Enterprise Software Solutions, Process Reengineering, Project/Program/Portfolio
421   Management Offices

422   •   Government-Mandated Projects - SOX/BASIL II, Environmental Protection or Labor
423   Law Compliance

424   •   Community Service or "Good Will" Projects - designed to improve the image or
425   credibility of the organization

426 While Contractors may also have the same categories of projects internally to the organization, as
427 projects are PROFIT CENTERS for Contractors, most of their projects will be revenue-generating
428 projects.

429 This vastly differs from owners for whom a project is either a cost or an investment center.

430 Owner organizations look at all the potential projects they can pursue in a year or other specific
431 period in time. They rank order all projects in terms of their Internal Rates of Return (IRR) or
432 Country Risk plus any other risk adjustments to give the risk-adjusted Return on Investment. The
433 example shown in Figure 3 shows that the Minimum Attractive Rate of Return (MARR) is equal to
434 the WACC + Risk Premium Adjustments. Only those projects that generate returns equal to or
435 greater than the MARR will be undertaken. Thus, Projects G and H will be deleted from the
436 portfolio. For more on this topic, see Unit 3- Managing Business Case, which will be explained in
437 detail, including the formulas. External Rates of Return (ERR) and select only those projects that
438 meet or exceed the Minimum Attractive Rate of Return (MARR), which is the Weighted Average
439 Cost of Capital (WACC) plus the Country Risks and any other Risk Adjustments such as location.
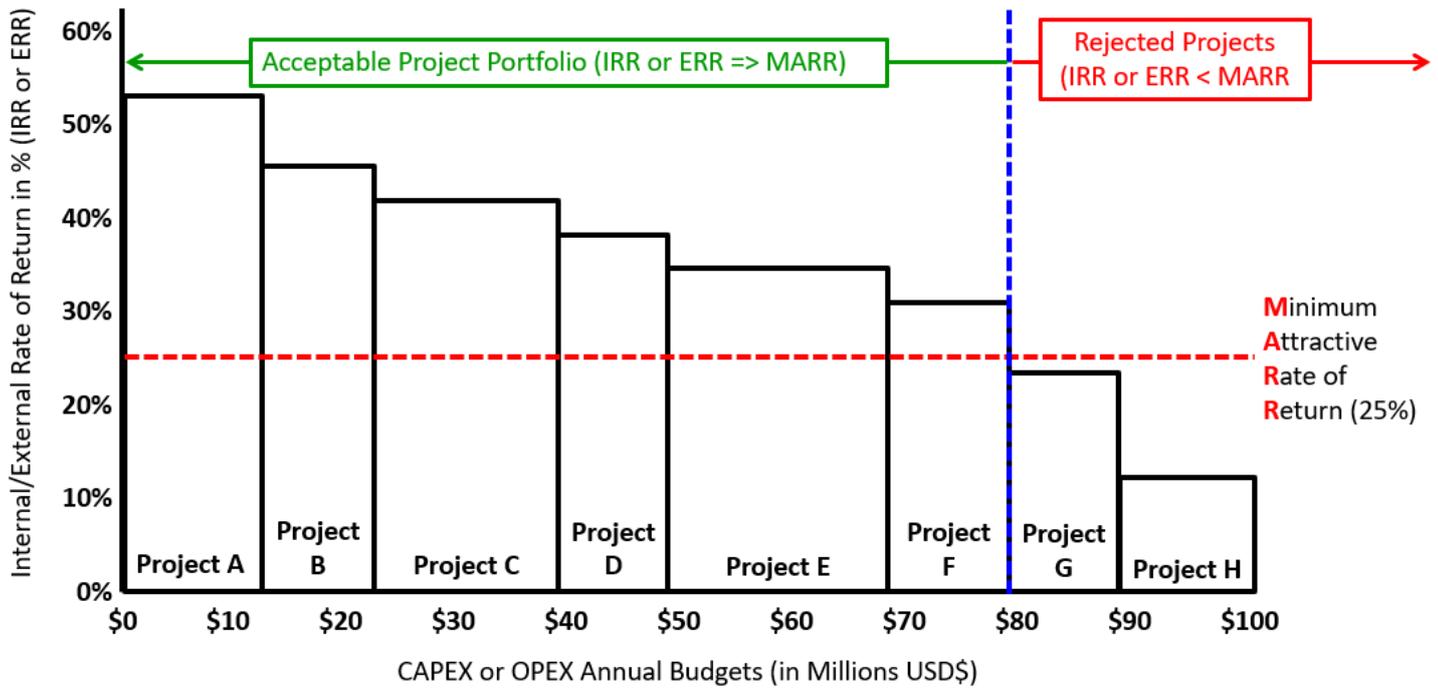
440 Figure 9- Portfolios of Projects Rank Ordered by IRR and selected/rejected based on MARR[14]

441 When looking at PROJECT PORTFOLIOS, we must consider the DEGREES OF DEPENDENCE between
442 two or more projects. Especially when looking at PROGRAMS, we often find that projects have
443 dependencies in many instances and must occur in a specific sequence. This information must be
444 communicated clearly to all stakeholders, specifically those in operations, as postponing or
445 canceling a project without knowing how it fits into the overall PROGRAM can lead to considerable
446 delay in time and loss of money, and deferring scheduled maintenance is a perfect example.

447

448

449

450

451

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[14] Adapted from Engineering Economy, 16th Edition, by Sullivan, Wicks and Koelling, Figure 13-4, Opportunity Costs and Risks, page 556.

Strategic Project Portfolio Management

Degrees of Dependence Between Projects

IF the results of the FIRST PROJECT would _____ by acceptance of the SECOND PROJECT…	… then the SECOND PROJECT is said to be _____ the FIRST PROJECT	Example
be technically possible or would result in benefits only	a prerequisite of	New SCADA System feasible only with the construction of new building to house it.
have increased benefits	a complement of	Additional hauling trucks more beneficial if a larger capacity loader was purchased
not be affected	independent of	A new air compressor and a security system for the warehouse
have decreased benefits	a substitute for	The purchase of an ERP computer system that has a CPM scheduling component built in
be impossible or would result in no benefits	mutually exclusive with	Brand A CPM scheduling software or Brand B CPM scheduling software

452 **FIGURE 10- Degrees of Dependence Between Portfolios of Projects**[15]

453 The numbers are shown below in **RED TYPEFACE (N),** corresponding to the details shown in **Figure**
454 **11.7**.

455 ✓ **(11.7) Asset Delivery Options**

456 Figure 7 is essential as there is a raging debate between the various "Agilists," the "Waterfall"
457 advocates, and those who claim "Hybrid" systems.

458 When we step away from looking at a PROJECT centric approach and look at all the options, any
459 organization has to "create, acquire, update, expand, repair, maintain and eventually dispose of
460 ORGANIZATIONAL ASSETS, the whole debate can be resolved quickly and at least theoretically, to
461 everyone's satisfaction as these are not in any way COMPETING delivery systems but are
462 complementary and synergistic with the criteria to determine which of the Asset Delivery Systems
463 is "best" or "most appropriate" is easily determined by two attributes or parameters. Those are:

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[15] Adapted from Engineering Economy, 16th Edition by Sullivan, Wickes & Koelling, Table 13-2, Page 559

464 ✓ **(11.7.7.1)** The degree to which the SCOPE or OBJECTIVE of the project is known at the
465   outset of the project, which goes from 100% in operations to about 70-75% in a
466   construction environment using traditional "waterfall" to 0% in an "agile." These
467   percentages may or may not change, so before anyone starts to adopt or adapt this for use
468   in your organization, you must determine what these percentages are. This will become
469   critical when we begin to look at Unit 8, Contract Management, as the "real" or "honest"
470   scope definition determines which contract type is appropriate.
471 ✓ **(11.7.7.2)** The key stakeholders' tolerance or expectation of how much change they are
472   willing to accept. It runs from zero or close to zero in an operational environment to over
473   100% in a purely "agile" environment.
474 ✓ **(11.7.7.3)**   **Operations**

475 For OWNER organizations, Operations are their primary, if not the only, reason they are in business.
476 Their business model is designed around producing a product or service and selling that product or
477 service. Effectively, these organizations convert a physical (tangible) asset into a financial asset in
478 an operating environment. In this environment, the scope of work and the objective are
479 exceptionally well defined to the point of having a patent on the process or formula and guarding
480 that formula as a proprietary secret. In this environment, change, even the slightest change, is not
481 acceptable. In the world of IT, this is what is being called DevOps, which is "the combination of
482 cultural philosophies, practices, and tools that increases an organization's ability to deliver
483 applications and services at high velocity: evolving and improving products at a faster pace than
484 organizations using traditional software development and infrastructure management processes."
485 https://aws.amazon.com/devops/what-is-devops/ Explained another way, it is "mass production"
486 techniques being applied to software development, leading to what is becoming known as a
487 "Citizen Developer" or "Citizen Programmer"
488 https://www.techopedia.com/definition/30968/citizen-developer where the average person off the
489 street with little or no programming skills can take modularized software components (see our Lego
490 Block analogy) and using those blocks of programming, create their Apps.

491 Other examples include food processing plants, oil, gas, mineral processing plants, clothing and
492 other manufacturing facilities, seaports, sewerage treatment, rail and airport infrastructure, and
493 other ongoing operations.

494 ✓ **(11.7.7.4)**   **Projectized Operations**

495 This is probably the most common application of the project management processes and is often
496 ignored or misunderstood. In many ways, this is an operating environment EXCEPT that the
497 throughput is not constant but driven by a variable demand where each "customer" or "client"
498 represents a "project." This includes virtually all "Professional Services" firms- Doctors, Dentists,
499 Lawyers, Engineers, Professors, Accountants, Commercial Airline Pilots, Bus Drivers, and Truckers,

500 as well as all the trades, Carpenters, Plumbers, Electricians, and Masons and taken to an extreme,
501 even Barbers, Hairdressers, and auto mechanics.

502 In this environment, the scope of services is usually quite well defined (i.e., Divorce Lawyer, Real
503 Estate Lawyer), and the "projects" (each client who walks through the door) are, in fact, PROFIT
504 centers. This category of individual has built their business model around the processes required to
505 "initiate, plan, execute, control and close" projects as they are defined by each profession and trade
506 and from which they hope that the costs of providing those services are less than the fair market
507 value of the services they are providing.

508 The exciting aspects of this classification of "project managers" are how projects are "initiated,
509 planned, executed, controlled and closed" and are embedded into the process for them to learn
510 their profession or trade. In many cases, this category of "project managers" are licensed, and the
511 licensing process includes their technical skills and their project management skills.

7 Asset Delivery Methodology Spectrum

7.1 Scope /Objectives Definition — Very High ← → Very Low/Unknown

7.2 Tolerance for Changes — Very Low or Zero ← → Very High/Expected

Pure Operations **7.3**

Objective (Business Case) Defined ~100%
Scope Defined >99%
Tolerance for Changes Very Low

Examples:
Oil/Gas Refineries (Mid-Downstream)
Food Processing Plants
Automobile Manufacturers
Telecom Equipment Production
DevOps IT Projects

Projectized Operations

7.4

Objective (Business Case) Defined 100-75%
Scope Defined >99%
Tolerance for Changes OK within tolerances

Examples:
Underground Mining Operations
Commercial Airlines
Commercial Transportation (Trucking & Busses)
Telecom Cell Site Design & Construction
Professional Services Providers
(Dentists, Barbers, Lawyers, Architects & Engineers, Auto Mechanics)
Farming
Citizen Programmer/Citizen Developer (IT)

Pure (Waterfall) Project Management

7.5

Objective (Business Case) Defined =>70-75%
Scope Defined >70% - 75%
Tolerance for Changes OK within tolerances

Examples:
Oil/Gas Exploration/Drilling (Upstream)
Design-Build or Firm Fixed Price Construction
Updates to EXISTING Software projects with few new bells or whistles or other new features or capability.

Integrated Project Management **7.7**

7.6

Objective (Business Case) Defined <75%
Scope Defined <75%
Tolerance for Changes OK within tolerances

Examples:
Cost Plus or Cost Reimbursable Contracting
Time & Materials Contracting
Unit Price Contracting
Integrated Project Delivery (IPD) Method
"Fast Tracked" or "Hyper Tracked" Projects

Pure "Agile"
(a.k.a. "Scientific Method" or "Trial and Error")

Objective (Business Case) Defined <70-75%
Scope Defined <70-75%
Tolerance for Changes Very High

Examples:
Pharmaceuticals
New Software/Hardware Development
Biotech
Any new product/services development <70-75% scope/objectives known.

Figure 11- Asset Delivery Option Spectrum of Choice

513

Profession or Trade	Integrated Asset, Portfolio, Program and Project Management Examples			
	Single Project	Program (See GAPPS Definition)	Portfolio	Primary 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 Law, 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)

514 **Figure 12– Examples of Projects, Programs, Portfolios, and Assets for Selected**
515 **Trades/Professions.**

516   ✓   **(11.7.7.5)** "Waterfall" or "Traditional" Project Management

517 This is the classic approach that has evolved over hundreds if not thousands of years where an
518 OWNER organization wants to "create, acquire, update, expand, maintain, repair and eventually
519 dispose of ORGANIZATIONAL ASSETS and either using their EXISTING ASSETS/RESOURCES
520 "initiate, plan, execute, control and close a PROJECT, the purpose of which is to leverage their
521 existing ASSETS to create MORE or BETTER assets.   IF the Owner does not have enough of their
522 ASSETS/RESOURCES, they can OUTSOURCE some or all of the project to those who provide those
523 PROFESSIONAL SERVICES on a "for-profit" basis. (See 8.4) For OWNERS, projects are almost
524 always either COST or INVESTMENT centers. In owner organizations, rarely, if ever, do they make
525 money from the project itself. Owners make money, reduce costs, or otherwise realize BENEFITS
526 not from what has become known as the "Waterfall Method," which was initially documented
527 and published by Esso or Diamond Shamrock Oil during the mid-1950s, is an INTEGRATED Asset,
528 Portfolio, Program (Operations), and Project Management Methodology. Clearly, this is not
529 based on the PROJECT life span but the ASSET life span, doing the project by exploiting whatever

530 ASSET the project was undertaken to "create, acquire, update, expand, maintain, repair and
531 eventually dispose of."
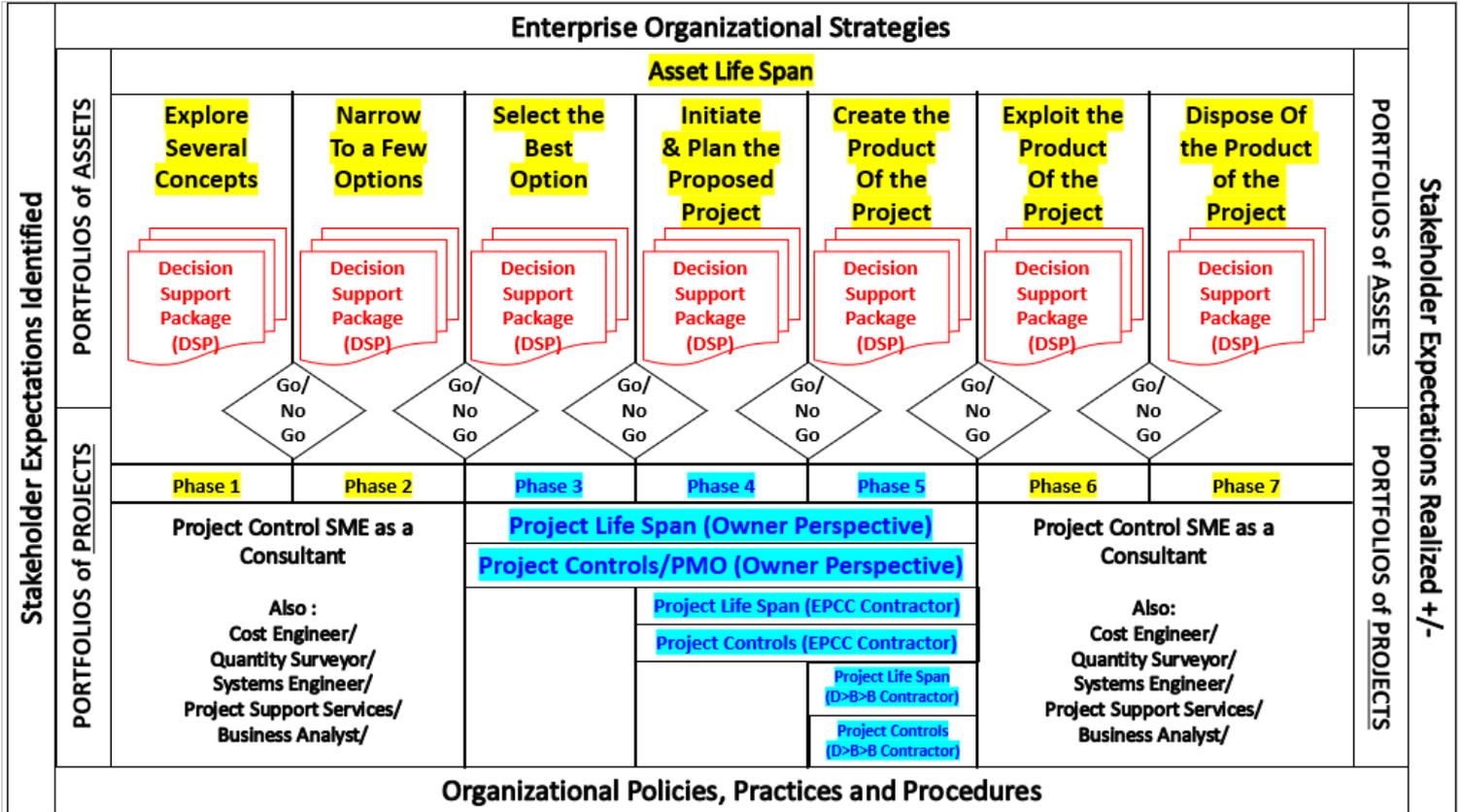
532 **Figure 13– Waterfall Model of the Integrated Asset, Portfolio, Program, and Project**
533 **Management Methodology**

534 As we can see from Figure 13, there is no project (highlighted in blue) until Phase 3 of the Asset
535 Life Span (shown in yellow highlight), and assuming the project is approved and funded, the
536 project is completed at the end of Phase 5 when the ASSET that the project was undertaken to
537 "create, acquire, expand, update, maintain or repair" is turned over to the Asset or Operations
538 Managers, put in service and used to (hopefully) generate the "benefits" for which the "asset" or
539 "product" the project was undertaken to "create, acquire, update, expand, upgrade, repair,
540 maintain and eventually dispose of."

541 From the CONTRACTOR's perspective, if the project is being delivered using the IPD approach,
542 he/she would be involved in all three Phases. If the project was contracted using Design-Build
543 (DB) or Engineer-Procure-Construct (EPC), the CONTRACTOR would participate in only two
544 phases. If the project were contracted using "Firm Fixed Price" or Unit Price type contracts, then

545 the CONTRACTOR would be engaged during Phase 5 or the project's Execution Phase. To give
546 more perspective, assuming a typical physical asset has a useful life span of, say, 30 years and
547 the phases 3, 4, and 5 only take on average 3-4 years, how realistic is it to expect the projects,
548 people, to be able to make STRATEGIC decisions about the Asset itself?

549   ✓ **(11.7.7.6)** **"Integrated Project Delivery" (IPD) Method**

550 This is a "trial and error" or "agile" method developed during the early 2000s by Architects and
551 some Engineers to help their clients who did not know precisely what they needed and wanted
552 AND were tolerant of or even expecting change to occur. This concept was evolving at the same
553 time our IT colleagues were re-discovering the same trial and error or "Scientific Method" and
554 named it "agile" or "Agile."

555 For more on this, refer to the American Institute of Architects' "Integrated Project Delivery" (IPD)
556 approach.

557 For more on IPD, see the Unit on Contracts as well.
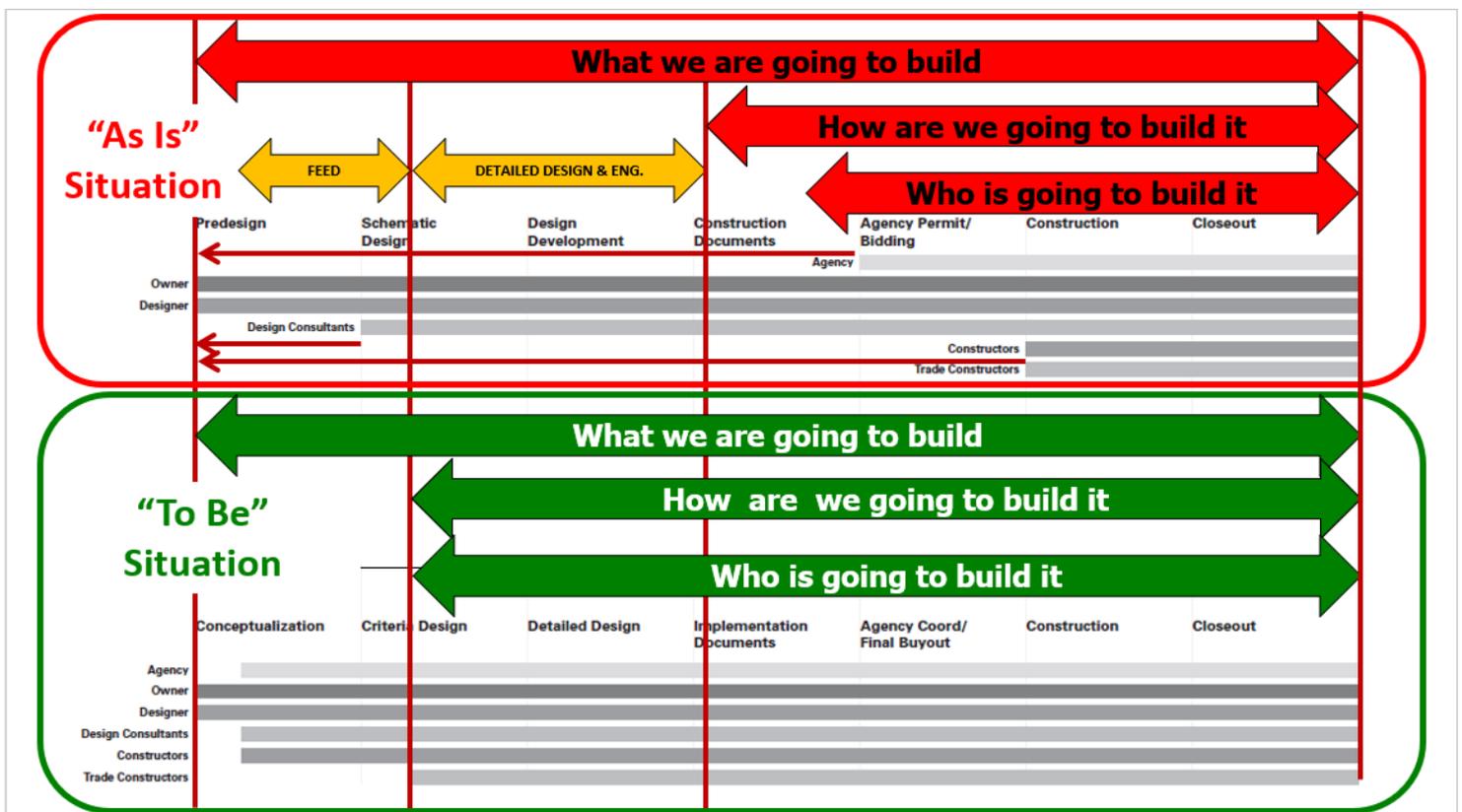
Figure 14 – AIA Integrated Project Delivery (IPD) Concept Map

559 For more on IPD, see the Unit on Contracts as well.

560   ✓ **(11.7.7.7)** "Agile," "Trial and Error," or "Scientific Method."

561 [The Agile Manifesto](#) notwithstanding,

562 what the world of IT is calling "agile"
563 or "Agile" is nothing more than the
564 same "trial and error" method used by
565 our [Neanderthal ancestors 300.000](#)
566 [years ago to tame fire](#) and the same
567 process used [6000 years ago to invent](#)
568 [the wheel](#), and the same method given
569 the name of the ["Scientific Method"](#)
570 around the 11th Century ([Ibn al](#)
571 [Haytham](#)) and which for the past 1000
572 or so years, has brought us hundreds
573 of thousands of new products and
574 services, including the telephone
575 (Bell), the lightbulb (Edison) and
576 penicillin (Fleming). Until or unless
577 people understand the FULL history,

Figure 15- Scientific Method Illustrated[16]

578 they cannot understand, much less be able to appreciate the irony, sarcasm, satire, farce, or
579 paradox that the more recent history has become. Think about the absurdity of it all. How can a
580 PROCESS so simple and basic that our Neanderthal ancestors were able to figure it out on their
581 own have evolved into the never-ending debate on the topic of agile vs. waterfall vs. hybrid?

582 Coming back to the PRINCIPLES underlying Integrated Asset, Portfolio, Program, and Project
583 Management, we must include the following GOVERNING PRINCIPLES:

584   ✓ **Empirical Observation**

585 The scientific method is empirical. It relies on direct observation of the world and disdains
586 hypotheses that contradict observable facts. This contrasts with methods that rely on pure
587 reason (including those proposed by Plato) and procedures that depend on emotional or other
588 subjective factors.

589   ✓ **Replicable Experiments**

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[16] University of Texas (N.D.) "The Scientific Method as an Ongoing Process"
https://utexaslearn.instructure.com/courses/2010099/pages/elaborate-scientific-hypothesis-and-theories

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

594   ✓ **Provisional Results**

595 The results of the scientific method are provisional; they are (or ought to be) open to question
596 and debate. If new data contradict a theory, that theory must be modified. For example, the
597 phlogiston theory of fire and combustion was rejected when the evidence against it appeared.

598   ✓ **Objective Approach**

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

602   ✓ **Systematic Observation**

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

608 Given that "agile" is nothing more than a more formalized version of the same "trial and error"
609 method used by our Neanderthal ancestors to tame fire, mapping "agile" to the Asset Life Span
610 does not require much more than applied "common sense." All we are doing is taking the
611 iterative processes associated with the "scientific method" and REPLACING the traditional
612 "linear" approach used in the waterfall to each of the phase gates. The model still works just as
613 well.

614 In this approach, the Asset Life Span does not change. The only differences are that each phase
615 gate requires more experimentation and iterations than is typically found in the pure waterfall
616 approach. That once the product of the project (always an asset) has been created and is turned
617 over to operations or the asset manager, that the final two phases play out regardless of which
618 method was used to create or develop the Asset

619 It is essential to recognize that this is NOT a project management methodology as is often
620 portrayed but an ASSET development methodology that is relatively LINEAR as we move through
621 each phase gate.

622 Because this method is so standard in so many projects and because so many people so poorly
623 understand it, we will walk you through the element component by component. Note the
624 numbers shown correspond to those shown in Figure 16.
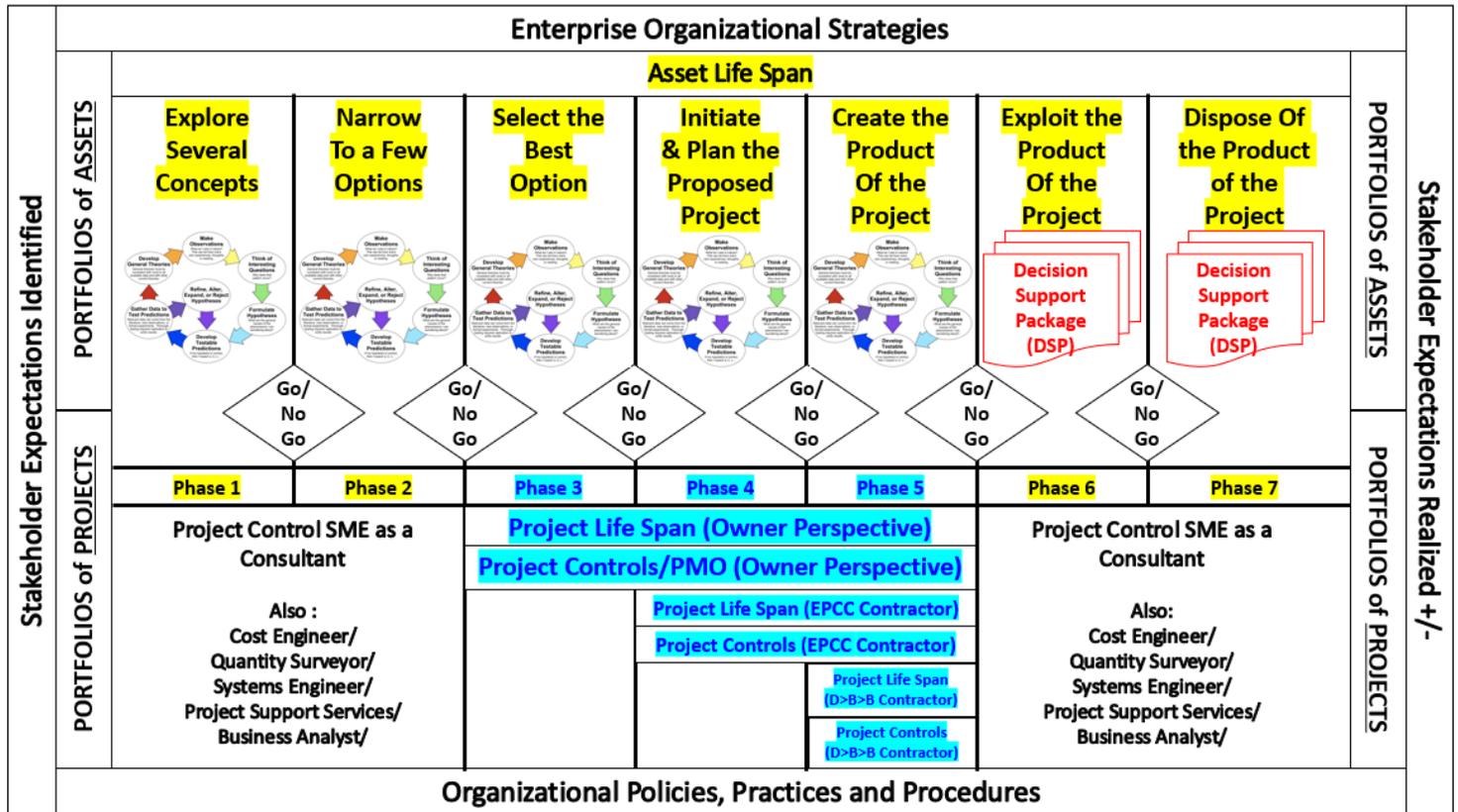
625 **Figure 16 – Mapping the Scientific Method (agile) to the Asset Life Span**

626 The numbers are shown below in **RED TYPEFACE (*N*),** corresponding to the graphic shown in
627 **Figure 17.0**

628 ✓ **(17.1) Stakeholder Expectations-**

629 This is a stakeholder-driven model where the stakeholders' needs, wants, and expectations are
630 supposed to be identified in the first phase and then UPDATED as we move through each of the
631 remaining Phase Gates. Implicit in this process is that as we proceed through each phase gate,
632 stakeholder expectations may have to be modified to be more realistic (For more on
633 Stakeholders, reference **Unit 2- Managing People**

634 ✓ **(17.2) Stakeholder Expectations Realized**

635 Suppose we follow this process the way it was designed, with new stakeholders being added
636 each time we pass through the next phase gate and communications with previously identified
637 stakeholders to make them aware of changes being made and negotiations in the event of
638 conflicts between different stakeholders when completed. In that case, the project should
639 substantially satisfy all stakeholder's needs, wants, and expectations.   For more information on
640 stakeholders, refer to **Unit 2- Managing People**.

641   ✓ **(17.3) Strategic Objectives**

642 When negotiating with stakeholders, the organization's strategic objectives should always be the
643 starting point. The objective is to progressively elaborate the Asset's design to maximize the
644 strategic benefits to the organization. For more on Strategic Objectives, reference Unit 1, Figure
645 5, and explanations

646   ✓ **(17.4) Organizational Policies, Procedures, and Practices**

647 Being bound by identifying and satisfying the stakeholders' needs, wants, and expectations to
648 maximize organizational strategic objectives govern, determine, or shape policies, procedures,
649 and practices. For more on Policies and Procedures, reference "Model Standard Operating
650 Procedures (SOP)."

651   ✓ **(17.5) Portfolios of ASSETS**

652 Not only is this model driven by the ASSET life span, not the project life span, but this model is
653 unique in so far as it recognizes that it "takes assets to make assets," that is, keeping in mind that
654 the terms "assets" and "resources" are used synonymously, that unless we have sufficient assets
655 or resources available to support the number of projects, one of the most significant risks is to
656 have too many projects and too few resources to staff or support those projects. As a "reality
657 check," ask yourself if the projects you are working on are understaffed or missing any five asset
658 classes (Money, People, Knowledge or Information, Tools or Equipment, or Support). If the
659 answer is YES, this stands as "prima facie" evidence that the processes matching the portfolio of
660 organizational assets or resources to the projects' portfolios are not being done effectively. For a
661 more significant explanation or review of what constitutes an Organizational Asset, see Unit 1,
662 Figures 7, 8, and 9.

663

Project Controls/PMO Handbook of "Best Tested and PROVEN Practices"
Researched and Compiled by the PTMC Team and Dr. Paul D. Giammalvo

③ Enterprise Organizational Strategies

⑦ Asset Life Span

① Stakeholder Expectations Identified

② Stakeholder Expectations Realized +/-

PORTFOLIOS of ASSETS — **⑤** — **PORTFOLIOS of ASSETS**

PORTFOLIOS of PROJECTS — **⑥** — **PORTFOLIOS of PROJECTS**

Explore Several Concepts	Narrow To a Few Options	Select the Best Option	Initiate & Plan the Proposed Project	Create the Product Of the Project	Exploit the Product Of the Project	Dispose Of the Product of the Project
⑩ Decision Support Package (DSP)	Decision Support Package (DSP)	Decision Support Package (DSP)	Decision Support Package (DSP)	Decision Support Package (DSP)	Decision Support Package (DSP)	Decision Support Package (DSP)
⑪ Go/No Go	Go/No Go	Go/No Go	Go/No Go	Go/No Go	Go/No Go	Go/No Go
⑨ Phase 1	⑨ Phase 2	⑨ Phase 3	⑨ Phase 4	⑨ Phase 5	⑨ Phase 6	⑨ Phase 7

Project Control SME as a Consultant

Also :
Cost Engineer/
Quantity Surveyor/
Systems Engineer/
Project Support Services/
Business Analyst/

⑧ Project Life Span (Owner Perspective)

Project Controls/PMO (Owner Perspective)

⑫ Project Life Span (EPCC Contractor)

Project Controls (EPCC Contractor)

⑬ Project Life Span (D>B>B Contractor)

Project Controls (D>B>B Contractor)

Project Control SME as a Consultant

Also:
Cost Engineer/
Quantity Surveyor/
Systems Engineer/
Project Support Services/
Business Analyst/

④ Organizational Policies, Practices and Procedures

664 **Figure 17 – "Waterfall" Model Showing Detailed Elements and Component**

(

666 **Figure 18– Asset Portfolio Manager's Role in Allocating Scarce/Limited Resources[17]**

667   ✓ The roles and responsibilities of the Asset Manager are clear and well established. He/she is
668   responsible for allocating scarce or limited resources (assets- people, machines, money, Knowledge
669   or information, and support services) to the portfolio of PROJECTS. In return, he/she is expected to
670   generate a favorable RETURN ON ASSETS or ROA, which is what the SHAREHOLDERS or other
671   critical organizational stakeholders expect. While rarely is there an actual job title of "Asset
672   Manager," most functional or line managers are, in effect, asset managers:

673   o Money is managed and controlled by Finance or Accounting Managers
674   o People are managed and controlled by HR Managers
675   o Knowledge is managed and controlled by Engineering or IT
676   o Equipment and Facilities are managed and controlled by Equipment Shops or Facilities
677   o Sales, Marketing or IT maintain intangibles. (Software is classified as an intangible asset)
678   o Information is collected and supported by any/all of them

679 This is almost guaranteed to generate tension between project managers and functional managers in their
680 roles as Asset Managers. There are often too many projects and insufficient assets or resources to meet
681 the projects' demands.

682

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[17] Adapted from Engineering Economy, 16th Edition by Sullivan, Wicks and Koelling, Figure 13-1, page 547

683 ✓ **(17.6) Portfolios of PROJECTS** (See Figure 5 and Figure 6 for more on this)

684 Whether an OWNER organization or a CONTRACTOR organization fails to balance or match the ASSETS or
685 RESOURCES we have available to the number of projects in our portfolio, we are setting the projects up for
686 failure. This is one of the "root causes" that we believe PMI's PMBOK Guide and PRINCE2 never worked as
687 they both ignore the asset (as a resource) managers' role. The "test" for this is straightforward: measuring
688 or assessing whether your projects do not have enough people, equipment, money, knowledge, or
689 information. If the answer is YES, then this indicates a failure to match portfolios of Assets to the portfolios
690 of Projects.

691 ✓ **(17.7) Asset Life Span**

692 While most dictionaries treat these
693 synonymously, using the term life
694 SPAN is technically more correct
695 than life CYCLE. In this model,
696 there is no "cycling," and the Asset
697 is created using the project
698 management processes shown in
699 this book. Still, it is sold,
700 decommissioned, or otherwise
701 disposed of at the end of the

Figure 19- ASSET Life SPAN Concept Illustrated terms

702 Asset's USEFUL LIFE. For OWNER organizations they do not realize any benefits DIRECTLY from the project.
703 For OWNER organizations, their "benefits" are derived not from the PROJECT but from the PRODUCT (the
704 Asset) that the project was undertaken to create. (For more on this, see Unit 3- Managing Business Case)

705 ✓ **(17.8) Project Life Span (Owners Perspective)**

706 In this model, the project from the OWNER'S perspective is nothing more than an "Asset Delivery System"-
707 a series of PROCESSES designed to "acquire, create, expand, upgrade, repair, maintain and eventually
708 dispose of ORGANIZATIONAL ASSETS. For OWNER organizations, a project is always a COST or INVESTMENT
709 center, while for a CONTRACTOR, a project is a PROFIT center.

710 ✓ **(17.9) Phases of the Asset Life Span**

711 Because this is an ASSET-centric model, not a PROJECT management model, we have chosen to show how
712 the PROJECT life span is a SUBSET of the ASSET life span. Before Phase 3, there is no project. Only
713 POTENTIAL projects, and at the end of Phase 5, the ASSET is turned over to the Asset or Operations
714 Manager and put into service. (See Figure 1 for a simple illustration)

715 Because of a problem with people confusing the PHASES of the Asset Life Span with the PROCESS
716 GROUPINGS (Compare Figures 3 and 19), we have named these Phases "Phase 1-7", understanding that
717 some organizations have eight or even 9 Phase Asset Life Spans. The key is not the phase NAME but the
718 FUNCTION each phase serves:

719   ✓   **(17.9.1)** **Phase 1** is designed to explore the options available to solve a problem or exploit a
720   business opportunity. There is no PROJECT at this point, and may never be one. At the end of Phase
721   1, we should have produced at MINIMUM a Level 1 Business Case, a Level 1 WBS, a Level 1 Cost and
722   Resource Budget, Level 1 Risk/Opportunity Analysis and include this in the Level 1 Decision Support
723   Package. (DSP)

724   ✓   **(17.9.2)** In **Phase 2**, we start preliminary designs or options to solve the problem or exploit a
725   business opportunity. Again, at this point, there is no "project," and there may never be one. During
726   Phase 2, we start to refine the business case to see if investing money and time on any specific
727   "solution" is or is not worth doing. At the end of Phase 2, we should have produced at MINIMUM a
728   Level 2 Business Case, a Level 2 WBS, a Level 2 Cost and Resource Budget, Level 2 Risk/Opportunity
729   Analysis and include this in the Level 2 Decision Support Package. (DSP)

730   ✓   **(17.9.3)** **Phase 3** is where we narrow down the potential "solutions" to a single choice. This is
731   where a project is "born" or "created" from an OWNER'S perspective. This is where an owner
732   would issue a PROJECT CHARTER, appoint a project manager, providing funding for the next phase
733   along with the authority necessary to acquire resources either internally or externally to prepare a
734   DECISION SUPPORT PACKAGE (DSP) to present to the appropriate levels of management to obtain
735   authorization (including funding and delegation of authority) to move on to Phase 4. One of the
736   biggest and most important decisions the OWNER's project manager needs to make is if they want
737   to OUTSOURCE some or all of the work and, if so, what type of CONTRACT he/she is planning on
738   using. At the end of Phase 3, we should have produced at MINIMUM a Level 3 Business Case, a
739   Level 3 WBS, a Level 3 Cost and Resource Budget, Level 3 Risk/Opportunity Analysis and include this
740   in the Level 3 Decision Support Package. (DSP)

741   ✓   **(17.9.4)** **Phase 4** is where the OWNER will start to involve CONTRACTORS. IF the project is to be bid
742   under a "Design-Build" (DB) or "Engineer, Procure, Construct" (EPC), then the Owner will bid or
743   negotiate with a contractor to provide these professional services. Suppose the OWNER's PM and
744   other key stakeholders decide to do their engineering and procurement of long-lead items. In that
745   case, the Owner will be responsible for those professional services and will need to prepare the
746   bidding documents for just the EXECUTION phase of the Asset Life Span.

747   ✓   **(17.9.5)** **Phase 5**- Regardless of which contacting method the Owner has chosen, this phase is
748   where the work is done, whether by the Owner's workforce, a DB or EPC contractor, or a Firm Fixed
749   or Unit Price Contractor.

750   ✓   **(17.9.6)** **Phase 6**- When the project is COMPLETED, it has produced an ASSET. Once tested and
751   commissioned, this ASSET is accepted by the Asset Manager and turned over to OPERATIONS,
752   where the newly acquired Asset is put in service and starts to generate revenues, save money, or
753   otherwise begin to yield the benefits it was undertaken to produce. It is important to note that
754   until the net benefits have paid back the project's COST, there can be no "benefits realization" to
755   the organization. In other words, there can be no positive benefits until AFTER the payback period
756   has been achieved. Very few people today seem to realize this, particularly many in the Agile
757   community of practice who seem to believe "benefits realization" begins when the project is
758   completed and the Asset is put into service.

759   ✓   **(17.9.7)** **Phase 7** is when the ASSET has reached its USEFUL LIFE (as opposed to Economic,

760   ✓   Ownership or Physical life), it is decommissioned, sold, abandoned, or scrapped. Because this
761   calculation is based on USEFUL life, there is no "cycle" involved. When the ASSET is no longer
762   useful, it is no longer carried on the books even though it may have SCRAP value.

Guild of Project Controls Combined Asset and Project Phase Gate Names:	Deliverables from Each Phase (Decision Support Package- DSP)				Primary Purpose of each Phase	Other Commonly Used Phase Gate Names
	WBS	Risk/ Opportunity Analysis	Schedule Level Accuracy Range from P50	Cost Estimate Level Accuracy Range from P50		
Phase 1	Level 1	Business Risk/ Opportunity	Level 1 +100% to -20%	Level 1 +100% to -20%	To explore several concepts, ideas, options or alternatives	Concept, Prefeasibility, Appraise, Assess, Identify, Rough Order of Magnitude; FEL 1, FED 1
Phase 2	Level 2	Technical Risk/ Opportunity	Level 2 +60% to -15%	Level 2 +60% to -15%	To narrow down the alternatives to the top 2-3 "better" options	Feasibility, Conceptual Design, Pre-Feed, Select, FEL 2, FED 2
Phase 3	Level 3	Procurement Risk/ Opportunity	Level 3 +30% to -10%	Level 3 +30% to -10%	To select the"best" single option and "Initiate" the project	Design, Feed, Define, Develop, FEL 3, FED 3
Phase 4	Level 4	Constructability Risk/ Opportunity	Level 4 +15% to -5%	Level 4 +15% to -5%	To refine and plan the project scope, cost, time and risks, and validate assumptions	Define, FEL 4
Phase 5	Level 5	SH&E Risks Cost & Schedule, Resource and Quality Risks/ Opportunity	Level 5 +5% to -5%	Level 5 +5% to -5%	To execute the project plan to create whatever benefit or business objectives (the "product" of the project) the project was undertaken to achieve	Execute
Phase 6	N/A	Business Risk/ Opportunity	N/A	N/A	To exploit the PRODUCT of the PROJECT (the new Asset)	Operate
Phase 7	N/A	Business Risk/ Opportunity	N/A	N/A	To decommision, dismantle or otherwise DISPOSE of the ASSET	Dismantle, decommision, recycle, sell

763 **Figure 20 – Phase Gate Summary of Names, Deliverables, Purpose, and Alternate Names**

764   ✓   **(17.10) Decision Support Packages (DSP)**

765 The Decision Support Packages are the information the key decision-makers need to decide to PROCEED with
766 creating the ASSET, MODIFY the Asset, or KILL the project. Typically, a DSP contains, at MINIMUM, the following
767 information appropriate to the phase. Within these generally accepted ranges of accuracy baselined against a P50
768 cost and duration for comparable projects of the same type, size, and complexity in the same region or locality. (See
769 Unit 5- Managing QA-QC for more on making these adjustments)

770   o   Business Case
771   o   WBS
772   o   Risk/Opportunity Assessment
773   o   Schedule
774   o   Cost/Resource Budget

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781 ✓ **(17.11) Go/No Go Decision**

782 Based on the key stakeholder's
783 assessment of the information contained
784 in the DSP combined with an evaluation of
785 the current and anticipated business
786 environment, a decision is made to
787 PROCEED with the creation of the ASSET,
788 to MODIFY the Asset or to KILL the project.
789 While this can happen in any phase, if it
790 happens in Phases 1 or 2, there is never
791 even a "project" yet. If the decision is

Figure 21 (17.11) - Go/No Go Decision Illustrated

→ **KILL Project**
→ **MODIFY Project**
→ **PROCEED "As Planned"**

792 made at the end of Phase 2 on a single solution, only then will a "project charter" be issued and funding
793 provided for Phase 3. If the project is still viable at the end of Phase 3, then approval is made to proceed to
794 Phase 4, along with appropriate funding and a formal delegation of authority.
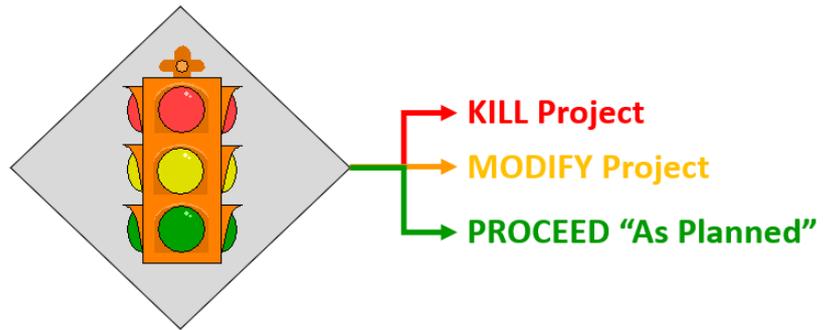
795 ✓ **(17.12) Phases 4-5 Execution Phase** using EPC or Design>Build Methods

796 Suppose the OWNER'S key stakeholders have decided to OUTSOURCE using a Design-Build (DB) or
797 "Engineer, Procure, Construct" (EPC) contracting arrangement. In that case, this is where the DB or EPC
798 contractor would take over. It is imperative to keep in mind that a project is always a PROFIT center for a
799 CONTRACTOR, while for an OWNER, the project is always a COST or INVESTMENT center. That the Owner
800 does NOT realize any benefits until the ASSET that the project created has been accepted, put into service,
801 and achieved PAYBACK. It is only AFTER the project has paid back the investment made can the
802 organization claim any Economic Value Added (EVA)

803 ✓ **(17.13) Phase 5 Execution Phase** using Lump Sum, Firm Fixed Price Contracting Methods

804 If the OWNER has chosen only to outsource the EXECUTION phase, usually done using a Firm Fixed Price or
805 Unit Price Contract, the CONTRACTOR is involved. As noted above, it is essential to realize that projects are
806 PROFIT centers for CONTRACTORS and COST or INVESTMENT centers for OWNERS. Because of two
807 different and, in some cases, mutually exclusive perspectives, it impacts the focus and decisions made by
808 the Owner and Contractors project managers and project control/PMO managers and team members.

809 Another graphic is commonly seen to illustrate this integrated Asset, Portfolio, Program, and Project
810 Management Life Spans known as the MacCleamy or Paulson Curve or, for our IT colleagues, the Boehm
811 Curve. For more on this, see the research by Daniel Davis-

812 The graphic shown in Figure 22 dates to the early to mid-1970s and illustrates what is known in "Big Oil" as
813 "Front End Loading" or "FEL." The concept, which originated around the same time in both construction
814 (Paulson and MacLeamy) and IT (Boehm), tells us ("applied common sense"?) that the better job of
815 defining what we need or want as early as possible in the asset life span, the less expensive it is to make
816 changes early on- that the later in the project you discover you missed something or did something wrong,
817 the more expensive it is to correct or remedy it.
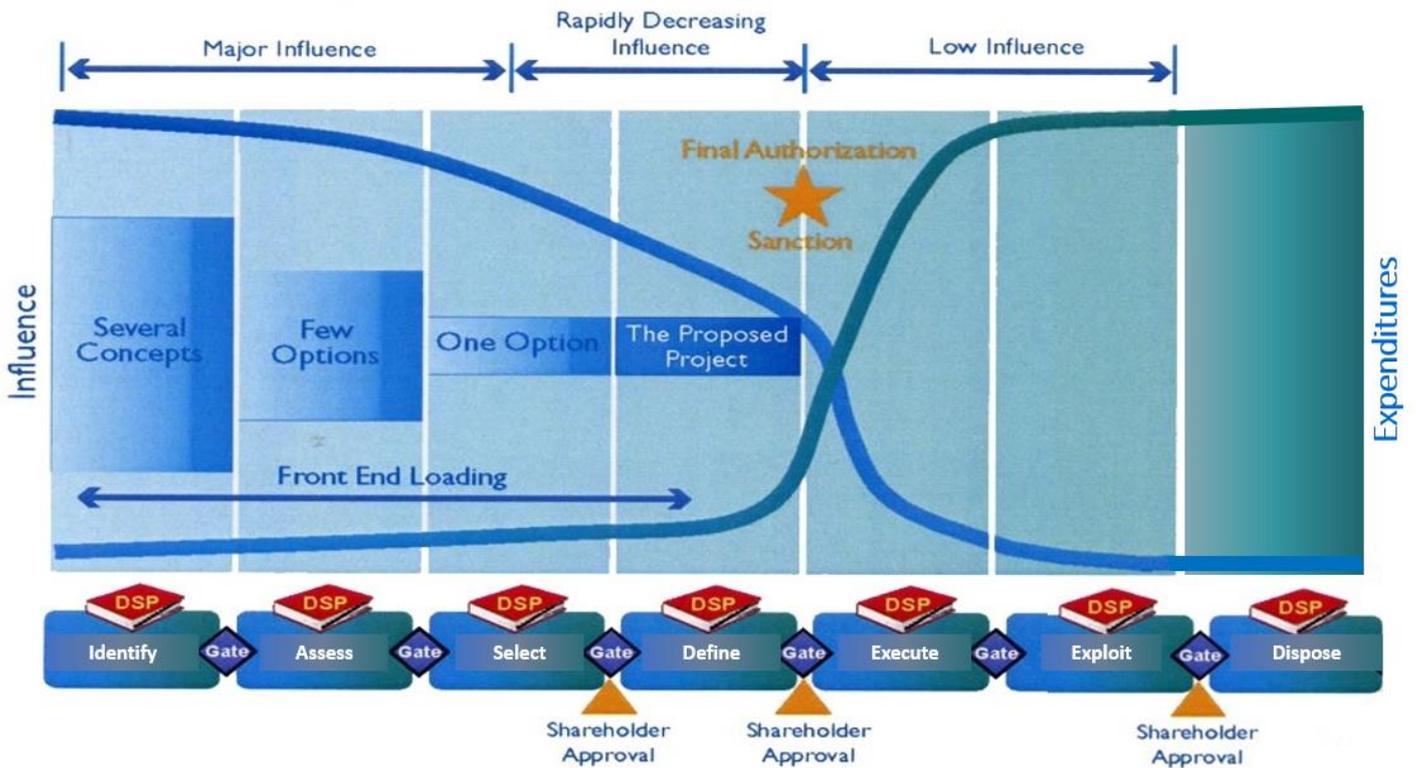
818   **Figure 22 – Asset Life Span Showing the "MacCleamy" or "Paulson Curve" or, for our IT Colleagues, the**
819   **"Boehm Curve"[18]**

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[18] *Paulson, Boyd C. 1976. "Designing to Reduce Construction Costs." Journal of the Construction Division 102 (4): 587-592.*
The actual graphic was taken from the Zadco Oil website about 10 years ago and is no longer accessible.

837   ✓   **Why Adopt the Lego Block Analogy?**
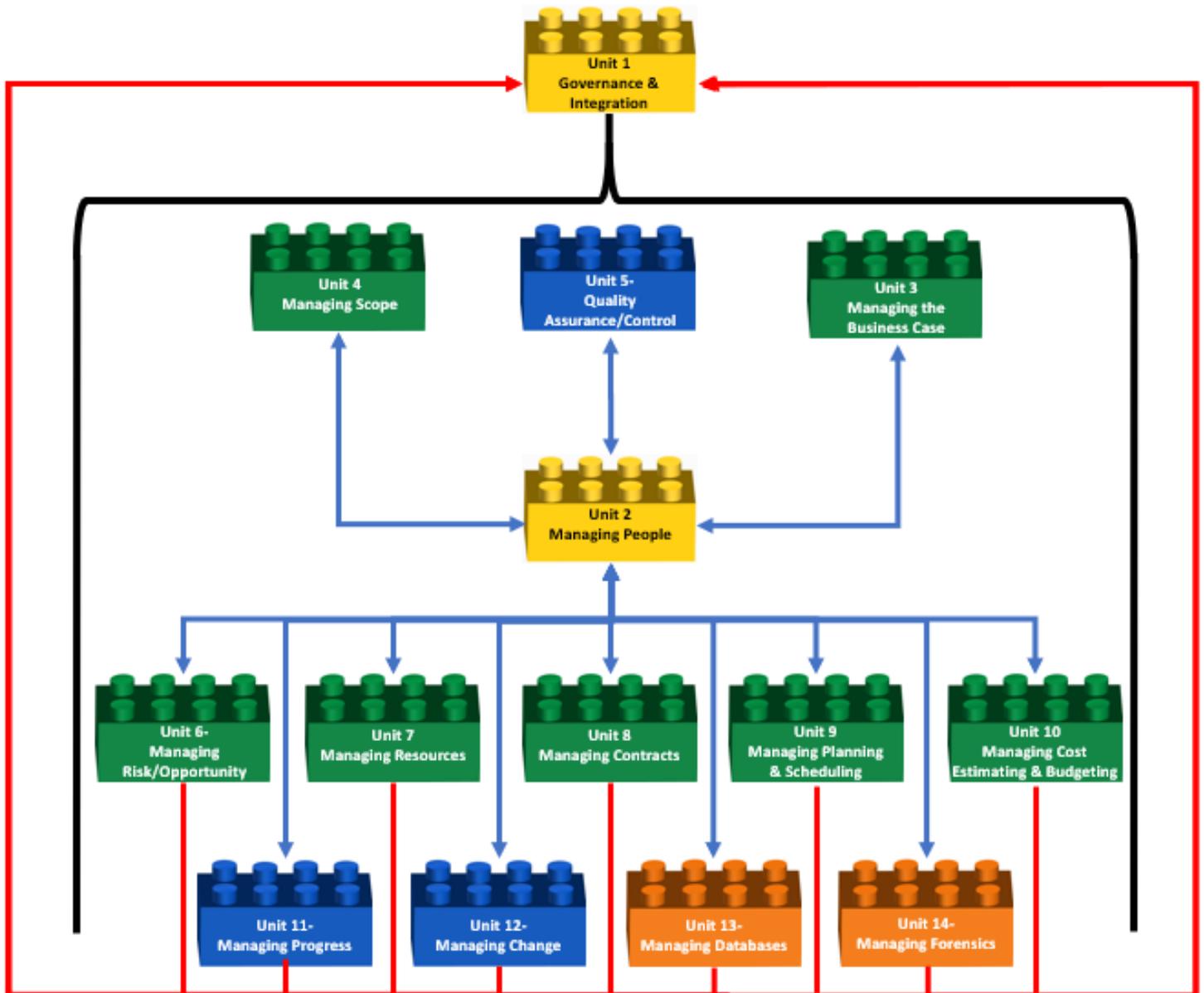
All Feedback Using Double Loop Learning
(Argyris & Schon)

838 **Figure 23- Single Project Structure from the 1,000 Meter View (6.8) and (6.9)**

839 In Figure 23, we can see how Unit 1- Managing Governance and Integration provides us with a guide

840 showing us how the Lego Blocks can all fit together, giving us the flexibility, adaptability, and scalability in

841 creating the process that works for our specific project, that while PEOPLE are at the center of everything,

842 they are constrained or limited by the Business Case (Unit 3), Unit 4, Quality Assurance and Quality

843 Control, not of the PRODUCT OF THE PROJECT but the PRODUCTS and SERVICES provided by the
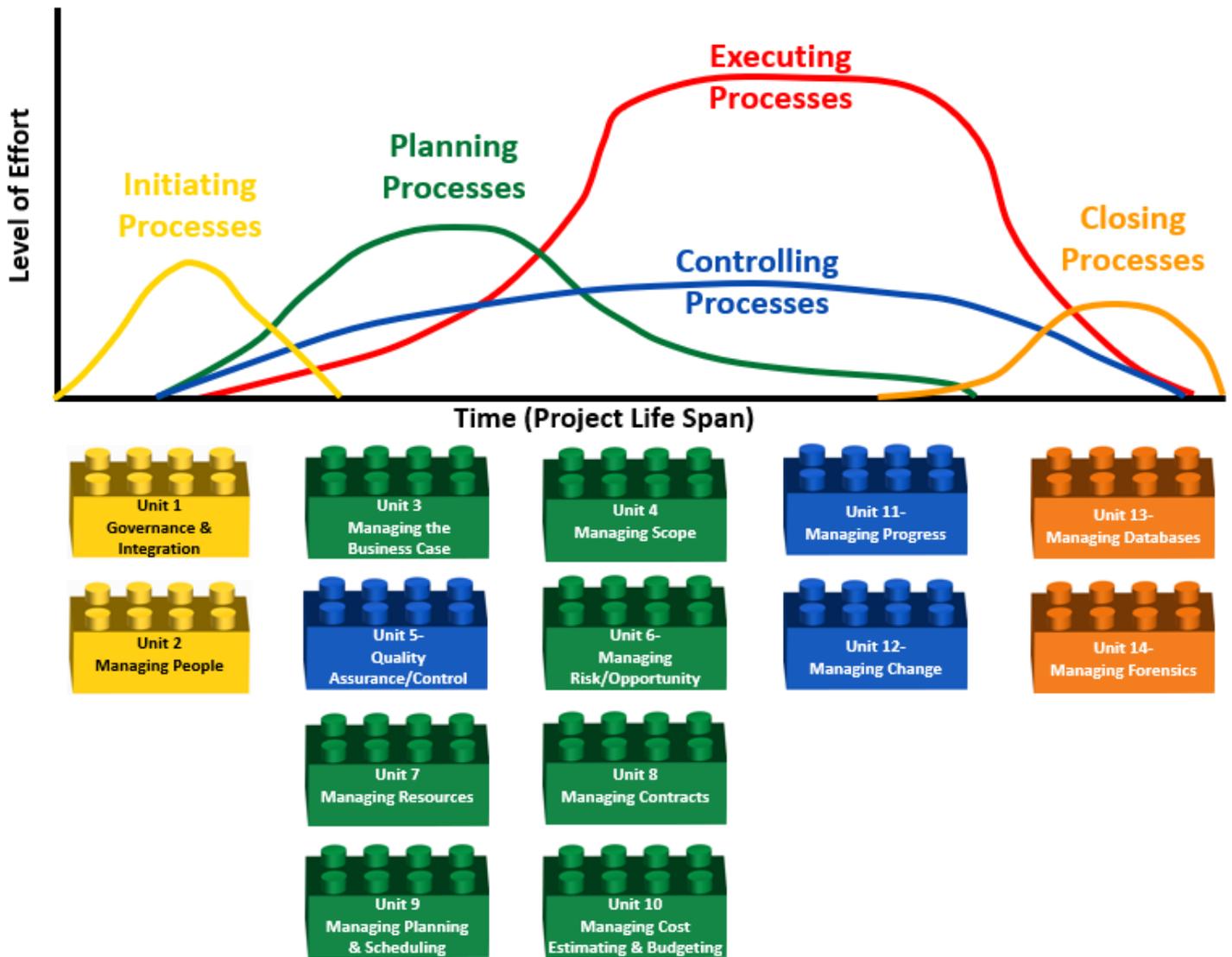
844 PMO/Project Controls Team to their customers and stakeholders

845 **Figure 24- Project Units Compared to the Process Groupings- 1,000 Meter View[19]**

846 Given that at the highest level of granularity, all projects are "initiated, planned, executed, controlled and
847 closed" (See Figure 6) and given that most if not all the tools and techniques used for Integrated Asset,
848 Portfolio, Program, and Project Management originated with general management and have been
849 customized or adapted for use in Asset, portfolio, programs, and projects, the real problem becomes how
850 to enable the FLEXIBILITY to adjust these tools & techniques to different sectors while providing the

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[19] Author's Note- Do NOT confuse or conflate the PROCESS GROUPINGS shown in Figure 20 with the Asset Life Span PHASE
GATES shown in Figure 17- **(17.1)** to **(17.7)**

851 SCALABILITY to apply them at different levels and ADAPTABILITY given that not all tools and techniques are
852 used on all projects.

853 For example, flying a plane from City A to City B is a project that involves removing an inflamed appendix
854 and designing and constructing a new bridge. And while all three of these projects use many, if not all, the
855 same tools & techniques, when and how they are used and exactly what they look like are often not the
856 same. For anyone doubting this, compare the process to INITIATE a flight from City A to City B to the
857 methodologies used in most hospitals to INITIATE removing an inflamed appendix to the methods to
858 INITIATE the design and construction of a bridge. You can appreciate how we need to design a system that
859 provides all the appropriate tools & techniques that anyone can use regardless of the project's type or size
860 while providing customization. For this reason, we have adopted the "Lego Block" analogy, understanding
861 that the different sizes and shapes of the Lego Blocks (tools & techniques) having been designed so they
862 can fit together provide the FLEXIBILITY and SCALEABILITY to apply them to any sector, context, size or
863 complexity of the project.

864 This is also a perfect opportunity to explain while there is no strict linear relationship between any of these
865 "Lego Blocks" of "Tools & Techniques," at this level of granularity, there is an implicit sequence based on
866 "common sense" understanding of the process.

867 Notice there are no "EXECUTING" Units in this "Project Controls/PMO Handbook"? To explain why NOT,
868 the fundamental PRINCIPLE being followed has been the mantra used by Bechtel for many years now, and
869 that is "Plan your Work, then Work Your Plan." Explained in more detail, IF:

870   o We develop a REALISTIC and ACHIEVABLE plan, AND IF
871   o We have reasonable control over the RESOURCES (Assets) that we need when we need them
872   AND IF
873   o We have a little bit of "luck" and don't face any "Black Swan" events, THEN
874   o Our projects should finish on time, within budget, and meet the project manager/project team's
875   control objectives.

876 We must also understand the two fundamental tenets of ACCOUNTABILITY:

877 To be held ACCOUNTABLE, the individual needs to have "REASONABLE" control over the events or the
878 impacts (+/-) of those events PLUS, to be held ACCOUNTABLE, he/she needs to have the formal AUTHORITY
879 to act, either to exploit opportunities or to avoid, mitigate or otherwise prepare for any adverse events.

880 Here are the five attributes required to be able to hold project SPONSORS, project MANAGERS, and project
881 CONTROLS practitioners ACCOUNTABLE[20]:

882   o Clear expectations.   (See Units 1, 2, 3, 7 and 8)
883   o Clear capability.   (See Units 1 and 2)
884   o Clear measurement.   (See Unit 11)

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20 Bregnan, Peter (2018) The Right Way to Hold People Accountable Peter Bregman (2016) "The Right Way to Hold People Accountable" HBR
https://hbr.org/2016/01/the-right-way-to-hold-people-accountable

885   o   Clear feedback.   (See Unit 11)

886   Clear consequences.   (See Unit 14- Managing Forensics)

887

888   ✓   **Logical Relationships/Sequencing Between the 14 Units**

889   o   **Unit 1- Governance and Integration:**

We always start with Unit 1. Why? This establishes the PROCESSES we need to be following, recognizing that those processes change depending on the context and application the project is being used for. IF we pick the wrong or inappropriate process map for our project, what are the chances it will

894   succeed? Also, be sure to appreciate that as project management is a complex,

895   dynamic, adaptive system, the relationships shown here are ILLUSTRATIVE only. The real or true

896   relationships can only be created using Systems Dynamics Software. MSP, P6, et al. are not capable of

897   modeling complex relationships.

898   o   **Unit 2- Managing People:**

Regardless of how much automation we implement, project management, at least for the foreseeable future, is going to require people. Even heavily robotized industries like auto manufacturing still need a lot of humans. To see where project management will be in 10-20 years, look at the evolution of robots in automobiles and invest 5 minutes of your time watching the 57-story tall

904   Changsha Apartment Building in Hunan Province, China, built in 19 days.   This is the future, and it is going

905   to happen quickly. Think about the roles people play in the Chinese Case Study.

906   o   **Unit 3- Managing Business Case.**

Once we have the six categories of stakeholders identified and completed a needs assessment, only then can we start developing an "accurate, precise, and reliable" business case. Failing to have a business case makes it almost impossible to evaluate changes to the project, and based on what is known as

911   "Front End Loading" (FEL) (see figure 18), the later in the project to make

912   decisions, the more costly and risky it becomes.

913   o   **Unit 4- Managing Scope:**

As we cannot begin to define scope until we know what the business case is, until/unless we have a pretty good idea of the business case, our scope also remains incomplete, which brings up the next Unit, Managing Quality, Unit 5.

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919   o   **Unit 5- Managing QA-QC:**

Unit 5- Managing QA/QC

As the tools & techniques we use for Quality Assurance and Quality Control are very much like those used in Risk Management, from the standpoint of learning, we need to familiarize ourselves with the QA/QC tools and then apply them to the Business Case and Scope outputs as those become the INPUTS into Unit 6- 924 Managing Risk & Opportunity.

925   o   **Unit 6- Managing Risk & Opportunity:**

Unit 6- Managing Risk & Opportunity

Logically, this is the next step in the process. Why? Doesn't it make sense that until we know the risks, it becomes almost impossible to do any planning/scheduling (Unit 9) or Cost Estimating or Budgeting (Unit 10)? How can we know how much contingency to build into our durations or cost estimates? And how about adding activities to MITIGATE or AVOID risk events or to EXPLOIT opportunities?

931   o   **Unit 7- Managing Resources:**

Unit 7- Managing Resources

If we don't know the number of resources available, their productivity, and their costs, wouldn't that impact our decision to "Make or Buy"? If resources of any type are scarce or in short supply or there are problems (risks), isn't that something we should consider outsourcing or subcontracting to specialists who do it every day?

937   o   **Unit 8- Managing Contracts:**

Unit 8- Managing Contracts

Given we know that the resources are a crucial input to the "Make or Buy" or "Insource vs. Outsourcing" decision once we have decided to outsource (subcontract) work. As noted, if we know the risks and opportunities and decide to "Make or Buy," we can build in buffers or contingencies into the riskier tasks, and if an assignment is perilous, we can schedule it at a less risky time. (i.e., we 943 don't want to be doing tower erections during hurricane or typhoon season?)

944   o   **Unit 9- Managing Planning & Scheduling:**

Unit 9- Managing Planning & Scheduling

While "planning and scheduling" happen at some level of granularity as part of each phase of the asset life span until we determine what resources are available and their productivity (Unit 7) and know what work packages have been outsourced or subcontracted and which ones we are doing "in-house."

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954   o   **Unit 10- Managing Cost Estimating and Budgeting:**

Why do we do planning and scheduling before we do Cost Estimating and Budgeting? Again there is nothing like applying "common sense" to get the answer. Having worked in Alaska's North Slope, where the average temperature is -20F and can drop to -60, placing concrete in the winter is 3+ times more 959 expensive than putting it in the summer. Doesn't it make sense to try to do all 960 your concrete placing during the summer, and if the client insists on having you place it during the winter, 961 you price it accordingly? Or how about trying to lay fiber optic cable underground in the tropics during the 962 rainy season?

963   o   **Unit 11- Managing Progress:**

Until or unless we have produced an "accurate, precise and reliable" cost and resource-loaded CPM schedule, how can we possibly manage the project effectively? The Cost and Resource Loaded CPM schedule produces the "S Curve" that is known as the "Performance Measurement Baseline," and that should be 968 done before the OWNER even issuing the "Notice to Proceed" (NTP)

969   o   **Unit 12- Managing Change:**

While change can happen at any time, as we know from Figure XX, the later the change occurs in the Asset Life Span, the riskier and more expensive it can become. Usually, the change management processes are included in the contract between the Owner and the Contractor, so the earlier we can start to plan for 974 changes, the easier it will be to manage them as the project approaches the end, 975 when the disputes and claims start.

976   o   **Unit 13- Managing Databases:**

Given that, especially for CONTRACTORS, today's cost and productivity data are being used to price and bid tomorrow's projects. The databases for both CONTRACTOR and OWNER must be kept current up to date. Why owners? To prepare a BUSINESS CASE, don't owners need current prices and the trends of 981 those prices to create a valid business case? At least in construction, with the 982 growing use of Building Information Modeling (BIM), the creation and updating of these databases become 983 an essential skill set and an OPPORTUNITY for those ENTREPRENEURS.

984   o   **Unit 14- Managing Forensics:**

This involves at least the Owner and Prime Contractor and may involve subcontractors and vendors, and that is to determine whether or not the project did or did not meet their contractual objectives in undertaking the project. For the Contractor, this can often be done within weeks of receipt of the final 989 payment, including retention. For the Owner, this may take months or even years

990 as the revenues or savings realized from the ASSET the project created have to pay back the investment
991 before calculating whether the Asset created by the projects did or did not deliver the desired "benefits."

992 Keep in mind that at this level, there is a practical or "common sense" reason for learning these tools and
993 techniques in a sequence; in actual practice, they overlap, and there is CONSIDERABLE feedback and
994 interactions between all the Units. However, at least initially, following them step by step is a great way to
995 learn how to apply them if and when conditions change, which they will.

996 While all examples are shown for PHYSICAL assets, does anyone lack the imagination to adapt this thinking
997 to knowledge-based assets? Aren't we already experimenting with self-correcting software? Or doesn't
998 Artificial Intelligence require this same type of "modular" thinking?

999

1000 ✓ **CENTRALIZED PLANNING vs. DECENTRALIZED EXECUTION**

1001 Field Marshall Helmut von Moltke told us way back in 1861-1867 that "no plan survives first contact with
1002 the enemy," and more recently, General Dwight Eisenhower told us in 1950 that "plans are useless, but
1003 planning is essential."

1004 So what does that mean in the context of Applied Project Management in general and Project Controls or
1005 Project Management Offices specifically?
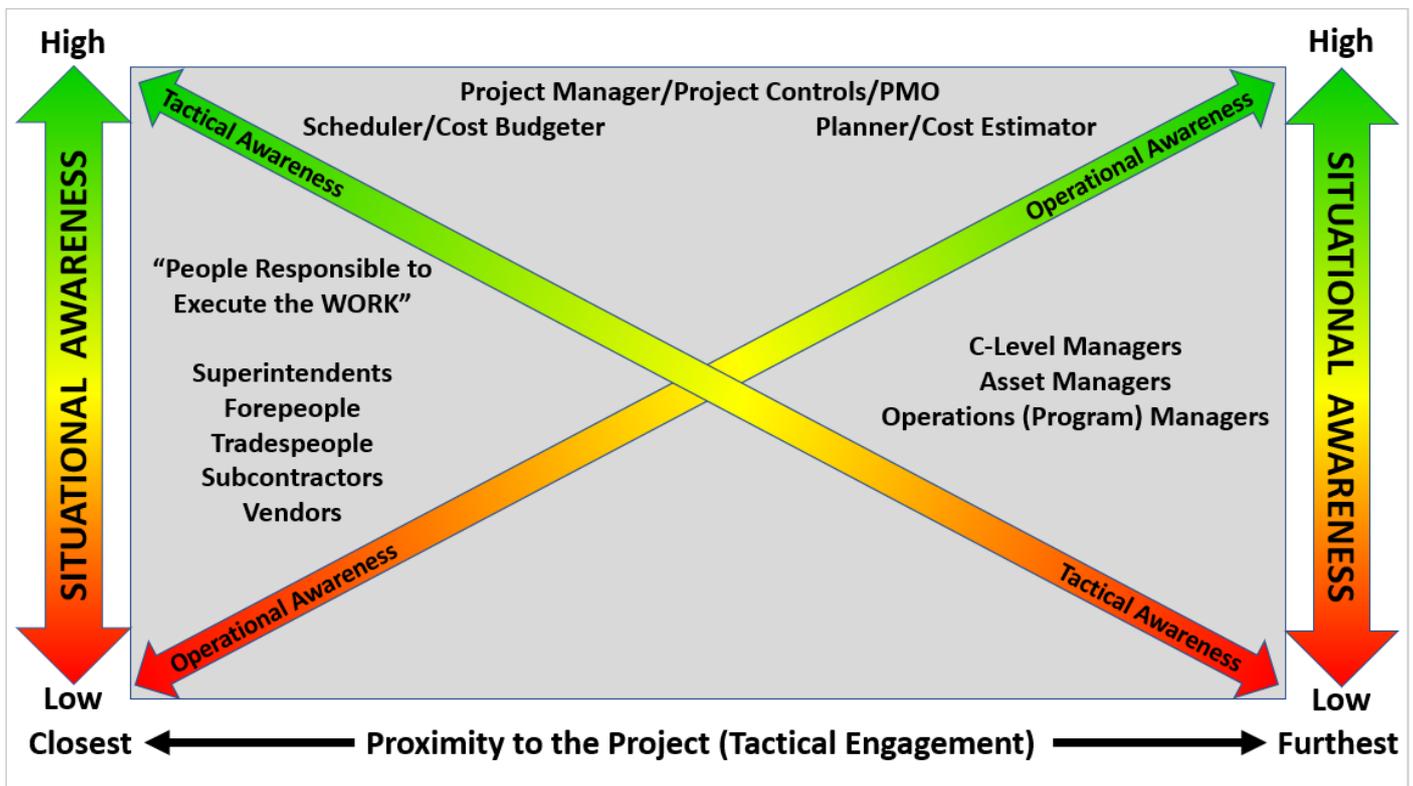
1006 **Figure 25- Situational Awareness Matrix (Adapted from Lt. Col. Paul Maykish)**

1007 Continuing forward using "Lessons Learned" from the military and reinforcing what we showed in Figure 5,
1008 introducing the 4 "Actors" in our "play," we can start to understand and appreciate that the PROJECT
1009 TEAM has a COMMUNICATIONS responsibility to translate the OPERATIONAL needs, wants and
1010 expectations of the C-Level, Asset, and Operations people who are FUNDING the projects into TACTICAL
1011 decisions necessary for those in the field who are responsible to PHYSICALLY EXECUTE the work and in
1012 return ensure that those on the front lines have the RESOURCES (= ASSETS) they need to stay within
1013 budget and on schedule.

1014 Conversely, the Project Controls team is responsible to COMMUNICATE what problems or constraints that
1015 the FIELD is experiencing and what they need to overcome these challenges that go beyond the authority
1016 or capabilities of the project team to the appropriate DECISION MAKERS, in particular the ASSET
1017 MANAGERS, as those are the FUNCTIONAL or LINE MANAGERS who control the ASSETS that the people in
1018 the field need- People, Money, Knowledge/Information, Physical (Equipment, Tools, Software) and even in
1019 some cases, Intangible RESOURCES or ASSETS.

1020 Explained another way, applying this tested and PROVEN approach, it means that the person or persons
1021 who have the most SITUATIONAL AWARENESS are the people who make DECISIONS that most affect those
1022 elements that are important to THEM. This means the Planners/Schedulers and Cost Estimators/Budgeting
1023 are not there to make decisions but are the people responsible for FACILITATING COMMUNICATIONS and
1024 UNDERSTANDING between the STRATEGIC DECISION MAKERS and the TACTICAL DECISION MAKERS in the
1025 field.

1026
1027 As shown in Figure 5, the PLANNER/COST ESTIMATOR is more focused on defining the STRATEGIC
1028 objectives (WHAT and WHO), while the SCHEDULER/COST BUDGETING is more focused on the TACTICAL
1029 aspects- WHEN, HOW, and HOW MUCH. This will be covered in more detail when we get to Unit 9-
1030 Managing Planning and Scheduling.

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1041 ✓ **Why Adopt a "Lego Block" Analogy?**

1042 Having been involved recently in a heated debate over the topic of "COMPLEXITY" in project management, the
1043 question of whether projects that are "COMPLEX" in any different from projects that are merely "LARGE" or
1044 "EXPENSIVE" or "COMPLICATED" or "TIME-CONSUMING."

1045 Having come from the trades, I counted up the "TOOLS" required by Electricians, Plumbers, Carpenters, Mechanics,
1046 and Surgeons, and the total, including both hand tools and electric-powered hand tools and the total becomes
1047 around 100 for a well-equipped self-employed tradesman or found in an operating theater. (Some are unique, but
1048 many are generic to all trades)

1049 As the two primary TEXTBOOKS we have been using in our competency development courses for 35+ years are:
1050 1) Humphrey's "Project Management using Earned Value Management, 4th
1051 Edition" https://www.amazon.com/Project-Management-Using-Earned-
1052 Value/dp/0996547940/ref=sr_1_1?s=books&sr=1-1 and

1053 2) "Engineering Economy 17th Edition", by William Sullivan, Elin Wicks, C
1054 Koelling- https://www.amazon.com/Engineering-Economy-17th-William-
1055 Sullivan/dp/0134870069/ref=sr_1_1?s=books&sr=1-1

1056 We counted the TECHNIQUES associated specifically with "Integrated Asset, Portfolio, Programme, and Project
1057 Management," and we counted ~200 "TECHNIQUES," understanding that many of the same TECHNIQUES associated
1058 with GENERAL business.
1059
1060 So if there are ~100 TOOLS and ~200 TECHNIQUES in total, are there any tools or techniques required for a COMPLEX
1061 project vs. a LARGE or EXPENSIVE or TIME-CONSUMING or COMPLICATED project? And there was nothing indicating
1062 that COMPLEXITY had any impact on the TOOLS or TECHNIQUES.
1063
1064 Recent research on the topic of COMPLEXITY (Nicolas Perony |TEDxZurich 2013 October 2013) also seems to indicate
1065 that "Complex systems that have many interacting parts, BUT the rules that govern are simple. What makes it
1066 unique is that the results are emergent- that the predictable behavior of the system is not the results of the
1067 individual rules but, to quote Aristotle, "the results of the whole are greater than the sum of the parts."
1068
1069 So given we only have ~100 TOOLS and ~200 TECHNIQUES and the only difference between "COMPLEX," "LARGE,"
1070 "EXPENSIVE," "COMPLICATED," and "TIME-CONSUMING" lies in the number of tools or expense of the tools &
1071 repetition of the techniques, then why doesn't that lend itself to the adoption of the "Lego Block" concept? That if
1072 we had a "Lego Blok" for each tool and technique, and Lego blocks of different sizes, colors and expense, that we
1073 could construct the object of ANY project ("the ASSET") in any configuration?

1074

1075 INSTEAD of arguing over which form of "agile" is best, maybe our IT colleagues need to spend more time studying
1076 history and seeing how they can adapt what history has taught us for use in today's world.

1077 **Figure 26- Conceptual Rationalization for Using the Lego Block Analogy**

1078 Figure 26 illustrates the thinking behind why the Lego Blocks analogy was adopted, with each Lego Block
1079 representing a single "tool" or "technique" associated with integrated Asset, Portfolio, Program, and
1080 Project Management are, for all intents and purposes, the same as those used in operations and general
1081 management given the difference between operations, program and project management lies in the fact
1082 that projects and programs have a defined end versus operations being open-ended, thus the ability to
1083 configure or adapt these tools and techniques into just about any size, complexity, or type of project. This
1084 "fit for use" concept helps to answer the question "How do you eat an elephant?" and the answer is "One
1085 bite at a time." If you break a project- ANY project, into small enough "work packages," sooner or later,
1086 you can "plan, execute, control, and close it." While once again being construction-oriented, is anyone
1087 willing to admit they lack the imagination or ability to innovate by adapting this thinking to YOUR project?

1088 At the same time, given that many of the tools and techniques are coming from general management,
1089 doesn't it make sense to learn how to use those tools then and adequately learn any tools/techniques that
1090 are unique to your specific trade, profession, or occupational specialty on a "just-in-time" basis as you
1091 progress through your career?

1092 This book is unique. Unlike PMI, IPMA, AACE, and APM/APMG, we differentiate between the OWNER and
1093 CONTRACTOR organizations' perspectives and explain both points of view in many cases that are
1094 significantly different in terms of objectives and procedures. However, the TOOLS AND TECHNIQUES are
1095 used by everyone.

1096 **SUPPLEMENTAL/SUPPORTING REFERENCES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1097 Miller Kelsey (2019) "Management."

1098 Proctor, James (2021) "Ten Business Process Best Practices"

1099 BEM (2016) "Process Mapping Best Practices: What's In A Process Map?"

1100 APQC (2020) "Best Practices in Process Improvement: The Seven Tenets of Process Management"

1101 Rever (2019) "6 Continuous Improvement Tools & Techniques" https://reverscore.com/continuous-
1102 improvement-tools/

1103 ASQ (N.D) "Continuous Process Improvement Model"

1104 Mulholland, Ben (2018) What is Continuous Process Improvement and How to Use it."

1105 Lt Col Alan Docauer, USAF (2014) Peeling the Onion Why Centralized Control / Decentralized
1106 Execution Works

1107 Sandeep Mulgund, Ph.D. (2021) Evolving the Command and Control of Airpower

1108 AIR FORCE DOCTRINE PUBLICATION (AFDP) 3-70 STRATEGIC ATTACK (2019) "Decentralised
1109 Execution and Centralized Planning"

1110 **SUPPLEMENTAL TEMPLATES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1111 Courtnell, Jane (2020) "Process Improvements: Your Ultimate Toolkit With 17 Free Templates"

1112 NASA Information Technology Program and Project Management Requirements

1113 Rockwell International (1993) "Continuous Improvement- Transforming Yesterday's Reality into
1114 Tomorrow's Vision"

1115 US Dept of Energy (Updated 2018) 4 Project Execution Plan Templates from REAL PROJECTS

1116 Nicolas Perony |TEDxZurich 2013 October 2013 "Complexity Explained"

1117 https://www.ted.com/talks/nicolas_perony_puppies_now_that_i_ve_got_your_attention_complexity_theor
1118 y/

1119 **RELEVANT PRINCIPLES, PHILOSOPHIES, OR TENETS FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1120 Project Management is PROCESS-based, and the closer we get to where the work is done, the more
1121 specific and unique the processes become.

1122 Shared accountability = No Accountability

1123 To be held accountable, a person needs to have "reasonable" control over the events or outcomes
1124 AND needs the formal authority to act to exploit or prevent them.

1125 "If you always do what you have always done, you will always get what you always got" (Henry
1126 Ford)

1127 "Doing the same things over and over again but expecting different results is the definition of
1128 INSANITY" (Albert Einstein)

1129

1130 **ARTIFICIAL INTELLIGENCE/MACHINE LEARNING FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1131 The Agility Effect (2020) "How Big Data and AI will Optimize Continuous Improvement."

1132 Valdes, Miguel (2017) "Intelligent continuous improvement, when BPM meets AI."

1133

1134   ✓   **Knowledge Management- "Lessons Learned" and "Continuous Process Improvement"**

1135 Despite PMI's efforts to get away from a process-based approach in favor of a principle-based model,
1136 integrated Asset, portfolio, program, and project management is now and always will be a PROCESS-based
1137 approach that is governed by principles. And many of these principles have evolved into what we know as
1138 "best tested and proven" practices, many of which are generic, applying to any/all projects, such as the
1139 need for standardized, multi-dimensional Work Breakdown Structures (WBS) and Cost Breakdown
1140 Structures (CBS) to those that are unique to a single sector or even a project within that sector.

1141 As one of the Five "Asset Classes" is Knowledge and as we increasingly are "initiating, planning, executing,
1142 controlling and closing" projects where the "asset" (the product of the project) is not tangible but
1143 intangible, we need to be very careful to learn the lessons from 6000+ years known by creating mostly
1144 PHYSICAL assets and start to ADAPT those "best tested and proven" tools & techniques for a knowledge-
1145 based world.

1146 Figure 27 explains as and entirely as possible what the elements that go into a process-based approach,
1147 where we have "ingredients" or "raw materials" and then applying the appropriate tools and techniques to
1148 these ingredients, we can transform them into a finished product, that can become an input to another
1149 follow on process or when finished, is classified as an ASSET, which is turned over to operations to be sold
1150 or otherwise exploited to generate a favorable return on investment or return on assets, as the case may
1151 be.

1152 We see the most significant differences between this level's different applications or contexts of applied
1153 project management. This is where the inputs, tools & techniques, and outputs to fly a plane from City A
1154 to City B, removing an inflamed appendix, designing, and building a bridge become incredibly unique and
1155 different. This is the most solid evidence for claiming that projects are "unique" one-time events. Even
1156 flying a plane from City A to City B, which is common to nearly all other "Projectized Operations," is
1157 "unique" (See Figure 11, Element 11.7.4)

1158   ✓   Different plane
1159   ✓   Different pilot/crew
1160   ✓   Different Weather and Winds
1161   ✓   Different number of passengers
1162   ✓   Different total weight and balance

INPUTS

✓ Ingredients
  ✓ Flour
  ✓ Oil
  ✓ Salt
  ✓ Yeast
  ✓ Tomatoes
  ✓ Garlic

TOOLS/TECHNIQUES

✓ Oven
✓ Recipe
✓ Mixing Bowls
✓ Spoons
✓ Rolling Pin

OUTPUTS

✓ Pizza
  ✓ For Sale
  (Final Product)
  ✓ For Eating
  (As Inputs to Other
  Processes)
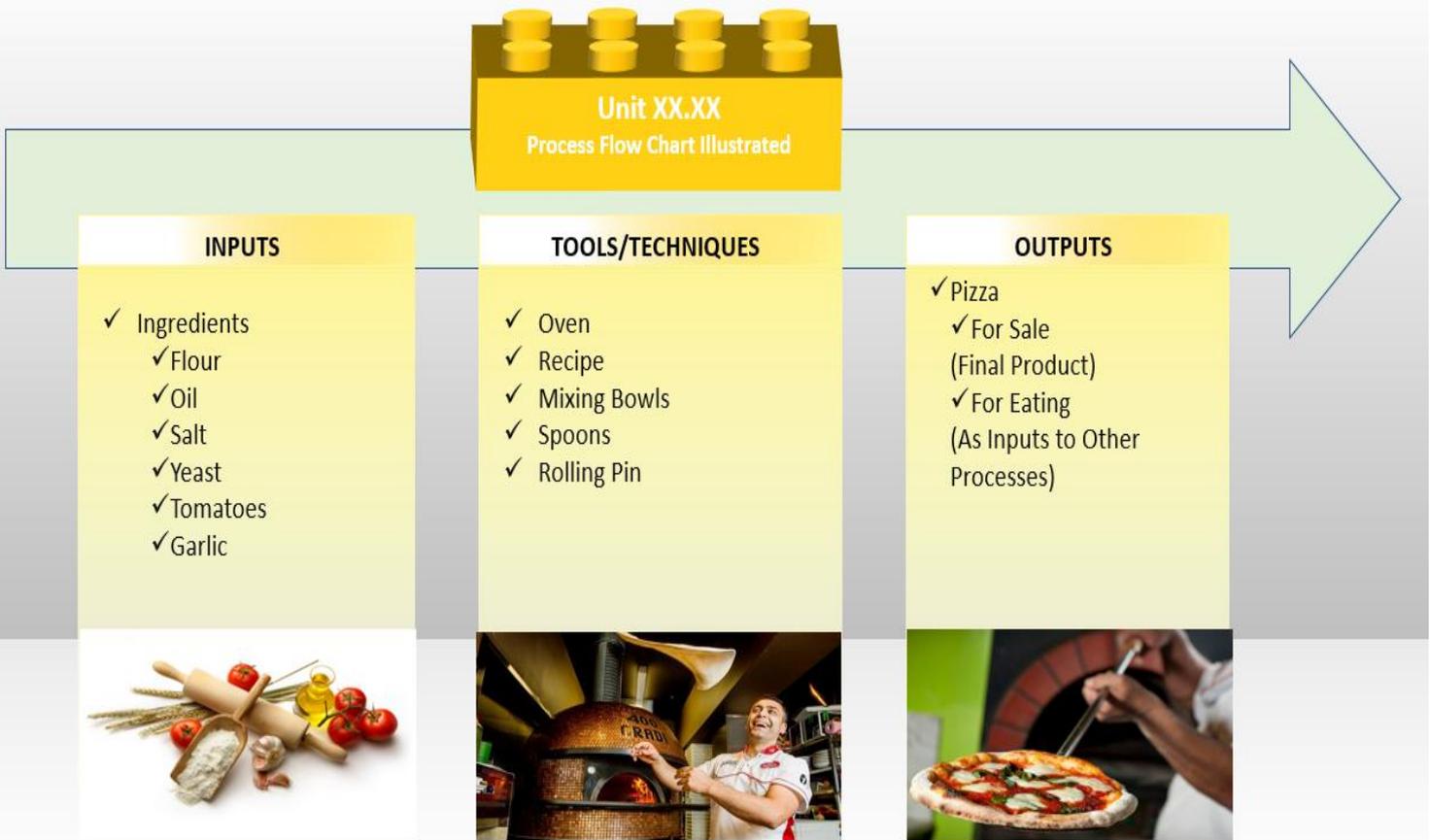
1164 **Figure 27 – Typical Process Mapping from 100 Meters**

1165 For whatever reasons, PMI, AACE, and IPMA have all embraced Shewhart's "Plan-Do-Check-Act" (PDCA) or
1166 Deming's "Plan-Do-Study-Adjust" (PDSA) Cycle as the basis for their quality control and continuous process
1167 improvement. As this model is appropriate for an OPERATING environment, where the scope of work is
1168 essentially unchanged, and the processes are repetition, the question is whether there is a model that is
1169 more appropriate for a PROCESS based approach, where the scope of work is less clearly defined than in
1170 operations and where the processes are not always precisely repetitive. Based on both implicit and explicit
1171 knowledge, we propose the Double Loop Learning model, developed by Chris Argyris and Doug Schon in
1172 their book "Organizational Learning." (1978)[21]. Why? Because while Shewhart and Demining were
1173 applying their method to factory operations, Argyris and Schon talked about how ORGANIZATIONS learn.
1174 We leave it up to you to decide which one is "best" or "more appropriate" for your specific application.
1175 Still, it should give you something to consider, especially if what you have been doing is NOT working,
1176 which, judging by much of the research or even watching the nightly news, seems to be familiar and
1177 growing worse as projects become more extensive and complex.

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[21] Argyris, C., & Schon, D. (1978). Organizational learning: A theory of action perspective. Reading, MA: Addison-Wesley.

1178 We believe this approach is more appropriate to support ORGANIZATIONAL change than the
1179 Shewhart/Deming Cycles.
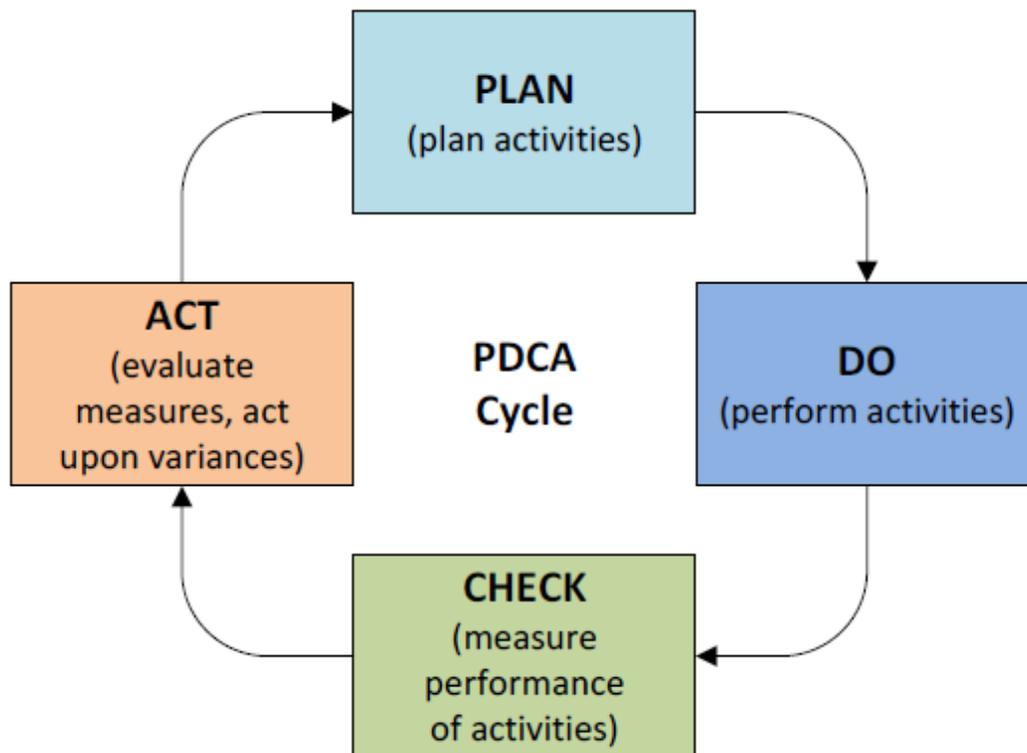
1180

Figure 28- Shewhart's "Plan-Do-Check-Act" Cycle (PDCA) and Deming's "Plan-Do-Study-Act" (PDSA) Cycle. [22]

1183 As training providers in "Applied Asset Portfolio, Program, and Project Management" methodologies for
1184 over 30 years, we have learned that storytelling is the most potent and effective way to teach project
1185 management.

1186 However, to be effective, you need to have people who have legitimate stories to tell. No matter how good
1187 a storyteller is, they cannot "fake" experiences. It doesn't take long before trainers who embellish their
1188 own experiences or, worse yet, try to use others' experiences quickly discover and lose credibility with
1189 their students/clients.

1190 This is why 2, 3, and even four-day courses are not worth the money. Not only are we faced with the
1191 "Forgetting Curve," but if people fail to start practicing what they have learned under the watchful eyes of
1192 a trained and experienced facilitator,

1193

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[22] Deming Institute (2022) https://deming.org/explore/pdsa/
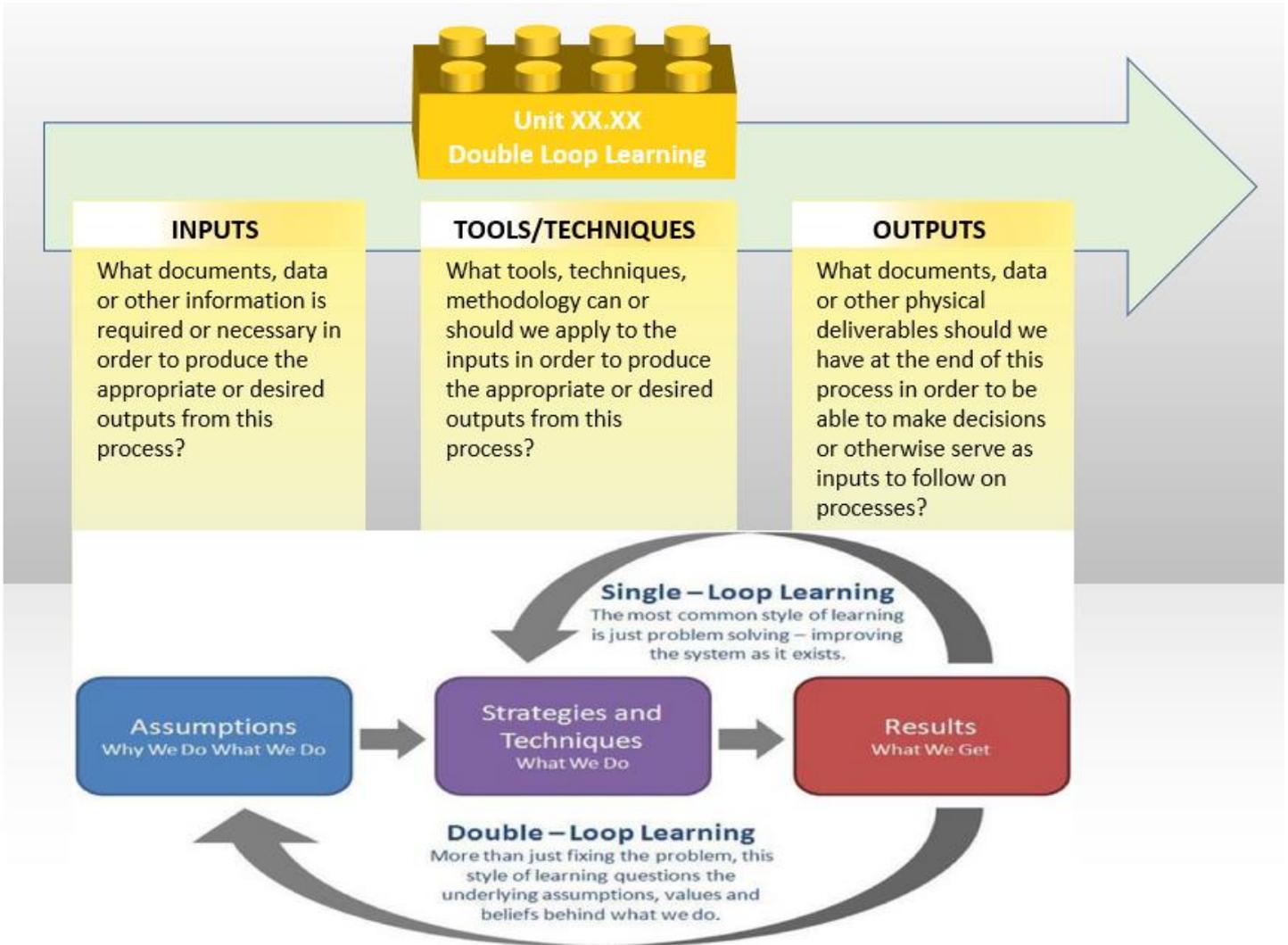
1195 **Figure 29– Process Mapping from 100 Meters Showing Continuous Process Improvements**

1196 Figure 29 shows how PMI and AACE (and many other professional societies) have adopted Shewhart's
1197 "Plan-Do-Check-Act" Cycle PDCA / and Deming's "Plan-Do-Study-Act" PDSA Cycle

1198 Which of these two approaches do YOU think makes more or the most sense in the context of an
1199 integrated asset, portfolio, program, and project environment?

1200   ✓   **Knowledge Management- Why Short Courses are NOT a Good Investment**

1201 **Figure 30**- Why Short Duration Courses are NOT Cost Effective.

1202 Under the heading of "Knowledge Management," it is worth noting that while incredibly popular, two,
1203 three, four, and even five-day courses are largely ineffective and waste time and money. This will be
1204 covered in more detail in Unit 2—Managing People, but keep in mind that when talking about Knowledge
1205 Management, we need to remember what does and does not result in "Value for the Money" or "generate
1206 a favorable return on training investment."

1207 **SUPPLEMENTAL/SUPPORTING REFERENCES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1208 Ten Recommendations from the US Government Accountability Office (GAO) to NASA on how to improve
1209 their Lessons Learned process

1210 "Lessons Learned" from the 1918 Spanish Flu Epidemic-

1211 Health Services and Delivery Research, No. 3.4. White S, Wastell D, Smith S, et al. Southampton (UK): NIHR
1212 Journals Library; 2015 Feb. "Lessons Learned from the UK's National Institute of Health"

1213 Ronald Moen, Clifford Norman (ND.) History and Evolution of Shewhart and Deming's PDCA/PDSA Cycles

1214 Maestro (2019) "The Importance of Storytelling in Effective Learning"

1215 Delen, Dusen, et al. (2013) "A comparative analysis of machine learning systems for measuring the impact of
1216 knowledge management practices."

1217

1218 **SUPPLEMENTAL TEMPLATES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1219   NASA Management Community
1220   Introducing Knowledge Management at NASA
1221   APQC (ND) "Knowledge Management Tools and Templates"
1222

1223 **RELEVANT PRINCIPLES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1224   The most effective method of capturing Lessons Learned and passing them down is storytelling, as
1225   evidenced in the Bible and Q'uran using parables.

1226

1227 **ARTIFICIAL INTELLIGENCE/MACHINE LEARNING FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1228   CIO Review (2020) "How Machine Learning Helps Knowledge Management"
1229   SAS Institute (ND) "Machine Learning Primer"
1230

1231   o **Process Mapping from 100 Meters**

1232 This book was designed as a "How To Do It" instruction manual for project controls and project
1233 management offices (PMOs). Given that projects continue to fail, much of what is being put forward here is
1234 the first step to process improvement.

1235 With PMI struggling to change their PMBOK Guide 7th Edition and growing battles between the different
1236 factions of "Agile" or "agile" with little or no improvements in IT project success rates yet on the other and
1237 some relatively impressive success rates developing a Covid-19 vaccine as a result of Trump's leadership
1238 there is no shortage of "Lessons Learned" that we can/should be taking advantage of.
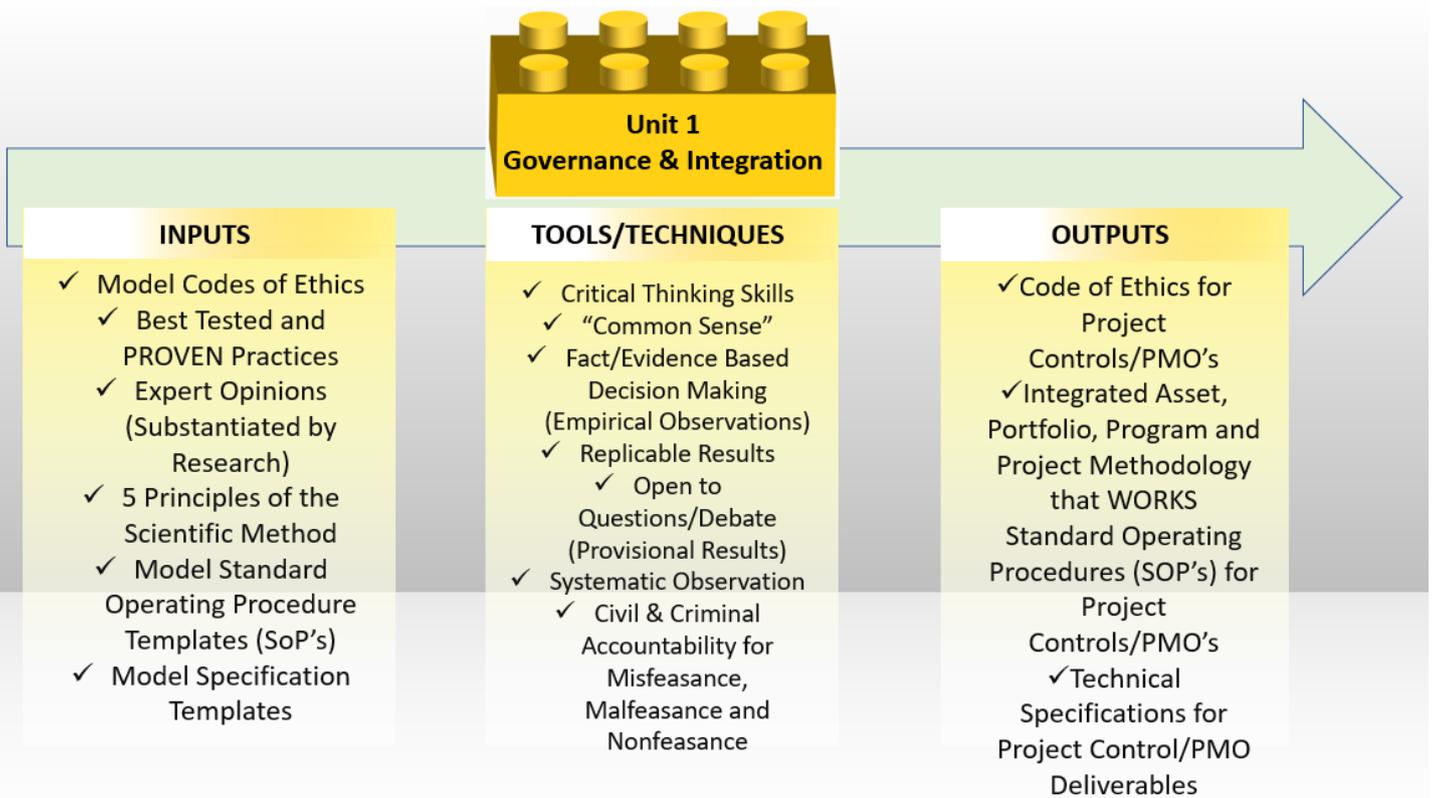
Figure 31– Process Mapping, 100 Meters View Showing Unit 1- Governance Inputs, Tools & Techniques, and Outputs

- o **INPUTS TO UNIT 1- GOVERNANCE AND INTEGRATION**

There is no shortage of research indicating that project management is not working, particularly on large, complex projects.

Here is a partial list of credible research that indicates that project management as currently being delivered is broken. In many instances, it provides us with root cause analysis and corrective or remedial actions.

With COVID-19, we are experiencing a whole new set of working conditions that will undoubtedly make things worse for ALL managers—asset, Portfolio, Program and Project, and Project Control/PMO Practitioners.

- ▪ **Model Codes of Ethics-**

The Code of Ethics we have adopted and recommend others consider adopting is the model Code of Ethics developed by the Society of Corporate Compliance and Ethics- (SCCE)

Please pay close attention to Paragraph R1.4 and consider how this will almost surely impact those of us working in project controls.

1255   ▪ **Expert Opinions**

1256   ▪ Glenn Butts, NASA (2010) "Megaprojects- A History of Denial."

1257   ▪ Prof. Bent Flyvbjerg, Oxford University (2011) "Over Budget, Over Time, Over and
1258   Over again" and (2017) "Sue, the Forecaster."

1259

1260 **Figure 32- "Root Cause" Analysis and Recommendations from Butts and Flyvbjerg**

1261   ✓ IPMA/KPMG/AIPM "Status Report" (2022)

1262   ✓ Arcadis Global Construction Disputes Report (2023)

1263   ✓ Ed Merrow, IPA (2012) "Megaprojects"

1264   ✓ Caletka Anthony (2017) "Buck the trend: Project intervention and profitability."

1265 Given that construction, with a history dating back to the pyramids of Egypt, we have to ask WHY, with 6000+ years
1266 of history behind us, why are we still having problems with projects "failing"- defined to be late, over budget, with
1267 quality problems, and in many cases, failure of the Asset being created or produced by the project to deliver the
1268 "benefits" or other returns on investment or return on assets that the project was undertaken to provide?

1269   ✓ **The Five Principles of the Scientific Method-**

1270 With PMI moving to a PRINCIPLE based 7th Edition, given that the "Scientific Method" has been around for
1271 close to 1000 years and has brought us hundreds of thousands of new products and given that "agile" in all
1272 its combinations and permutations is nothing more than the "Scientific Method" provided a new color

1273 lipstick, we are advocating that practitioners go back and adopt the 5 Attributes of the Scientific Method in
1274 the research and writing of this book.

1275   o **Empirical Observation**

1276 The scientific method is empirical. It relies on direct observation of the world and disdains hypotheses that
1277 contradict observable facts. This contrasts with methods that rely on pure reason (including those
1278 proposed by Plato) and procedures that depend on emotional or other subjective factors.

1279   o **Replicable Experiments**

1280 Scientific experiments are replicable. That is, if another person duplicates the investigation, he or she will
1281 get the same results. Scientists are supposed to publish enough of their method so that another person
1282 with appropriate training could replicate the results. This contrasts with methods that rely on unique
1283 experiences to a particular individual or a small group of individuals.

1284   o **Provisional Results**

1285 The results of the scientific method are provisional; they are (or ought to be) open to question and debate.
1286 If new data contradict a theory, that theory must be modified. For example, the phlogiston theory of fire
1287 and combustion was rejected when the evidence against it emerged.

1288   o **Objective Approach**

1289 The scientific method is objective. It relies on facts and the world as it is rather than on beliefs, wishes, or
1290 desires. Scientists attempt (with varying degrees of success) to remove their biases when making
1291 observations.

1292   o **Systematic Observation**

1293 The scientific method is strictly systematic; it relies on carefully planned studies rather than random or
1294 haphazard observation. Nevertheless, science can begin from some random observation. Isaac Asimov said
1295 that the most exciting phrase to hear in science is not "Eureka!" but "That's funny." After the scientist
1296 notices something funny, he or she proceeds to investigate it systematically.

1297 **TOOLS & TECHNIQUES TO UNIT 1- GOVERNANCE AND INTEGRATION**

1298   o **Critical Thinking Skills**

1299 The very essence of the "scientific method" is based on "observable facts." And the facts are crystal clear
1300 that what we are doing is not working. As Einstein told us, "doing the same things over and over again but
1301 expecting different results is the definition of insanity." When will we follow our advice, go back and
1302 establish what has been tested and proven to work for the past 6000+ years, and then adapt it to take
1303 advantage of today's technology?

1304   o **"Common Sense"**

1305 This book has adopted the LEGAL definition of "Common Sense." Black's Law Dictionary defines "common
1306 sense" as "Sound practical judgment; that degree of intelligence and reason, as exercised upon the
1307 relations of persons and things and the ordinary affairs of life, which is possessed by the generality of
1308 mankind, and which would suffice to direct the conduct and actions of the individual in a manner to agree
1309 with the behavior of ordinary persons."23

1310 This book proposes that we start by adopting the same legal standards as those applied in "professional
1311 liability" or "professional negligence" cases. The Judicial Council of California Civil Jury Instructions (2020
1312 edition) defines the "Standard of Care" for PROFESSIONALS being:

1313   o *"A/An] [insert professional] is negligent if [he/she/nonbinary pronoun] fails to use the skill and*
1314   *care that a reasonably careful [insert professional] would have used in similar circumstances.*
1315   *This level of skill, knowledge, and care is sometimes referred to as "the standard of care." [You*
1316   *must determine the level of skill and care that a reasonably careful [insert professional] would*
1317   *use in similar circumstances based only on the testimony of the expert witnesses[, including*
1318   *[name of defendant],] who have testified in this case.]*[24]

1319

1320   o **Fact/Evidence-Based Decision Making (Empirical Observations)**

1321 Unfortunately, especially on social media, anyone who has access to a mobile device and a Wifi hotspot
1322 can publish unsupported and, in many cases, unsupportable OPINIONS, with not even an attempt to
1323 justify, rationalize, or explain any basis to back up what they have to say.

1324 PMI has a fairly robust Code of Ethics on "Honesty" that states:

1325   o *5.1 Description of Honesty*
1326 *Honesty is our duty to understand the truth and act truthfully in our communications and conduct.*
1327 *5.2 Honesty: Aspirational Standards As practitioners in the global project management community:*
1328   *5.2.1.1 We earnestly seek to understand the truth.*
1329   *5.2.1.2 We are truthful in our communications and our conduct.*
1330   *5.2.1.3 5.2.3 We provide accurate information promptly.*
1331   o *Comment: These provisions imply that we take appropriate steps to ensure that the information*
1332   *we base our decisions upon or provide to others is accurate, reliable, and timely. This includes*
1333   *having the courage to share bad news even when it may be poorly received. Also, when*
1334   *outcomes are adverse, we avoid burying information or shifting blame to others. When results*
1335   *are positive, we avoid taking credit for the achievements of others. These provisions reinforce*
1336   *our commitment to being both honest and responsible.*
1337   *5.2.1.4 We make commitments and promises, implied or explicit, in good faith.*
1338   *5.2.1.5 We strive to create an environment in which others feel safe to tell the truth.*

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[23] Black's Law Dictionary Definition of "Common Sense"
[24] The Judicial Council of California Civil Jury Instructions (2020 edition) https://www.justia.com/trials-litigation/docs/caci/600/600/

1339   o   *Honesty: Mandatory Standards As practitioners in the global project management community,*
1340   *we require the following of ourselves and our fellow practitioners:*
1341   ■ *We do not engage in or condone behavior designed to deceive others, including but*
1342   *not limited to making misleading or false statements, stating half-truths, providing*
1343   *information out of context, or withholding information if known, would render our*
1344   *statements as misleading or incomplete.*
1345   ■ *We do not engage in dishonest behavior with the intention of personal gain or at the*
1346   *expense of another.*
1347   o   *Comment: The aspirational standards exhort us to be truthful. Half-truths and nondisclosures*
1348   *intended to mislead stakeholders are as unprofessional as affirmatively making*
1349   *misrepresentations. We develop credibility by providing complete and accurate information.*

1350 Based on PMI's marketing materials about their PMP and the postings by their PMP Certified "Leaders,"
1351 ignore this part of the Code. They won't even hold their organization HQ accountable for violations, much
1352 less their own "thought leaders." How much longer are we going to tolerate the blatant hypocrisy of not
1353 only PMI but other supposedly "not-for-profit" professional societies?

1354 Here is what PMI claims about its PMP


1355
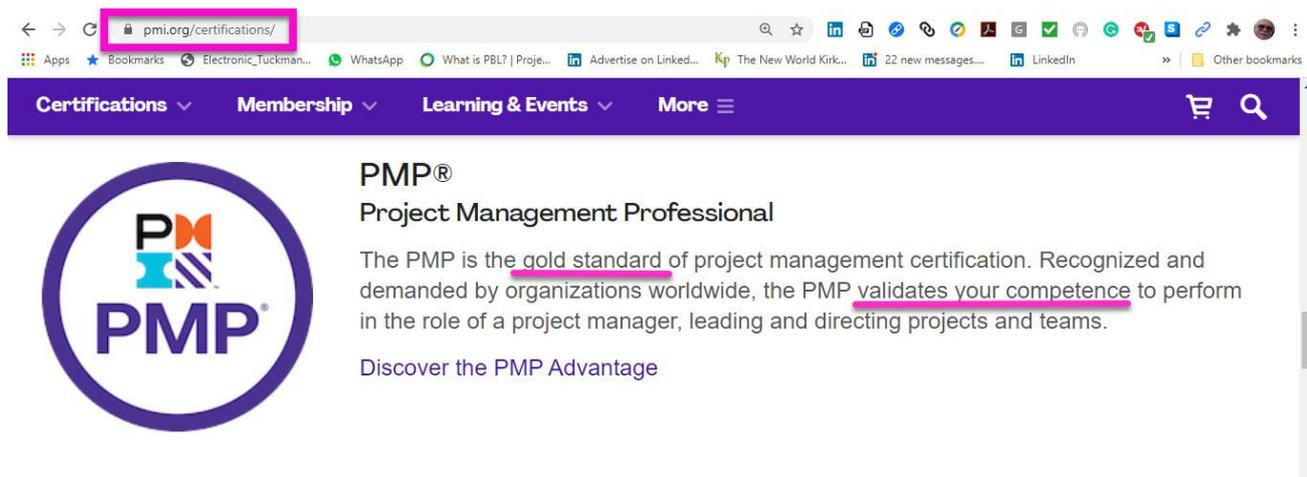
1356 Figure 33- PMI's Marketing Claims About their PMP

1357 And here is the crucial part of what one of the PMP's Founding Fathers, Lee R. Lambert, had to say on
1358 LinkedIn: (Posting has since been taken down, but we have a full copy of the original posting for anyone
1359 interested)

1360   *The answer is obvious to most. Possessing the PMP shouts to the world that you have passed a*
1361   *comprehensive exam and confirmed that you are aware of and understand the processes, terms, tools, and*
1362   *techniques represented in the PMI's Guide to the Project Management Body of Knowledge. THAT'S IT!!*
1363   *Passing the PMP exam does not confirm that you are an accomplished project manager with a long history of*
1364   *leading successful projects. To claim or even imply that earning the PMP is any more than an indicator of*
1365   *general Knowledge in the field is questionable. The PMP may open the door to opportunities to prove a*
1366   *project manager's skill, but it does not replace hands-on experience as a project manager. Maybe the*

1367   *acronym should be PPMP (Potential Project Management Professional), similar to the EIT (Engineer In*
1368   *Training). As the PPMP demonstrates the capability of successfully leading projects, it morphs into the PMP.*
1369   *Over the years, the PMP Certification's success has become one of PMI's claims to fame. What the PMP*
1370   *represents has been distorted, misunderstood, and often assumed to be something it isn't. Let me repeat: the*
1371   *PMP does not confirm project management competency. No matter how many times you say it does, the*
1372   *PMP does NOT confirm project management competency!*

1373 And here are the requirements from the US Federal Trade Commission's "truth-in-advertising rules" that
1374 apply to advertisers.

1375   ✓ Under the US Federal Trade Commission Act:
1376   o Advertising must be **truthful and non-deceptive**.
1377   o Advertisers must have **evidence to back up their claims** and
1378   o Advertisements cannot be unfair.

1379 So you decide: Is PMI violating its own Code of Ethics? Is PMI violating the letter, if not the intent, of the US
1380 "Truth in Advertising" laws? How much longer can you or should you turn a blind eye before you are willing
1381 to speak out against it?

1382

1383   ✓ **Civil & Criminal Accountability for Misfeasance, Malfeasance, and Nonfeasance**
1384   o *"Malfeasance is a wrongful or criminal act perpetrated by a public official or another person of*
1385   *authority. An act of malfeasance is done intentionally, disregarding the fact that the action is*
1386   *morally or legally wrong and will cause someone harm. The adjective form is malfeasant. The*
1387   *word malfeasance is derived from the French word malfaisance, which means wrongdoing.*
1388   o *A misfeasance is a lawful act performed in an unlawful, illegal, or defamatory manner.*
1389   *Generally, misfeasance differs from malfeasance in that the actor does not intend to harm, but*
1390   *the harm comes through the actor's irresponsibility or negligence. The adjective form*
1391   *is misfeasant. The word misfeasance is derived from the French word mesfaisance, meaning to*
1392   *mis-do.*
1393   o *Nonfeasance is the failure to do something that one is legally responsible for doing. It is an*
1394   *intentional failure to live up to one's legal or moral duty in a given situation, a refusal to fulfill*
1395   *one's obligation. The adjective form is nonfeasant. The word nonfeasance is derived from the*
1396   *French word faisance, meaning an action, and the prefix non—, which means not.*[25]

1397 In 2009 and 2010, Glenn Butts, Head Estimator at NASA, published a series of scathing analyses of NASA's
1398 cost estimating and scheduling practices. In slide 32, he proposes a pretty radical solution.

1399 Yet here we are, 10+ years later, and just now, we are starting to see examples where some people are
1400 being held ACCOUNTABLE for their misfeasance, non-feasance, and malfeasance. As Glenn told us, "Before
1401 things can change, the approach and the consequences must change." Or, to quote Henry Ford, "If you

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[25] Grammarist Definitions (ND) https://grammarist.com/usage/malfeasance-misfeasance-and-nonfeasance/

1402 always do what you have always done, you will always get what you always got." So, how much longer are
1403 YOU willing to tolerate the use of processes that we know produce failures?

1404

1405 **Figure 34- Recommendations by Glenn Butts, NASA**

1406 Curiously enough, isn't this precisely the policy being implemented by President Duarte of the Philippines
1407 today?

1408 Here are two recent examples where "Project Sponsors" are held financially and criminally accountable for
1409 their misfeasance, malfeasance, and non-feasance for their decisions.

1410   o   Texas Power Grid Failure (2021)-
1411   o   They join Kevin Marsh, CEO of SCANA Corp., by holding them both CRIMINALLY and FINANCIALLY
1412   accountable for their decisions.

1413 When will PMI, AACE, and IPMA follow the Guild of Project Controls' lead in making it an ETHICAL
1414 VIOLATION to accept or contribute to "Death March" projects knowingly?

1415 The Guild based their CoE on the model developed by the Society of Corporate Compliance and Ethics
1416 Professionals (SCCE)

1417 These fundamental principles of holding people accountable for their decisions must "flow down" to
1418 project sponsors, managers, and controllers.

1419

1420 ✓ **Model Standard Operating Procedures (SOP)**

1421 A Standard Operating Procedure (SOP) is a document consisting of step-by-step instructions on how to
1422 execute a task or series of tasks

1423 o As a minimum, the SoP should contain the following:

1424 • Title page. This includes 1) the title of the procedure, 2) an SOP identification number, 3) the
1425 date of issue or revision, 4) the name of the agency/division/branch the SOP applies to, and
1426 5) the signatures of those who prepared and approved of the SOP. This can be formatted
1427 however you like as long as the information is clear.

1428 • Table of Contents. This is only necessary if your SOP is quite long, allowing for ease of
1429 reference. A simple standard outline is what you'll find here.

1430 • Quality Assurance/Quality Control. A procedure is not suitable if it cannot be checked.
1431 Provide the necessary materials and details so the reader can ensure they've obtained the
1432 desired results. This may or may not include other documents, like performance evaluation
1433 samples.

1434 • Reference. List all cited or significant references. If you reference other SOPs, attach the
1435 necessary information in the appendix.

1436 • Maintaining and Updating your Standard Operating Procedure

1437 • Test the procedure. Have someone with limited knowledge of the process (or a person
1438 representative of the typical reader) use your SOP to guide them.

1439 • Has the SOP been reviewed by those who perform the procedure? At the end of the day, it
1440 doesn't matter what your bosses think of the SOP. It matters to those who do the work.

1441 • Have all stakeholders reviewed the SOP? Once the team gives you the go-ahead, please
1442 send it to your senior managers for final acceptance and endorsement.

1443 • Once approved, start implementing your SOP. This may involve executing formal training for
1444 the affected personnel (e.g., classroom training, computer-based training, etc.), or it may
1445 mean your paper is hung up in the bathroom.

1446 • Make Ensure you include a way to update and improve the process. This will require a
1447 feedback loop from the Double Loop Learning process.

1448

1449 **OUTPUTS**

1450 A Standard Operating Procedure that people follow and work.
1451

1452 **REFERENCES AND TEMPLATES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1453 As we are quickly moving towards the application of Artificial Intelligence, Automation, and Machine
1454 Learning in project management, before we can move forward, we need first to figure out what is
1455 legitimate "best tested and PROVEN" practices and which ones are marginal and don't consistently
1456 produce "acceptable" results.

1457 Adam Henshall recently published an OUTSTANDING reference on writing EFFECTIVE Standard Operating
1458 Procedures. Here is his 16-step process:

1459 • Use Process Street to manage your standard operating procedures

1460 • Writing standard operating procedures: a quick how-to guide

1461 • Step 1: Understand how you are going to present your SOPs

1462 • Step 2: Gather the relevant stakeholders

1463 • Step 3: Work out your purpose

1464 • Step 4: Determine the structure of your SOP

1465 • Step 5: Prepare the scope of the procedure

1466 • Step 6: Use a consistent style

1467 • Step 7: Use correct notation, if applicable

1468 • Step 8: Work out all the necessary steps of the process

1469 • Step 9: Try to assess potential problems in the process

1470 • Step 10: Determine metrics against which the SOPs can be judged

1471 • Step 11: Test the process

1472 • Step 12: Send the process to superiors

1473 • Step 13: Clarify the method of optimizing the process

1474 • Step 14: Run a risk assessment on your process

1475 • Step 15: Consider creating a flow diagram

1476 • Step 16: Finalize and implement the SOPs

1477 • Examples of Process Street's fully-written and usable SOPs

1478 • Ensure your SOPs adhere to ISO standards
1479

1480 And here is a source for all the TEMPLATES he recommends:

1481 Trying to automate a broken system makes absolutely no sense.

1482 ✓ **Model Standard PMO Specifications**

1483 Here is the "go-to" source for showing us how to create STANDARDIZED specifications. The Construction
1484 Specifications Institute (CSI) has been around for 75 years and is the preeminent source for structuring
1485 specifications, so they appear only once in the contract documents.

1486 More importantly, as we get into the following Units: 6- Managing Scope, 7- Managing Planning and
1487 Scheduling, 8-Managing Cost Estimating and Budgeting, and 13- Managing Databases, you will see their
1488 STANDARDIZED WBS/CBS coding structures known as "Omniclass" appear to be the most well organized
1489 and complete, forming the basis for adoption by Building Information Modeling. (BIM) While there are
1490 other competing standards, research indicates Omniclass is the best developed, based on Uniformat and
1491 Masterformat that started in the 1960s.

1492 **OUTPUTS FROM UNIT 1- GOVERNANCE AND INTEGRATION**

1493   ✓ **Code of Ethics for Project Controls/PMO's**

1494 To our knowledge, the ONLY project management standards-setting organization following the "Model
1495 Code of Ethics" created by the Society for Corporate Compliance and Ethics Professionals (SCCE) and
1496 ADAPTED for use by project professionals is the Guild of Project Controls.

1497   ✓ **Integrated Asset, Portfolio, Program, and Project Methodology that WORKS**

1498 As evidenced by the adoption by all the major international and nearly all national oil gas companies who
1499 have been using the fully integrated Asset, Portfolio, Program, and Project Management Methodology for
1500 65 years now, we can only recommend that unless someone comes up with another model that has been
1501 TESTED AND PROVEN to work that we start with the model shown in Figures 2, 9, 12 and 13.

1502 To our knowledge, the only two professional societies that have adopted this tested and proven model are
1503 AACE, with its Total Cost Management Framework, and the Guild of Project Controls, with its Compendium
1504 of Best Tested and Proven Practices, which formed the basis for this book.

1505   ✓ **Standard Operating Procedures (SOPs) for Project Controls/PMOs**

1506 Here is a Model Standard Operating Procedure developed by one of our Guild of Project Controls
1507 Certification students, Tijo Kurian, for SCHEDULING using the GAO's "Best Practices in Scheduling" as the
1508 benchmark or standard and applying CSI's Construction Manual of Practice as the basis to construct the
1509 specification. [26]

1510 For graduate students or practitioners wanting to write papers for AACE, Guild or Project Controls, or other
1511 certification programs just for personal satisfaction, we are actively seeking people to apply the standards
1512 referenced here to write model Specifications for the other Units as well.

1513   ✓ **Technical Specifications for Project Control/PMO Deliverables**

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[26] Kurian, T. (2020). How to develop a MODEL Standard Operating Procedure (SOP) for Scheduling; PM World Journal, Vol. IX, Issue II, February.

1514 Here is a [Model Technical Specification](#) developed by one of our Guild of Project Controls Certification
1515 students, Tijo Kurian, for SCHEDULING REQUIREMENTS using the GAO's "Best Practices Scheduling" as the
1516 benchmark or standard and applying CSI's Construction Manual of Practice as the basis to construct the
1517 specification. [27]

1518 For graduate students or practitioners wanting to write papers for AACE, Guild or Project Controls, or other
1519 certification programs just for personal satisfaction, we are actively seeking people to apply the standards
1520 referenced here to write model Specifications for the other Units as well.

1521 **SUPPLEMENTAL/SUPPORTING REFERENCES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1522 Moffett and Moore (2011) [The Standard of Care: Legal History and Definitions: the Bad and Good News](#)

1523 Holland, Kent (2011) [Standard of Care for Design Professionals](#)

1524 Goguen, Dave, JD (ND.) [What is the "Standard of Care" in a Medical Malpractice Case?](#)

1525 **SUPPLEMENTAL TEMPLATES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1526 Construction Specifications Institutes (CSI) [Project Practice Guide, 3rd Edition](#) (NOT FREE)

1527 CSI [Construction Contract Administration Practice Guide](#) (CCAPG) 2nd Edition (NOT FREE)

1528 CSI [Construction Specifications Practice Guide](#) (CSPG) (NOT FREE)

1529 [Australian Government Department of Health](#) (FREE)-

1530 [Safety Culture Standard Operating Procedures](#) (2020) (FREE)

1531 WikiHow (ND) "[How to Write an SoP](#)"

1532 US Environmental Protection Agency (2007) "[How to Write an SOP](#)"

1533 **RELEVANT PRINCIPLES, PHILOSOPHIES, AND TENETS FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1534 The technical specifications in ANY contract should appear one time and place and one time only, and they
1535 should appear in the same place in every contract under a STANDARDIZED coding structure.

1536 IF the professional societies we belong to cannot or will not exemplify the values and beliefs they espouse,
1537 how can they expect their "member/owners to do so?

1538 **Artificial Intelligence/Machine Learning FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1539 Marchese, Peter (ND) "[The e-SPECS® BIM Process](#)"

1540 Arcat Inc. (n.d.) "[Spec Wizard.](#)"

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[27] Kurian, T. (2019). How to write a Model Scheduling Specification Incorporating the GAO's "Best Practices in Scheduling" Appendices. PM World Journal, Vol. VIII, Issue XI, December https://pmworldlibrary.net/wp-content/uploads/2019/12/pmwj88-Dec2019-Kurian-how-to-write-a-model-scheduling-specification.pdf

1541   What can I do NEXT? What do you recommend?
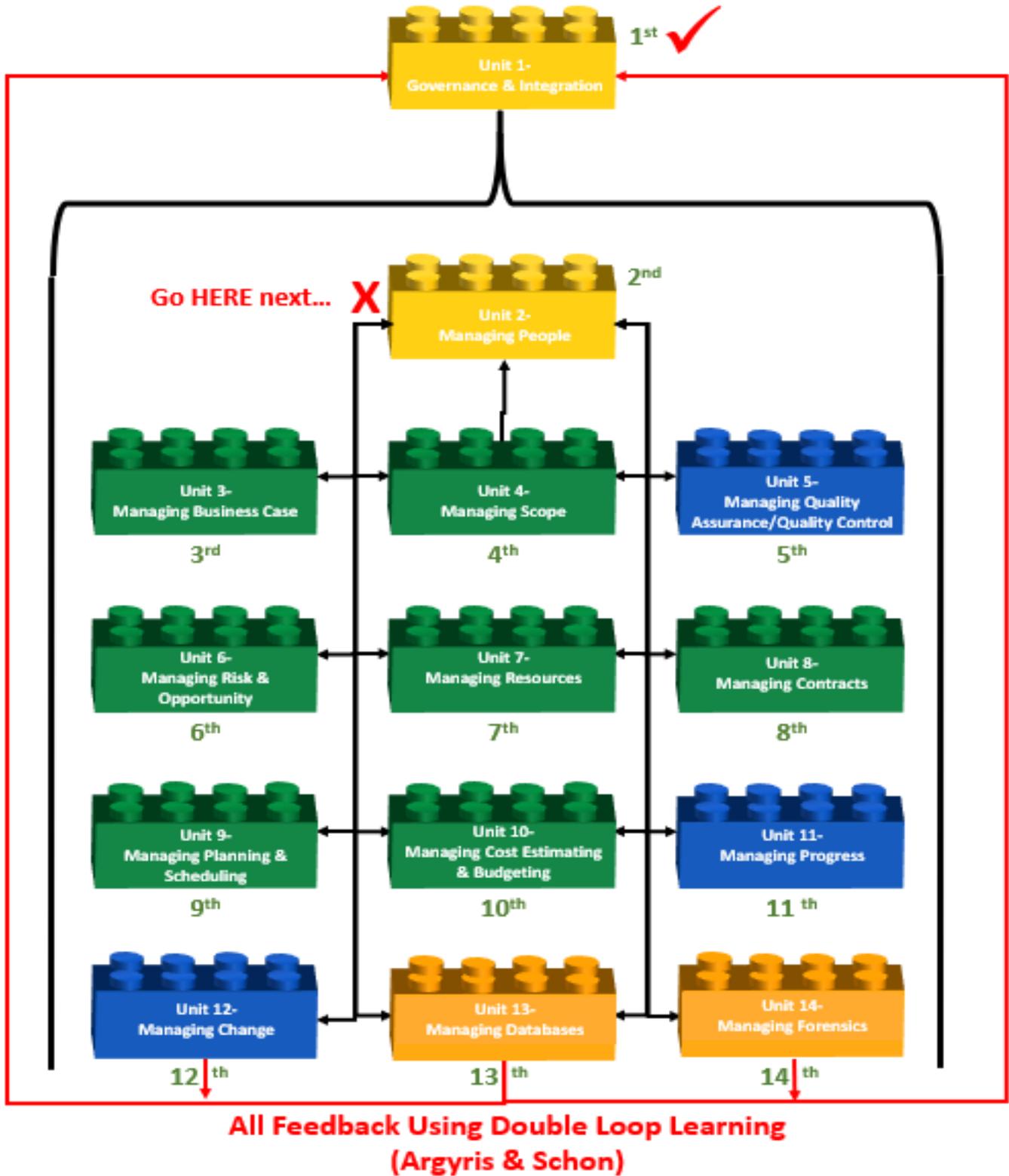
1542   **Figure 35- Which Module is recommended NEXT?**