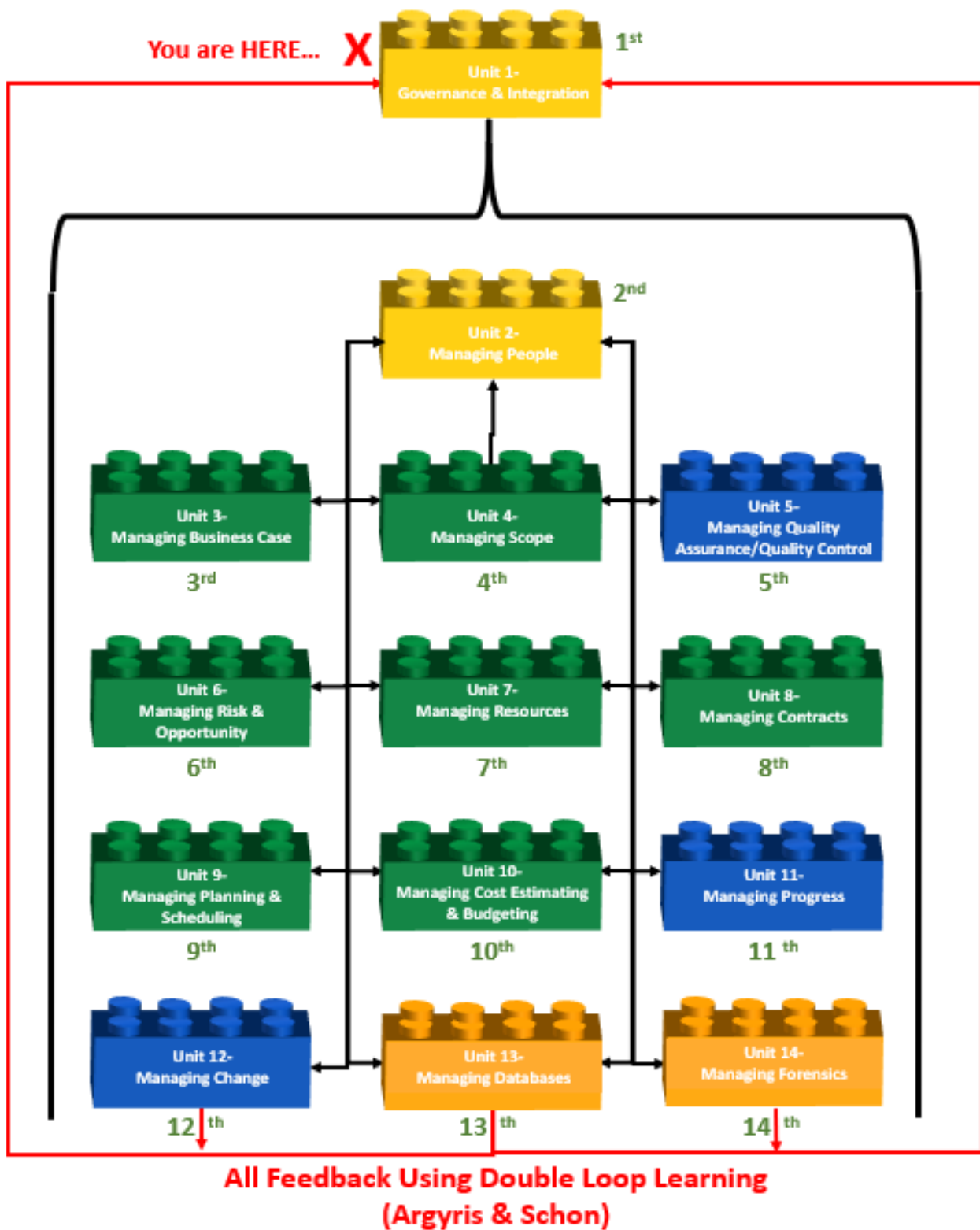


Project Controls/PMO Handbook of “Best Tested and PROVEN Practices”

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1 UNIT 1- GOVERNANCE AND INTEGRATION



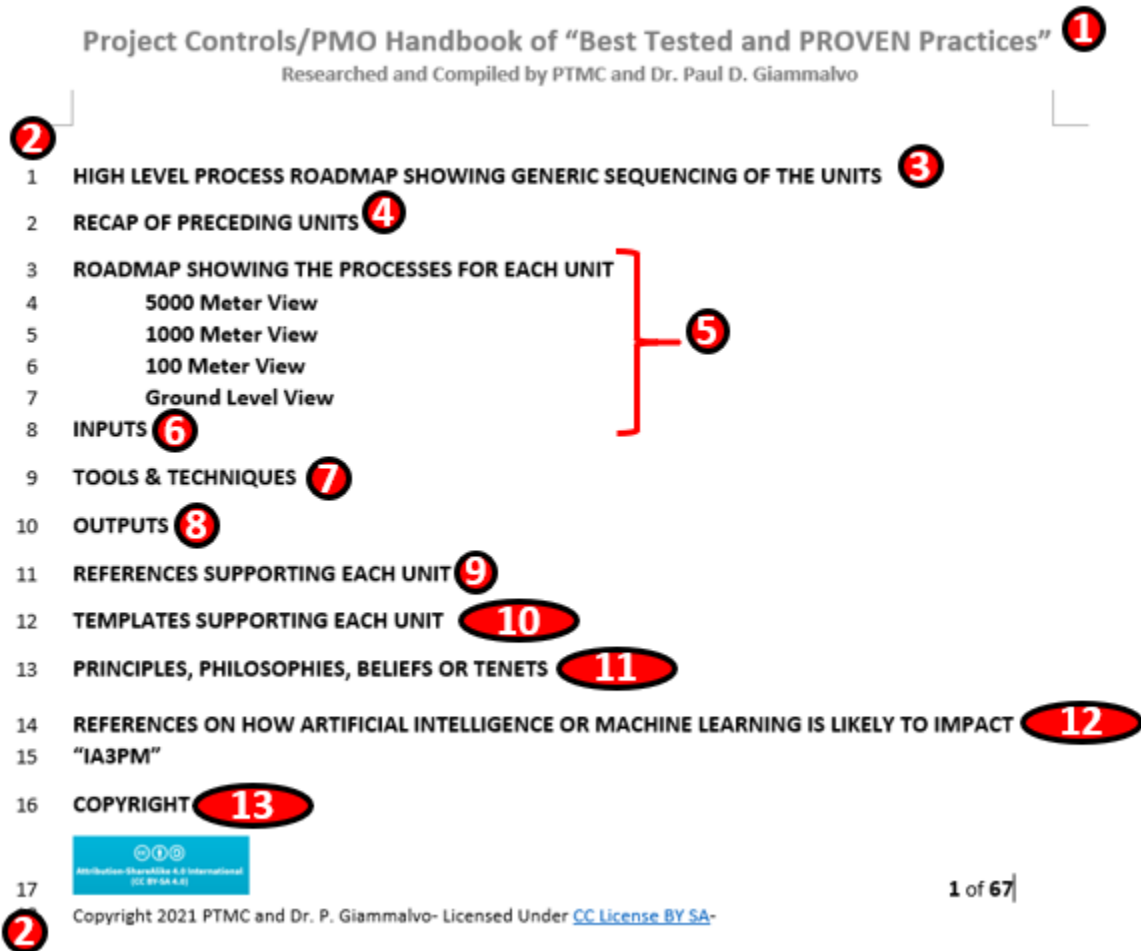
2 Figure 1- High-Level Process Map Showing Progress



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3 HOW IS THIS BOOK SET UP AND ORGANIZED?



4

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 adopted is to
7 label the GRAPHIC or FIGURE with the first value (2) (the number of the FIGURE) and the item it explains or
8 refers to in the second number. (2.1) We follow this convention throughout the book.

- 9 ✓ (2.1) This book is based on 100+ years of combined “hands-on” experience doing projects where our
10 own money is on the line if the projects “succeed” or “fail” and growing frustration with what appears to
11 be a focus by professional societies and even individuals on generating revenues from creating books not
12 designed to help improve the “success” rates of project delivery, but on providing the base for yet
13 another exam-based certification. This book is the opposite. A selected group of EXPERIENCED
14 practitioners who, like us, have “skin in the game” if our projects succeed or fail, have RESEARCHED
15 “best tested and PROVEN” practices, tools, and techniques based on our first-hand experience, and have
16 proven to CONSISTENTLY produce superior results.
- 17 ✓ (2.2) Because this is a “Living Document,” we fully expect and, in fact, encourage other like-minded
18 practitioners, who, through their personal experiences, know of “best tested and proven” practices and
19 are willing to share them, to do so. To make this easy, we have provided line-item numbers to help you
20 identify where any proposed changes, additions, or modifications should appear.

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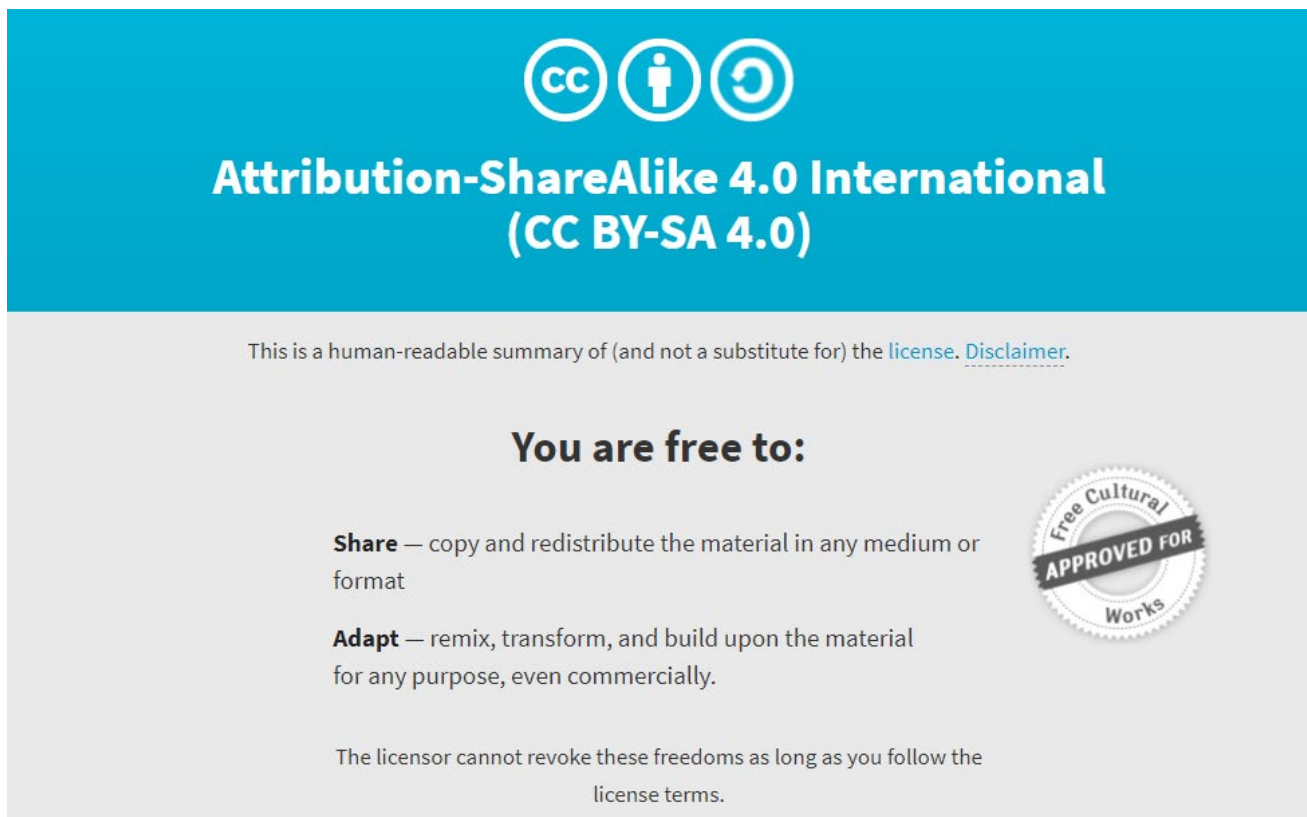
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- 21 ✓ (2.3) Somehow, it appears as though many people seem to have forgotten or never fully realized that
22 “integrated asset, portfolio, program, and project management” is nothing more than a series of
23 PROCESSES. And that those processes, when integrated, are nothing more than a DELIVERY SYSTEM to
24 “create, acquire, expand, upgrade, repair, maintain, and eventually dispose of ORGANIZATIONAL ASSETS.
25 Neither projects nor the people who manage them lie at the “center of the universe.” We are just
26 another “cog in the wheel.”
- 27 ✓ (2.4) Because project management is a SYSTEM, and the PROCESSES that go into this system are all
28 linked to one another, a major focus in this book is going to be on HOW and WHY the processes are
29 linked to one another. Very few of the books on project management talk about HOW or WHY we
30 execute the processes in any sequence or order, and we will try to explain that to you. However, we also
31 advocate for a “Lego Block” approach, providing SCALABILITY, ADAPTABILITY, and FLEXIBILITY in how and
32 when the processes and the associated tools & techniques are implemented.
- 33 ✓ (2.5) One of the reasons we believe PMI’s PMBOK Guide failed is that the processes were of such a high
34 level that they were, for all intents and purposes, worthless to try to apply, which many people tried,
35 despite PMI’s claims that the PMBOK is not a process roadmap, but a Body of Knowledge, but have tried
36 to use it as one anyway. This book addresses the need for a “how-to-do-it” process road map. Having
37 been in the training and consulting business for going on 30 years, the one question our clients have all
38 asked is, “HOW DO WE DO THIS?” While this book focuses on the processes, the primary focus is on
39 **HOW TO SELECT AND USE THE TOOLS AND TECHNIQUES OF OUR CRAFT OR TRADE.** If you know which
40 tool or technique to use and are COMPETENT at using that tool or technique, how much does it matter
41 on what project you use that tool or technique? To address this need, we take the level of granularity
42 down to “where the rubber meets the road, where we actually apply the tools and techniques to
43 accomplish work. As our background is in engineering and construction, we will use examples from
44 these fields to provide you with enough knowledge and understanding to ADAPT or ADOPT what we
45 show to your specific application. Each tool and technique is presented as a LEGO BLOCK to provide
46 FLEXIBILITY, SCALABILITY, and ADAPTABILITY. Using this analogy, we encourage people that once you
47 have learned HOW and WHEN to use each tool and technique, it is up to your imagination to INNOVATE,
48 figuring out how BEST or BETTER to use them for YOUR projects.
- 49 ✓ (2.6) As this is a process-based model, we provide you with a checklist of what our 100+ years of
50 experience have shown us is necessary to execute each process successfully. Because the CONTEXT is so
51 important, your inputs may or may not be the same, but it at least gives you a STARTING POINT. Think of
52 this book as a COOKBOOK with RECIPES that you can ADAPT to your own tastes and the size of your
53 family or clients.
- 54 ✓ (2.7) The heart of this book revolves around how to use the Tools and Techniques. Unlike most books
55 published, this one focuses on which tools and techniques have been proven to work for each PROCESS
56 and how to USE them appropriately and correctly. Having come up through the trades, if a carpenter
57 knows WHEN and HOW to use the tools in his/her toolbox, does it really matter if he/she is building a
58 birdhouse, a doghouse, a mansion, or the Burj Khalifa? We believe this is where PMI’s PMBOK has
59 FAILED: with too much focus on the PROCESSES (ITTOs) at too high a level to be useful, and not enough
60 focus on **WHAT Tools & Techniques** to use, **WHEN**, and **HOW** to use each.
- 61 ✓ (2.8) As Stephen Covey told us to “begin with the end in mind,” we’ve spent a lot of time and effort
62 RESEARCHING what really WORKS, and just like in the cookbooks, we have provided “best in class”
63 examples of what your OUTPUTS should look like IF you have done a good job demonstrating that you
64 KNOW and UNDERSTAND HOW and WHEN to use those Tools and Techniques.
- 65 ✓ (2.9) Because there is no shortage of what we call “Blovitating Poohbahs,” especially on Linked In, who
66 have no shortage of OPINIONS with nothing to back them up, what we have written represents not only
67 what we have learned in the “School of Hard Knocks” about what works and what doesn’t but,

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68 consistent with the “[Scientific Method](#)” we have provided supporting evidence that not only have these
69 “best tested and proven” approaches worked for us, but also have worked for others.
70 ✓ (2.10) While there are no shortages of templates floating around the internet when doing our research,
71 we chose COMPLETE SETS of fully integrated templates that have been tested in the marketplace,
72 including in courts of law. Selecting “ad hoc” templates that look nice but have never been used and
73 tested in the marketplace is foolish.
74 ✓ (2.11) As a little bit of a “poke in the eye” to PMI and their move towards a PRINCIPAL-based PMBOK
75 Guide 7th Edition, we have included a section showing just how futile and useless this approach is. Not
76 only do most of the “principles, philosophies, beliefs, and tenets” associated with Integrated Asset,
77 Portfolio, Program, and Project Management apply to general or operations management, but many of
78 them only serve to highlight the weaknesses underlying so many project “failures.”
79 ✓ (2.12) Whether we like it or not, artificial intelligence and machine learning are already starting to
80 impact the practice of Integrated Asset, Portfolio, Program, and Project Management (IA3PM), and we
81 need to start preparing NOW for this inevitability and for those who truly are “LEADERS,” (rather than
82 merely “Blovitating Poohbah’s) need to shape how it evolves.
83 ✓ (2.13) Lastly, as all the research for this book came from the internet, neither we nor anyone else has
84 any right to claim OWNERSHIP for any of it. All of what we share came from “open-source” publications
85 or from owners who permitted us to publish. Therefore, neither we nor anyone else SHOULD be
86 charging for what is, in effect, COMMON KNOWLEDGE. This is why we are publishing the CONTENT we
87 have compiled AT NO COST under Creative Commons License BY (Attribution) and SA (Share Alike). Our
88 “added value” contribution will remain to continue researching, compiling, and keeping the CONTENT
89 updated and current.



90 **Figure 3- Creative Commons License BY SA**



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91 To cite anything you like from this book properly using [APA format](#):

92 “Giammalvo, Paul D., and PTMC, (2021) Identify Unit, Line Items, Figure Number(s) Under Creative
93 Commons License BY SA v 4.0.” We recommend that anyone writing papers learn how to use the
94 CITEFAST app to cite anything from this book (or any other source).

95 ✓ **What is PTMC’s Business Model?**

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

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

108
109 As noted above, while this book is the CORE TEXTBOOK for our 6-month graduate-level COMPETENCY
110 DEVELOPMENT COURSES, we can also provide a course on a single unit. Since we are focused on
111 COMPETENCY DEVELOPMENT, we do not believe 2-, 3-, or 4-day courses are an effective means of
112 transferring technology. For more information and pricing, contact Ms. Yani Suratman at
113 yanisuratman@gmail.com or WhatsApp her at +6281-6187-3992.

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

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

118
119 Likewise, there is no shortage of evidence that for well over 6000 years, humans have been “initiating,
120 planning, executing, controlling, and closing projects” in construction, medicine, entertainment, and new
121 product development, so wouldn’t you think that in 6000+ years, we should have learned enough
122 lessons to know how to prevent project failures?

123
124 So what can or should we do to fix what is broken? The first step is to admit to the facts:

- 125 ○ The propensity for humans to “initiate, plan, execute, control, and close” projects is part of the
126 human psyche- something that sets us apart from the lesser animals. Humans have always done
127 projects; we do them now, and there is no reason to believe we will not continue to do them well
128 into the future.
- 129 ○ IF we would take the time to STUDY and UNDERSTAND the LONG history of project management in
130 general but more specifically, “Agile,” whether disciplined, agnostic, or any other combination or
131 permutation, is nothing more than the same “trial and error” method used by our [Neanderthal](#)
132 [ancestors 300,000 years ago to tame fire](#) and the same way used [6000 years ago to invent the](#)
133 [wheel](#), and the same method given the name of the “[Scientific Method](#)” around the 11th Century



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and which for the past 1000 or so years, has brought us hundreds of thousands of new products and services, including the telephone (Bell), the lightbulb (Edison) and penicillin (Fleming).

- Projects are nothing more than a DELIVERY system designed to “create, acquire, expand, update, repair, maintain, and eventually dispose of ORGANIZATIONAL ASSETS.
- Project Management is PROCESS-based, and those processes are unique to the specific type of project and the sector they are being applied to. For example, assuming we can all agree that flying a commercial jet from City A to City B, removing an inflamed appendix, and designing and constructing a bridge are all projects. At the very highest levels, they are “initiated, planned, executed, controlled, and closed,” but the deeper we drill down into the processes, the more unique and application-specific the processes become.
- There are no “tools or techniques” that are “unique” only to project management. All the tools and techniques used in project management originated hundreds, if not thousands, of years ago. Most of them evolved and were documented during the 17th and 18th centuries
- The same truth applies to the principles. The fundamental principles or tenets applicable to General, Asset, and Operations Management also apply to Project Management. The ONLY meaningful differentiator between PROJECTS, PROGRAMS, and OPERATIONS is that projects have a defined finish at the outset. Programs and Operations have NO PREDETERMINED FINISH date.
- The “root cause” reasons for continually failing projects have been well researched and documented by many credible sources quoted in this book, yet we continue to ignore them.

✓ Purpose/Objective of the book

As this book is designed to support YOUR EFFORTS in developing and assessing YOUR COMPETENCY or the competency of those in your team or organization, in APPLIED “Integrated Asset, Portfolio, Program and Project Management, (IA3PM), the layout and the structure is based on research done to identify the “best tested and PROVEN PRACTICES,” meaning that unlike PMI’s PMBOK Guide (that advocates those processes used on “most projects most of the time” or “average” practices) or AACE’s RECOMMENDED Practices, this book focuses less on the PROCESSES (which we already know are context or application-specific) and more on the “Tools and Techniques.”

The thinking behind this focus on “HOW to Do It” is based on the primary author’s 30 years as a Union tradesman, from apprentice to journeyman to master builder, before becoming an academic. Think about it. IF a carpenter (or any other tradesperson) knows which tool to use and how to use it, does it matter if he/she is building a house, a fine piece of furniture, a bridge, or the Burj Khalifa? If you can master HOW and WHEN to use the tool or technique, does it matter what you use that tool to accomplish

Thus, this book will focus on what tools/techniques are used as part of each process and HOW TO USE THAT TOOL, as it is normally and customarily applied for that process.

This book includes a complete literature review of:

- Association for the Advancement of Cost Engineers (AACE) Total Cost Management Framework (TCMF)¹
- Guild of Project Controls Competency-Based Certification Program (GPC)²
- Global Alliance for Program and Project Standards (GAPPS)³

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>

³ Global Alliance for Program and Project Standards “Tools for Assessment” <https://globalpmstandards.org/tools/tools-for-assessment/>



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175 ○ International Labor Organization (ILO) “Regional Competency Standards”⁴
176 ○ PMI’s 2015 version of the “PMP Exam Content Outline” (PMI)⁵
177 ○ PMI’s 2020 version of the PMP Exam Content Outline.”⁶
178 ○ PRAXIS Framework⁷
179 ○ The Institute of Asset Management (PAS 55 and ISO 55000)⁸
180 ○ Our company’s in-house Competency Assessment Program (PTMC-CAP) is a derivative that
181 evolved from the Guilds and Trade Unions, so we rely heavily on the International Labor
182 Organization’s (ILO) “[Model Regional Competency Assessment](#)” when designing our programs.
183 Given that Integrated Asset, Portfolio, Program, and Project Management is PROCESS BASED and given that
184 many of the “Best Tested and Proven” TOOLS and TECHNIQUES apply to more than one process, we will
185 present the tool and technique used by the PROCESS it is most often associated with and shows how to use
186 it for that purpose, but at the same time, will note the same tool/technique can be and often is used for
187 other processes. OTHER processes. This is especially true of the tools & techniques shown in Unit 5 -
188 Managing QA-QC and Unit 6 - Managing Risk & Opportunity.

189 Figure 6 below provides this book’s “big picture” perspective. Unit 1—Governance and Integration focuses
190 on the process maps and takes a “top-down” approach.
191
192 Once we have developed an understanding of the processes, including where to find more information on
193 them, as we get into each of the remaining units, the focus will change from learning “what the process is”
194 to “how to use the tools and techniques to support or execute that process.”
195
196 Another driver behind the importance of this book is to understand and appreciate that as we move towards
197 the application of Artificial Intelligence (AI), Automation, and Modularization to all aspects of project
198 management, the more we are going to require STANDARDIZATION not only in terminology but more
199 importantly, in the various processes and coding structures. Without standardization, both the process and
200 the codes, the different “Apps” will be unable to exchange data.

201 ✓ **Artificial Intelligence Policy (AI)**

202 Generative AI tools, including Grammarly Pro and Citefast, were used in the preparation of this work to
203 assist with brainstorming, structuring, copyediting, and supporting citations. The editor and all contributors
204 and peer reviewers are solely responsible for the accuracy and integrity of the final content.

205 ✓ **“Fair Use Doctrine” Copyright Policy**

206 Notwithstanding any/all copyright claims, this review, comments, challenges, and
207 recommendations are being made under the “[Fair Use Doctrine](#)” ([17 US Code § 107](#)) and are
208 consistent with the [5 Attributes of the Scientific Method](#), specifically, results are PROVISIONAL.
209 “Results obtained through the scientific method are provisional; they are (or ought to be) open
210 to questions and debate. If new data arise that contradict a theory, that theory must be
211 modified.”

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>

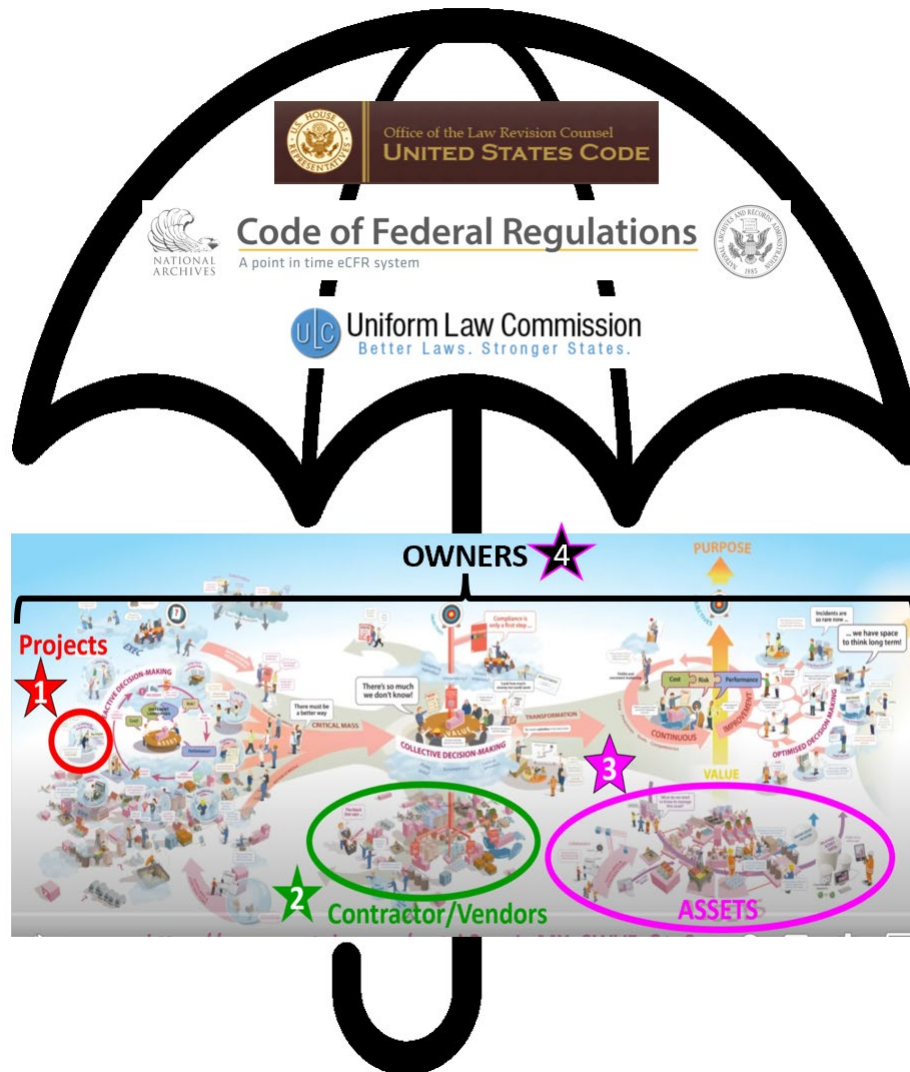
⁸ The Institute of Asset Management <https://theiam.org/about-us/>



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212 ✓ The Ecosystems and Biosphere of Project Management



213 **Figure 4- BUSINESS ECOSYSTEM of INTEGRATED Asset, Portfolio, Program, and Project Management.**

214 Investopedia defines “Business Ecosystem.”⁹ as:

215 “a dynamic network of organizations like suppliers, distributors, and government agencies,
216 collaborating and competing to deliver specific products or services. This interconnected structure,
217 akin to a biological ecosystem, requires flexibility and adaptability from each participant to thrive in a
218 constantly evolving marketplace.

219

220 To put each ECOSYSTEM of INTEGRATED Asset, Portfolio, Program, and Project Management in an
221 appropriate perspective, we need to understand that, regardless of the country we may be from, regardless
222 of your country, we are bound by Federal laws and regulations, State or Provincial laws and regulations, and,
223 in some cases, there are local city laws and regulations. In the example shown, we are illustrating the US

⁹ Investopedia definition of Business Ecosystem (9/2025)- <https://www.investopedia.com/terms/b/business-ecosystem.asp>

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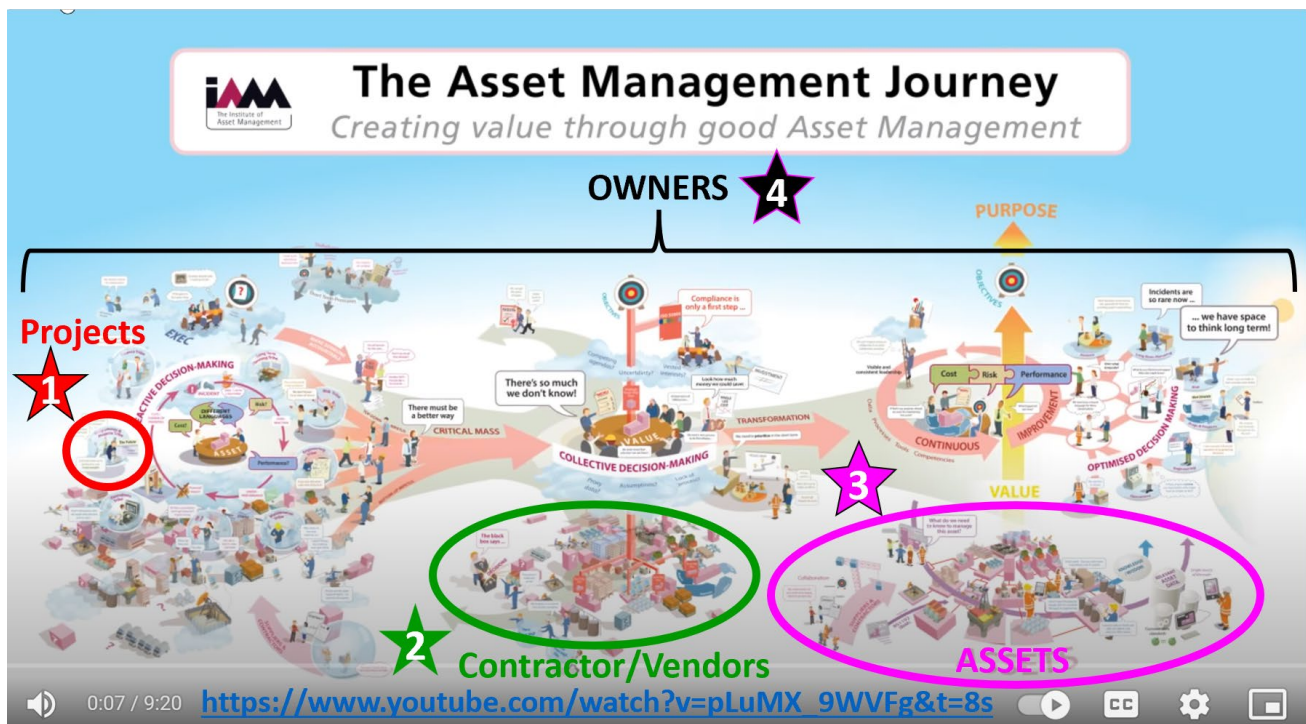
224 Federal Government Laws and Regulations and the State Regulations. For your country, you need to
225 research and investigate, and across your phase-gate asset and project lifespans, ensure compliance with the
226 relevant laws and regulations. This helps to explain what makes each portfolio, program, and project
227 management UNIQUE. Even the same project in a different country, state, territory, or city will almost
228 certainly make it differ in costs, duration, and both risks and opportunities.

229 Likewise, the compilation of individual business ecosystems across all 197 countries, from Afghanistan to
230 Zimbabwe and every country in between, constitutes the Business Biosphere. Thus, we can begin to
231 appreciate just how complicated the INTEGRATION of Asset, Portfolio, Program, and Project management
232 can become. The concept of business ecosystems and the business biosphere originated with business
233 strategist James Moore, who adopted this biological concept in his 1993 *Harvard Business*
234 *Review* article “Predators and Prey: A New Ecology of Competition”, in which he paralleled companies
235 operating in the increasingly interconnected world of [commerce](#) to a community of organisms adapting and
236 evolving to survive. Moore suggested that a company be viewed not as a single firm in an industry, but as a
237 member of a business ecosystem with participants spanning across multiple industries.¹⁰

238

239 ✓ **Decomposing to the Next Levels of Detail**

240 The next level of detail can be found in the Institute of Asset Management (TheIAM), with their “big picture”
241 showing all the major “actors,” “players,” and “key stakeholders” in the INTEGRATED Asset, Portfolio,
242 Program, and Project Management show.



243

244 **Figure 5- [The Institute of Asset Management’s Journey](#) from the 15,000 Meter Level**

¹⁰ Harvard Business Review. "[Predators and Prey: A New Ecology of Competition](#)."

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245 The Institute of Asset Management Journey is a ~10-minute YouTube video that explains why project
246 management consistently yields such disappointing results.

247 Introducing the major “actors” or “players” or “key stakeholders.”

- 248 1. Projects for a CONTRACTOR or VENDOR, a project is a potential PROFIT CENTER. For OWNERS, a Project
249 is always a COST or INVESTMENT CENTER. For an OWNER, a Project is nothing more nor anything less
250 than a DELIVERY SYSTEM
 - 251 1.1. Project Teams- Project Teams can consist of as few as a single person up to a hundred or more.
 - 252 1.2. Project Teams normally consist of a Single Project Manager plus Cost Estimators/Cost Budgeters,
253 Planners & Schedulers, QA/QC, Safety, Health, and Environmental Managers. The team may also
254 include Contract Managers/Legal, Engineering, Finance, HR, and Plant/Equipment Managers.
 - 255 1.3. Normally, the OWNER will have his/her own team, often called the Project Management Office or
256 PMO.
- 257 2. However, the Prime Contractor will have his/her own PMO Office consisting of the same staffing, full or
258 part-time.
 - 259 2.1. Very important to recognize that both CONTRACTORS and VENDORS are in business to make a
260 profit. That is, the primary objective of both CONTRACTORS and VENDORS is to “initiate, plan,
261 execute, control, and close” projects as their core business. Thus, while CONTRACTORS and
262 OWNERS can realize secondary intangible benefits, their primary object in undertaking the project
263 is to make a profit.
 - 264 2.2. And each major Subcontractor and/or Vendor will also have the same PMO Office consisting of the
265 same staffing, full or part-time.
- 266 3. Asset Managers- Unlike CONTRACTORS and VENDORS, who undertake projects to make a PROFIT, for an
267 OWNER, a project is ALWAYS a COST or INVESTMENT CENTER. The only reasons an OWNER organization
268 undertakes a project are either to:
 - 269 3.1.1. Exploit an OPPORTUNITY or MITIGATE a potential Risk
 - 270 3.1.2. Acquire, update, expand, repair, maintain, and eventually dispose of organizational ASSETS.
 - 271 3.1.3. Meet or fulfill government laws, regulations, or mandates.
 - 272 3.2. Thus, for an OWNER, project management is nothing more nor anything less than a DELIVERY
273 SYSTEM to “acquire, update, expand, repair, maintain, and eventually dispose of organizational
274 ASSETS.”
 - 275 3.3. The only way an OWNER can realize any benefits is by putting the PRODUCT (=ASSET) produced by
276 the CONTRACTORS/VENDORS to work or otherwise in service.
 - 277 3.4. Surprisingly, few people fully understand that OWNERS derive no benefits directly from the
278 PROJECT. For an OWNER, the only way they can realize benefits is by exploiting the ASSETS
279 “acquired, updated, expanded, repaired, maintained, and eventually disposed of through the
280 project management delivery processes.
- 281 4. This is the Investopedia definition of ASSETS:¹¹
 - 282 4.1. Identifiable assets are measured by fair value and provide future benefits to a company.
 - 283 4.2. Examples include cash, property, equipment, and inventories that can be quickly valued.
 - 284 4.3. These assets play a crucial role in mergers and acquisitions for assessing company value.
 - 285 4.4. Tangible and intangible assets are identifiable, unlike goodwill, which can’t be separately valued.
 - 286 4.5. Goodwill arises when the purchase price exceeds the fair value of identifiable assets and liabilities.

¹¹ Investopedia Definition of Identifiable Assets (Jan 2026)

https://www.investopedia.com/terms/i/identifiable_asset.asp

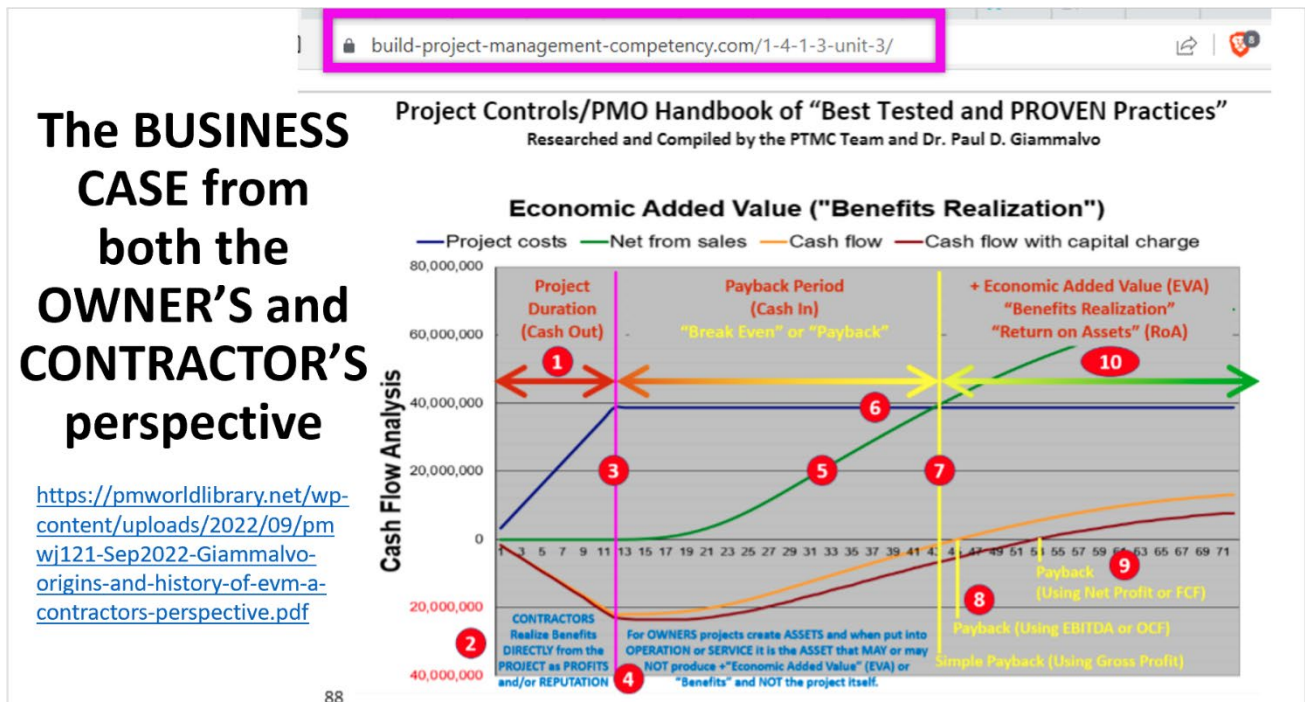


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287 We will explore the definitions and types of ASSETS that either OWNERS or CONTRACTORS can employ the
288 use of their ASSETS in more detail under another heading.

289 5. Another important aspect to understand at this point is to review and reflect upon how and when an
290 OWNER can realize net positive return on their investment (RoI), return on assets (RoA), or return on
291 equity (RoE).



292 Figure 6- The Business Case from Both the CONTRACTORS and OWNERS Perspectives.¹²

293 This will be covered in greater detail in Unit 4- Managing the Business Case, but for the time being,
294 remember that only the CONTRACTOR can profit from the PROJECT. The OWNER can realize BENEFITS not
295 from the project itself, but ONLY from the ASSET (=Product) that the project was undertaken to create or
296 produce. And more importantly, the OWNER cannot realize POSITIVE benefits ("Economic Value Added,"
297 "Benefits Realization," or "Return on Assets") until AFTER the savings or increased revenues have repaid the
298 initial project investment. (Confluence of (6.5), (6.6), and (6.7).

299 ✓ The Four Levels of Strategic Decision Making Defined

300 Given the confusion caused by many who claim that project managers make strategic decisions, this book is
301 based on research that originated with Sun Tzu 2500 years ago and has been reaffirmed over the years by
302 Field Marshal Carl von Clausewitz and Helmuth von Moltke. It shows that in any organization, there are four
303 levels of strategic decision-making.

304
305 This model was recognized for project management around 1985 by R. Max Wideman, and informal research
306 done by our company over the past 30 years on our Fortune 500 clients indicates that this model remains
307 just as valid today as it was 2500 years ago when Sun Tzu first published it, validated again in 1985 by Max,

¹² The Project Manager's MBA: How to Translate Project Decisions into Business Success 1st Edition, (2001)
by [Dennis J. Cohen](#) (Author), [Robert J. Graham](#) (Author) https://www.amazon.com/Project-Managers-MBA-Translate-Decisions-ebook/dp/B000PY3Z44/ref=sr_1_1?s=books&sr=1-1

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308 and still useful today in most organizations. All we can do is urge you to look at your organization to see
309 whether this is valid, and, if not, what strategic decision-making model are you using?

310 This will be explored in more detail when we get into —Managing People, but as we progress through the
311 process maps, we must understand who these 4 “actors” or “actresses” are and what roles and
312 responsibilities they have in our story. It also raises the question of how those who claim that project
313 managers make strategic decisions consistent with the tenets of the “scientific method” can prove these
314 claims. Consistent with the tenets of the “[Scientific Method](#),” where is your proof to support your claims?

315 ○ (7.1)- GRAND STRATEGY-

316 At the 15,000-meter view, we can see that the “C-Level” actors are responsible for establishing the
317 organization’s “Grand Strategy. “Black’s Law Dictionary defines “Grand Strategy” as “Entity planning of
318 major goals and objectives. Essential corporate actions are mapped to a comprehensive, long-term plan.
319 Market, product, and organizational development tied to the acquisition, divestiture, diversification,
320 joint ventures, and strategic alliances are all key factors in the objectives and the planning.”¹³ For more
321 on the topic of “Grand Strategy,” we recommend this 2017 paper by [Nina Silove](#), “[Beyond the Buzzword:
322 The Three Meanings of ‘Grand Strategy.’](#)”

323 ○ (7.2)- STRATEGY-

324 Investopedia defines “Strategic Management” as “the management of an organization’s RESOURCES
325 (logistics) (Unit 7) to achieve its goals and objectives. Strategic management involves setting objectives,
326 analyzing the competitive environment, analyzing the internal organization, evaluating strategies, and
327 ensuring that management rolls out the strategies [across the organization](#).”¹⁴ Note that in this
328 document, the terms “RESOURCES” and “ASSETS” are used synonymously, understanding the
329 fundamental principle that it “takes assets to create, acquire, update, expand, repair, and maintain new
330 or existing assets.” Also, appreciate that what we refer to as “Asset Managers” are almost always
331 FUNCTIONAL managers? i.e., HR manages/controls Human Assets? Is finance responsible for the
332 allocation of Financial Assets? Do engineers and IT managers manage Knowledge Assets? Keep that in
333 the back of your mind as you read this book.

334 ○ (7.3)- GRAND TACTICS or OPERATIONS-

335 Investopedia defines Operating activities as “the functions of a business causally related to providing its
336 goods or services to the market. These are the company’s core business activities, such as
337 manufacturing, distributing, marketing, and selling products or services. Operating activities will
338 generally provide the majority of a company’s [cash flow](#) and largely determine whether it is
339 profitable.”¹⁵ In OWNER organizations, Operations Managers are genuinely the “stars” of the show.
340 Why? Because it is operations that produce whatever products or services the company is in business to
341 provide. IF you are a PROJECT MANAGER and want to be the “star” of the show, then you need to join a
342 CONTRACTOR organization, where projects are PROFIT centers.¹⁶

343 ○ (7.4)-TACTICS-

¹³ Black’s Law Dictionary Online (N.D.) <https://thelawdictionary.org/grand-strategy/>

¹⁴ Investopedia Definition of “Strategic Management” (2020) <https://www.investopedia.com/terms/s/strategic-management.asp>

¹⁵ Investopedia Definition of “Operations” (2020) <https://www.investopedia.com/terms/o/operating-activities.asp>

¹⁶ 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>



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344 “Short-term, easily identifiable objectives. With simple goals set by the Operational or Asset
345 Management level, the tactical goals are bite-sized parts of the higher-level game plan. This level is
346 primarily concerned with IMPLEMENTATION, and the personnel and other resources or assets employed
347 here are technically proficient and capable. Junior officers and senior Non-Commissioned Officers
348 manage combat. Securing and defending geographic points and persons, or denying the same to the
349 enemy, are easily identifiable tactical goals. This level takes objectives within a battle.”¹⁷ Doesn’t this
350 describe EXACTLY what project managers are responsible for? Deliver on time? Within Budget? No lost
351 time injuries? No environmental or OSHA citations?

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

¹⁷ An Introduction to Strategic Studies (N.D.)

https://en.m.wikiversity.org/wiki/What_Is_Strategy%3F_Why_Study_Strategy%3F

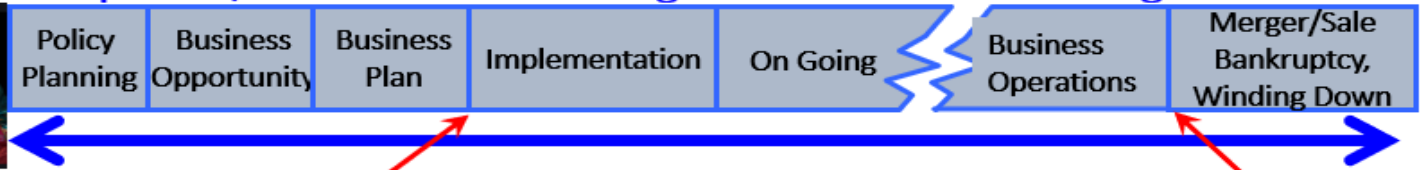


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Corporate, Business Unit or Organizational Level Managers...

Corporate Life Span
~100 Years **1**
GRAND STRATEGIES



Asset Life Span
3-40 Years
STRATEGY

2



Operations Life Span
2-30 Years
GRAND TACTICS

Project Life Span
0.5 to 3 Years
TACTICS

4



Project Managers
Manage Projects...

CAPEX Funded Projects
OPEX Funded Projects

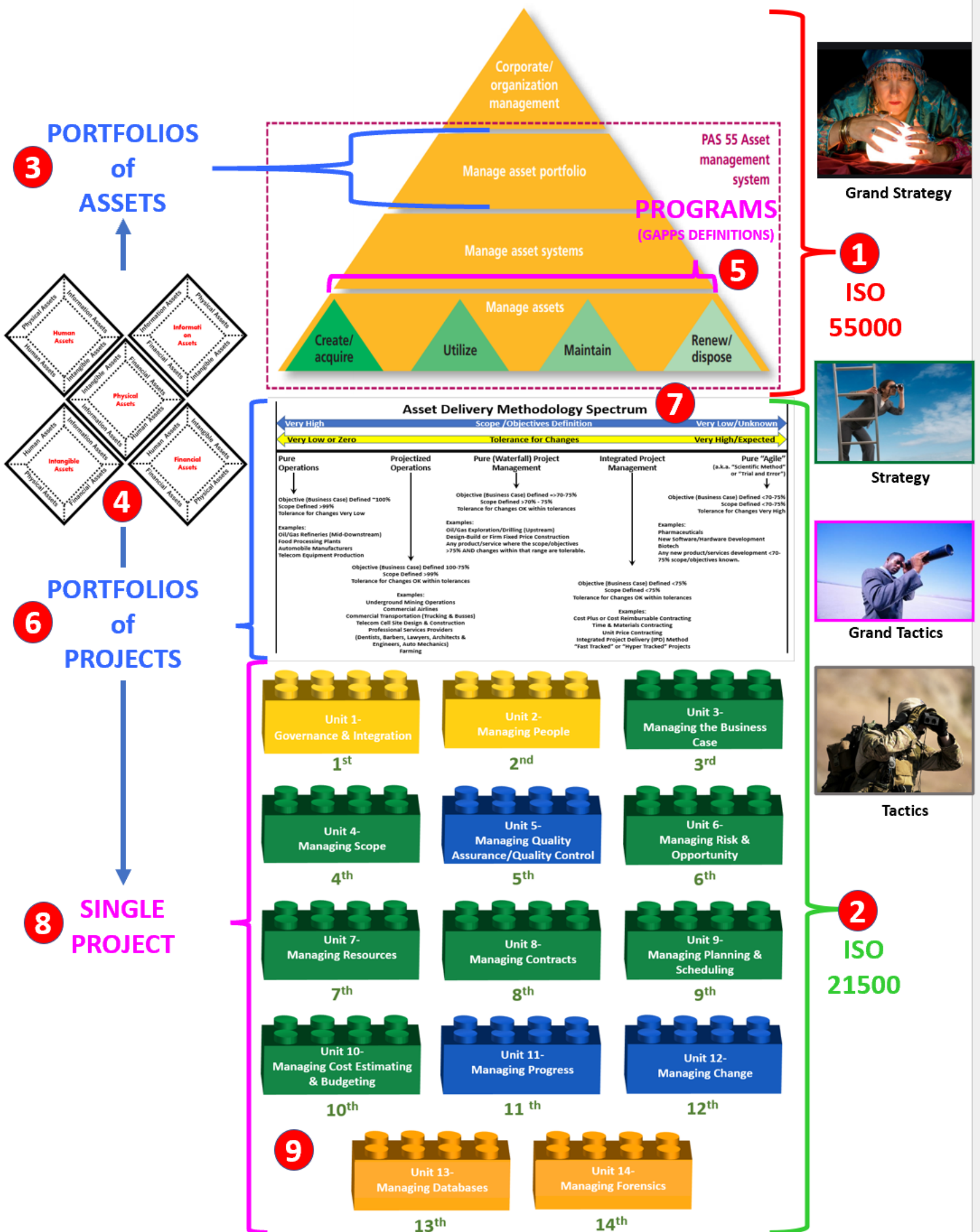
[https://en.wikiversity.org/wiki/Introduction to Strategic Studies/What Is Strategy%3F Why Study Strategy%3F](https://en.wikiversity.org/wiki/Introduction_to_Strategic_Studies/What_Is_Strategy%3F_Why_Study_Strategy%3F)



356 **Figure 7 - Introducing the Four “Actors” for Integrated Asset, Portfolio, Program, and Project Management and their Roles- 15,000-Meter View.** (Adapted from
357 published work of Max Wideman, circa 1985, Used with permission

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358 Figure 8- Fully Integrated Asset, Portfolio, Program, and Project Management Process Map: 10,000 Meter View

359 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)

360



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361 The numbers are shown below in **RED TYPEFACE (N)**, corresponding to the graphic shown in **Figure (8.1) ISO**
362 **5500:2018-**

363 ISO 55000 evolved from British Standards PAS 55.1 and PAS 55.2. The PAS Asset Standards were developed
364 by a consortium of 50 organizations from 15 different industry sectors in 10 countries. They have been
365 adopted and applied across most industries and sectors, public and private, and in diverse regulatory
366 regimes, cultures, and environments. Benefits from these implementations range from “it provided a
367 structured basis for coordinating all our efforts into a common, business-prioritized direction” to very
368 substantial bottom-line performance gains.

369
370 Because PAS 55 is publicly available and because PAS 55 and ISO 55000 cover the same topics, consistent
371 with the principles underlying this publication by selecting only those “best tested and proven” practices
372 freely available on the internet, these are the graphics we have incorporated into this document- **PAS 55**
373 **Part 1- Specification for the optimized management of physical assets-** and **PAS 55 Part 2- Guidelines for**
374 **the Implementation of PAS 55-** ISO 55000:2014 and 55000:2018 provides an overview of asset
375 management, its principles and terminology, and the expected benefits from adopting asset management.
376 ISO evolved from British Standards PAS 55.1 and PAS 55.2

377 **ISO 55000:2014**, the “2nd Generation” of PAS 55, can be applied to all types of assets and by all types and
378 sizes of organizations.

379 “The ISO 55000 series comprises the three standards in asset management—**ISO 55000, ISO 55001, and ISO**
380 **55002**. When used together, the three standards provide a framework and guidelines for developing an
381 integrated and effective asset management system. Such a system includes both tangible and intangible
382 assets. These standards were developed over several years to create a universal standard in asset
383 management systems.” For a 10-minute video explaining the asset management process, go **HERE**.
384

385 ✓ **(6.2) ISO 21500:2021**

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

388 ISO 21500:2012 provides a high-level description of concepts and processes considered to form good project
389 management practice. Projects are situated within programs and project portfolios; however, ISO
390 21500:2012 does not provide detailed guidance on managing them. Topics about general management are
391 addressed only within the context of project management.

392
393 ISO 21500:2012 was just replaced by ISO 21502:2020, and it is even worse than 21500, which was not widely
394 accepted or adopted by project managers. **This article by Dr. Paul D. Giammalvo** explains why it is flawed and
395 should be replaced

396 ✓ **(8..3) and (8..4) Portfolios of ASSETS- 5.000 Meter Perspective**

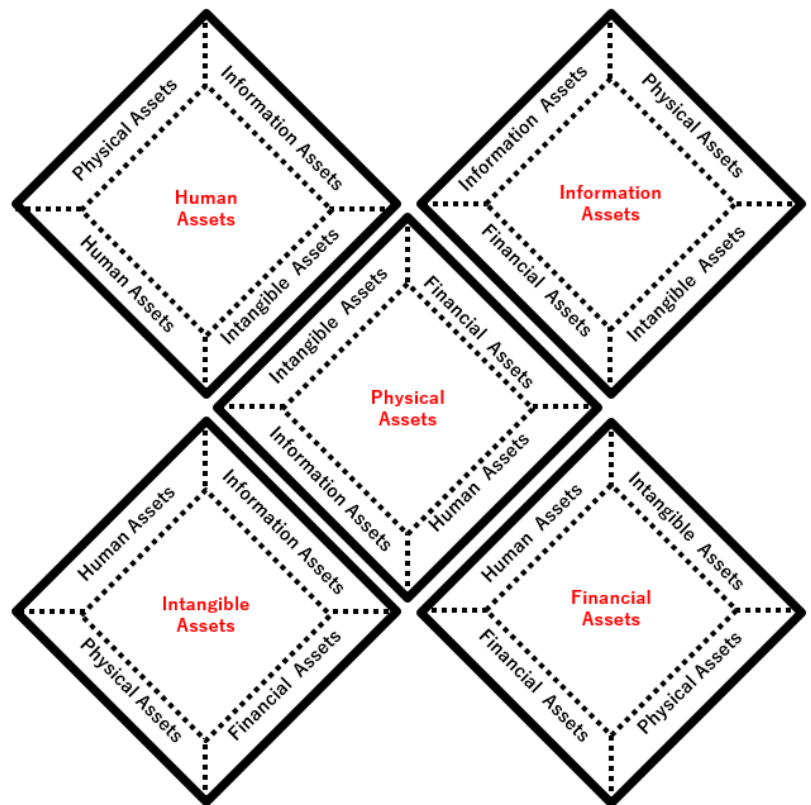


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397 The Business Dictionary defines an “Asset” to be: **Figure 9 (8..3 and 8..4)- Portfolios of Assets**

- 398 ○ “1. Something valuable that an entity
399 owns, benefits from, or uses in
400 generating income. 2. Accounting:
401 Something that an entity has acquired
402 or purchased, and that has monetary
403 value (its cost, book value, market
404 value, or residual value).”
- 405 ○ An asset can be (1) something
406 physical, (TANGIBLE) such as cash,
407 tools, machinery, inventory, land, and
408 buildings, (2) or INTANGIBLE like an
409 enforceable claim against others, such
410 as accounts receivable, (3) a right,
411 such as a copyright, patent,
412 trademark, lease, or (4) an
413 assumption, such as goodwill. Assets
414 can also be living, such as humans,
415 livestock, or pets.
- 416 ○ Assets are shown on their owners’
417 balance sheets and are usually
418 classified according to the ease with
419 which they can be converted into
420 cash.



421 We will explore this in more detail later, but notice that these ASSETS are owned and controlled by “Line” or
422 “Functional” managers? This becomes important when we understand the potential impact the control and
423 allocation of these usually scarce or limited ASSETS have on PROJECT portfolios. Note that the term
424 RESOURCES is also synonymous with ASSETS when used in this context.

425 Lastly, the Business Dictionary defines “Asset Management” as “Prudent administration of investable (liquid)
426 assets, aimed at achieving an optimum risk-reward ratio.” We will delve into this in greater detail, especially
427 in Unit 2.

428 ✓ **(8..5) PROGRAMS- 1,000 Meter Level Perspective (Operational Level)**

429 Programs represent a thorny problem not uncommon in project management: establishing a common
430 [LEXICON or VERNACULAR](#) for Integrated Asset, Portfolio, Program, and Project Management (IA3PM). This
431 can be illustrated by visiting [Max Wideman’s Comparative Glossary of Project Management Terms](#), where
432 you will find 13 definitions for “Program” or “Program.”

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433 Based on Sergio Pelligrinelli’s research, the Global Alliance for Project Performance Standards (GAPPS)
 434 reaffirmed his findings, showing that there are four very different definitions of “Program,” and that not only
 435 did everyone swear their definition was correct, but no one was even willing to consider changing. Thus, we
 436 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.

437 **Figure 10– Definitions of “Program” from GAPPS with Examples**

438 Notice in Figure 10 that the demarcation lines between the definitions are porous and expansive with grey
 439 fill. This indicates that some organizations use other definitions that don’t fit neatly into any single existing
 440 category but instead cross boundaries, making things even more complicated. Context or perspective may
 441 affect the terminology one uses. We may label a much larger project for a CONTRACTOR as a MEGA-
 442 PROJECT, yet from the OWNER’S perspective, he/she may mark it as a Strategic Program. So context and
 443 perspective matter, as do the relative size and complexity. For this reason, given that project management is
 444 a BUSINESS undertaking, we rely on credible Business Dictionaries whenever possible to define the terms we
 445 use in this book.

446 ✓ (8.6) and (8.7) Portfolios of PROJECTS

447 Portfolios of Projects are the summation of 100% of the projects that any organization is “initiating,
 448 planning, executing, controlling, or closing” at any given point in time. This portfolio may or may not be part
 449 of a program, so be clear about those definitions.

- 450 ○ For owners, projects fall into four generic categories, and all of them compete for scarce or limited
 451 resources (assets) that any organization has available.
- 452 • Revenue Generating or “Top Line” Projects - Sales and Marketing Initiatives, New Plant
 453 Construction (Capital Investment), or Mergers/Acquisitions/IPOs (New Market Penetration)



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- 454 • Cost Containment or “Bottom Line” Projects - Reorganizations, Outsourcing, Enterprise
455 Software Solutions, Process Reengineering, Project/Program/Portfolio Management Offices
- 456 • Government-Mandated Projects - SOX/Basel II, Environmental Protection, or Labor Law
457 Compliance
- 458 • Community Service or “Good Will” Projects - designed to improve the image or credibility of
459 the organization

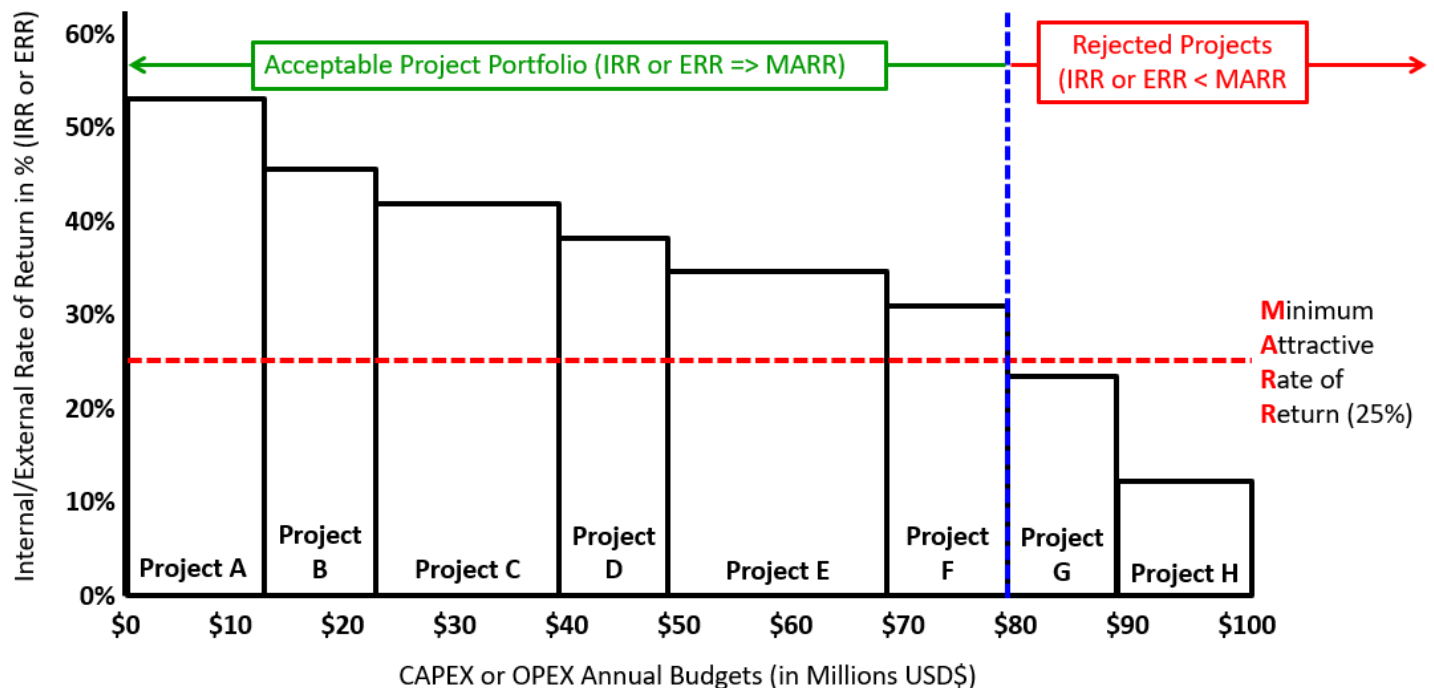
460 While Contractors may also have the same categories of projects internally, since projects are PROFIT
461 CENTERS for Contractors, most of their projects will be revenue-generating.

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

463 Owner organizations consider all the potential projects they can pursue in a year or another specific period.
464 They rank-order all projects by their Internal Rate of Return (IRR) or by Country Risk, plus any other risk
465 adjustments, to derive the risk-adjusted Return on Investment. The example in Figure 11 shows that the
466 Minimum Attractive Rate of Return (MARR) equals the WACC plus Risk Premium Adjustments. Only those
467 projects that generate returns equal to or greater than the MARR will be undertaken. Thus, Projects G and H
468 will be deleted from the portfolio. For more on this topic, see [Unit 3- Managing Business Case](#), which will be
469 explained in detail, including the formulas. External Rates of Return (ERR) and select only those projects that
470 meet or exceed the Minimum Attractive Rate of Return (MARR), which is the Weighted Average Cost of
471 Capital (WACC) plus the Country Risks and any other Risk Adjustments, such as location.

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472 **Figure 11- Portfolios of Projects Rank Ordered by IRR/ERR and selected/rejected based on MARR¹⁸**

473 When looking at PROJECT PORTFOLIOS, we must consider the DEGREES OF DEPENDENCE between two or
 474 more projects. Especially when looking at PROGRAMS, we often find that projects have dependencies and
 475 must occur in a specific sequence. This information must be communicated clearly to all stakeholders,
 476 particularly those in operations, as postponing or canceling a project without understanding how it fits into
 477 the overall PROGRAM can lead to considerable delays and losses, with deferred scheduled maintenance as a
 478 prime example.

479

480

481

482

483

¹⁸ Adapted from Engineering Economy, 16th Edition, by Sullivan, Wicks and Koelling, Figure 13-4, Opportunity Costs and Risks, page 556.

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

484 **FIGURE 12- Degrees of Dependence Between Portfolios of Projects¹⁹**

485 The numbers are shown below in **RED TYPEFACE (N)**, corresponding to the details shown in **Figure 13.7**.

486 ✓ **(13.7) Asset Delivery Options**

487 Figure 13 is essential, as there is a raging debate among the various “Agilists,” the “Waterfall” advocates,
488 and those who claim to use “Hybrid” systems.

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

- 495 ✓ **(13.7.7.1)** The degree to which the SCOPE or OBJECTIVE of the project is known at the outset of the
496 project, which goes from 100% in operations to about 70-75% in a construction environment using
497 traditional “waterfall” to 0% in an “agile” environment. These percentages may change, so before
498 anyone adopts or adapts this for use in your organization, you must determine their values. This will

¹⁹ Adapted from Engineering Economy, 16th Edition by Sullivan, Wickes & Koelling, Table 13-2, Page 559



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499 become critical when we begin to look at Unit 8, Contract Management, as the “real” or “honest”
500 scope definition determines which contract type is appropriate.

501 ✓ (13.7.7.2) The key stakeholders’ tolerance or expectation of how much change they are willing to
502 accept. It runs from zero or close to zero in an operational environment to over 100% in a purely
503 “agile” environment.

504 ✓ (13.7.7.3) **Operations**

505 For OWNER organizations, Operations are their primary, if not the only, reason they are in business. Their
506 business model is designed around producing and selling a product or service. Effectively, these
507 organizations convert a physical (tangible) asset into a financial asset in an operating environment. In this
508 environment, the scope of work and the objective are exceptionally well-defined, to the point of holding a
509 patent on the process or formula and guarding that formula as a proprietary secret. In this environment,
510 change, even the slightest change, is not acceptable. In the world of IT, this is what is being called DevOps,
511 which is “the combination of cultural philosophies, practices, and tools that increases an organization’s
512 ability to deliver applications and services at high velocity: evolving and improving products at a faster pace
513 than organizations using traditional software development and infrastructure management processes.”
514 <https://aws.amazon.com/devops/what-is-devops/> Explained another way, it is “mass production”
515 techniques being applied to software development, leading to what is becoming known as a “Citizen
516 Developer” or “Citizen Programmer” <https://www.mendix.com/glossary/citizen-developer/> where the
517 average person off the street with little or no programming skills can take modularized software
518 components (see our Lego Block analogy) and using those blocks of programming, create their Apps.

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

522 ✓ (13.7.7.4) **Projectized Operations**

523 This is probably the most common application of the project management processes and is often ignored or
524 misunderstood. In many ways, this is an operating environment, EXCEPT that the throughput is not constant
525 but is driven by variable demand, where each “customer” or “client” represents a “project.” This includes
526 virtually all “Professional Services” firms- Doctors, Dentists, Lawyers, Engineers, Professors, Accountants,
527 Commercial Airline Pilots, Bus Drivers, and Truckers, as well as all the trades, Carpenters, Plumbers,
528 Electricians, and Masons, and taken to an extreme, even Barbers, Hairdressers, and auto mechanics.

529 In this environment, the scope of services is usually quite well-defined (e.g., Divorce Lawyer, Real Estate
530 Lawyer), and the “projects” (each client who walks through the door) are, in fact, PROFIT centers. This
531 category of individual has built their business model around the processes required to “initiate, plan,
532 execute, control, and close” projects as they are defined by each profession and trade, and from which they
533 hope that the costs of providing those services are less than the fair market value of the services they are
534 providing.

535 The exciting aspects of this classification of “project managers” are how projects are “initiated, planned,
536 executed, controlled, and closed” and are embedded into the process for them to learn their profession or
537 trade. In many cases, this category of “project managers” is licensed, and the licensing process assesses both
538 their technical and project management skills.



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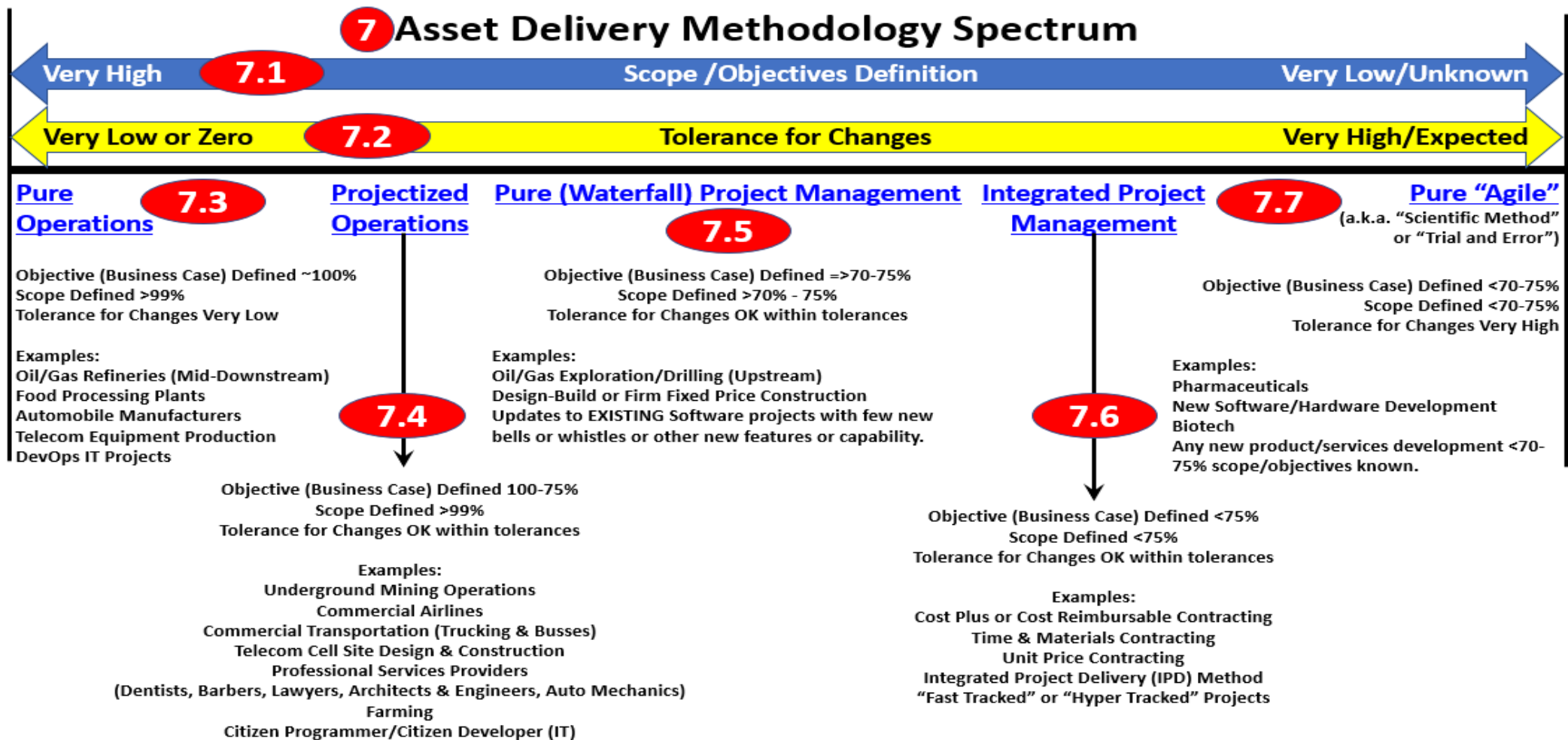


Figure 13- Asset Delivery Option Spectrum of Choice



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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)

541 **Figure 14– Examples of Projects, Programs, Portfolios, and Assets for Selected Trades/Professions.**

542 ✓ (13.7.7.5) “Waterfall” or “Traditional” Project Management

543 This is the classic approach that has evolved over hundreds if not thousands of years where an OWNER
544 organization wants to “create, acquire, update, expand, maintain, repair and eventually dispose of
545 ORGANIZATIONAL ASSETS and either using their EXISTING ASSETS/RESOURCES “initiate, plan, execute,
546 control and close a PROJECT, the purpose of which is to leverage their existing ASSETS to create MORE or
547 BETTER assets. If the Owner does not have sufficient ASSETS/RESOURCES, they can OUTSOURCE some or
548 all of the project to PROFESSIONAL SERVICES providers on a “for-profit” basis. (See 8.4) For OWNERS,
549 projects are almost always either COST or INVESTMENT centers. In owner organizations, they rarely, if
550 ever, make money from the project itself. Owners make money, reduce costs, or otherwise realize
551 BENEFITS not from what has become known as the “Waterfall Method,” which was initially documented
552 and published by Esso or Diamond Shamrock Oil during the mid-1950s, is an INTEGRATED Asset, Portfolio,
553 Program (Operations), and Project Management Methodology. Clearly, this is not based on the PROJECT

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554 life span but the ASSET life span, doing the project by exploiting whatever ASSET the project was
555 undertaken to “create, acquire, update, expand, maintain, repair, and eventually dispose of.”



556 Figure 15– Waterfall Model of the Integrated Asset, Portfolio, Program, and Project Management
557 Methodology

558 As we can see from Figure 15, there is no project (highlighted in blue) until Phase 3 of the Asset Life Span
559 (shown in yellow highlight), and assuming the project is approved and funded, the project is completed at
560 the end of Phase 5 when the ASSET that the project was undertaken to “create, acquire, expand, update,
561 maintain or repair” is turned over to the Asset or Operations Managers, put in service and used to
562 (hopefully) generate the “benefits” for which the “asset” or “product” the project was undertaken to
563 “create, acquire, update, expand, upgrade, repair, maintain and eventually dispose of.”

564 From the CONTRACTOR’s perspective, if the project is being delivered using the IPD approach, he/she
565 would be involved in all three Phases. If the project were contracted using Design-Build (DB) or Engineer-
566 Procure-Construct (EPC), the CONTRACTOR would participate in only two phases. If the project were
567 contracted using “Firm Fixed Price” or Unit Price type contracts, the CONTRACTOR would be engaged
568 during Phase 5, the project’s Execution Phase. To give more perspective, assuming a typical physical asset
569 has a useful life span of, say, 30 years and the phases 3, 4, and 5 only take on average 3-4 years, how
570 realistic is it to expect the projects and people to be able to make STRATEGIC decisions about the Asset
571 itself?

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✓ (13.7.7.6) “Integrated Project Delivery” (IPD) Method

This is a “trial and error” or “agile” method developed in the early 2000s by Architects and some Engineers to help clients who did not know precisely what they needed and wanted, and were tolerant of, or even expected, change. This concept was evolving at the same time our IT colleagues were rediscovering the same trial-and-error, or “Scientific Method,” and naming it “agile” or “Agile.”

For more on this, refer to the American Institute of Architects’ “Integrated Project Delivery” (IPD) approach.

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

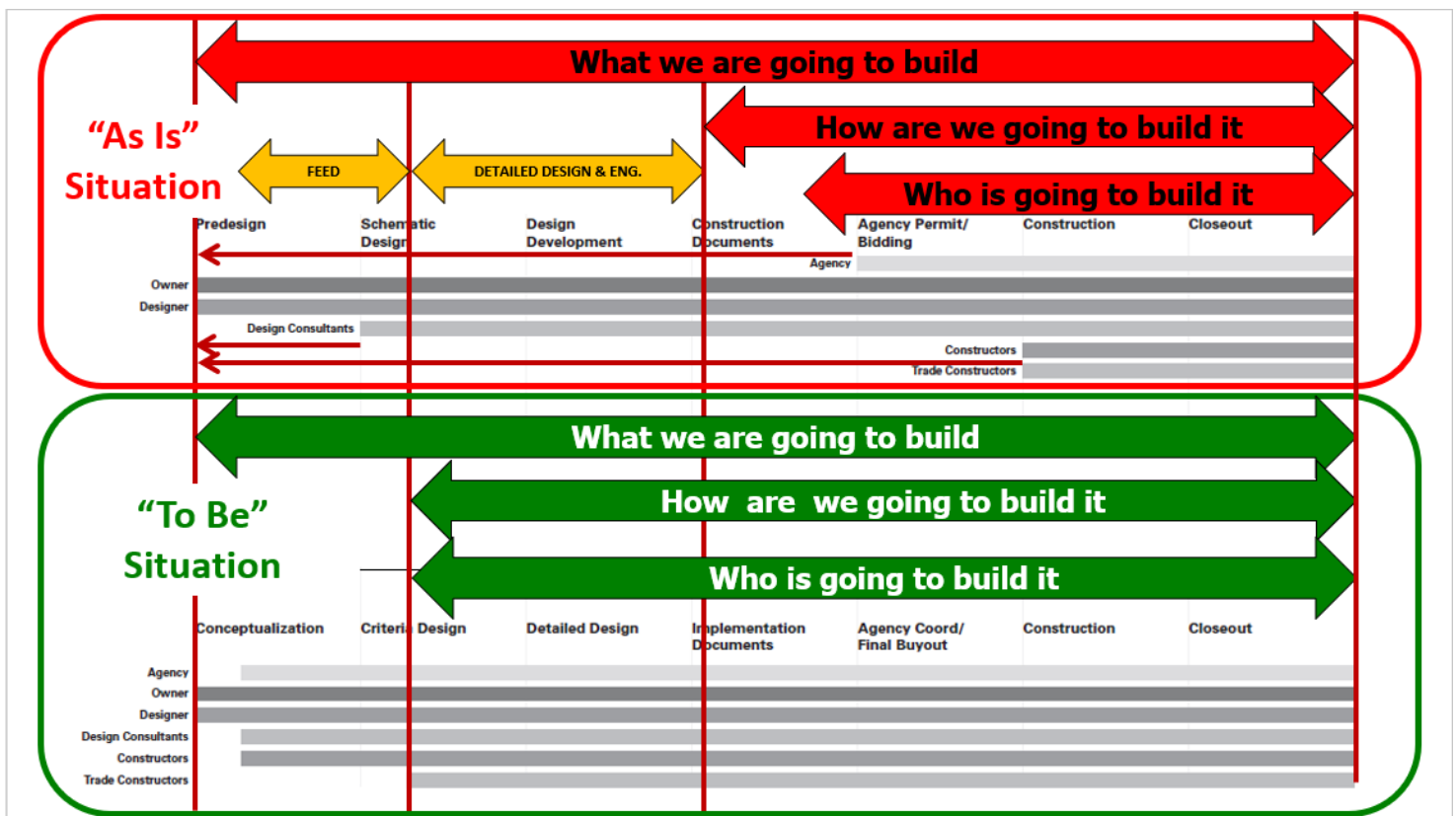


Figure 16 – AIA Integrated Project Delivery (IPD) Concept Map

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

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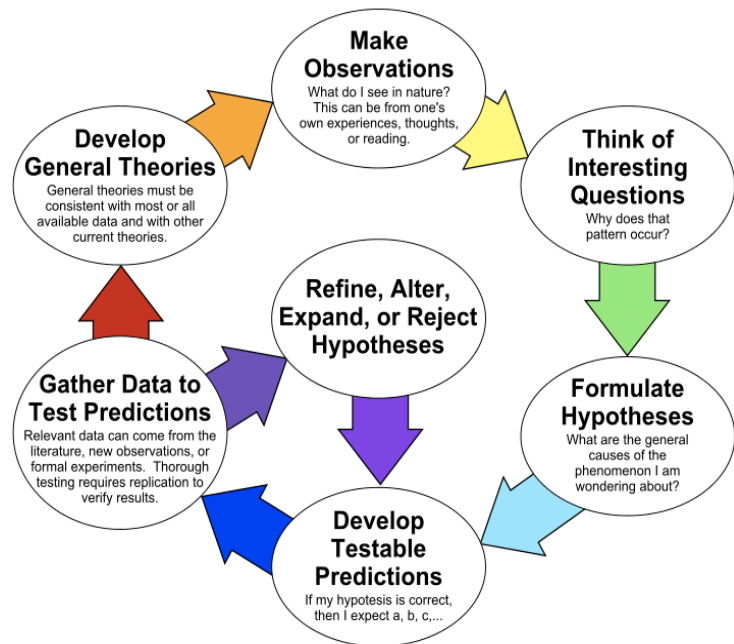
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587 ✓ (13.7.7.7) “Agile,” “Trial and Error,” or “Scientific Method.”

588 [The Agile Manifesto](#) notwithstanding,

Figure 17- Scientific Method Illustrated²⁰

589 what the world of IT is calling “agile” or
590 “Agile” is nothing more than the same
591 “trial and error” method used by our
592 [Neanderthal ancestors 400.000 years ago](#)
593 [to tame fire](#) and the same process used
594 [6000 years ago to invent the wheel](#), and
595 the same method given the name of the
596 “Scientific Method” around the 11th
597 Century ([Ibn al Haytham](#)) and which for
598 the past 1000 or so years, has brought us
599 hundreds of thousands of new products
600 and services, including the telephone
601 (Bell), the lightbulb (Edison) and penicillin
602 (Fleming). Until or unless people
603 understand the FULL history, they cannot
604 understand, much less appreciate, the
605 irony, sarcasm, satire, farce, or paradox
606 that the more recent history has become.
607 Think about the absurdity of it all. How
608 can a PROCESS so simple and basic that our Neanderthal ancestors were able to figure it out on their own
609 have evolved into the never-ending debate over agile vs. waterfall vs. hybrid?



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

612 ✓ **Empirical Observation**

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

616 ✓ **Replicable Experiments**

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

621 ✓ **Provisional Results**

²⁰ University of Texas (N.D.) “The Scientific Method as an Ongoing Process”

<https://utexaslearn.instructure.com/courses/2010099/pages/elaborate-scientific-hypothesis-and-theories>

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

625 ✓ **Objective Approach**

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

629 ✓ **Systematic Observation**

630 Strictly speaking, the scientific method is systematic; it relies on carefully planned studies rather than on
631 random or haphazard observation. Nevertheless, science can begin from a random observation. Isaac
632 Asimov said that the most exciting phrase to hear in science is not “Eureka!” but “That’s funny.” After the
633 scientist notices something unusual, they investigate it systematically.

634 Given that “agile” is nothing more than a more formalized version of the same “trial and error” method
635 used by our Neanderthal ancestors to tame fire, mapping “agile” to the Asset Life Span requires little
636 more than applied “common sense.” All we are doing is taking the iterative processes associated with the
637 “scientific method” and REPLACING the traditional “linear” approach used in the waterfall with each
638 phase gate. The model still works just as well.

639 In this approach, the Asset Life Span remains unchanged. The only differences are that each phase gate
640 requires more experimentation and iteration than is typical in the pure waterfall approach. That once the
641 product of the project (always an asset) has been created and is turned over to operations or the asset
642 manager, the final two phases play out regardless of which method was used to create or develop the
643 Asset.

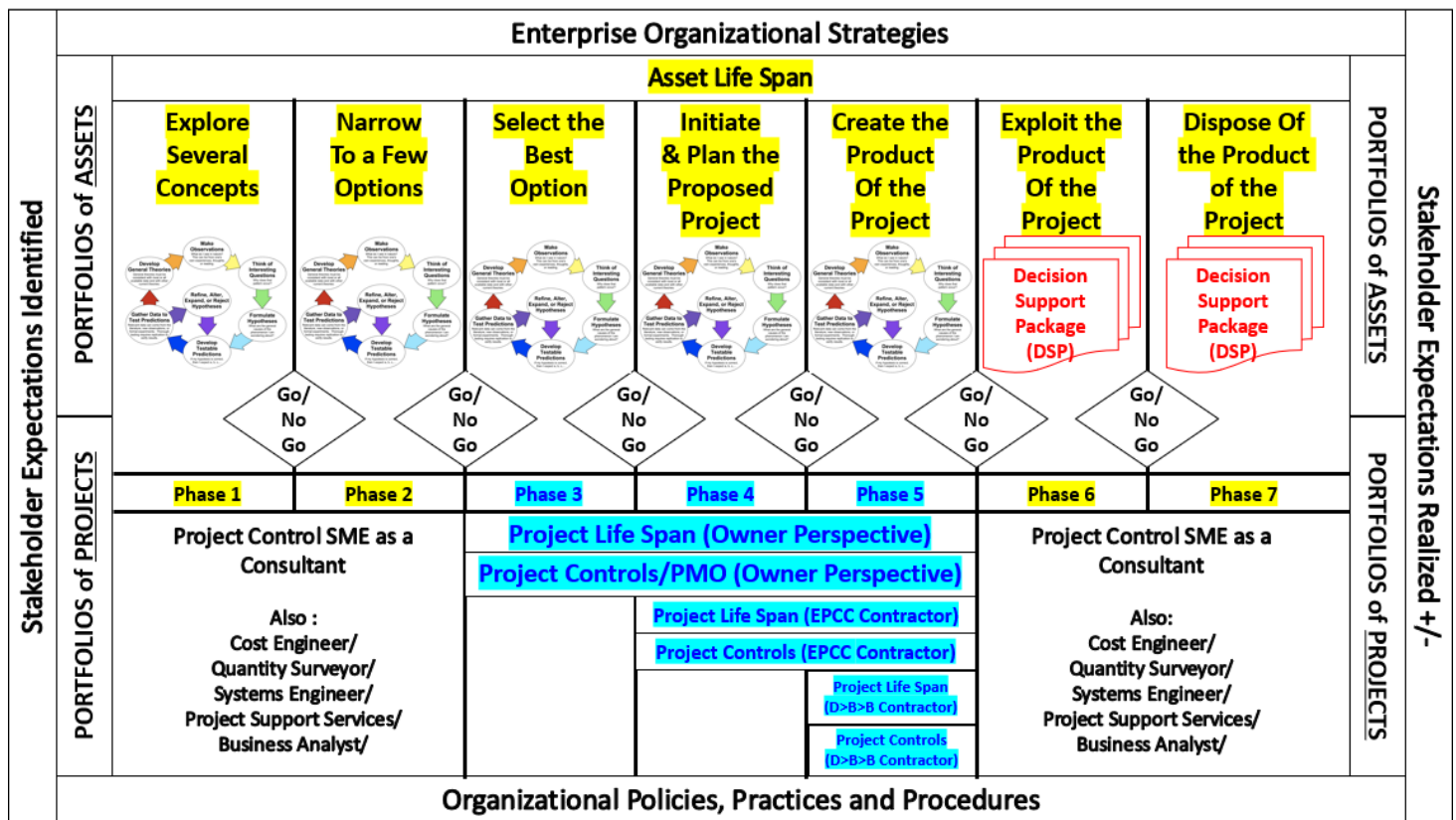
644 It is essential to recognize that this is NOT a project management methodology as is often portrayed, but
645 an ASSET development methodology that is relatively LINEAR as we move through each phase gate.

646 Because this method is so standard across so many projects and so many people have a poor
647 understanding of it, we will walk you through the element, component by component. Note the numbers
648 shown correspond to those shown in Figure 17.



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649 **Figure 18 – Mapping the Scientific Method (agile) to the Asset Life Span**

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

651 ✓ **(19.1) Stakeholder Expectations-**

652 This is a stakeholder-driven model in which stakeholders’ needs, wants, and expectations are identified in
 653 the first phase and then UPDATED as we move through each of the remaining Phase Gates. Implicit in this
 654 process is that as we proceed through each phase gate, stakeholder expectations may have to be
 655 modified to be more realistic (For more on Stakeholders, reference [Unit 2- Managing People](#))

656 ✓ **(19.2) Stakeholder Expectations Realized**

657 Suppose we follow this process as designed, with new stakeholders added each time we pass through the
 658 next phase gate, communications with previously identified stakeholders to make them aware of changes
 659 being made, and negotiations in the event of conflicts between different stakeholders when completed.
 660 In that case, the project should substantially satisfy all stakeholders’ needs, wants, and expectations. For
 661 more information on stakeholders, refer to [Unit 2- Managing People](#).

662 ✓ **(19.3) Strategic Objectives**

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When negotiating with stakeholders, the organization’s strategic objectives should always be the starting point. The objective is to progressively elaborate the Asset’s design to maximize the strategic benefits to the organization. For more on Strategic Objectives, reference Unit 1, Figure 11, and explanations

✓ (19.4) Organizational Policies, Procedures, and Practices

Being bound by identifying and satisfying the stakeholders’ needs, wants, and expectations to maximize organizational strategic objectives governs, determines, or shapes policies, procedures, and practices. For more on Policies and Procedures, reference “Model Standard Operating Procedures (SOP).”

✓ (19.5) Portfolios of ASSETS

Not only is this model driven by the ASSET life span, not the project life span, but this model is unique in so far as it recognizes that it “takes assets to make assets,” that is, keeping in mind that the terms “assets” and “resources” are used synonymously, that unless we have sufficient assets or resources available to support the number of projects, one of the most significant risks is to have too many projects and too few resources to staff or support those projects. As a “reality check,” ask yourself whether the projects you are working on are understaffed or missing any of the five asset classes (Money, People, Knowledge or Information, Tools or Equipment, or Support). If the answer is YES, this constitutes “prima facie” evidence that the processes for matching the portfolio of organizational assets or resources to the projects’ portfolios are not being carried out effectively. For a more significant explanation or review of what constitutes an Organizational Asset, see Unit 1, Figures 11, 12, and 9.

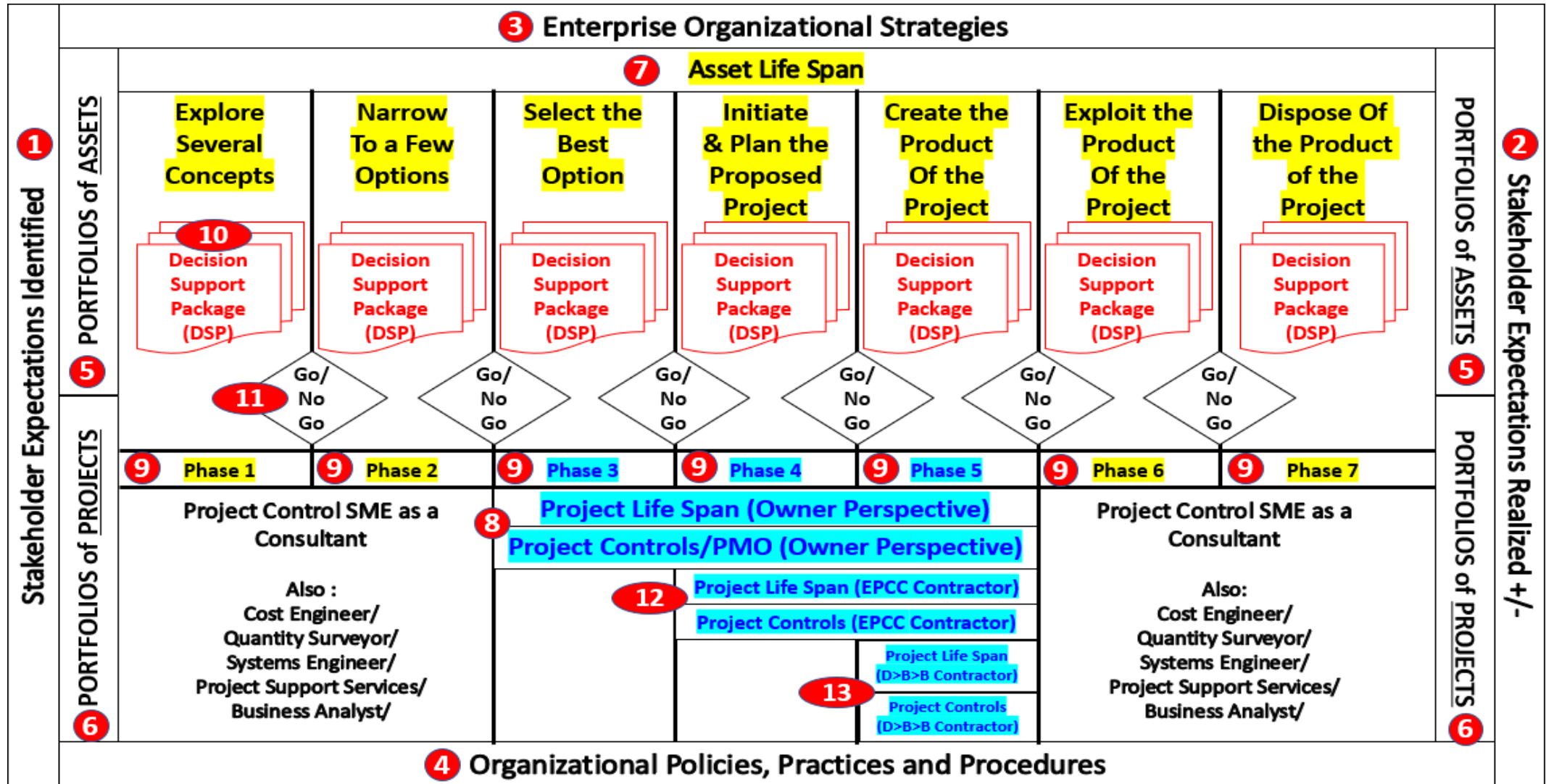
681

Figure 19 below is a COMPILATION or ADAPTION of two published documents or graphics. The core structure came from Chevron Oil, which, combined with what is shown in Figure 24, came from what was then known as Zadco Oil, now known as ADNOC Oil. The organizational structure was published in a paper presented at the [2011 AACE International Presentations OWN.547 “Building Owner’s Cost Engineering Organizational Capability”](#) Rod Knoll, Tim Mitchell, and Earl J. Seabrook, III, CCC. This accurately and precisely explains the relationship between the ASSET LIFE SPAN and the PROJECT LIFE SPAN, as was first published by either Esso or Diamond Shamrock Oil, circa 1956, but almost surely dates back to the early days of the discovery of oil in Pennsylvania around 1895.



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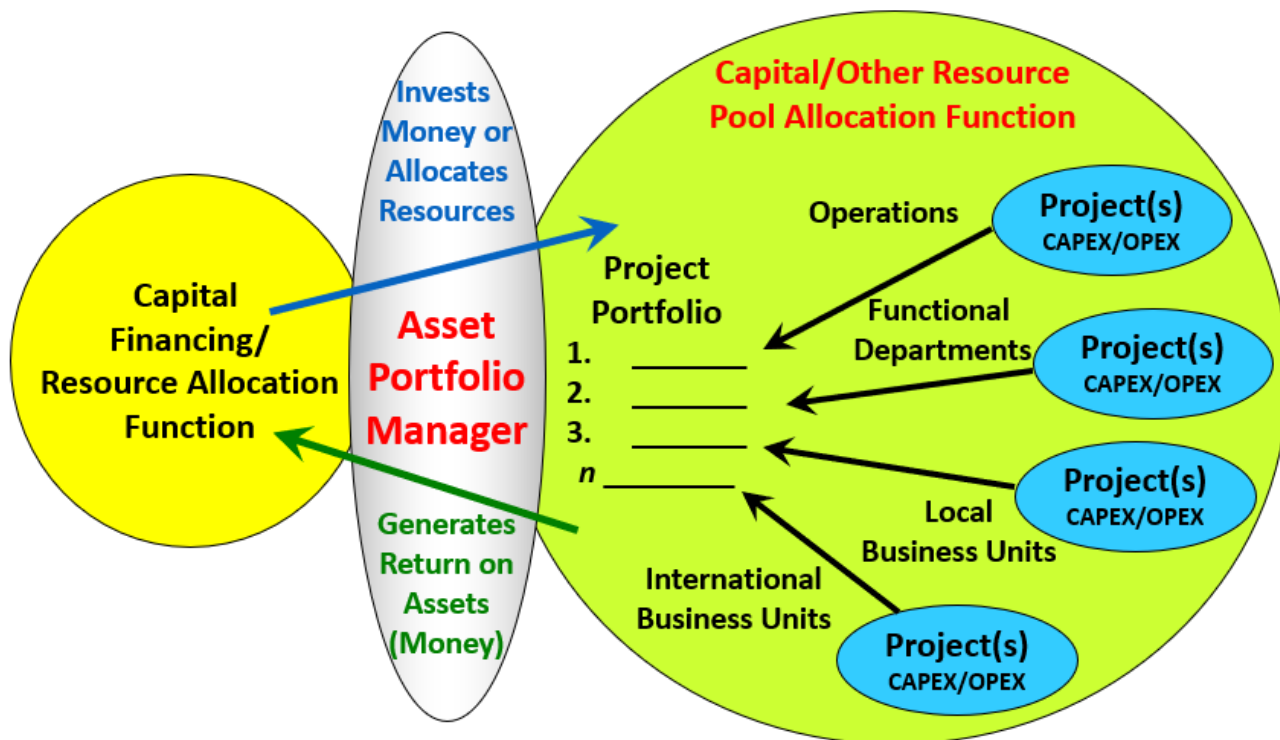
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690 Figure 19 – “Waterfall” Model Showing Detailed Elements and Components

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692 **Figure 20– Asset Portfolio Manager’s Role in Allocating Scarce/Limited Resources**²¹

- 693 ✓ The roles and responsibilities of the Asset Manager are clear and well established. He/she is responsible for
694 allocating scarce or limited resources (assets- people, machines, money, Knowledge or information, and
695 support services) to the portfolio of PROJECTS. In return, he/she is expected to generate a favorable RETURN
696 ON ASSETS or ROA, which is what the SHAREHOLDERS or other critical organizational stakeholders expect.
697 While rarely is there an actual job title of “Asset Manager,” most functional or line managers are, in effect,
698 asset managers:
- 699 ○ Money is managed and controlled by Finance or Accounting Managers
 - 700 ○ People are managed and controlled by HR Managers
 - 701 ○ Knowledge is managed and controlled by Engineering or IT
 - 702 ○ Equipment and Facilities are managed and controlled by Equipment Shops or Facilities
 - 703 ○ Sales, Marketing, or IT maintain intangibles. (Software is classified as an intangible asset)
 - 704 ○ Information is collected and supported by any/all of them

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

- 708
709 ✓ **(19.6) Portfolios of PROJECTS** (See Figure 7 and Figure 8 for more on this)

710 Whether an OWNER organization or a CONTRACTOR organization fails to balance or match the ASSETS or
711 RESOURCES we have available with the number of projects in our portfolio, we set the projects up for failure. This is
712 one of the “root causes” we believe PMI’s PMBOK Guide and PRINCE2 never worked, as they both ignore the role of

²¹ Adapted from Engineering Economy, 16th Edition by Sullivan, Wicks and Koelling, Figure 13-1, page 547

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asset (as a resource) managers. The “test” for this is straightforward: measuring whether your projects lack sufficient people, equipment, money, knowledge, or information. If the answer is YES, this indicates a failure to match Asset portfolios to Project portfolios.

✓ (19.7) Asset Life Span

While most dictionaries treat these terms synonymously, using the term life SPAN is technically more correct than life CYCLE. In this model, there is no “cycling,” and the Asset is created using the project management processes shown in this book. Still, it is sold, decommissioned, or otherwise disposed of at the end of the Asset’s USEFUL LIFE. OWNER organizations do not realize any benefits DIRECTLY from the project. For OWNER organizations, their “benefits” are derived not from the PROJECT but from the PRODUCT (the Asset) created by the project. (For more on this, see [Unit 3- Managing Business Case](#))



✓ (19.8) Project Life Span (Owner’s Perspective)

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

✓ (19.9) Phases of the Asset Life Span

Because this is an ASSET-centric model, not a PROJECT management model, we have chosen to show how the PROJECT life span is a SUBSET of the ASSET life span. Before Phase 3, there is no project. Only POTENTIAL projects, and at the end of Phase 5, the ASSET is turned over to the Asset or Operations Manager and put into service. (See Figure 19 for a simple illustration)

Because of confusion between the PHASES of the Asset Life Span and the PROCESS GROUPINGS (Compare Figures 27 and 29), we have named these Phases “Phase 1-7,” recognizing that some organizations have eight or even 9 Phase Asset Life Spans. The key is not the phase NAME but the FUNCTION each phase serves:

- ✓ (19.9.1) **Phase 1** is designed to explore the options available to solve a problem or exploit a business opportunity. There is no PROJECT at this point, and may never be one. At the end of Phase 1, we should have produced, at MINIMUM, a Level 1 Business Case, a Level 1 WBS, a Level 1 Cost and Resource Budget, and a Level 1 Risk/Opportunity Analysis, and include them in the Level 1 Decision Support Package. (DSP)
- ✓ (19.9.2) In **Phase 2**, we start preliminary designs or options to solve the problem or exploit a business opportunity. Again, at this point, there is no “project,” and there may never be one. During Phase 2, we start refining the business case to determine whether investing time and money in any specific “solution” is worth it. At the end of Phase 2, we should have produced, at MINIMUM, a Level 2 Business Case, a Level 2 WBS, a Level 2 Cost and Resource Budget, and a Level 2 Risk/Opportunity Analysis, and include them in the Level 2 Decision Support Package. (DSP)
- ✓ (19.9.3) **Phase 3** is where we narrow down the potential “solutions” to a single choice. This is where a project is “born” or “created” from an OWNER’S perspective. This is where an owner would issue a PROJECT CHARTER, appoint a project manager, and provide funding for the next phase, along with the authority

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necessary to acquire resources either internally or externally to prepare a DECISION SUPPORT PACKAGE (DSP) to present to the appropriate levels of management to obtain authorization (including funding and delegation of authority) to move on to Phase 4. One of the biggest and most important decisions the OWNER’s project manager needs to make is whether to OUTSOURCE some or all of the work and, if so, what type of CONTRACT they plan to use. At the end of Phase 3, we should have produced, at MINIMUM, a Level 3 Business Case, a Level 3 WBS, a Level 3 Cost and Resource Budget, and a Level 3 Risk/Opportunity Analysis, and include them in the Level 3 Decision Support Package. (DSP)

- ✓ **(19.9.4) Phase 4** is where the OWNER will start to involve CONTRACTORS. IF the project is to be bid under a “Design-Build” (DB) or “Engineer, Procure, Construct” (EPC), then the Owner will bid or negotiate with a contractor to provide these professional services. Suppose the OWNER’s PM and other key stakeholders decide to do their engineering and procurement of long-lead items. In that case, the Owner will be responsible for those professional services and will need to prepare the bidding documents for just the EXECUTION phase of the Asset Life Span.
- ✓ **(19.9.5) Phase 5-** Regardless of which contacting method the Owner has chosen, this phase is where the work is done, whether by the Owner’s workforce, a DB or EPC contractor, or a Firm Fixed or Unit Price Contractor.
- ✓ **(19.9.6) Phase 6-** When the project is COMPLETED, it has produced an ASSET. Once tested and commissioned, this ASSET is accepted by the Asset Manager and turned over to OPERATIONS, where the newly acquired Asset is put in service and begins to generate revenue, save money, or otherwise yield the benefits it was undertaken to produce. It is important to note that until the net benefits have recouped the project’s COST, there can be no “benefits realization” for the organization. In other words, there can be no positive benefits until AFTER the payback period has been achieved. Very few people today seem to realize this, particularly many in the Agile community of practice, who believe “benefits realization” begins when the project is completed, and the Asset is put into service.
- ✓ **(19.9.7) Phase 7** is when the ASSET has reached its USEFUL LIFE (as opposed to Economic,



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- 781 ✓ Ownership or Physical life), it is decommissioned, sold, abandoned, or scrapped. Because this calculation is
 782 based on USEFUL life, there is no “cycle” involved. When the ASSET is no longer useful, it is no longer carried
 783 on the books, even if it has 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 decommission, dismantle or otherwise DISPOSE of the ASSET	Dismantle, decommission, recycle, sell

784 **Figure 22 – Phase Gate Summary of Names, Deliverables, Purpose, and Alternate Names**

785 ✓ (19.10) Decision Support Packages (DSP)

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

- 791 ○ Business Case
- 792 ○ WBS
- 793 ○ Risk/Opportunity Assessment
- 794 ○ Plans and Schedule
- 795 ○ Cost/Resource Budget
- 796 ○ Stakeholders

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798

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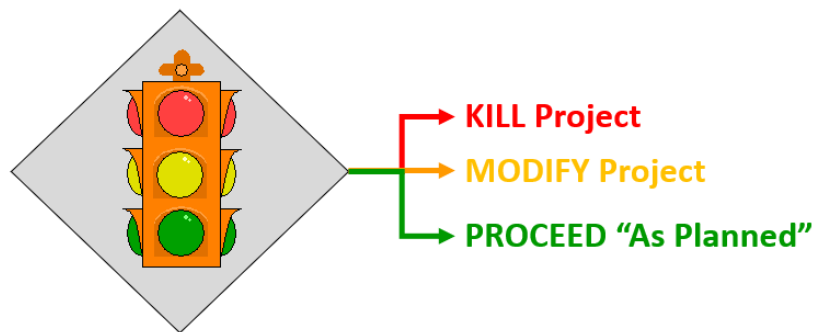
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802 ✓ (19.11) Go/No Go Decision

803 Based on the key stakeholders’
804 assessment of the information contained in
805 the DSP, combined with an evaluation of the
806 current and anticipated business environment,
807 a decision is made to PROCEED with the
808 creation of the ASSET, to MODIFY the Asset, or
809 to KILL the project. While this can happen at
810 any phase, if it happens in Phases 1 or 2, there
811 is no “project” yet. If the decision is made at
812 the end of Phase 2 to proceed with a single
813 solution, only then will a “project charter” be
814 issued and funding provided for Phase 3. If the project is still viable at the end of Phase 3, then approval is made to
815 proceed to Phase 4, along with appropriate funding and a formal delegation of authority.

Figure 23 (19.11) - Go/No Go Decision Illustrated



816 ✓ (19.12) Phases 4-5 Execution Phase using EPC or Design>Build Methods

817 Suppose the OWNER’S key stakeholders have decided to OUTSOURCE using a Design-Build (DB) or “Engineer,
818 Procure, Construct” (EPC) contracting arrangement. In that case, this is where the DB or EPC contractor would take
819 over. It is imperative to keep in mind that a project is always a PROFIT center for a CONTRACTOR, whereas for an
820 OWNER, it is always a COST or INVESTMENT center. That the Owner does NOT realize any benefits until the ASSET
821 created by the project has been accepted, put into service, and achieved PAYBACK. It is only AFTER the project has
822 paid back the investment made that the organization claims any Economic Value Added (EVA)

823 ✓ (19.13) Phase 5 Execution Phase using Lump Sum, Firm Fixed Price Contracting Methods

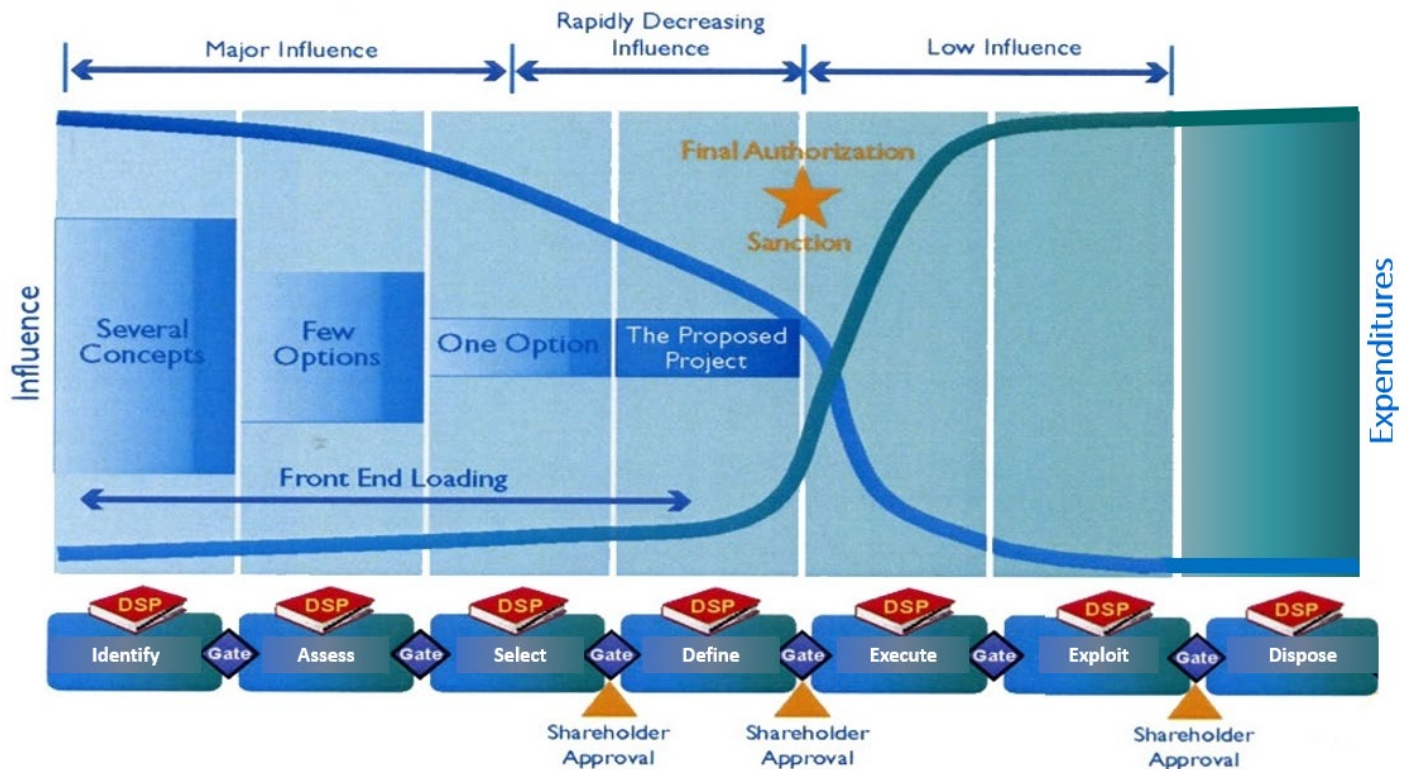
824 If the OWNER has chosen to outsource only the EXECUTION phase, usually done under a Firm Fixed Price or Unit
825 Price Contract, the CONTRACTOR is involved. As noted above, it is essential to realize that projects are PROFIT
826 centers for CONTRACTORS and COST or INVESTMENT centers for OWNERS. Because of two different and, in some
827 cases, mutually exclusive perspectives, the focus and decisions of the Owner and Contractors’ project managers,
828 project control/PMO managers, and team members are affected.

829 Another graphic commonly illustrates this integrated Asset, Portfolio, Program, and Project Management Life Spans,
830 known as the MacCleamy or Paulson Curve, or, for our IT colleagues, the Boehm Curve. For more on this, see the
831 research by [Daniel Davis](#)-

832 The graphic shown in Figure 24 dates to the early to mid-1970s and illustrates what is known in “Big Oil” as “Front
833 End Loading” or “FEL.” The concept, which originated around the same time in both construction (Paulson and
834 MacLeamy) and IT (Boehm), tells us (“applied common sense”?) that the better job of defining what we need or
835 want as early as possible in the asset life span, the less expensive it is to make changes early on- that the later in the
836 project you discover you missed something or did something wrong, the more expensive it is to correct or remedy it.

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837 **Figure 24 – Asset Life Span Showing the “MacCleamy” or “Paulson Curve” or, for our IT Colleagues, the “Boehm**
838 **Curve”^{22, 23}**

839 While this FEL SYSTEM, or “Phase-Gated System,” dates back to the early discovery of oil in Pennsylvania around
840 1865, it wasn’t formally documented or publicly introduced by either Diamond Shamrock or Esso Oil until around
841 1956.

842

843 **INTRODUCING A TESTED AND PROVEN STEP-BY-STEP SYSTEM TO INITIATE, PLAN, EXECUTE, CONTROL, and CLOSE** 844 **MOST PROGRAMS AND PROJECTS**

845 As this was designed as a “hands-on” document, it is intended to give you examples of TESTED AND PROVEN systems
846 or workflow processes that enable anyone to follow the step-by-step instructions or “recipe” to enable the reader to
847 get started immediately.

848 As the authors and contributors all subscribe to the 5 attributes of the Scientific Method, everything we present
849 fulfills all 5 attributes, especially the Asset Life Spans illustrated in Figures 19, 25, and 27 below.

850 While the actual graphic was ADAPTED from Humphrey and Associates’ “Project Management Using Earned Value
851 Management, 4th Edition”, Figure 1-8 on page 35, it is the same workflow process that we have been using for 50
852 years, both as OWNERS and CONTRACTORS. Meaning this workflow process not only has been TESTED and PROVEN

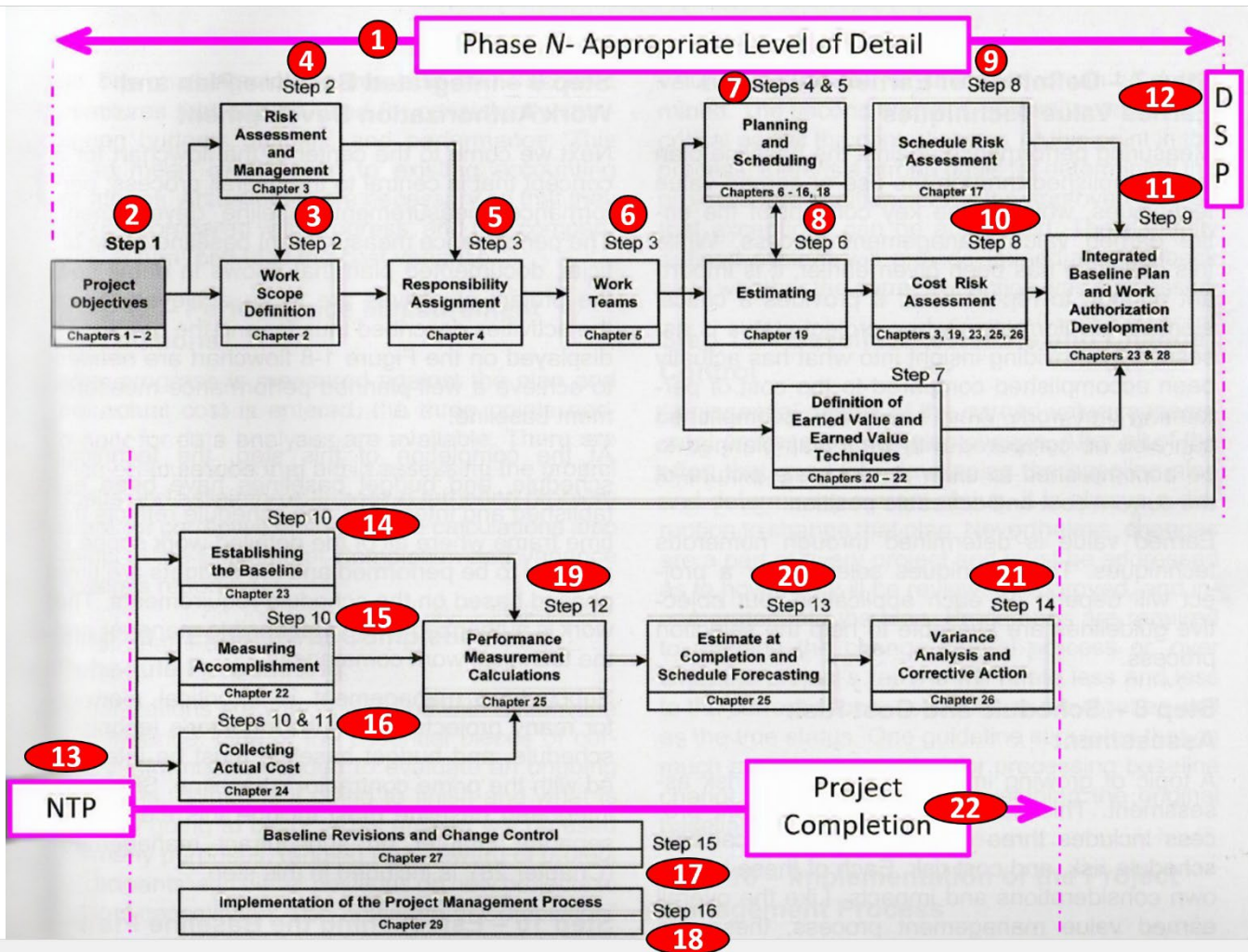
²² Paulson, Boyd C. 1976. “Designing to Reduce Construction Costs.” *Journal of the Construction Division* 102 (4): 587-592.
The actual graphic was taken from the Zadco Oil website about 10 years ago and is no longer accessible.

²³ This graphic was originally captured from the Zadco Oil, now known as ADNOC Oil, circa 1977, but supposedly originated during the late 1800s, and was first introduced publicly by Esso or Diamond Shamrock Oil, circa 1956.

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853 to work, but it also works whether the reader is representing an OWNER or a CONTRACTOR’S organization. The step-
854 by-step process works for everyone, at least for construction and similar engineered projects.



855 **Figure 25 – A TESTED and PROVEN SYSTEM to “Initiate, Plan, Execute, Control, and Close” MOST Projects²⁴**

856 As noted, this workflow has been VALIDATED by both OWNERS and CONTRACTORS for MOST projects, especially in
857 oil, gas, mining, and other major construction projects. To walk readers through the process step by step:

- 858 (1) If you are an OWNER, you will apply this workflow process starting with the 1st Phase of your FEL or
859 Phase-Gated System, and use it to develop the DECISION SUPPORT PACKAGE (DSP) (11). However,
860 if you are a CONTRACTOR, you would start the workflow process beginning with Step 1 as defined
861 by Humphrey’s. (2)
- 862 (2) For an OWNER, this step would be the first step in each phase of the FEL system and would be
863 repeated at each subsequent phase until the project has been approved for execution and funded.
864 The OBJECTIVE for an OWNER is usually either to solve a problem, exploit an opportunity, or to
865 meet or comply with a governmental law or rule. For a CONTRACTOR, this is the first step. For most

²⁴ Humphrey’s & Associates (2018) Figure 1-8 Earned Value Management Process https://www.amazon.com/Project-Management-Using-Earned-Value/dp/0996547940/ref=sr_1_1?s=books&sr=1-1

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contractors, the OBJECTIVE in undertaking any project is to make a PROFIT, although contractors may have other objectives, both tactical and strategic, for bidding and winning a specific project.

- (3) The 2nd step in the process is to define the scope. For the OWNER, this is or should be a process that is PROGRESSIVELY ELABORATED, becoming more refined each time the owner progresses through each phase gate. For a CONTRACTOR, in Step 2, the contractor takes the scope defined in the bid or contract documents and converts it into the WBS/CBS structure used by the contractor's cost estimating system, preferably using an Activity-Based Costing system. To explore this topic in more detail, turn to [Unit 3- Managing the Business Case](#).
- (4) For both OWNER and CONTRACTOR, as the WBS/CBS evolves, they should be identifying not only the RISKS, but also the OPPORTUNITIES. To explore this topic in more detail, turn to [Unit 6- Managing Risk and Opportunity](#).
- (5) In Step 3, both OWNERS and CONTRACTORS have to look at RESPONSIBILITY ASSIGNMENTS. While this applies mostly to PEOPLE, both OWNERS and CONTRACTORS should also consider the RESOURCES or ASSETS required. This includes all 5 categories of ASSETS, as shown in Figure 7. To explore this topic in more detail, turn to [Unit 2 - Managing People](#) and [Unit 7 - Managing Resources](#).
- (6) In this step, after knowing the PEOPLE and RESOURCES we are going to be needing, we need to commit those resources. OWNERS need to identify resources to complete the remaining phase-gating processes, while CONTRACTORS need to determine which resources we will need to EXECUTE the project.
- (7) For both OWNERS and CONTRACTORS, this is where the results of the Risk & Opportunities and available RESOURCES or ASSETS come together. For the OWNER, the focus is on PLANNING, while for a CONTRACTOR, the focus is on SCHEDULING. To explore the nuanced differences further, turn to [Unit 9: Managing Planning and Scheduling](#).
- (8) For both OWNERS and CONTRACTORS, before we can conduct the COST or PRODUCTIVITY ESTIMATING, it is essential to know when the work is scheduled to be executed or completed. This is particularly important when working outdoors, where weather and climatic conditions have major impacts on productivity, which in turn affects durations.
- (9) Concurrently, we also conduct Schedule Risk/Opportunity analysis, which we can learn more about from [Unit 6- Managing Risk and Opportunity](#).
- (10) Once we have analyzed the risks & opportunities afforded by scheduling, we can translate those risks and opportunities into monetary impacts. Again, turning to [Unit 6- Managing Risks and Opportunities](#) will explain how to do that.
- (11) At this point, if we are OWNERS, we will be producing the Decision Support Package (DSP) (12), or if owners are complete with the FEL System workflow phases, the owner will be ready to put the project out for BID. To explore the details of how to do that, turn to [Unit 8- Managing Contracts](#). Once the owner has received bids, the decision is made to award the contract and issue a NOTICE TO PROCEED (NTP) to the contractor. (13)
- (12) This only applies to OWNERS and only BEFORE they are finished with the FEL or Phase-Gated System. Once the OWNER has approved the project and provided the FUNDING, they can put the project out for BID, as shown in [Unit 8 - Managing Contracts](#). After the bidding and procurement processes, and has awarded a contract, the Notice to Proceed (NTP) is issued by the OWNER to the CONTRACTOR. This is explained in [Unit 8- Managing Contracts](#).



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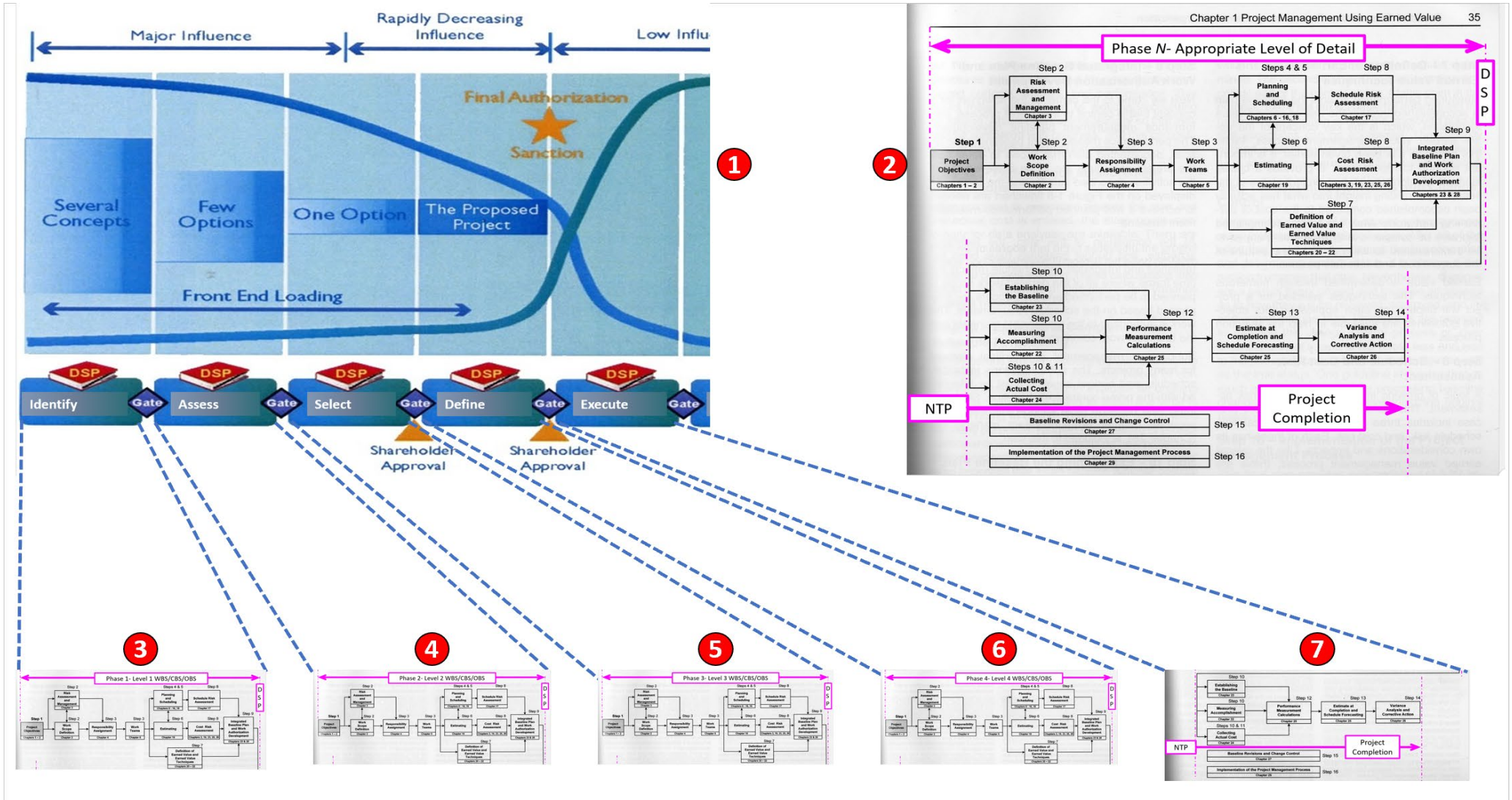
- (13) The Notice to Proceed (NTP) is the document that authorizes the CONTRACTOR to begin the EXECUTION phase of the project. This is the “starting gun” that sets the specific time the project clock starts running.
- (14) When using Earned Value Management whether following ANSI/SEA 748 or Earned Value Management based on the research of Taylor, Gantt, Fayol, the Gilbreth’s et al., as captured and documented by Gillette and Dana in their 1909 book “[*Cost Keeping and Management Engineering: A Treatise for Engineers, Contractors and Superintendents Engaged in the Management of Engineering Construction*](#)” we need to start with a PERFORMANCE MEASUREMENT BASELINE, which can take different forms but what our authors recommend is the use of S-Curves showing both the early and late date curves, and SPI vs CPI Matrix known as the Bullseye Chart, and Statistical Process Control Charts. To see the specific details, turn to [Unit 11- Managing Progress](#).
- (15) In Step 10, we are measuring PHYSICAL PROGRESS against the BASELINE, and for the CONTRACTORS, we are, or at least should be, getting PAID PROMPTLY for the work we have correctly and substantially completed in conformance with the contractual obligations. For more on this, explore [Unit 11- Managing Progress](#) and [Unit 8- Managing Contracts](#).
- (16) Also, an integral part of Step 10 is to collect the ACTUAL COST of the work being performed. This applies equally to both the OWNER and the CONTRACTOR, with the understanding that unless the contract is an open-book contract, the OWNER is not entitled to see the CONTRACTOR’s actual costs. Implicit in this is the ability to use the EVM fully and correctly: the OWNERS PMB will always be larger than the PMB the CONTRACTOR is measuring against. For more on this, see [Unit 11- Managing Progress](#).
- (17) From the (13) NTP to the completion of the Project, (22) we need to manage changes and revisions to the contract. [Unit 8 - Managing Contracts](#), [Unit 11 - Managing Contracts](#), and [Unit 12 - Managing Change](#) will explain this in greater detail.
- (18) This is where the importance of Activity Based Costing/Activity Based Management (ABC/ABM) becomes so critical. Unit 10 - Managing Cost Estimating and Budgeting; Unit 11 - Managing Progress. The essence of SUCCESSFUL projects is to create REALISTIC and ACHIEVABLE plans, which include appropriate risk buffers, then EXECUTING THE PLAN.
- (19) To measure how EFFECTIVELY and EFFICIENTLY we are EXECUTING THE PLAN is measured using Earned Value Management, but NOT as advocated under ANSI/SEA 748, but Earned Value Management based on the research of Taylor, Gantt, Fayol, the Gilbreth’s et al., as captured and documented by Gillette and Dana in their 1909 book “[*Cost Keeping and Management Engineering: A Treatise for Engineers, Contractors and Superintendents Engaged in the Management of Engineering Construction*](#)”.
- (20) For both OWNERS and CONTRACTORS alike, a key element of EVM is the ability to FORECAST both COSTS and COMPLETION DATES. This is explained in considerable detail in Unit 11- Managing Progress.
- (21) As both OWNERS and CONTRACTORS, we want to measure VARIANCES in both time and costs, and use that information as the basis to FORECAST when the project will be finished and how much it is going to cost. Again, we find the details in both [Unit 11: Managing Progress](#) and [Unit 12: Managing Change](#).
- (22) IF we had created a REALISTIC and ACHIEVABLE plan with appropriate buffers for risks and we EXECUTE THAT PLAN, our projects should finish ON TIME and WITHIN BUDGET.



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952 Figure 26- For OWNERS INTEGRATING WORKFLOW PROCESSES INTO PHASE GATED PROCESS

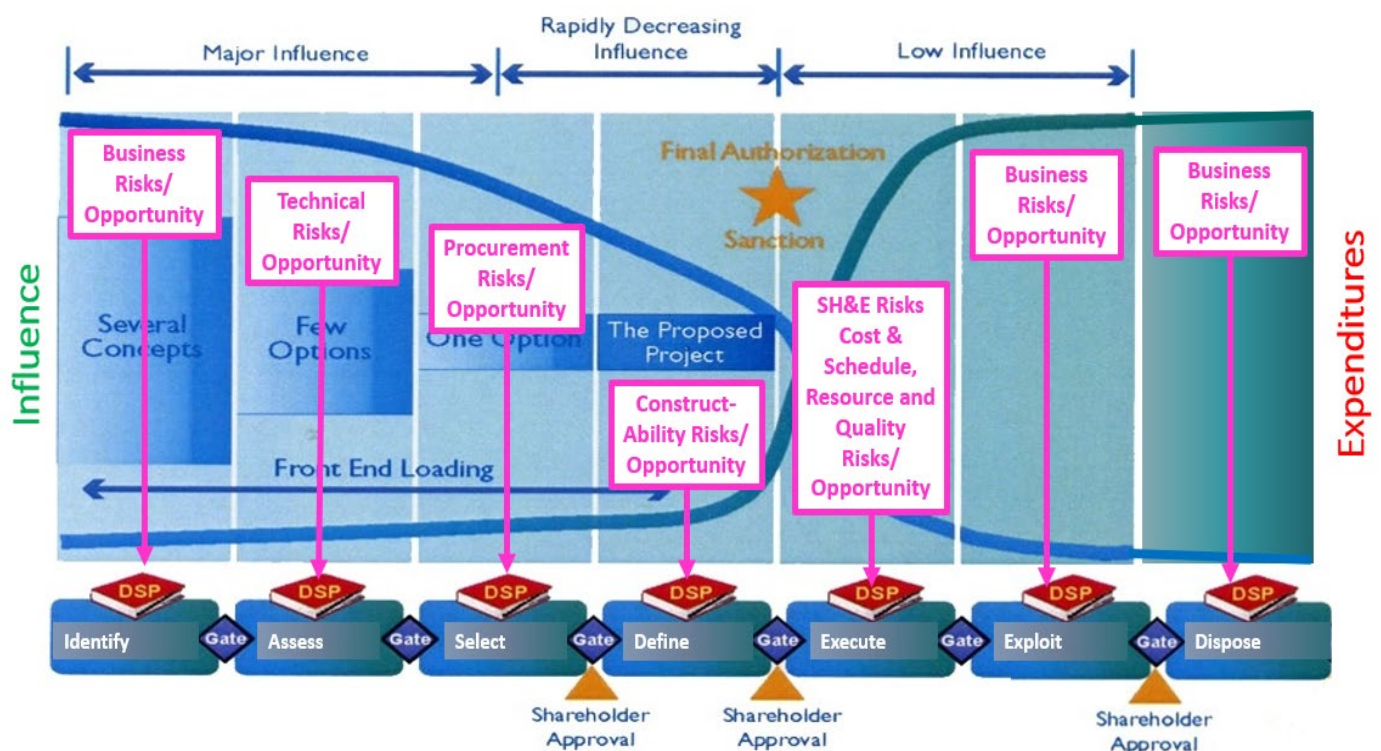
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953 In Figure 26, we illustrate how to INTEGRATE the WORKFLOW PROCESSES from HUMPHREY with the FEL or Phase-
954 Gated System.

- 955 (1) This is a partial figure showing the Phase-Gated or FEL System (also known as the McCleamy,
956 Paulson, or Boehm Curve) as shown in Figure 24.
- 957 (2) And here is the complete process shown by Humphrey as the complete “Initiate, Planning,
958 Executing, Controlling, and Closing” workflow process.
- 959 (3) We apply the top half of the processes (from (1) to DSP (12) for Phase 1 at a level of detail using
960 the WBS/CBS/OBS/RBS level 1 Decision Support Package (DSP). (12)
- 961 (4) We repeat that same set of processes, (1) for Phase 2, at a level of detail using
962 WBS/CBS/OBS/RBS level 2 Decision Support Package (DSP). (12)
- 963 (5) We repeat that same set of processes (1) for Phase 3 at a level of detail using
964 WBS/CBS/OBS/RBS level 3 Decision Support Package (DSP). (12)
- 965 (6) We repeat that same set of processes (1) for Phase 4 at a level of detail using
966 WBS/CBS/OBS/RBS level 4 Decision Support Package (DSP). (12)
- 967 (7) But when we have completed each of the Phases of the FEL System, have put the project out for
968 bid, and have selected a winning contractor(or have opted to perform the project in-house), we
969 then move from issuance of the NTP (13) and start to follow the steps (14) to (21) until we
970 complete the project. (22).

972 To reiterate what we show in [Unit 6 - Managing Risk and Opportunity](#), we can see that in each
973 of the FEL Phase Gated Systems, there are separate FOCUSES on which risks and opportunities
974 are considered in each phase-gate Decision Support Package.



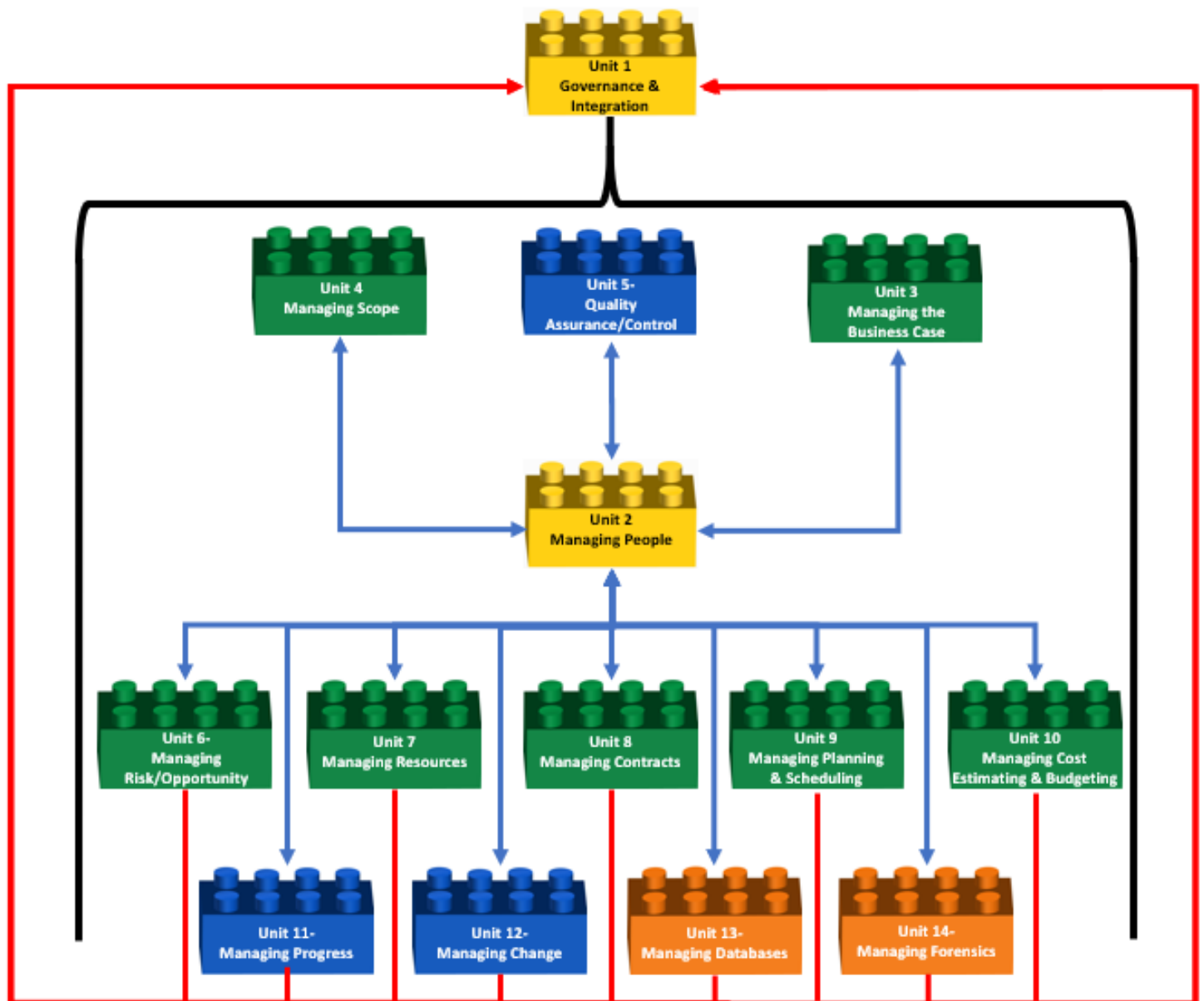
975
976 **Figure 27- Showing Priority of Risk/Opportunity Analysis During Each Phase of the Asset Life Span**

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977

✓ Why Adopt the Lego Block Analogy?



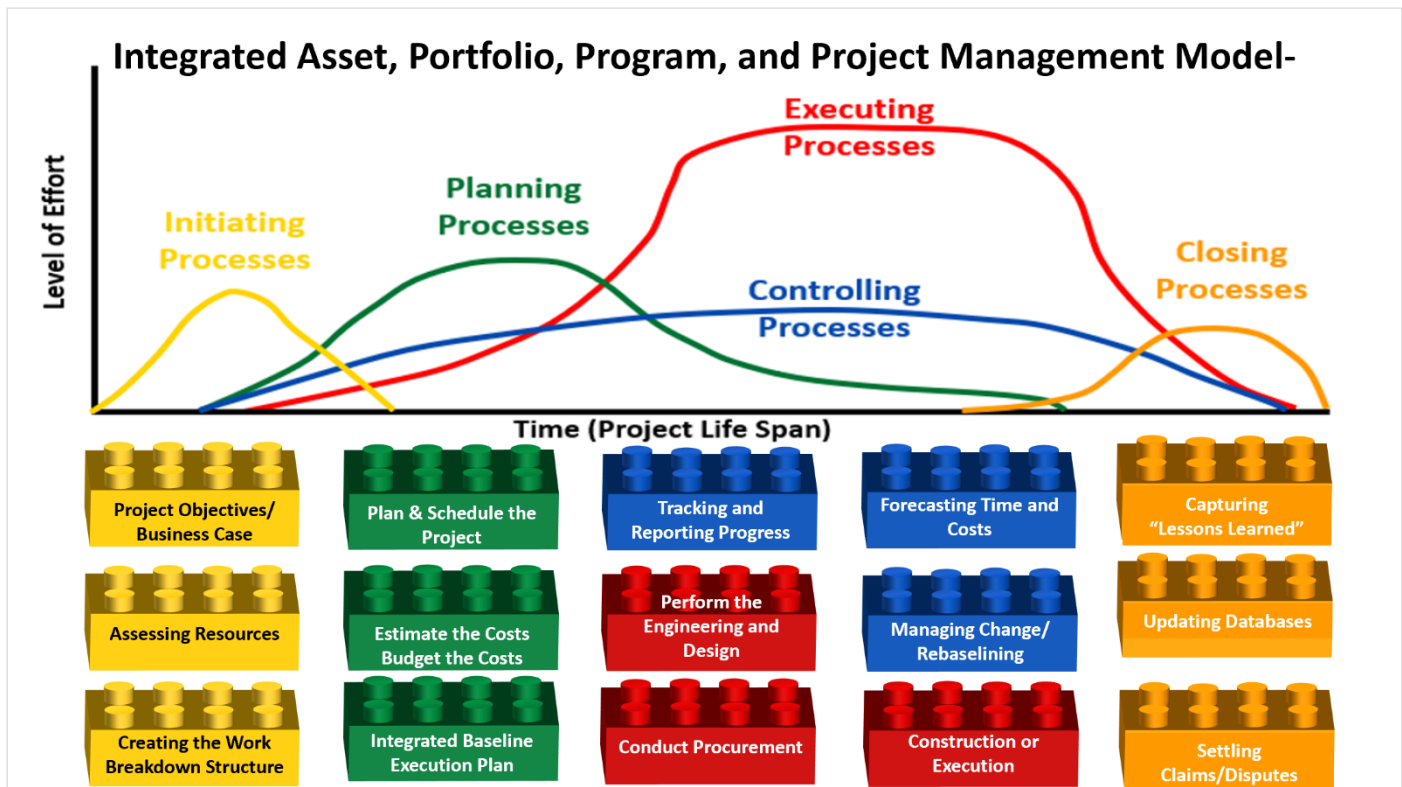
All Feedback Using Double Loop Learning (Argyris & Schon)

978 Figure 28- Single Project Structure from the 1,000 Meter View (6.8) and (6.9)

979 In Figure 28, we can see how Unit 1- Managing Governance and Integration provides us with a guide showing us how
980 the Lego Blocks can all fit together, giving us the flexibility, adaptability, and scalability in creating the process that
981 works for our specific project, that while PEOPLE are at the center of everything, they are constrained or limited by
982 the Business Case (Unit 3), Unit 4, Quality Assurance and Quality Control, not of the PRODUCT OF THE PROJECT but
983 the PRODUCTS and SERVICES provided by the PMO/Project Controls Team to their customers and stakeholders.

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984 **Figure 29- Project Units Compared to the Process Groupings- 1,000 Meter View²⁵**

985 Given that at the highest level of granularity, all projects are “initiated, planned, executed, controlled and closed”
986 (See Figure 29) and given that most if not all the tools and techniques used for Integrated Asset, Portfolio, Program,
987 and Project Management originated with general management and have been customized or adapted for use in
988 Asset, portfolio, programs, and projects, the real problem becomes how to enable the FLEXIBILITY to adjust these
989 tools & techniques to different sectors while providing the SCALABILITY to apply them at different levels and
990 ADAPTABILITY given that not all tools and techniques are used on all projects.

991 For example, flying a plane from City A to City B is a project that involves removing an inflamed appendix and
992 designing and constructing a new bridge. And while all three of these projects use many, if not all, the same tools &
993 techniques, when and how they are used and exactly what they look like are often not the same. For anyone
994 doubting this, compare the process of INITIATING a flight from City A to City B to the methodologies used in most
995 hospitals to INITIATE the removal of an inflamed appendix, and to the methods used to INITIATE the design and
996 construction of a bridge. You can appreciate how we need to design a system that provides all the appropriate tools
997 & techniques anyone can use, regardless of the project’s type or size, while offering customization. For this reason,
998 we have adopted the “Lego Block” analogy, understanding that the different sizes and shapes of the Lego Blocks
999 (tools & techniques) have been designed so they can fit together, providing the FLEXIBILITY and SCALEABILITY to
1000 apply them to any sector, context, size, or complexity of the project.

1001 This is also a perfect opportunity to explain that, while there is no strict linear relationship among these “Lego
1002 Blocks” of “Tools & Techniques,” at this level of granularity, there is an implicit sequence based on a “common
1003 sense” understanding of the process.

²⁵ 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)

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1004 Notice there are no “EXECUTING” Units in this “Project Controls/PMO Handbook”? To explain why NOT, the
1005 fundamental PRINCIPLE being followed is the mantra Bechtel has used for many years now: “Plan your Work, then
1006 Work Your Plan.” Explained in more detail, IF:

- 1007 ○ We develop a REALISTIC and ACHIEVABLE plan, AND IF
- 1008 ○ We have reasonable control over the RESOURCES (Assets) that we need when we need them, AND IF
- 1009 ○ We have a little bit of “luck” and don’t face any “Black Swan” events, THEN
- 1010 ○ Our projects should finish on time, within budget, and meet the project manager/project team’s control
- 1011 objectives.

1012 We must also understand the two fundamental tenets of ACCOUNTABILITY:

1013 To be held ACCOUNTABLE, the individual needs to have “REASONABLE” control over the events or the impacts (+/-)
1014 of those events, PLUS, to be held ACCOUNTABLE, he/she needs to have the formal AUTHORITY to act, either to
1015 exploit opportunities or to avoid, mitigate, or otherwise prepare for any adverse events.

1016 Here are the five attributes required to be able to hold project SPONSORS, project MANAGERS, and project
1017 CONTROLS practitioners ACCOUNTABLE²⁶:

- 1018 ○ Clear expectations. (See Units 1, 2, 3, 7, and 8)
- 1019 ○ Clear capability. (See Units 1 and 2)
- 1020 ○ Clear measurement. (See Unit 11)
- 1021 ○ Clear feedback. (See Unit 11)
- 1022 ○ Clear consequences. (See [Unit 14- Managing Forensics](#))

1023
1024 ✓ **Logical Relationships/Sequencing Between the 14 Units**



- [Unit 1- Governance and Integration:](#)

○ We always start with Unit 1. Why? This establishes the PROCESSES we need to follow, recognizing that these processes change depending on the project’s context and application. IF we pick the wrong or inappropriate process map for our project, what are the chances it will succeed? Also, be sure to appreciate that, as project

1030 management is a complex, dynamic, adaptive system, the relationships shown here are

1031 ILLUSTRATIVE only. Real relationships can only be created using Systems Dynamics Software. MSP, P6, et al. are
1032 not capable of modeling complex relationships.



- [Unit 2- Managing People:](#)

○ Regardless of how much automation we implement, project management will, at least for the foreseeable future, require people. Even heavily robotized industries like auto manufacturing still need many 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

1038 your time watching the 57-story-tall [Changsha Apartment Building in Hunan Province, China](#), built in 19 days. This
1039 is the future, and it is going to happen quickly. Think about the roles people play in the Chinese Case Study.

26 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>

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1045

○ [Unit 3- Managing Business Case.](#)

Once we have identified the six stakeholder categories and completed a needs assessment, we can begin 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 “Front End Loading” (FEL) (see figure 27), the later in the project decisions are made, the more costly and risky they become.



1050

○ [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.



1051

○ [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- Managing Risk & Opportunity](#).



1057

○ [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?



1063

○ [Unit 7- Managing Resources:](#)

If we don't know the number of available resources, their productivity, and their costs, wouldn't that affect 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?



1069

○ [Unit 8- Managing Contracts:](#)

Given that 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 buffers or contingencies into riskier tasks, and if an assignment is perilous, we can schedule it for a less risky time. (i.e., we don't want to be doing tower erections during hurricane or

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○ [Unit 9- Managing Planning & Scheduling:](#)

While “planning and scheduling” occur at varying levels of granularity across each phase of the asset life span, we determine which resources are available and their productivity (Unit 7), and know which work packages have been outsourced or subcontracted and which we are doing “in-house.”



○ [Unit 10- Managing Cost Estimating and Budgeting:](#)

Why do we plan and schedule 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 expensive than putting it in the summer. Doesn’t it make sense to try to do all your concrete placing during the summer, and if the client insists on having you place it during the winter, you price it accordingly? Or how about trying to lay fiber optic cable underground in the tropics during the rainy season?



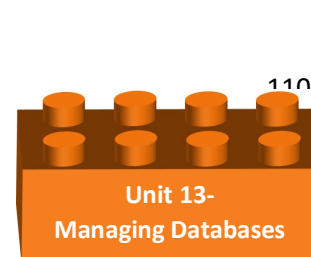
○ [Unit 11- Managing Progress:](#)

Until 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 done before the OWNER even issues the “Notice to Proceed” (NTP)



○ [Unit 12- Managing Change:](#)

While change can happen at any time, as we know from Figure 27, the later the change occurs in the Asset Life Span, the riskier and more expensive it can become. Usually, change management processes are included in the contract between the Owner and the Contractor, so the earlier we start planning for changes, the easier it will be to manage them as the project approaches the end, when disputes and claims arise.



○ [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 up to date. Why owners? To prepare a BUSINESS CASE, don’t owners need current prices and price trends to create a valid business case? At least in construction, with the growing use of Building Information Modeling (BIM), creating and updating these databases has become an essential skill set and an OPPORTUNITY for those ENTREPRENEURS.



○ [Unit 14- Managing Forensics:](#)

This involves at least the Owner and Prime Contractor and may involve subcontractors and vendors, and is intended to determine whether the project met its contractual objectives. For the Contractor, this can often be done within weeks of receipt of the final payment, including retention. For the Owner, this may take months or even years, as the revenues or savings realized from the ASSET the project created must repay the investment before the Owner can determine whether the ASSET delivered the desired “benefits.”

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1116 Keep in mind that at this level, there is a practical, or “common sense,” reason for learning these tools and
1117 techniques in sequence; in actual practice, they overlap, and there is CONSIDERABLE feedback and interaction
1118 among all the Units. However, at least initially, following them step by step is a great way to learn how to apply them
1119 if and when conditions change, which they will.

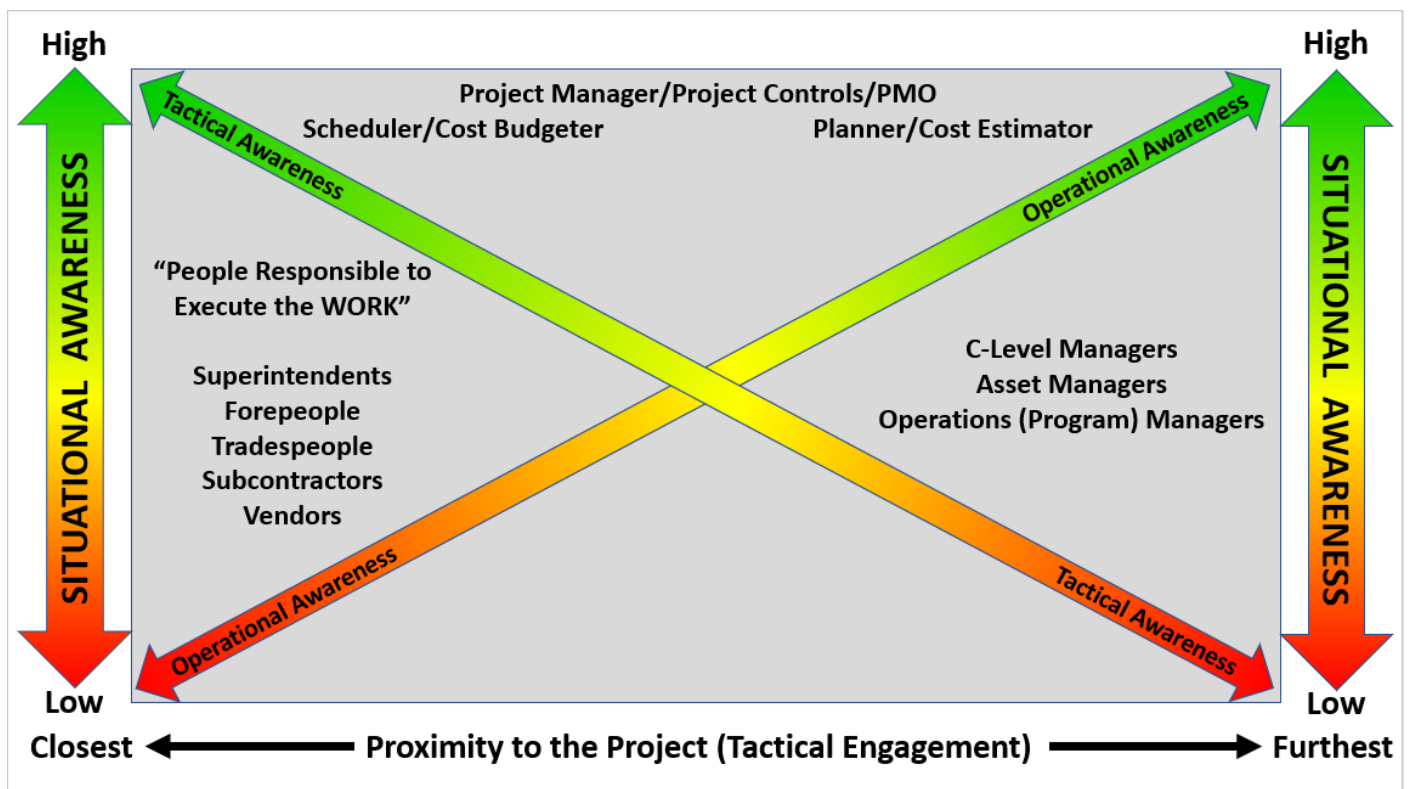
1120 While all examples are shown for PHYSICAL assets, does anyone lack the imagination to adapt this thinking to
1121 knowledge-based assets? Aren’t we already experimenting with self-correcting software? Or doesn’t Artificial
1122 Intelligence require this same type of “modular” thinking?

1123

1124 ✓ CENTRALIZED PLANNING vs. DECENTRALIZED EXECUTION

1125 Field Marshal Helmut von Moltke told us way back in 1861-1867 that “no plan survives first contact with the
1126 enemy,” and, more recently, General Dwight D. Eisenhower told us in 1950 that [“plans are useless, but planning is
1127 essential.”](#)

1128 So what does that mean in the context of Applied Project Management in general and Project Controls or Project
1129 Management Offices specifically?



1130 Figure 30- Situational Awareness Matrix [\(Adapted from Lt. Col. Paul Maykish\)](#)

1131 Continuing forward using “Lessons Learned” from the military and reinforcing what we showed in Figure 7,
1132 introducing the 4 “Actors” in our “play,” we can start to understand and appreciate that the PROJECT TEAM has a
1133 COMMUNICATIONS responsibility to translate the OPERATIONAL needs, wants and expectations of the C-Level,
1134 Asset, and Operations people who are FUNDING the projects into TACTICAL decisions necessary for those in the field
1135 who are responsible to PHYSICALLY EXECUTE the work and in return ensure that those on the front lines have the
1136 RESOURCES (= ASSETS) they need to stay within budget and on schedule.

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1137 Conversely, the Project Controls team is responsible to COMMUNICATE what problems or constraints that the FIELD
1138 is experiencing and what they need to overcome these challenges that go beyond the authority or capabilities of the
1139 project team to the appropriate DECISION MAKERS, in particular the ASSET MANAGERS, as those are the
1140 FUNCTIONAL or LINE MANAGERS who control the ASSETS that the people in the field need- People, Money,
1141 Knowledge/Information, Physical (Equipment, Tools, Software) and even in some cases, Intangible RESOURCES or
1142 ASSETS.

1143 Put another way, applying this tested and PROVEN approach means that the person or persons with the most
1144 SITUATIONAL AWARENESS are the ones who make DECISIONS that most affect the elements that are important to
1145 THEM. This means the Planners/Schedulers and Cost Estimators/Budgeting are not there to make decisions but are
1146 the people responsible for FACILITATING COMMUNICATIONS and UNDERSTANDING between the STRATEGIC
1147 DECISION MAKERS and the TACTICAL DECISION MAKERS in the field.

1148
1149 As shown in Figure 30, the PLANNER/COST ESTIMATOR is more focused on defining the STRATEGIC objectives (WHAT
1150 and WHO), while the SCHEDULER/COST BUDGETING is more focused on the TACTICAL aspects- WHEN, HOW, and
1151 HOW MUCH. This will be covered in more detail when we get to [Unit 9- Managing Planning and Scheduling](#).

1152 ✓ A Brief History-

1153 As we can see in Figures 19, 24, and 27, this is an ASSET CENTRIC model, first popularized by Esso or Diamond
1154 Shamrock Oil around the mid-1950s (based on verbal statements from credible “old-timers”) and attesting to the
1155 fact that it WORKS is still in use today, 65+ years later, by all the major International and nearly all National Oil
1156 companies. However, the concept of PROJECTS as a DELIVERY SYSTEM to “create, acquire, update, expand, repair,
1157 maintain, and eventually dispose of ORGANIZATIONAL ASSETS almost surely dates back hundreds if not thousands of
1158 years.

1159
1160 This model focuses on creating ASSETS to solve problems, comply with laws or regulations, or exploit opportunities,
1161 with PROJECTS being nothing more than a DELIVERY SYSTEM designed to “create, update, expand, upgrade, repair,
1162 maintain, and eventually dispose of ORGANIZATIONAL ASSETS. Thus, the ASSET solves the problem or creates value,
1163 not the project.

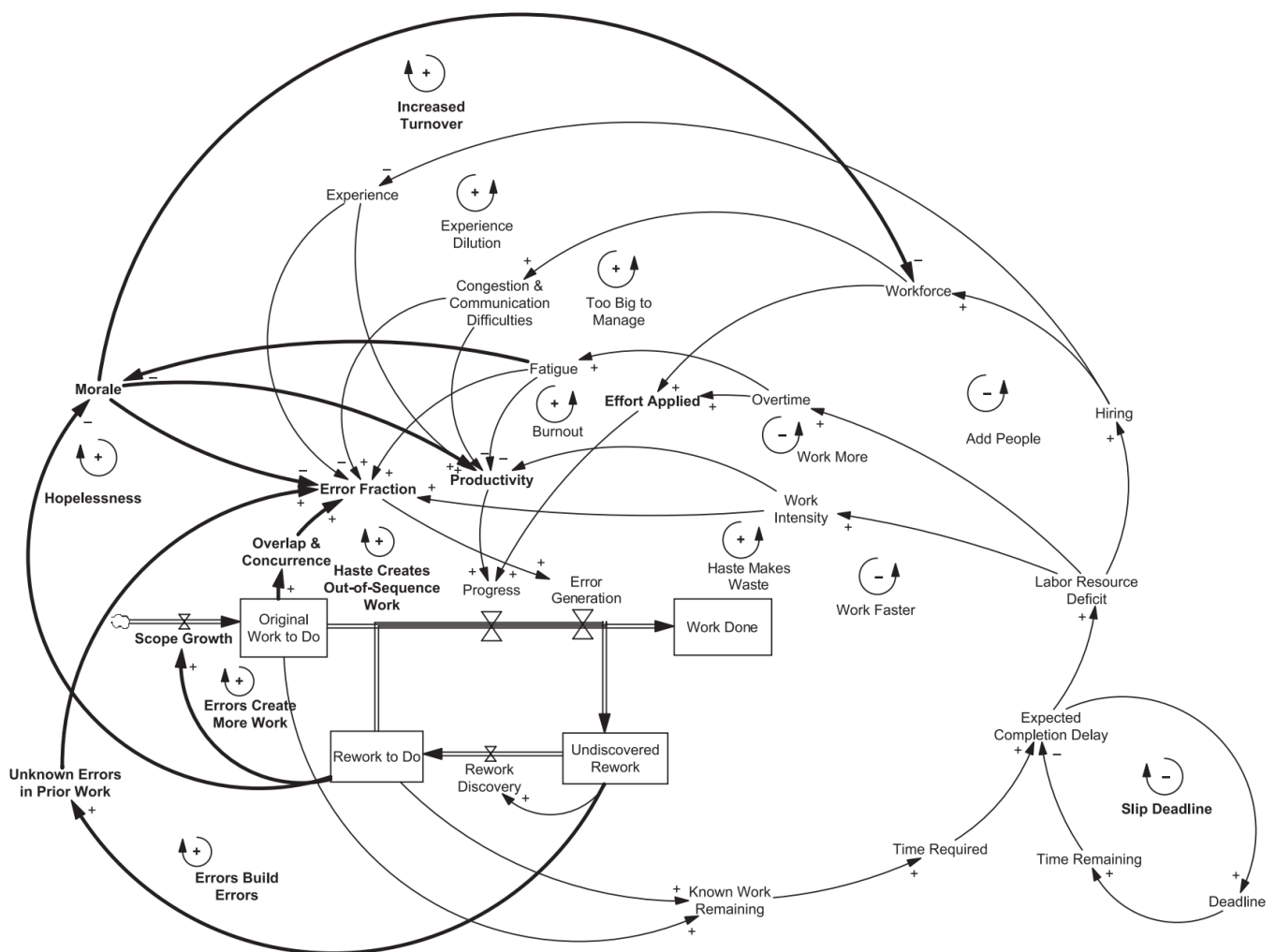
1164 To help communicate as clearly and effectively as possible, the numbers shown below in RED TYPEFACE (N)
1165 correspond to the graphic by referencing the GRAPHIC NUMBER (1), followed by the Number from that graphic
1166 explaining that component. (Graphic number (i.e., **(1)**) followed by the COMPONENT or ELEMENT number **(1.1)**,
1167 **(1.2)**, **(1.3)**, etc.)

1168
1169 This convention applies to all future graphics containing components requiring further narrative explanation.
1170 Supplemental or supporting graphics may well explain the tool or technique, how to use or apply it in the unit’s
1171 context, and the processes associated with that unit. Remember that the same tool or method can be (and often is)
1172 used across multiple techniques, producing different outputs.

1173 One final cautionary note: as we start to get into ever more complex relationships, we want to remind you that
1174 because projects are “complex, dynamic, adaptive” systems, what these relationships between the different Units
1175 look like is shown in Figure 26, appreciating that what we are showing is a simplified version of the real or true
1176 interactions between these units.

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1177

1178 **Figure 31- Systems Dynamics Model Showing the TRUE or REAL “Logic” in Project Management**

1179 Figure 31 has been shown as a reminder that the logic illustrated here is only a fraction of the real or true logical
1180 relationships, which helps explain one of the limitations of popular software such as MS Project or Oracle’s
1181 Primavera P6 to portray the workflow realistically and that is none of those programs allow the use of those pesky
1182 FEEDBACK LOOPS which we show in all our graphics but only conceptually. What we fail to show, but that remains
1183 the case nonetheless, are the facts that these feedback loops can have both a compounding effect (making the
1184 impact greater than the sum of the parts) and a dampening effect, hiding or masking the impacts. For more on this,
1185 see Simpson’s Paradox, which we cover in [Unit 13- Managing Databases](#).

1186

1187 ✓ Why Adopt a “Lego Block” Analogy?

1188 Having been involved recently in a heated debate over the topic of “COMPLEXITY” in project management, the
1189 question of whether projects that are “COMPLEX” are any different from projects that are merely “LARGE”,
1190 “EXPENSIVE”, “COMPLICATED”, or “TIME-CONSUMING”

1191 Having come from the trades, I counted up the “TOOLS” required by Electricians, Plumbers, Carpenters, Mechanics,
1192 and Surgeons, and the total, including both hand tools and electric-powered hand tools, comes to around 100 for a

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1193 well-equipped self-employed tradesman or as found in an operating theater. (Some are unique, but many are
1194 generic to all trades)

1195 As the two primary TEXTBOOKS we have been using in our competency development courses for 35+ years are:

1196 1) Humphrey’s “Project Management using Earned Value Management, 4th

1197 Edition” [https://www.amazon.com/Project-Management-Using-Earned-](https://www.amazon.com/Project-Management-Using-Earned-Value/dp/0996547940/ref=sr_1_1?s=books&sr=1-1)

1198 [Value/dp/0996547940/ref=sr_1_1?s=books&sr=1-1](https://www.amazon.com/Project-Management-Using-Earned-Value/dp/0996547940/ref=sr_1_1?s=books&sr=1-1) and

1199 2) “Engineering Economy 17th Edition”, by [William Sullivan](#), [Elin Wicks](#), [C](#)

1200 Koelling- [https://www.amazon.com/Engineering-Economy-17th-William-](https://www.amazon.com/Engineering-Economy-17th-William-Sullivan/dp/0134870069/ref=sr_1_1?s=books&sr=1-1)

1201 [Sullivan/dp/0134870069/ref=sr_1_1?s=books&sr=1-1](https://www.amazon.com/Engineering-Economy-17th-William-Sullivan/dp/0134870069/ref=sr_1_1?s=books&sr=1-1)

1202 We counted the TECHNIQUES specifically associated with “Integrated Asset, Portfolio, Program, and Project
1203 Management,” totaling ~200 TECHNIQUES, recognizing that many of the same TECHNIQUES are also associated with
1204 GENERAL business.

1205
1206 So if there are ~100 TOOLS and ~200 TECHNIQUES in total, are there any tools or techniques required for a COMPLEX
1207 project vs. a LARGE, EXPENSIVE, TIME-CONSUMING, or COMPLICATED project? And nothing was indicating that
1208 COMPLEXITY had any impact on the TOOLS or TECHNIQUES.

1209
1210 Recent research on the topic of COMPLEXITY ([Nicolas Perony | TEDxZurich 2013 October 2013](#)) also seems to indicate
1211 that “Complex systems that have many interacting parts, BUT the rules that govern are simple. What makes it
1212 unique is that the results are emergent- that the predictable behavior of the system is not the result of the individual
1213 rules but, to quote Aristotle, “the results of the whole are greater than the sum of the parts.”

1214
1215 So, given we only have ~100 TOOLS and ~200 TECHNIQUES and the only difference between “COMPLEX,” “LARGE,”
1216 “EXPENSIVE,” “COMPLICATED,” and “TIME-CONSUMING” lies in the number of tools or expense of the tools &
1217 repetition of the techniques, then why doesn’t that lend itself to the adoption of the “Lego Block” concept? That if
1218 we had a “Lego Block” for each tool and technique, and Lego blocks of different sizes, colors, and costs, we could
1219 construct the object of ANY project (“the ASSET”) in any configuration?

1220

1221 INSTEAD of arguing over which form of “agile” is best, maybe our IT colleagues need to spend more time studying
1222 history and seeing how they can adapt what it has taught us to today’s world.

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1223 **Figure 32- Conceptual Rationalization for Using the Lego Block Analogy**

1224 Figure 32 illustrates the thinking behind why the Lego Blocks analogy was adopted, with each Lego Block
1225 representing a single “tool” or “technique” associated with integrated Asset, Portfolio, Program, and Project
1226 Management are, for all intents and purposes, the same as those used in operations and general management given
1227 the difference between operations, program and project management lies in the fact that projects and programs
1228 have a defined end versus operations being open-ended, thus the ability to configure or adapt these tools and
1229 techniques into just about any size, complexity, or type of project. This “fit for use” concept helps answer the
1230 question, “How do you eat an elephant?” The answer is “One bite at a time.” If you break a project- ANY project-
1231 into small enough “work packages,” sooner or later, you can “plan, execute, control, and close it.” While once again
1232 being construction-oriented, is anyone willing to admit they lack the imagination or ability to innovate by adapting
1233 this thinking to YOUR project?

1234 At the same time, given that many of the tools and techniques are coming from general management, doesn’t it
1235 make sense to learn how to use those tools then and adequately learn any tools/techniques that are unique to your
1236 specific trade, profession, or occupational specialty on a “just-in-time” basis as you progress through your career?

1237 This book is unique. Unlike PMI, IPMA, AACE, and APM/APMG, we differentiate between the OWNER and
1238 CONTRACTOR organizations’ perspectives and explain both points of view, as many cases differ significantly in
1239 objectives and procedures. However, the TOOLS AND TECHNIQUES are used by everyone.

1240 **SUPPLEMENTAL/SUPPORTING REFERENCES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

- 1241 Miller Kelsey (2019) “[Management.](#)”
1242 Proctor, James (2021) “[Ten Business Process Best Practices](#)”
1243 APQC (2020) “[Best Practices in Process Improvement: The Seven Tenets of Process Management](#)”

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- Rever (2019) “6 Continuous Improvement Tools & Techniques” <https://reverscore.com/continuous-improvement-tools/>
- ASQ (N.D) “[Continuous Process Improvement Model](#)”
- Mulholland, Ben (2018) [What is Continuous Process Improvement and How to Use it.](#)”
- Lt Col Alan Docauer, USAF (2014) [Peeling the Onion: Why Centralized Control / Decentralized Execution Works](#)
- Sandeep Mulgund, Ph.D. (2021) [Evolving the Command and Control of Airpower](#)

SUPPLEMENTAL TEMPLATES FOR UNIT 1- GOVERNANCE AND INTEGRATION

- Courtneil, Jane (2020) “[Process Improvements: Your Ultimate Toolkit With 17 Free Templates](#)” NASA [Information Technology Program and Project Management Requirements](#)
- Rockwell International (1993) “[Continuous Improvement- Transforming Yesterday’s Reality into Tomorrow’s Vision](#)”
- US Dept of Energy (Updated 2018) [4 Project Execution Plan Templates from REAL PROJECTS](#)
- Nicolas Perony | TEDxZurich 2013 October 2013 “Complexity Explained”
https://www.ted.com/talks/nicolas_perony_puppies_now_that_i_ve_got_your_attention_complexity_theory/

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

- Project Management is PROCESS-based, and the closer we get to where the work is done, the more specific and unique the processes become.
- Shared accountability = No Accountability
- To be held accountable, a person needs to have “reasonable” control over the events or outcomes AND needs the formal authority to act to exploit or prevent them.
- “If you always do what you have always done, you will always get what you always got” (Henry Ford)
- “Doing the same things over and over again but expecting different results is the definition of INSANITY” (Albert Einstein)

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

- The Agility Effect (2020) “[How Big Data and AI will Optimize Continuous Improvement.](#)”
- Valdes, Miguel (2017) “[Intelligent continuous improvement, when BPM meets AI.](#)”

✓ Knowledge Management- “Lessons Learned” and “Continuous Process Improvement”

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

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

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Figure 33 explains as and entirely as possible what the elements that go into a process-based approach, where we have “ingredients” or “raw materials” and then applying the appropriate tools and techniques to these ingredients, we can transform them into a finished product, that can become an input to another follow on process or when finished, is classified as an ASSET, which is turned over to operations to be sold or otherwise exploited to generate a favorable return on investment or return on assets, as the case may be.

We see the most significant differences between this level’s different applications or contexts of applied project management. This is where the inputs, tools & techniques, and outputs for flying a plane from City A to City B, removing an inflamed appendix, and designing and building a bridge differ markedly. This is the most solid evidence for claiming that projects are “unique” one-time events. Even flying a plane from City A to City B, which is common to nearly all other “Projectized Operations,” is “unique” (See Figure 13, Element 13.7.4)

- ✓ Different plane
- ✓ Different pilot/crew
- ✓ Different Weather and Winds
- ✓ Different number of passengers
- ✓ Different total weight and balance

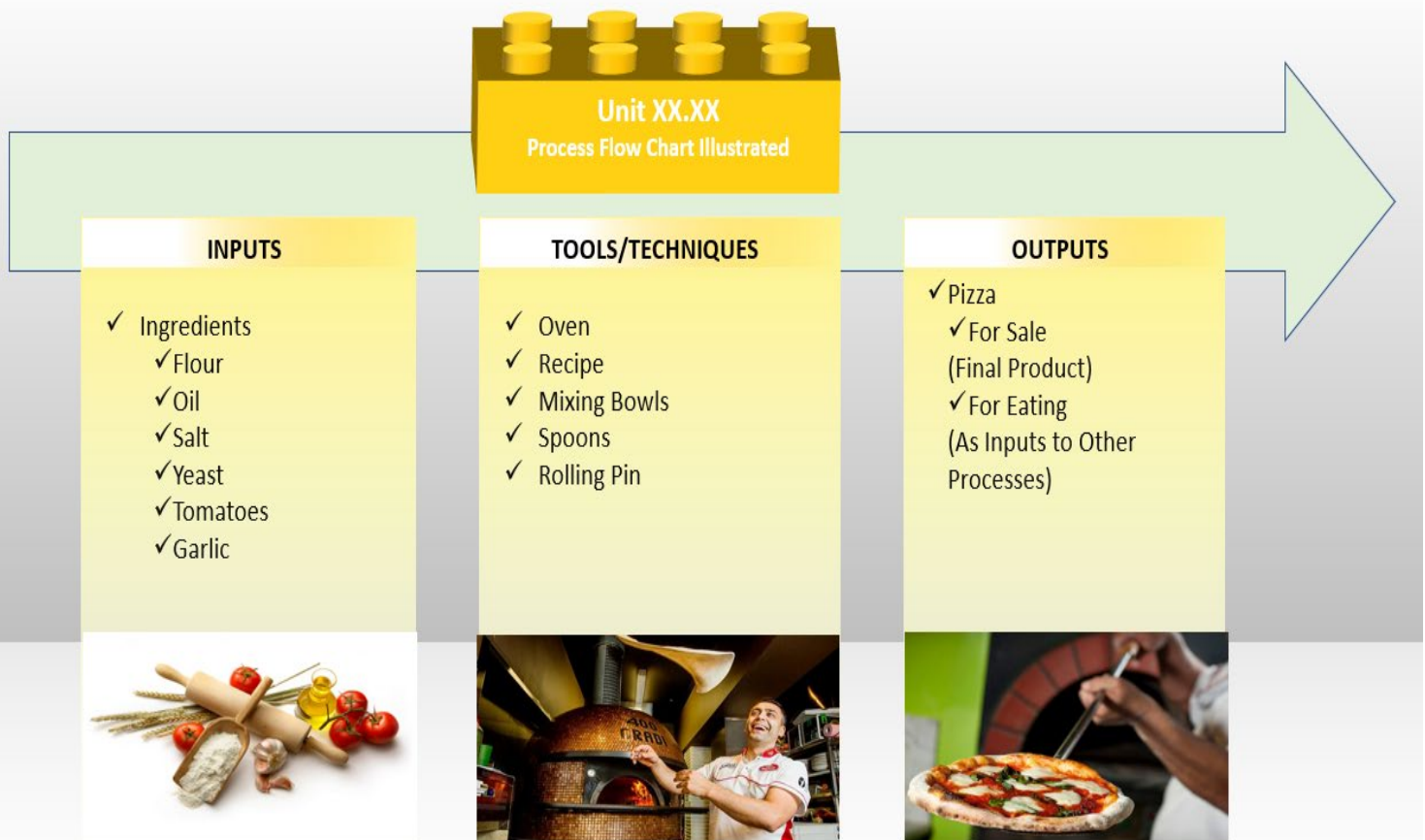


Figure 33 – Typical Process Mapping from 100 Meters

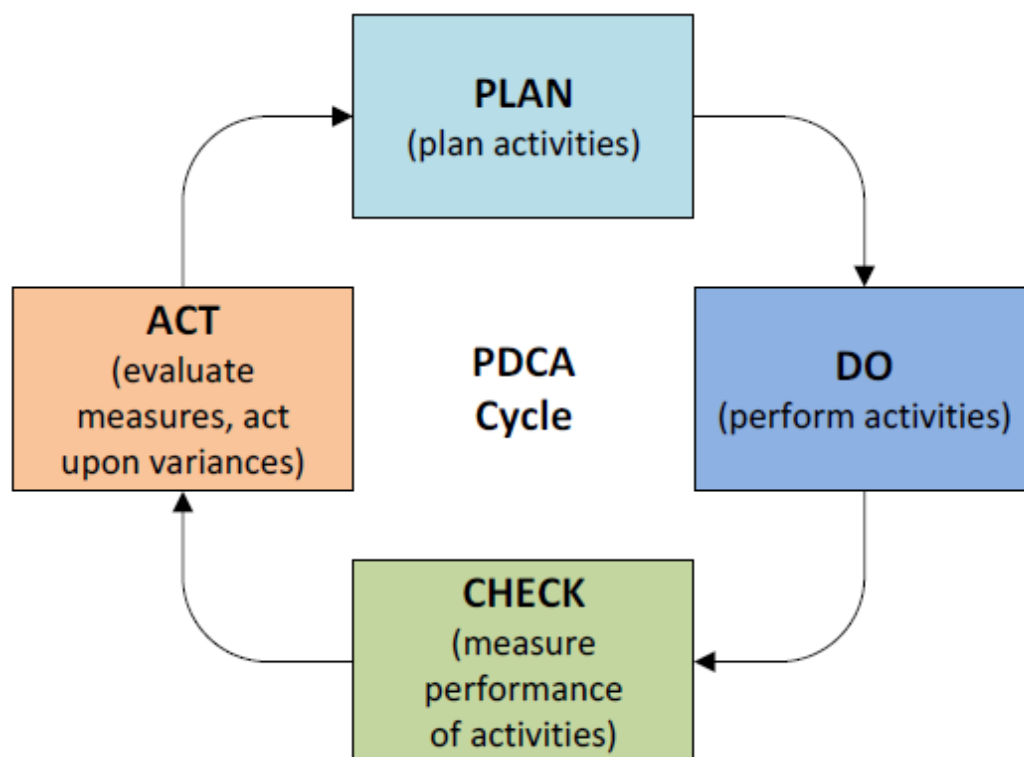
For whatever reasons, PMI, AACE, and IPMA have all embraced Shewhart’s “Plan-Do-Check-Act” (PDCA) or Deming’s “Plan-Do-Study-Adjust” (PDSA) Cycle as the basis for their quality control and continuous process improvement. As

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1305 this model is appropriate for an OPERATING environment, where the scope of work is essentially unchanged, and the
1306 processes are repetitive, the question is whether there is a model that is more appropriate for a PROCESS-based
1307 approach, where the scope of work is less clearly defined than in operations and where the processes are not always
1308 precisely repetitive. Based on both implicit and explicit knowledge, we propose the Double Loop Learning model,
1309 developed by Chris Argyris and Doug Schon in their book “Organizational Learning” (1978)²⁷. Why? While Shewhart
1310 and Deming were applying their methods to factory operations, Argyris and Schon discussed how ORGANIZATIONS
1311 learn. We leave it up to you to
1312 https://www.ted.com/talks/colas_perony_puppies_now_that_i_ve_got_your_attention_complexity_theory/ve
1313 you something to consider, especially if what you have been doing is NOT working, which, judging by much of the
1314 research or even by watching the nightly news, seems familiar and is getting worse as projects become more
1315 extensive and complex.

1316 We believe this approach is more appropriate to support ORGANIZATIONAL change than the Shewhart/Deming
1317 Cycles.



1318

1319 **Figure 34- Shewhart’s “Plan-Do-Check-Act” Cycle (PDCA) and Deming’s “Plan-Do-Study-Act” (PDSA) Cycle.**²⁸

1320 As training providers in “Applied Asset Portfolio, Program, and Project Management” methodologies for over 30
1321 years, we have learned that storytelling is the most potent and effective way to teach project management.

²⁷ Argyris, C., & Schon, D. (1978). Organizational learning: A theory of action perspective. Reading, MA: Addison-Wesley.

²⁸ Deming Institute (2022) <https://deming.org/explore/pdsa/>

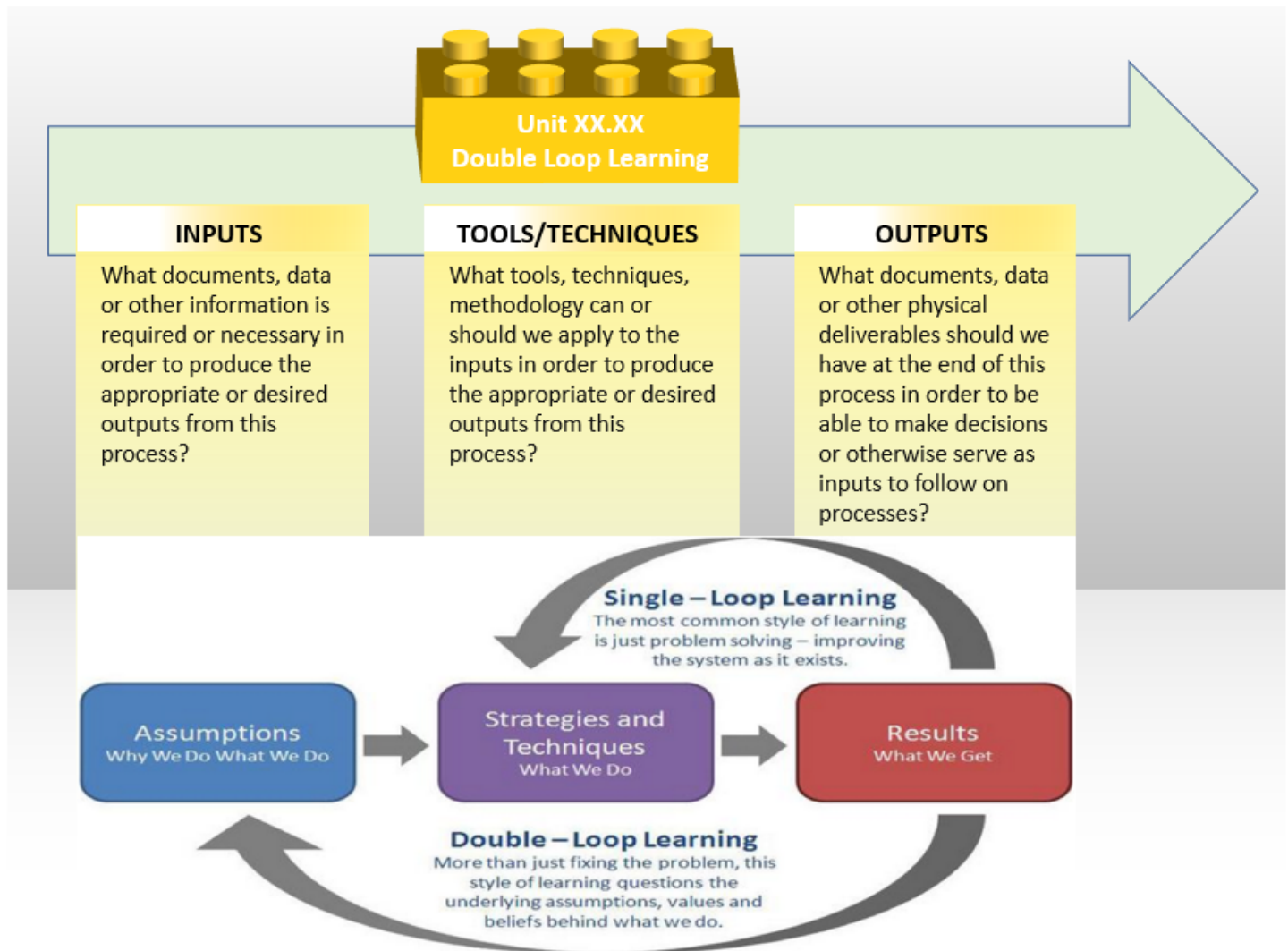
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1322 However, to be effective, you need people with legitimate stories to tell. No matter how good a storyteller is, they
1323 cannot “fake” experiences. It doesn’t take long before trainers who embellish their own experiences or, worse yet,
1324 try to use others’ experiences quickly discover and lose credibility with their students/clients.

1325 This is why 2-, 3-, and even 4-day courses are not worth the money. Not only are we faced with the “Forgetting
1326 Curve,” but if people fail to start practicing what they have learned under the watchful eye of a trained and
1327 experienced facilitator, they will become frustrated and lack the mentoring and support they need when things go
1328 wrong.

1329



1331 **Figure 35– Process Mapping from 100 Meters Showing Continuous Process Improvements**

1332 Figure 34 shows how PMI and AACE (and many other professional societies) have adopted Shewhart’s “Plan-Do-
1333 Check-Act” Cycle PDCA / and Deming’s “Plan-Do-Study-Act” PDSA Cycle.

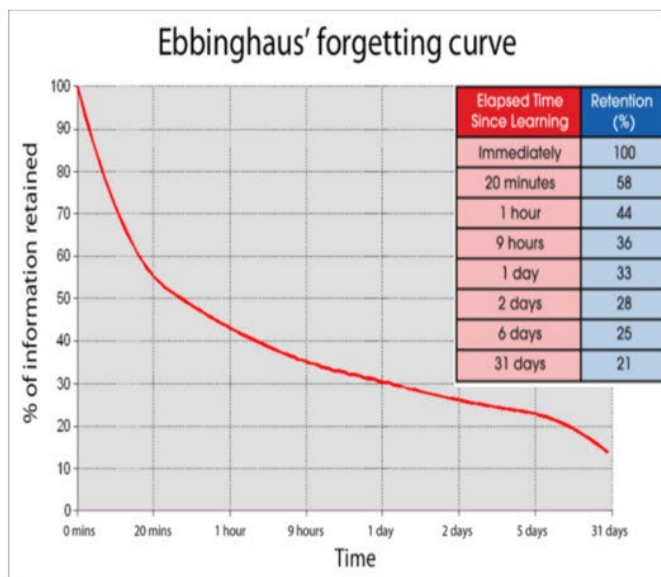
1334 Which of these two approaches do YOU think makes more or the most sense in the context of an integrated asset,
1335 portfolio, program, and project environment?

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1336 ✓ Knowledge Management- Why Short Courses are NOT a Good Investment

Why 2, 3, 4 or Even 5 Day Courses DON'T WORK...



Ebbinghaus “Forgetting Curve”

<http://www.senseandsensation.com/2013/03/retrieval-getting-and-forgetting-part-8.html>

https://www.csustan.edu/sites/default/files/groups/Writing%20Program/forgetting_curve.pdf



“Application Curve”

https://www.hbs.edu/faculty/Publication%20Files/16-121_bc0f03ce-27de-4479-a90e-9d78b8da7b67.pdf

<https://www.shiftelearning.com/blog/statistics-on-corporate-training-and-what-they-mean-for-your-companys-future>

1337 **Figure 36: Why Short-Duration Courses are NOT Cost-Effective.**

1338 Under the heading of “Knowledge Management,” it is worth noting that, while incredibly popular, two-, three-, four-
1339 , and even five-day courses are largely ineffective and waste time and money. This will be covered in more detail in
1340 Unit 2—Managing People, but keep in mind that when talking about Knowledge Management, we need to
1341 remember what does and does not result in “Value for the Money” or “generate a favorable return on training
1342 investment.”

1343 SUPPLEMENTAL/SUPPORTING REFERENCES FOR UNIT 1- GOVERNANCE AND INTEGRATION

1344 Ten Recommendations from the US Government Accountability Office (GAO) to NASA on [how to improve its Lessons](#)
1345 [Learned process](#)

1346 [“Lessons Learned” from the 1918 Spanish Flu Epidemic-](#)

1347 Health Services and Delivery Research, No. 3.4. White S, Wastell D, Smith S, et al. Southampton (UK): [NIHR Journals](#)
1348 [Library](#); 2015 Feb. [“Lessons Learned from the UK’s National Institute of Health”](#)

1349 Ronald Moen, Clifford Norman (ND) [History and Evolution of Shewhart and Deming’s PDCA/PDSA Cycles](#)

1350 Maestro (2019) [“The Importance of Storytelling in Effective Learning”](#)

1351 Delen, Dusen, et al. (2013) [“A comparative analysis of machine learning systems for measuring the impact of](#)
1352 [knowledge management practices.”](#)

1353

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1354 SUPPLEMENTAL TEMPLATES FOR UNIT 1- GOVERNANCE AND INTEGRATION

- 1355 [NASA Management Community](#)
- 1356 [Introducing Knowledge Management at NASA](#)
- 1357 APQC (ND) “[Knowledge Management Tools and Templates](#)”
- 1358

1359 RELEVANT PRINCIPLES FOR UNIT 1- GOVERNANCE AND INTEGRATION

- 1360 The most effective method of capturing Lessons Learned and passing them down is storytelling, as
- 1361 evidenced by the Bible and the Qur’an, which use parables.
- 1362

1363 ARTIFICIAL INTELLIGENCE/MACHINE LEARNING FOR UNIT 1- GOVERNANCE AND INTEGRATION

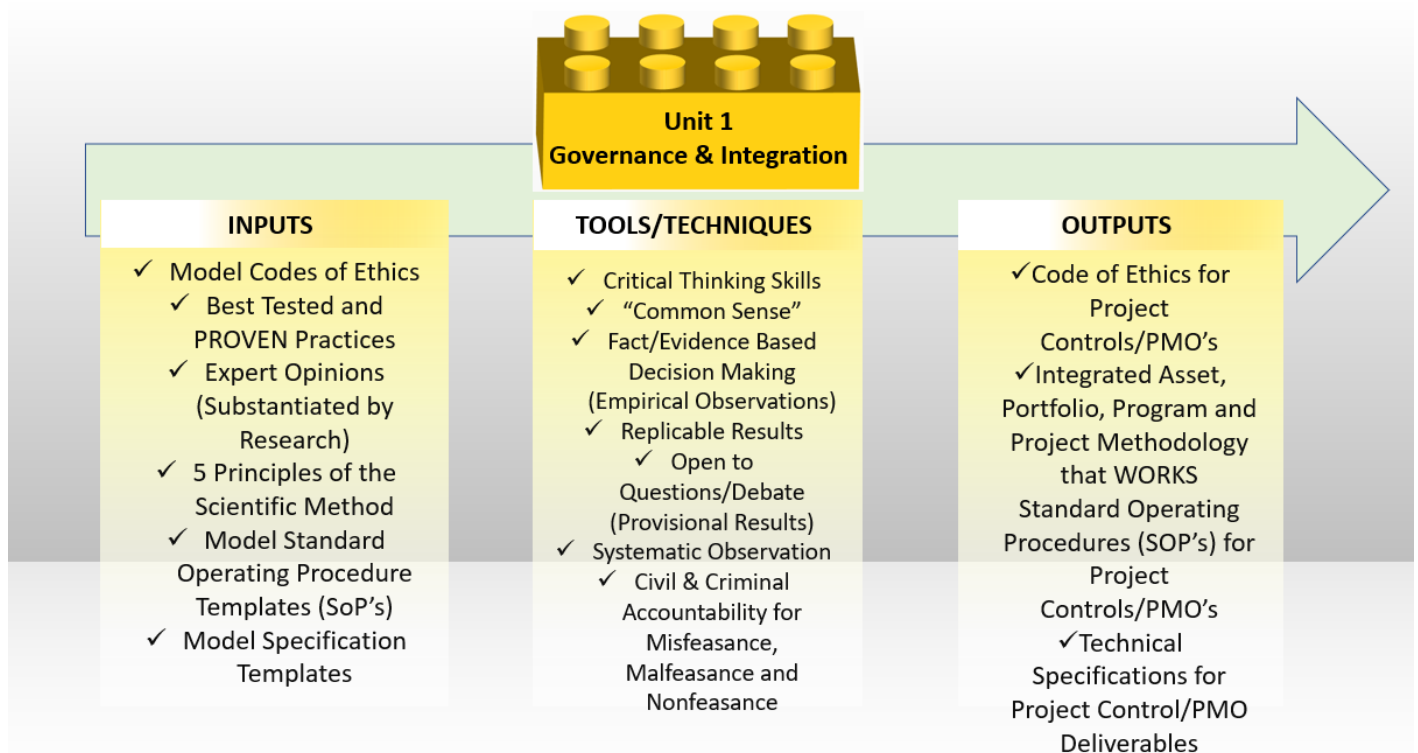
- 1364 CIO Review (2020) “[How Machine Learning Helps Knowledge Management](#)”
- 1365 SAS Institute (ND) “[Machine Learning Primer](#)”
- 1366
- 1367 ○ **Process Mapping from 100 Meters**

1368 This book was designed as a “How To Do It” instruction manual for project controls and project management offices
1369 (PMOs). Given that projects continue to fail, much of what is being put forward here is the first step to process
1370 improvement.

1371 With PMI struggling to change their PMBOK Guide 7th Edition and growing battles between the different factions of
1372 “Agile” or “agile” with little or no improvements in IT project success rates yet on the other and some relatively
1373 impressive success rates developing a Covid-19 vaccine as a result of Trump’s leadership there is no shortage of
1374 “Lessons Learned” that we can/should be taking advantage of.

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1375 **Figure 37– Process Mapping, 100 Meters View Showing Unit 1- Governance Inputs, Tools & Techniques, and**
1376 **Outputs**

1377 ○ **INPUTS TO UNIT 1- GOVERNANCE AND INTEGRATION**

1378 There is no shortage of research indicating that project management is not working, particularly on large, complex
1379 projects.

1380 Here is a partial list of credible research indicating that project management, as currently delivered, is broken. In
1381 many instances, it provides us with root cause analysis and corrective or remedial actions.

1382 With COVID-19, we are experiencing a whole new set of working conditions that will undoubtedly make things worse
1383 for ALL managers—asset, Portfolio, Program, and Project, and Project Control/PMO Practitioners.

1384 ■ **Model Codes of Ethics-**

1385 The Code of Ethics we have adopted and recommend others consider adopting is the model [Code of Ethics](#)
1386 developed by the Society of Corporate Compliance and Ethics (SCCE)

1387 Please pay close attention to Paragraph R1.4 and consider how this will almost surely impact those of us working in
1388 project controls.

1389 ■ **Expert Opinions**

- 1390
 - Glenn Butts, NASA (2010) "[Megaprojects- A History of Denial.](#)"
 - Prof. Bent Flyvbjerg, Oxford University (2011) [Over Budget, Over Time, Over and Over again](#)"
1392 and (2017) "[Sue, the Forecaster.](#)"

1393

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- [Arcadis Global Construction Disputes Report](#) (2023)
- Ed Merrow, IPA (2012) “[Megaprojects](#)”
- Caletka Anthony (2017) “[Buck the trend: Project intervention and profitability.](#)”

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

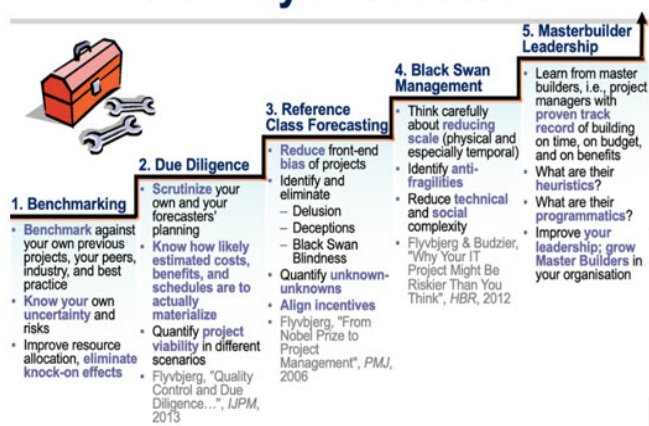
What are the ROOT CAUSES...??

- 1) Humans have been “initiating, planning, executing, controlling and closing projects in construction, entertainment and new product development sectors for 6000+ years.
- 2) In that time, SURELY we have or at least should have learned WHAT to do and HOW to go about doing it so the project finishes on time and within budget.
- 3) There is no shortage of sound research showing us HOW or WHY projects fail, having been identified by Glenn Butts (NASA) over 10 years ago <https://is.gd/Mzo3rz> and Bent Flyvbjerg (Oxford) <http://bit.ly/2wDnh4e>; <http://bit.ly/2eEugA2> and <http://bit.ly/1y0JDdu> and EC Harris/Arcadis Annual Construction Dispute Review- <https://is.gd/giuW8>

Stairway to Success

How Do We Underestimate?

- Let Me Count The Ways -



1. **OMIT PROBABLE SCOPE** from estimate
 2. **OMIT POSSIBLE RISKS** from analysis
 - Internal & External
 3. **UNREALISTIC, OPTIMISTIC assumptions**
 4. Use historically **LOW ESCALATION** projections
 - RAND Study – Reason for 11.2% of Cost Growth
 5. **Issue cost estimates in BASE YEAR dollars**
 - Estimates should be in then year dollars (escalated to year in which it is spent)
 6. **Many estimates NOT PREPARED BY A BONA FIDE ESTIMATOR**
 - Everyone's a estimator
 - Being certified no guarantee of having necessary experience
 7. **REWARD failure, PUNISH honesty**
 8. **NOT ENOUGH TIME** to prepare **CREDIBLE** estimates
 - Time often spent doing “what if” exercises, or splitting dollars into arbitrary buckets
- RAND Study – Reason for 74% of Cost Growth**

Figure 38- “Root Cause” Analysis and Recommendations from Butts and Flyvbjerg

✓ The Five Principles of the Scientific Method-

With PMI moving to a PRINCIPLE based 7th Edition, given that the “Scientific Method” has been around for close to 1000 years and has brought us hundreds of thousands of new products and given that “agile” in all its combinations and permutations is nothing more than the “Scientific Method” provided a new color lipstick, we are advocating that practitioners go back and adopt the [5 Attributes of the Scientific Method](#) in the research and writing of this book.

○ Empirical Observation

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

○ Replicable Experiments

Scientific experiments are replicable. That is, if another person duplicates the investigation, he or she will get the same results. Scientists are supposed to publish enough of their method so that another person with appropriate

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1415 training could replicate the results. This contrasts with methods that rely on the unique experiences of a particular
1416 individual or a small group.

1417 ○ **Provisional Results**

1418 The results of the scientific method are provisional; they are (or ought to be) open to question and debate. If new
1419 data contradict a theory, that theory must be modified. For example, the phlogiston theory of fire and combustion
1420 was rejected when the evidence against it emerged.

1421 ○ **Objective Approach**

1422 The scientific method is objective. It relies on facts and the world as it is rather than on beliefs, wishes, or desires.
1423 Scientists attempt (with varying degrees of success) to remove their biases when making observations.

1424 ○ **Systematic Observation**

1425 The scientific method is strictly systematic; it relies on carefully planned studies rather than random or haphazard
1426 observation. Nevertheless, science can begin from a random observation. Isaac Asimov said that the most exciting
1427 phrase to hear in science is not “Eureka!” but “That’s funny.” After the scientist notices something unusual, they
1428 investigate it systematically.

1429 **TOOLS & TECHNIQUES TO UNIT 1- GOVERNANCE AND INTEGRATION**

1430 ○ **Critical Thinking Skills**

1431 The very essence of the “scientific method” is based on “observable facts.” And the facts are crystal clear that what
1432 we are doing is not working. As Einstein told us, “doing the same things over and over again but expecting different
1433 results is the definition of insanity.” When will we follow our advice, go back and establish what has been tested and
1434 proven to work for the past 6,000+ years, and then adapt it to take advantage of today’s technology?

1435 ○ **“Common Sense”**

1436 This book has adopted the LEGAL definition of “Common Sense.” Black’s Law Dictionary defines “common sense” as
1437 “Sound practical judgment; that degree of intelligence and reason, as exercised upon the relations of persons and
1438 things and the ordinary affairs of life, which is possessed by the generality of mankind, and which would suffice to
1439 direct the conduct and actions of the individual in a manner to agree with the behavior of ordinary persons.”²⁹

1440 This book proposes that we start by adopting the same legal standards as those applied in “professional liability” or
1441 “professional negligence” cases. The Judicial Council of California Civil Jury Instructions (2020 edition) defines the
1442 “Standard of Care” for PROFESSIONALS as:

1443 ○ *“A/An [insert professional] is negligent if [he/she/nonbinary pronoun] fails to use the skill and care that a*
1444 *reasonably careful [insert professional] would have used in similar circumstances. This level of skill,*
1445 *knowledge, and care is sometimes referred to as “the standard of care.” [You must determine the level of*
1446 *skill and care that a reasonably careful [insert professional] would use in similar circumstances, based*
1447 *solely on the testimony of the expert witnesses [including [name of defendant]] who have testified in this*
1448 *case.]³⁰*
1449

²⁹ Black’s Law Dictionary Definition of “Common Sense”

³⁰ The Judicial Council of California Civil Jury Instructions (2020 edition) <https://www.justia.com/trials-litigation/docs/caci/600/600/>

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

Unfortunately, especially on social media, anyone with access to a mobile device and a Wi-Fi hotspot can publish unsupported and, in many cases, unsupportable OPINIONS without even attempting to justify, rationalize, or explain any basis for what they have to say.

PMI has a fairly robust [Code of Ethics](#) on “Honesty” that states:

○ *5.1 Description of Honesty*

Honesty is our duty to understand the truth and act truthfully in our communications and conduct.

○ *5.2 Honesty: Aspirational Standards As practitioners in the global project management community:*

5.2.1.1 We earnestly seek to understand the truth.

5.2.1.2 We are truthful in our communications and our conduct.

5.2.1.3 5.2.3 We provide accurate information promptly.

○ *Comment: These provisions imply that we take appropriate steps to ensure that the information we base our decisions upon or provide to others is accurate, reliable, and timely. This includes having the courage to share bad news even when it may be poorly received. Also, when outcomes are adverse, we avoid burying information or shifting blame to others. When results are positive, we avoid taking credit for others’ achievements. These provisions reinforce our commitment to being both honest and responsible.*

5.2.1.4 We make commitments and promises, implied or explicit, in good faith.

5.2.1.5 We strive to create an environment in which others feel safe to tell the truth.

○ *Honesty: Mandatory Standards. As practitioners in the global project management community, we require the following of ourselves and our fellow practitioners:*

- *We do not engage in or condone behavior designed to deceive others, including, but not limited to, making misleading or false statements, stating half-truths, providing information out of context, or withholding information when known to be misleading or incomplete.*
- *We do not engage in dishonest behavior with the intention of personal gain or at the expense of another.*

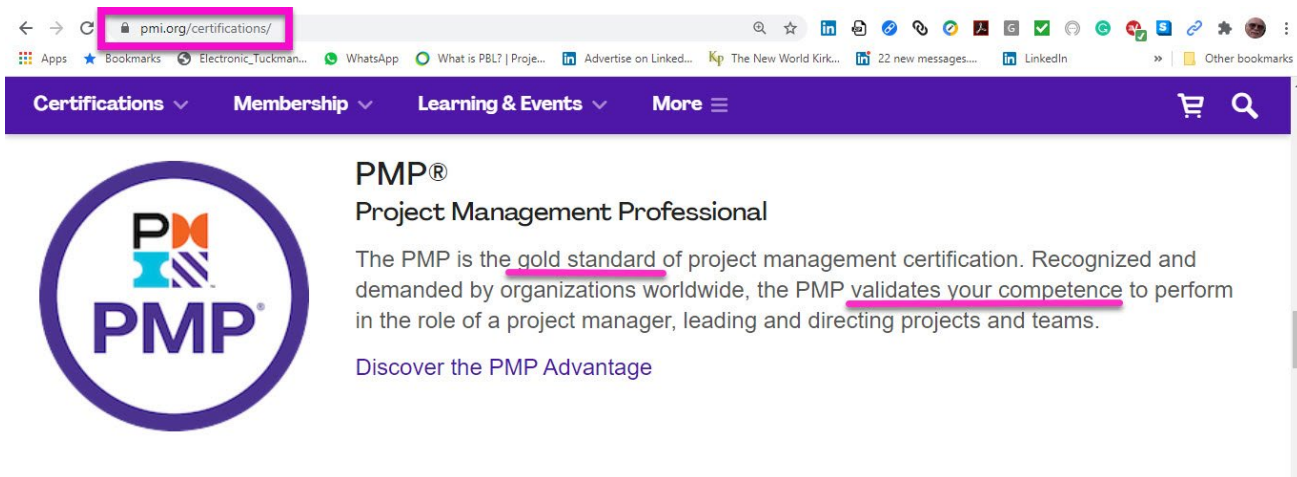
○ *Comment: The aspirational standards exhort us to be truthful. Half-truths and nondisclosures intended to mislead stakeholders are as unprofessional as affirmatively making misrepresentations. We develop credibility by providing complete and accurate information.*

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

Here is what PMI claims about its PMP

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1483

1484 **Figure 39- PMI’s Marketing Claims About their PMP**

1485 And here is the crucial part of what one of the PMP’s Founding Fathers, Lee R. Lambert, had to say on [LinkedIn](#):
1486 (Posting has since been taken down, but we have a full copy of the original posting for anyone interested)

1487 *The answer is obvious to most. Possessing the PMP signals to the world that you have passed a*
1488 *comprehensive exam and that you are aware of and understand the processes, terms, tools, and techniques*
1489 *outlined in PMI’s Guide to the Project Management Body of Knowledge. THAT’S IT!! Passing the PMP exam*
1490 *does not confirm that you are an accomplished project manager with a long history of leading successful*
1491 *projects. To claim, or even imply, that earning the PMP is more than an indicator of general knowledge in the*
1492 *field is questionable. The PMP may open doors to opportunities to demonstrate a project manager’s skills,*
1493 *but it does not replace hands-on experience as a project manager. Maybe the acronym should be PPMP*
1494 *(Potential Project Management Professional), similar to EIT (Engineer-in-Training). As the PPMP*
1495 *demonstrates the ability to successfully lead projects, it evolves into the PMP. Over the years, the PMP*
1496 *Certification’s success has become one of PMI’s claims to fame. What the PMP represents has been distorted,*
1497 *misunderstood, and often assumed to be something it isn’t. Let me repeat: the PMP does not confirm project*
1498 *management competency. No matter how many times you say it does, the PMP does NOT confirm project*
1499 *management competency!*

1500 And here are the requirements from the US Federal Trade Commission’s “truth-in-advertising rules” that apply to
1501 advertisers.

- 1502 ✓ Under [the US Federal Trade Commission Act](#):
- 1503 ○ Advertising must be **truthful and non-deceptive**.
 - 1504 ○ Advertisers must have **evidence to back up their claims** and
 - 1505 ○ Advertisements cannot be unfair.

1506 So you decide: Is PMI violating its own Code of Ethics? Is PMI violating the letter, if not the intent, of the US “Truth in
1507 Advertising” laws? How much longer can you or should you look the other way before you are willing to speak out
1508 against it?

1509

- 1510 ✓ **Civil & Criminal Accountability for Misfeasance, Malfeasance, and Nonfeasance**
- 1511 ○ “*Malfeasance is a wrongful or criminal act perpetrated by a public official or another person of authority.*
 - 1512 *An act of malfeasance is committed intentionally, disregarding that the action is morally or legally wrong*

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and will cause harm. The adjective form is malfeasant. The word malfeasance is derived from the French word *malfeasance*, which means wrongdoing.

- A misfeasance is a lawful act performed in an unlawful, illegal, or defamatory manner. Generally, misfeasance differs from malfeasance in that the actor does not intend to harm, but the harm comes through the actor's irresponsibility or negligence. The adjective form is misfeasant. The word misfeasance is derived from the French word *mesfeasance*, meaning to mis-do.
- Nonfeasance is the failure to do something that one is legally responsible for doing. It is an intentional failure to live up to one's legal or moral duty in a given situation, a refusal to fulfill one's obligation. The adjective form is nonfeasant. The word nonfeasance is derived from the French word *faisance*, meaning an action, and the prefix *non—*, which means not.³¹

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

Yet here we are, 10+ years later, and we are just now seeing examples of some people being held ACCOUNTABLE for their misfeasance, non-feasance, and malfeasance. As Glenn told us, “Before things can change, the approach and the consequences must change.” Or, to quote Henry Ford, “If you always do what you have always done, you will always get what you always got.” So, how much longer are YOU willing to tolerate the use of processes that we know produce failures?

³¹ Grammarist Definitions (ND) <https://grammarist.com/usage/malfeasance-misfeasance-and-nonfeasance/>

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“There Will Be No More Drugs”

◆ There will be no more cost & schedule overruns

Can be compared to saying

◆ There will be no more drugs in this country

• If it sounds impossible - consider this!

The dictator of small country:

- ☑ Appears on national TV and says:
- ☑ “There will be no more drugs in this country.”
- ☑ Everyone laughs at his naiveté and says such a result is impossible.

The next night 2 dozen people were lined up and shot

- ☑ The dictator appears on TV and says these people were caught with drugs.

This happened every night for the next 2 weeks

- ☑ The number of people shot every night **diminished until there were none!**
- ☑ In-country rehabilitation centers filled up.



Point

Before things change - the approach and consequences must change!

Page 32

◀ 32 of 48 ▶

Figure 40- [Recommendations by Glenn Butts, NASA](#)

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

Here are two recent examples in which “Project Sponsors” are held financially and criminally accountable for their misfeasance, malfeasance, and non-feasance in their decisions.

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

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

The Guild based their CoE on the model developed by the [Society of Corporate Compliance and Ethics Professionals \(SCCE\)](#)

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

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



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1546 A Standard Operating Procedure (SOP) is a document consisting of step-by-step instructions on how to execute a
1547 task or series of tasks

- 1548 ○ As a minimum, the SoP should contain the following:
- 1549 ● Title page. This includes 1) the title of the procedure, 2) an SOP identification number, 3) the date of
1550 issue or revision, 4) the name of the agency/division/branch the SOP applies to, and 5) the
1551 signatures of those who prepared and approved the SOP. This can be formatted however you like as
1552 long as the information is clear.
 - 1553 ● Table of Contents. This is only necessary if your SOP is quite long, allowing for ease of reference. A
1554 simple standard outline is what you'll find here.
 - 1555 ● Quality Assurance/Quality Control. A procedure is not suitable if it cannot be checked. Provide the
1556 necessary materials and details so the reader can ensure they've obtained the desired results. This
1557 may or may not include other documents, like performance evaluation samples.
 - 1558 ● Reference. List all cited or significant references. If you reference other SOPs, attach the necessary
1559 information in the appendix.
 - 1560 ● Maintaining and Updating your Standard Operating Procedure
 - 1561 ● Test the procedure. Have someone with limited knowledge of the process (or a person
1562 representative of the typical reader) use your SOP to guide them.
 - 1563 ● Has the SOP been reviewed by those who perform the procedure? At the end of the day, it doesn't
1564 matter what your bosses think of the SOP. It matters to those who do the work.
 - 1565 ● Have all stakeholders reviewed the SOP? Once the team gives you the go-ahead, please send it to
1566 your senior managers for final acceptance and endorsement.
 - 1567 ● Once approved, start implementing your SOP. This may involve conducting formal training for the
1568 affected personnel (e.g., classroom training, computer-based training), or it may mean your paper is
1569 hung up in the bathroom.
 - 1570 ● Ensure you include a way to update and improve the process. This will require a feedback loop from
1571 the Double Loop Learning process.
 - 1572

1573 OUTPUTS

1574 A Standard Operating Procedure that people follow and work by.
1575

1576 REFERENCES AND TEMPLATES FOR UNIT 1- GOVERNANCE AND INTEGRATION

1577 As we are quickly moving towards the application of Artificial Intelligence, Automation, and Machine Learning in
1578 project management, before we move forward, we first need to determine which practices are legitimate “best
1579 tested and PROVEN” and which are marginal and don't consistently produce “acceptable” results.

1580 Adam Henshall recently published an OUTSTANDING reference on writing EFFECTIVE Standard Operating
1581 Procedures. Here is his 16-step process:

- 1582 ● [Use Process Street to manage your standard operating procedures](#)
- 1583 ● [Writing standard operating procedures: a quick how-to guide](#)
- 1584 ● [Step 1: Understand how you are going to present your SOPs](#)
- 1585 ● [Step 2: Gather the relevant stakeholders](#)
- 1586 ● [Step 3: Work out your purpose](#)
- 1587 ● [Step 4: Determine the structure of your SOP](#)
- 1588 ● [Step 5: Prepare the scope of the procedure](#)

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- Step 6: Use a consistent style
- Step 7: Use correct notation, if applicable
- Step 8: Work out all the necessary steps of the process
- Step 9: Try to assess potential problems in the process
- Step 10: Determine metrics against which the SOPs can be judged
- Step 11: Test the process
- Step 12: Send the process to superiors
- Step 13: Clarify the method of optimizing the process
- Step 14: Run a risk assessment on your process
- Step 15: Consider creating a flow diagram
- Step 16: Finalize and implement the SOPs
- Examples of Process Street’s fully-written and usable SOPs
- Ensure your SOPs adhere to ISO standards

And here is a source for all the [TEMPLATES](#) he recommends:

Trying to automate a broken system makes absolutely no sense.

✓ **Model Standard PMO Specifications**

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

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

OUTPUTS FROM UNIT 1- GOVERNANCE AND INTEGRATION

✓ **Code of Ethics for Project Controls/PMO’s**

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

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

As evidenced by the adoption by all the major international and nearly all national oil gas companies who have been using the fully integrated Asset, Portfolio, Program, and Project Management Methodology for 65 years now, we can only recommend that unless someone comes up with another model that has been TESTED AND PROVEN to work that we start with the model shown in Figures 2, 13, 16 and 17.

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

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



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1628 Here is a [Model Standard Operating Procedure](#) developed by one of our Guild of Project Controls Certification
1629 students, Tijo Kurian, for SCHEDULING, using the GAO’s “Best Practices in Scheduling” as the benchmark and
1630 applying CSI’s Construction Manual of Practice as the basis for the specification. ³²

1631 For graduate students or practitioners wanting to write papers for AACE, Guild, or Project Controls, or other
1632 certification programs, just for personal satisfaction, we are actively seeking people to apply the standards
1633 referenced here to write model Specifications for the other Units as well.

1634 ✓ **Technical Specifications for Project Control/PMO Deliverables**

1635 Here is a [Model Technical Specification](#) developed by one of our Guild of Project Controls Certification students, Tijo
1636 Kurian, for SCHEDULING REQUIREMENTS, using the GAO’s “Best Practices Scheduling” as the benchmark and
1637 applying CSI’s Construction Manual of Practice as the basis for the specification. ³³

1638 For graduate students or practitioners wanting to write papers for AACE, Guild, Project Controls, or other
1639 certification programs, just for personal satisfaction, we are actively seeking applicants to apply the standards
1640 referenced here to write model Specifications for the other Units as well.

1641 **SUPPLEMENTAL/SUPPORTING REFERENCES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1642 Moffett and Moore (2011) [The Standard of Care: Legal History and Definitions: the Bad and Good News](#)

1643 Holland, Kent (2011) [Standard of Care for Design Professionals](#)

1644 Goguen, Dave, JD (ND.) [What is the “Standard of Care” in a Medical Malpractice Case?](#)

1645 **SUPPLEMENTAL TEMPLATES FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1646 Construction Specifications Institute (CSI) [Project Practice Guide, 3rd Edition](#) (NOT FREE)

1647 CSI [Construction Contract Administration Practice Guide](#) (CCAPG) 2nd Edition (NOT FREE)

1648 CSI [Construction Specifications Practice Guide](#) (CSPG) (NOT FREE)

1649 [Australian Government Department of Health](#) (FREE)-

1650 [Safety Culture Standard Operating Procedures](#) (2020) (FREE)

1651 WikiHow (ND) [“How to Write an SoP”](#)

1652 US Environmental Protection Agency (2007) [“How to Write an SOP”](#)

1653 **RELEVANT PRINCIPLES, PHILOSOPHIES, AND TENETS FOR UNIT 1- GOVERNANCE AND INTEGRATION**

1654 The technical specifications in ANY contract should appear once and only once, and in the same place in every
1655 contract, under a STANDARDIZED coding structure.

1656 IF the professional societies we belong to cannot or will not exemplify the values and beliefs they espouse, how can
1657 they expect their “member/owners to do so?

³² Kurian, T. (2020). How to develop a MODEL Standard Operating Procedure (SOP) for Scheduling; PM World Journal, Vol. IX, Issue II, February.

³³ 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>

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1658 Artificial Intelligence/Machine Learning FOR UNIT 1- GOVERNANCE AND INTEGRATION

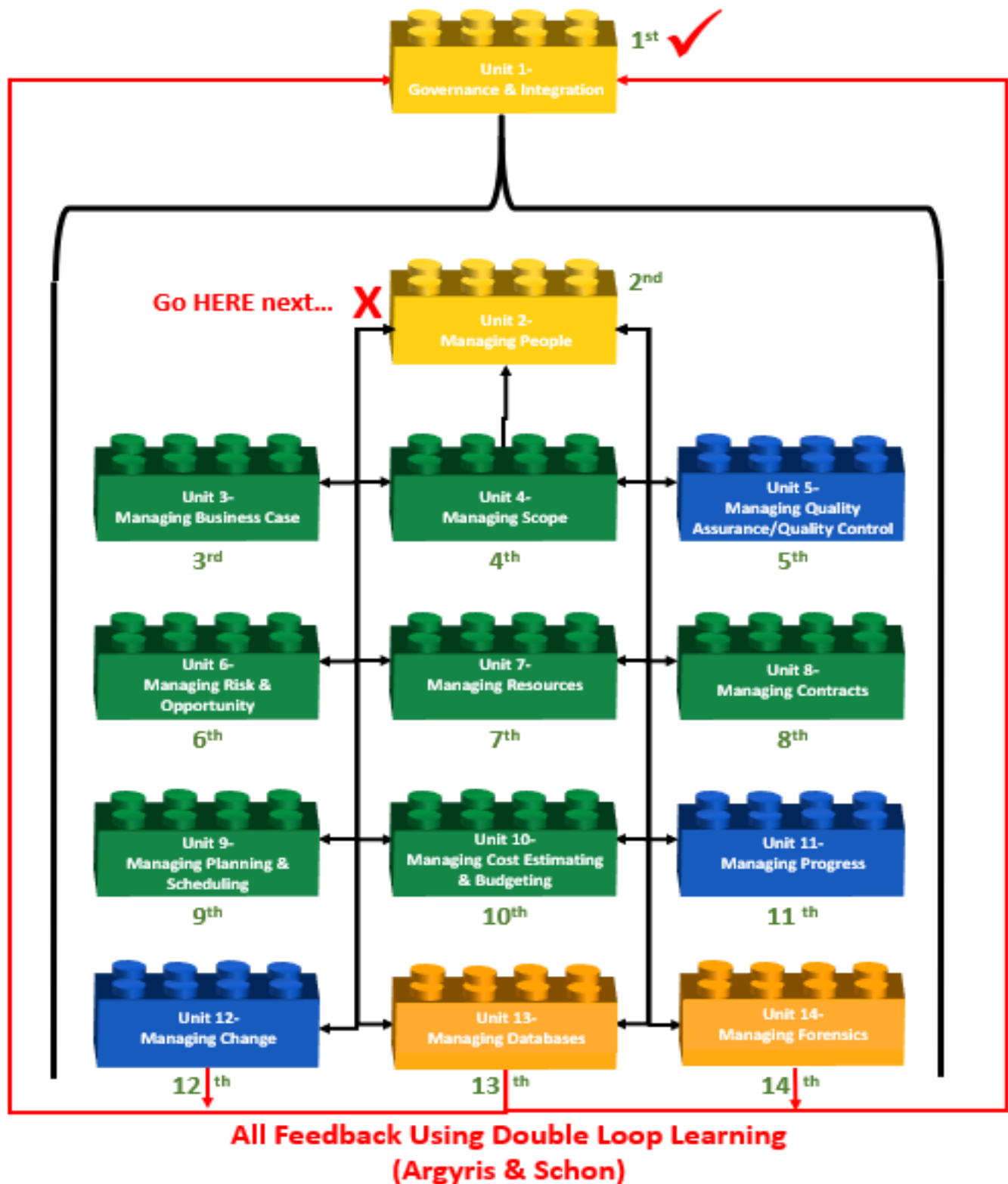
1659 Marchese, Peter (ND) “[The e-SPECS® BIM Process](#)”

1660 Arcat Inc. (n.d.) “[Spec Wizard.](#)”

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1661 What can I do NEXT? What do you recommend?



1662 Figure 41- Which Module is recommended NEXT?