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To prepare for operational-level logistics (OpLog) billets, Marine Corps logistics officers require advanced education associated with tools requisite in alternate frameworks that can assist operational-level logisticians in solving complex problems within dynamic systems. This study examines Marine Corps education and learning, operational-level logisticians' roles and responsibilities, and the future operating environment, then analyzes business and industry logistics education. This study identifies Scrum and Program Management as non-military alternate frameworks to develop OpLog concepts of logistics support in the complex and uncertain environments as described in our future force concepts.

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MASTER OF MILITARY STUDIES

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Operational-Level Logistics Education


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OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF MILITARY STUDIES

**AUTHOR:**  
Major Kieran O'Neil

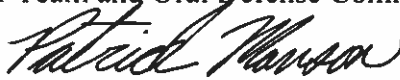
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## Executive Summary

**Title:** Operational-Level Logistics Education

**Author:** Major Kieran O’Neil, United States Marine Corps

**Thesis:** To prepare for operational-level logistics (OpLog) billets, Marine Corps logistics officers require advanced education associated with tools requisite in alternate frameworks that can assist operational-level logisticians to solve complex problems within dynamic systems.

**Discussion:** Marine Corps education does not effectively prepare field-grade logistics officers to solve logistics problems at the operational level in the 21st century. This study begins by examining current Marine Corps education and learning, Marine Corps operational-level logisticians' roles and responsibilities, and the future operating environment. The future operating environment for logisticians is analyzed through the lens of *Sustaining the Force in the 21st Century* and applied to the uncertain and complicated conceptual environments described by the *Commandant’s Planning Guidance* and *Advantage at Sea*. The complexity of the joint logistics enterprise and global integration presents opportunities for problem-solving, but integration and interoperability challenges will impede these opportunities. A follow-on analysis of logistics education for business and industry will provide recommendations for inclusion in Marine Corps operational-level logistics education. Operational-level logisticians need evolutionary problem-solving methods to maintain a competitive advantage and provide effective and efficient sustainment to tactical-level formations.

**Conclusion:** Program Management and Scrum provide adaptable non-military frameworks that enable operational-level logistics to develop concepts of logistics support in complex and uncertain environments. Both frameworks are designed as managerial tools that leverage the knowledge and experience of the team members to solve problems.

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THE OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE MARINE CORPS COMMAND AND STAFF COLLEGE OR ANY OTHER GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT.

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## *Preface*

Having served as a logistics officer for 15 years, I continued to feel less certain about what constituted operational-level logistics and the challenges at the component level to support tactical-level formations. I used this time to research how the Marine Corps is conceptualizing the future operating environment and its logistics implications to fill in the gaps in my understanding of logistics planning at the operational-level.

I want to thank Dr. DiNardo and LtCol Manson for their guidance and for helping me get across the finish line. I also want to thank the Joint Operational Logistics Elective primary instructors and guest lecturers who expanded and challenged my understanding of operational-level logistics and its role in the future fight.

## **Marine Corps Education and Learning**

The 38th Commandant of the Marine Corps identified "Education and training" as one of "five priority focus areas" which must be addressed to compete, deter conflict, and ultimately win during future major combat operations.<sup>1</sup> Additionally, the Marine Corps Combat Development and Integration's, *Sustaining the Force in the 21st Century* describes the changes needed for logistics success to take place in the future environment which, "will notably require adjustment to logistics education, TTPs, and modification to existing doctrine."<sup>2</sup> Marine Corps logisticians need to reassess how they view their roles and responsibilities when solving problems at the operational-level of war. Based on the Marine Corps' future force design and how it views competing and conflict as expressed in new concepts, Marine Corps logistics education for the operational-level needs to be reevaluated. What has worked since the end of World War II is no longer tenable. Field-grade logistics officers require education tailored specifically towards great power competition in a contested environment to ensure successful tours in operational-level billets. Current education, including the Marine Corps Planning Process (MCP) and Joint Planning Process (JPP), are foundational requirements, but do not effectively prepare operational-level logisticians for the problem-solving challenges and complex environment they will plan for and operate in. To prepare for operational-level logistics (OpLog) billets, Marine Corps logisticians require advanced education associated with tools requisite in non-military alternate frameworks which can assist operational-level logisticians to solve complex problems within dynamic systems.

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<sup>1</sup> Gen David H. Berger, *Commandant's Planning Guidance*, 1, [https://www.marines.mil/Portals/1/Publications/Commandant's%20Planning%20Guidance\\_2019.pdf?ver=2019-07-17-090732-937](https://www.marines.mil/Portals/1/Publications/Commandant's%20Planning%20Guidance_2019.pdf?ver=2019-07-17-090732-937).

<sup>2</sup> Combat Development and Integration, Headquarters US Marine Corps, *Sustaining the Force in the 21st Century*, May 12, 2019, 18.

The Marine Corps' literature on logistics and learning converges to describe logistics responsibilities. Marine Corps Doctrinal Publication (MCDP) 4 Logistics and MCDP 7 Learning describe how the Marine Corps views education through their respective functions. Both publications discuss the need for education to support problem-solving while operating in contested environments comprised of complex systems. Uncertainty, friction, and unknowns about related and unrelated actors within the system complicate contested environments and complex systems. Due to myriad uncertainty and unknowns, a variety of processes or problem-solving tools are required. MCDP 7 refers to "analysis, synthesis, reasoning, and problem solving."<sup>3</sup> Similarly, MCDP 4 describes that "logisticians must develop considerable expertise in solving a great variety of problems...that aid logisticians in their work [and] must provide flexible tools that aid...rapid and responsive problem solving."<sup>4</sup> The problem-solving "flexible tools" described in MCDP 4 and MCDP 7 suggest the need for new and alternate problem-solving frameworks. MCDP 4 and MCDP 7 also discuss the need for "adaptability" due to evolving conditions driving logistics education to require a greater understanding of "the larger art of war."<sup>5</sup> Logisticians require education that enables them to develop, apply, and manage various problem-solving tools that build on their existing knowledge of operational design and approach.

Operational-level logistics education is primarily the responsibility of the Marine Corps Logistics Operations Group (MCLOG). MCLOG's current portfolio of activities associated with OpLog includes Expeditionary Logistics Operations Course (EXLOC) and Operational-Level

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<sup>3</sup> Headquarters US Marine Corps, *Learning*, MCDP 7 (Washington, DC: Headquarters US Marine Corps, February 20, 2020), 1-6.

<sup>4</sup> Headquarters US Marine Corps, *Logistics*, MCDP 4 (Washington, DC: Headquarters US Marine Corps, April 4, 2018), 2-34.

<sup>5</sup> Headquarters US Marine Corps, *Logistics*, 3-27.

Logistics Seminars.<sup>6</sup> OpLog is categorized as "Collective Training," while EXLOC, categorized as "Individual Training," is designed to educate and certify Expeditionary Logistics Instructors (ELI).<sup>7</sup> ELI training and readiness (T&R) standards drive EXLOC educational and learning objectives.<sup>8</sup> Seventy references, categorized as military/service doctrine or publications, inform ELI T&R standards.<sup>9</sup> The following section will provide a more thorough analysis of operational-level logistics roles and responsibilities, followed by analyzing the future operating environment as defined by current concepts, and business and industry logistics education will illustrate the need to further enable advances to operational logistics.

### **Operational-level Logistics Roles and Responsibilities**

OpLog billets are aligned to geographic combatant commands (GCC) at the Marine Corps' component level (i.e., Marine forces (MARFOR)). MCTP 3-40C Operational-Level Logistics states, "operational-level logistics is designed, planned, coordinated, and executed at the Marine Corps component commands."<sup>10</sup> MARFOR logisticians are responsible for bridging strategic and service-level capabilities with tactical-level requirements to support GCC campaign objectives.<sup>11</sup> In support of GCC objectives, MARFOR logisticians analyze subordinate assigned the Marine Air Ground Task Force's (MAGTF) mission and capabilities in order to develop a

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<sup>6</sup> Commandant of the Marine Corps, *Marine Corps Logistics Tactics, Training, and Education Program*, MCO 3502.8A, June 12, 2020, 2-5, <https://www.marines.mil/Portals/1/Publications/MCO%203502.8A.pdf?ver=2020-06-16-110330-103>.

<sup>7</sup> Commandant of the Marine Corps, *Marine Corps Logistics Tactics, Training, and Education Program*, 2-5.

<sup>8</sup> Commandant of the Marine Corps, *Marine Corps Logistics Tactics, Training, and Education Program*, 2; Commandant of the Marine Corps, *Marine Corps Instructional Systems Design/Systems Approach to Training and Education Handbook*, NAVMC 1553.1A, September 15, 2016, 5-10, <https://www.marines.mil/portals/1/Publications/NAVMC%201553.1A.pdf?ver=2017-01-09-072054-373>.

<sup>9</sup> Commandant of the Marine Corps, *Logistics Training and Readiness Manual*, NAVMC 3500.27D, February 12, 2019, 15-2 – 15-17, <https://www.marines.mil/portals/1/Publications/NAVMC%203500.27D.pdf?ver=2019-05-07-104242-857>.

<sup>10</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, MCTP 3-40C (Washington DC: Headquarters US Marine Corps, April 4, 2018), 1-1.

<sup>11</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, 1-1 – 1-3.

concept of logistics support throughout a campaign. MARFOR logisticians "conduct globally integrated logistics operations" by leveraging "a multitiered matrix of key global logistics providers" known as the joint logistics enterprise (JLEnt).<sup>12</sup> It is critical that an operational-level logisticians knows the MAGTF, its requirements and capabilities, but must plan beyond it by operationalizing the JLEnt to be relevant in future conflicts.

Figure 1 depicts the lens used to determine a MAGTF's tactical-level logistics requirements and capabilities within the assigned MAGTF. The six functions and 49 subfunctions of tactical logistics provide a framework for logisticians to design a tactical-level logistics plan.<sup>13</sup> Similarly, Figure 2 depicts the OpLog framework for joint core logistics functions.<sup>14</sup> The logistics functions overlap significantly between tactical and operational-level.<sup>15</sup> There are a series of military operational specialties responsible for the technical and subject matter expertise requisite within each of the functions or subfunctions. Logistics officers are not trained to conduct the nuances within each function and subfunction. However, logistics officers are responsible for integrating the requisite expertise, aggregate each functional concept, and synthesize it into a concept of logistics support.<sup>16</sup> Whether analyzing the tactical functions of logistics or joint functions, logisticians need to identify the direct and indirect relationships

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<sup>12</sup> US Department of Defense, *Joint Logistics*, Joint Publication 4-0 (Washington, DC: US Department of Defense, May 8, 2019), ix.

<sup>13</sup> Headquarters US Marine Corps, *Tactical-Level Logistics*, MCTP 3-40B (Washington DC: Headquarters US Marine Corps, April 4, 2018), 1-7 – 1-10.

<sup>14</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, 2-5. *Operational-Level Logistics* identifies eight areas of Sustainment ("Provision of logistic services, Personnel support, Integrated supply support, Distribution, Maintenance, Engineering, Health service support, and Contracted logistics support"). *Operational-Level Logistics* does not explicitly represent these eight areas as 'functions of logistics' nor 'core logistics functions.' This study assumes that the discrepancy is administrative in nature due to version control and oversight. For the purposes of the study the 'Core Logistics Functions' from Joint Publication 4-0 *Joint Logistics* (p. II-2) is assumed to be the accurate representation of operational-level functions of logistics.

<sup>15</sup> 'Operational Contract Support' while listed as a separate function within the joint framework is included at the tactical-level as a subfunction under 'Services'. 'Deployment and Distribution' at the joint level is relatively equivalent to "Transportation" at the tactical-level, however, "Distribution" is listed separately as a subfunction under "Supply".

<sup>16</sup> Headquarters US Marine Corps, *Tactical-Level Logistics*, 1-7.

that occur between each and every logistics function. A critical requirement for logisticians is to understand how each tactical or core logistics function relates and interacts with the other logistics functions in a constantly changing operational environment.

Supply	Maintenance	Transportation
<ul style="list-style-type: none"> <li>Determination of requirements</li> <li>Requisition authority</li> <li>Storage</li> <li>Procurement</li> <li>Distribution</li> <li>Salvage</li> <li>Disposal</li> </ul>	<ul style="list-style-type: none"> <li>Inspection and classification</li> <li>Servicing and repair</li> <li>Modification</li> <li>Rebuilding and overhaul</li> <li>Reclamation</li> <li>Recovery and evacuation</li> </ul>	<ul style="list-style-type: none"> <li>Embarkation and landing support</li> <li>Port and terminal operations</li> <li>Motor transport</li> <li>Aerial delivery</li> <li>Freight and passenger transportation</li> <li>Material handling equipment</li> </ul>
General Engineering	Health Services Support	Services
<ul style="list-style-type: none"> <li>Engineer reconnaissance</li> <li>Bridging</li> <li>Horizontal/vertical construction</li> <li>Facilities maintenance</li> <li>Demolition/obstacle removal</li> <li>Explosive ordnance disposal</li> <li>Receive, store, and distribute bulk fuel</li> <li>Water production and storage</li> <li>Power generation and distribution</li> </ul>	<ul style="list-style-type: none"> <li>Casualty management</li> <li>Force health protection and prevention</li> <li>Medical logistics</li> <li>Medical command and control</li> <li>Medical stability operations</li> </ul>	<p><b>Command:</b></p> <ul style="list-style-type: none"> <li>Personnel administration</li> <li>Religious ministries support</li> <li>Financial management</li> <li>Communications</li> <li>Billing</li> <li>Food service and subsistence support</li> <li>band</li> <li>Morale, eelfare and recreation</li> </ul> <p><b>CSS:</b></p> <ul style="list-style-type: none"> <li>Disbursing</li> <li>Postal</li> <li>MCCS exchange services</li> <li>Security</li> <li>Legal services</li> <li>Civil affairs</li> <li>Mortuary affairs</li> <li>Contracting</li> </ul>

Figure 1<sup>17</sup>

Core Logistics Functions	
Core Functions	Functional Capabilities
Deployment and Distribution	<ul style="list-style-type: none"> <li>Move the force</li> <li>Sustain the force</li> <li>Operate the joint deployment and distribution enterprise</li> </ul>
Supply	<ul style="list-style-type: none"> <li>Manage supplies and equipment</li> <li>Inventory management</li> <li>Manage global supplier networks</li> </ul>
Maintenance	<ul style="list-style-type: none"> <li>Depot maintenance operations</li> <li>Field maintenance operations</li> <li>Equipment reset</li> </ul>
Logistics Services	<ul style="list-style-type: none"> <li>Food service</li> <li>Water and ice service</li> <li>Contingency base services</li> <li>Hygiene services</li> <li>Mortuary affairs</li> </ul>
Operational Contract Support	<ul style="list-style-type: none"> <li>Contract support integration</li> <li>Contracting support</li> <li>Contractor management</li> </ul>
Engineering	<ul style="list-style-type: none"> <li>General engineering</li> <li>Combat engineering</li> <li>Geospatial engineering</li> </ul>
Joint Health Services	<ul style="list-style-type: none"> <li>Force health protection</li> <li>Health service support</li> </ul>

Figure 2<sup>18</sup>

Referencing Figure 1 and 2 frameworks for conducting logistical planning at both the tactical and operational levels of war, the scope and complexity of solving logistics planning problems at the operational-level will be explored in greater detail. The currently designed framework for operational-level logisticians to solve problems begins with determining MAGTF requirements and capabilities through the 'lens' of the tactical functions of logistics usually generated by individual units. At the MARFOR or operational-level, logisticians next apply the operational-level functions ('joint core logistics functions') to determine valid requirements above the MAGTF's organic capacity. After coordination vertically, horizontally, and laterally within the MAGTF, logisticians at the operational-level seek additional sources to fill requirements beyond what the MAGTF can support. In order to accomplish this, logisticians

<sup>17</sup> Headquarters US Marine Corps, *Tactical-Level Logistics*, 1-10.

<sup>18</sup> US Department of Defense, *Joint Logistics*, II-2.

overlay naval logistics integration, joint, interagency, international (partners/allies), coalition, and host nation sustainment solutions against Marine Corps shortfalls.<sup>19</sup> Integrated with these sources are organizations such as: Defense Logistics Agency (DLA), Logistics Civil Augmentation Program (LOGCAP), alternate operational contract support supply sources, Marine Corps Logistics Command, Marine Corps Systems Command, and functional combatant commands. In the future operating environment, logisticians will also incorporate capabilities or organizations currently in development or not yet identified. The current framework to ingest additional capabilities or organizations is limited. As theater specifics may require a logistician to seek out alternate, available sources of support, these organizations mentioned above will enable the development of a concept of logistics support through the depiction of "sustainment activities and joint logistic systems."<sup>20</sup> Operational-level logisticians are often unaware of all the sources of support and need an education that provides effective frameworks and subsequent tools to navigate this complex resourcing environment.

Interoperability and integration of systems, both physical and electronic, additionally pose unique challenges. "Operational-level logistics is inherently joint and combined," driving the necessity of component logisticians for "effective and seamless interaction" among all coordinating and support forces.<sup>21</sup> An example of existing challenges exists within Naval Logistics Integration (NLI). NLI is described as bringing "Navy, Marine Corps, and Coast Guard logisticians together to seek and exploit opportunities for integrating capabilities,

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<sup>19</sup> The word/concept 'sustainment' is introduced and used here to encompass all capabilities possible that can be leveraged to provide solutions across the functions of logistics. Joint Publication 1-02 defines sustainment as "the provision of logistics and personnel services required to maintain and prolong operations until successful mission accomplishment," (281). Joint Publication 4-0 identifies sustainment as "one of the seven joint functions," (I-1).

<sup>20</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, 2-1.

<sup>21</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, A-2.

processes, and technologies.”<sup>22</sup> However, despite consistent advances, NLI represents “a far cry from logistics systems integration.”<sup>23</sup> Even though NLI represents the forefront of the Naval Services’ logistics integration initiatives, Marines and Sailors continue to encounter system interoperability problems.<sup>24</sup> NLI system interoperability problems represent a small piece of the larger integration issues that are compounded when trying to integrate logistics capabilities across the JLEnt and beyond. Integration challenges extend across time and organizations, whether joint, international, interagency, coalition, etc. Another example of an interoperability challenge exists across these organizations and their classification of information or a lack thereof. Some organizations outside of the defense or military construct will not have the appropriate systems nor authority to access classified information. Similarly, classification levels and access can vary among interagency, coalition, and even joint forces. Component logisticians are responsible for solving system interoperability and integration problems among all resources and consumers from suppliers to the supported unit (i.e., MAGTF).<sup>25</sup> Additionally, their responsibilities will be to effectively communicate to their requisite commander the level of risk associated with information challenges resulting from interoperability and integration challenges.

Marine Corps operational-level logisticians are trained and educated in the Marine Corps and Joint Planning Processes which aid Marines in developing plans. Still, neither process fully provides a framework for appropriately developing and adapting logistics plans at the operational-level. Recognizing that MCPP is primarily designed for MAGTF command element

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<sup>22</sup> LtCol Roy E. Truba, CDR Christopher Kading, and LtCol Randy Hodge, “Greater Naval Integration through Logistics: Bring Navy, Marine, and Coast Guard logistics together,” *Marine Corps Gazette*, 104, no. 3 (March 2020), 10, <https://search-proquest-com.lomc.idm.oclc.org/docview/2388305182?pq-origsite=primo>.

<sup>23</sup> Truba, Kading, and Hodge, “Greater Naval Integration through Logistics, 12.

<sup>24</sup> Truba, Kading, and Hodge, “Greater Naval Integration through Logistics, 13.

<sup>25</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, A-2, E-1 – E-5.

planning organized around command and control, the Marine Corps' MAGTF Staff Training Program has published additional pamphlets. One specific pamphlet, MSTP Pamphlet 4-0.2 *A Logistics Planner's Guide*, is aligned to and augments MCPP from the planning perspective of a logistics staff member.<sup>26</sup> MSTP Pamphlet 4-0.2 is primarily designed for use at the tactical-level and not wholistically relevant to OpLog planning.<sup>27</sup> *Operational-Level Logistics* explains that "the essence of operational-level logistics is the ability to identify and incorporate into a coherent plan all relevant logistic enablers (e.g., other Services, functional CCDRs, GCCs) that can support and sustain Marine forces engaged in a campaign or operation."<sup>28</sup> "Enablers" or "sustainment activities" vary from theater to theater. GCC's assign specific sustainment responsibilities to executive agents (EA) to serve as lead service within the AOR for specific sustainment responsibilities.<sup>29</sup> Simple identification of the EA and its theater capabilities is not enough for sustainment problem-solving. Logisticians are required to synthesize these potential capabilities into effective activities in support of the warfighter or tactical-level MAGTF. The ability to synthesize and integrate these capabilities requires advanced managerial skills. Describing the future operating environment is critical to further develop the complex picture of what a logistician needs to understand to design a sustainment network in conjunction with a supported unit's concept of operations.

## **The Future Operating Environment**

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<sup>26</sup> MAGTF Staff Training Program, *A Logistics Planner's Guide*, MSTP Pamphlet 4-0.2 (Quantico, VA: MAGTF Staff Training Program, June 29, 2011), Foreword, 1.

<sup>27</sup> MAGTF Staff Training Program, *A Logistics Planner's Guide*, Foreword.

<sup>28</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, 2-1.

<sup>29</sup> US Department of Defense, *Joint Logistics*, III-3, III-6.

Commandant of the Marine Corps, General Berger, describes, "The coming decade will be characterized by conflict, crisis, and rapid change—just as every decade preceding it."<sup>30</sup> General Berger further articulates that the Marine Corps will be "a naval expeditionary force-in-readiness and prepared to operate inside actively contested maritime spaces,"<sup>31</sup> which requires Marines who can "create systems that are resilient and match our warfighting approach in order to protect our ability to make decisions that generate tempo."<sup>32</sup> Operating environments known to the Marine Corps are expected to change over the next decade. Resources and capabilities currently available to OpLog planners will become obsolete in the future against a near peer adversary. Likewise, as emerging concepts become available, logisticians will need to become versed on their application and integration. A logistician's ability to effectively adapt their concept of logistics support is directly affected by the rate of change of obsolete and emerging capabilities.

Re-integrating the Marine Corps with the Naval Service does not logistically equate to a naval solution and single-source provider for all logistical requirements. The Marine Corps will remain reliant on a multitude of sourcing capabilities and options across the functions of tactical logistics or joint core logistics functions. *Operational-Level Logistics* and Joint Publication 4-0 describe the possible services that may be assigned as "the lead service for [common user logistics] CUL."<sup>33</sup> Once a service is designated as the lead, it is incumbent on the service component to coordinate with the CUL lead for requirements. Additionally, *Operational-Level Logistics* and Joint Publication 4-0 dictate that the Marine Corps component is responsible for

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<sup>30</sup> Berger, *Commandant's Planning Guidance*, 1.

<sup>31</sup> Berger, *Commandant's Planning Guidance*, 1.

<sup>32</sup> Berger, *Commandant's Planning Guidance*, 9.

<sup>33</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, D-1; US Department of Defense, *Joint Logistics*, II-5 – II-6.

sourcing service-specific requirements.<sup>34</sup> Additionally, as supply chains and equipment procurement processes continue to evolve, commercial off the shelf (COTS) options become more relevant. Future logistics solutions specific to a theater may instead require procurement (i.e., COTS solutions) of products produced in that theater. The Naval Service only represents a single way of sourcing or distributing requirements, not the only way.<sup>35</sup> The Marine Corps' physical placement in the operating environment in line with the Naval Service's objectives will complicate the physical distribution and sustainment networks.

The Commandant's Planning Guidance, Advantage at Sea (a.k.a. Tri Service Maritime Strategy), and their related concepts (Expeditionary Advanced Base Operations (EABO), Littorals Operations in a Contested Environment (LOCE), and Distributed Maritime Operations (DMO)) explain how the future fighting environment for the Naval Services will be oriented. Relevant to the logistics community is that these operational concepts combine leveraging all domain capabilities in distributed, littoral environments while contested by the adversary in support of the fleet, and ultimately geographic combatant commander's objectives.<sup>36</sup> *Sustaining the Force in the 21st Century* provides the functional concept for future logistics and sustainment development in the environment described by the Naval Services' operational concepts.

*Sustaining the Force in the 21st Century* describes the logistician's future operating environment. Identified challenges "will require action and solutions at all levels...smaller, distributed and agile units of employment at the tactical-level; to enterprise systems re-

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<sup>34</sup> Headquarters US Marine Corps, *Operational-Level Logistics*, E-1 – E-5; US Department of Defense, *Joint Logistics*, II-4 – II-6, III-17 – III-19.

<sup>35</sup> Col Daniel W. Elzie, "Component Logistics: Executing operational logistics," *Marine Corps Gazette* 97, no. 10 (October 2013), 34-35.

<sup>36</sup> *Advantage at Sea: Prevailing with Integrated All-Domain Naval Power*, December 2020, 25, [https://www.hqmc.marines.mil/Portals/134/Docs/TriServiceStrategy.pdf?ver=aCvncEhhajXlkti8Ws5x8A%3D%3D&utm\\_source=mm&utm\\_medium=web&utm\\_campaign=force\\_designmarines.mil](https://www.hqmc.marines.mil/Portals/134/Docs/TriServiceStrategy.pdf?ver=aCvncEhhajXlkti8Ws5x8A%3D%3D&utm_source=mm&utm_medium=web&utm_campaign=force_designmarines.mil).

engineering and business process improvements within the operational and strategic level."<sup>37</sup> Sustaining the Force speculates operational logistics across its four lines of effort<sup>38</sup> can become globally integrated by leveraging the correct sensors, data, and networks while improving sustainment by making the "supply chain shorter, flatter, and non-linear."<sup>39</sup> Operational-level logisticians will be required to develop global reaching, long-range solutions by integrating all facets of capabilities across the joint, interservice, interagency, coalition, host nation, and future alternative means of sustainment. Assuming MAGTF supply inventory at the tactical-level will decrease due to dispersion of forces within the adversary's weapons engagement zone (WEZ) as outlined in current Marine Corps concepts, an additional onus on the operational-level to sustain the inside force requires OpLog to become more responsive and flexible. While "precise guidance" for how these four lines of effort will be applied is forthcoming, alternative sustainment methods currently include: "tactical manufacturing (e.g., additive manufacturing and 3D printing)" and "21st Century foraging."<sup>40</sup> Operational-level logisticians will be at the center of a flattened sustainment network intended to seamlessly integrate all methods of sustainment across the tactical, operational, and strategic levels. A flattened, global reaching sustainment network will require long-range precision logistics and distribution solutions. Logisticians will be required to design adaptive processes that adjust based on the operating environment's changing characteristics.

Complicating the sustainment network design is "the need to shield and exploit signatures" while operating in "increasingly non-permissive or denied environments."<sup>41</sup>

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<sup>37</sup> Combat Development and Integration, *Sustaining the Force in the 21st Century*, 2.

<sup>38</sup> *Sustaining the Force in the 21st Century* identifies the four lines of effort as: (1) Enable Global Logistics Awareness; (2) Diversify Distribution; (3) Improve Sustainment; and (4) Optimize Installations to Support Sustained Operations. Combat Development and Integration, *Sustaining the Force in the 21st Century*, 5.

<sup>39</sup> Combat Development and Integration, *Sustaining the Force in the 21st Century*, 5-13.

<sup>40</sup> Combat Development and Integration, *Sustaining the Force in the 21st Century*, 14, 17.

<sup>41</sup> Combat Development and Integration, *Sustaining the Force in the 21st Century*, 3.

Logisticians will need to navigate the requirement for data and information about supported units and resource providers while simultaneously minimizing and protecting their signal and signature. As such, logisticians need to understand when and what information-driven outcomes can and cannot be controlled. Process-oriented solutions in a flattened sustainment network require adaptability in the face of absent or communication denied information.

The concept of employment for Marine Corps littoral forces in support of fleet objectives has significant effects on its corresponding concept of logistics support. As a means to reduce risk, MAGTF elements will be distributed and intended to be self-sustaining. Self-sustaining implies either the supported MAGTF will retain the capacity and inventory on hand or be able to requisition requirements rapidly. The Marine Corps' design for sustaining the future force advocates for reduced inventories within the MAGTF as a principled measure to reduce their footprint and signature while increasing speed and sustainability. With these measures, sustainability emphasis will shift from the MAGTF to the operational-level sustainment network's responsiveness and flexibility. Notably, the Marine Corps has identified that "Precise guidance for the application of *Sustaining the Force in the 21st Century* will be published in a forthcoming implementation plan."<sup>42</sup> The lack of precise guidance has translated into a diminished understanding of logistics planning requirements and developing concepts of logistics support.

The future operating environment is characterized as uncertain, complex, and rapidly changing. Actions in the future operating environment will consist of competing and escalating towards possible conflict against peer adversaries. Operational-level logisticians require advanced skills to be able to navigate the characteristics of the future operating environment

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<sup>42</sup> Combat Development and Integration, *Sustaining the Force in the 21st Century*, 14.

while challenged by peer adversary actions. Analyzing business and industry logistics education provides insight to advanced civilian managerial skills that can enable an operational-level logistician to synthesize and integrate capabilities across the force, leveraging global supply chain innovation and ideas, to solve future force sustainment problems.

### **Business and Industry Logistics Education Review**

Non-military logistics educational strategy scholars have focused on identifying skills, and ultimately academic requirements, which better prepare logisticians. In “Educational Strategies for Succeeding in Logistics: A Comparative Analysis”, Paul Murphy and Richard Poist "proposed a Business Logistics Management (BLM) Model, which suggests that modern logistics executives must possess a combination of business, logistics, and management skills."<sup>43</sup> One of Murphy's and Poist's findings describes that contemporary logisticians are managers first and logisticians second.<sup>44</sup> A majority of the skills categorized under management include skills that the Marine Corps would categorize as leadership traits. However, not all leadership and management skills are interchangeable. Some management skills described in the BLM model align toward specific team building, process improvement, and adaptive thinking responsibilities.<sup>45</sup>

Murphy and Poist also focused specifically on what educators recommend to aid logisticians in becoming well-rounded generalists; responses included international business and

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<sup>43</sup> Paul R. Murphy and Richard F. Poist, "Educational Strategies for Succeeding in Logistics: A Comparative Analysis," *Transportation Journal* 33, no. 3 (1994), 36, <https://search-ebscohost-com.lomc.idm.oclc.org/login.aspx?direct=true&db=mth&AN=9502225082&site=ehost-live>

<sup>44</sup> Murphy and Poist, "Educational Strategies for Succeeding in Logistics", 44; Paul R. Murphy and Richard F. Poist, "Skill Requirements of Senior-level Logisticians: A Longitudinal Assessment," *Supply Chain Management* 12, no. 6 (2007), 430, doi:10.1108/13598540710826353, <https://www-proquest-com.lomc.idm.oclc.org/scholarly-journals/skill-requirements-senior-level-logisticians/docview/216866924/se-2?accountid=14746>.

<sup>45</sup> Murphy and Poist, "Educational Strategies for Succeeding in Logistics", 36-38.

international logistics.<sup>46</sup> In “Contemporary Logistics Education: An International Perspective,” Yen-Chun Jim Wu took this concept a step further and suggested that “different views on logistics skills and education are likely to exist in different regions.”<sup>47</sup> Mr. Jim Wu continued to describe international perspectives about what logistics skills are essential based on different world regions. Reasons for these differences included cultural norms, current education level, and engagement in an international environment.<sup>48</sup> Marine Corps logisticians should be educated on foreign nations’ logistics to leverage their capabilities, strengths, weaknesses, networks, etc. Foreign nation logistics education would directly align to OpLog due to the nature of expeditionary logistics requirements in the international arena. According to Mr. Jim Wu’s 2007 research, “[n]o studies have been undertaken to provide an overall picture of the current logistics curricula from an international perspective.”<sup>49</sup> Gaps in research and analysis present opportunities for organizations like the Center for Naval Analysis (CNA). CNA research could observe and analyze international logistics education to provide clarity on recommended logistics practices, opportunities, and curriculum logisticians could leverage in the international arena.<sup>50</sup>

In “Logistics and Supply Chain Education and Jobs: A Study of UK Markets,” Yew Wong et al. reinforce Murphy and Poist’s findings that logisticians need to be “managers first.”<sup>51</sup>

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<sup>46</sup> Murphy and Poist, “Educational Strategies for Succeeding in Logistics”, 46.

<sup>47</sup> Yen-Chun Jim Wu, “Contemporary Logistics Education: An International Perspective,” *International Journal of Physical Distribution & Logistics Management* 37, no. 7 (2007), 506, doi:10.1108/09600030710776455. <https://www-proquest-com.lomc.idm.oclc.org/scholarly-journals/contemporary-logistics-education-international/docview/232592574/se-2?accountid=14746>.

<sup>48</sup> Jim Wu, “Contemporary Logistics Education,” 507.

<sup>49</sup> Jim Wu, “Contemporary Logistics Education,” 507.

<sup>50</sup> Center for Naval Analysis, “About Us: Who We Are, Leadership, Research,” accessed March 31, 2021, <https://www.cna.org/about/>.

<sup>51</sup> Chee Yew Wong et al., “Logistics and Supply Chain Education and Jobs: A Study of UK Markets,” *The International Journal of Logistics Management* 25, no. 3 (2014), 549, doi:10.1108/ijlm-01-2013-0003, <https://search-proquest-com.lomc.idm.oclc.org/scholarly-journals/logistics-supply-chain-education-jobs-study-uk/docview/2112666115/se-2?accountid=14746>.

Mr. Wong et al. elaborate that those previously identified skills are particularly valuable “when they become senior logistics executives.”<sup>52</sup> Education centered on the specifics of logistics or supply chain management develops specialists rather than managers. This does not suggest that Marine Corps logisticians should not also possess a general understanding of those specialist functions. Logisticians require education to integrate various specialists and manage those specialists through a planning problem or project.

Logisticians face solving problems within the complexity and uncertainty of “multinational, intergovernmental, and commercial organizations at every operational echelon.”<sup>53</sup> In “National Security and Global Logistics: Adapting to the Uncertainties of Tomorrow,” Claude Christianson reinforces the fact that US logistics capabilities need to be agile and adaptable in “unpredictable environments” to succeed.<sup>54</sup> Mr. Christianson describes logisticians as capable of developing adaptive sustainment plans that leverage supply chains and logistics capabilities across a global network.<sup>55</sup> Logistics education encompassing these attributes will need to include effective tools to enable identifying resourcing solutions outside of the Marine Corps, Naval Service, and even the JLEnt. Exploring sourcing solutions outside of the JLEnt could be furthered researched by CNA. In addition to researching international logistics education, sourcing solutions beyond the JLEnt could be identified through CNA research that observes how partner or commercial industries leverage global logistics. To maintain a competitive advantage, logisticians require education that enables their ability to seek and leverage resourcing solutions beyond current conventional means. Understanding how and

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<sup>52</sup> Yew Wong et al., "Logistics and Supply Chain Education and Jobs," 549.

<sup>53</sup> Christianson, "National Security and Global Logistics," 6.

<sup>54</sup> Claude V. Christianson, "National Security and Global Logistics: Adapting to the Uncertainties of Tomorrow," *Army Sustainment* 44, no. 6 (2012), 5.

<sup>55</sup> Christianson, "National Security and Global Logistics," 7.

where to leverage capabilities that exist outside of one's organization can be equally, if not more effective especially when providing theater specific or globally integrated solutions.

Contrary to some of the previous authors, John Mangan and Martin Christopher mention in "Management Development and the Supply Chain Manager of the Future" that "[t]here is little data available concerning the types, quantities, and effectiveness of training and development are undertaken by logistics and supply chain manager."<sup>56</sup> Formal academic institutions focus on general logistics and supply chain management principles which leaves a gap in educational environments because Mangan and Christopher's research indicates that most development comes from organizational and job experience.<sup>57</sup> Educational environments can replicate on-the-job experience through experiential learning methods. Mr. Mangan and Mr. Christopher do not address alternate, effective methods of instruction outside of what they found in their research. Methods of instruction used in academic institutions matter when addressing logistics education. MCDP 7 emphasizes the value of experiential learning combining professional reading and deliberate practice.<sup>58</sup> Experiential learning matches the job experience required to develop logistics managers best. Educational institutions should implement experiential learning methods to prepare their logistics professionals effectively.

Research indicates that logisticians require education that enables problem-solving, collaborative working environments, and managerial skills. Logisticians are integrators of various processes and capabilities to provide goods or services to a customer. One key theme among the authors revolves around logisticians as managers vice specialists. Managers need to

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<sup>56</sup> John Mangan and Martin Christopher, "Management Development and the Supply Chain Manager of the Future," *International Journal of Logistics Management* 16, no. 2 (2005), 182, doi:<http://dx.doi.org.lomc.idm.oclc.org/10.1108/09574090510634494>, <https://www-proquestcom.lomc.idm.oclc.org/scholarly-journals/management-development-supply-chain-manager/docview/235865597/se-2?accountid=14746>.

<sup>57</sup> Mangan and Martin, "Management Development," 182-183.

<sup>58</sup> Headquarters US Marine Corps, *Learning*, 1-17.

develop adaptive processes and tools based on changes in the environment while anticipating customer requirements. Marine Corps and ultimately, Naval Forces, logistics education and learning objectives need to provide an understanding of available capabilities across a global network. As logisticians become more senior, their knowledge needs to include advanced and diverse problem-solving frameworks.

## **Recommendations**

Scrum and Program Management are recommended problem-solving frameworks that have evolved from existing management and problem-solving tools cultivated in the global environment of business and industry. Scrum is named after the rugby term because it “refers to the way a team works together” with “[c]areful alignment, unity of purpose, and clarity.”<sup>59</sup> Scrum is an evolved and specific form of what is known as agile project management technique.<sup>60</sup> Similar to Scrum’s evolution from agile, Program Management (PgM) evolved as a higher form of project management. PgM evolved as a higher form because project management techniques were observed as less adaptive when faced with changing environments and ineffectively aligning outcomes to strategic organizational goals.<sup>61</sup> Both Scrum and PgM provide their own unique frameworks for problem-solving that are critical for operational-level logisticians and will be discussed in detail starting with Scrum.

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<sup>59</sup> Jeff Sutherland, *Scrum : The Art of Doing Twice the Work in Half the Time*, First Edition, (New York: Crown Business, 2014), 8.

<sup>60</sup> Agile is the philosophy of taking an iterative approach towards solving project management problems. “The goal of the Agile approach is to create early, measurable ROI [return on investment] through defined, iterative delivery of product features.” Scrum provides a framework (or method) for applying an agile iterative approach. Scrum “provides a process for how to identify the work, who will do the work, how it will be done, and when it will be completed by.” Scott W. O’Connor, “Agile vs. Scrum: What’s the Difference?,” last modified May 24, 2020, <https://www.northeastern.edu/graduate/blog/agile-vs-scrum/>.

<sup>61</sup> Michael Thiry, *Program Management*, (Taylor & Francis Group, 2010), 13, *ProQuest Ebook Central*, <https://ebookcentral.proquest.com/lib/usmcu-ebooks/detail.action?docID=564132>.

Scrum provides the mechanics of leading a team through a framework designed for solving problems. Schwaber and Sutherland explain that “Scrum is a lightweight framework that helps people, teams and organizations generate value through adaptive solutions for complex problems.”<sup>62</sup> Operational-level logisticians have the challenge of blending myriad JLEnt capabilities, enablers, and resources into a solution set required by a subordinate, supported unit (i.e., MAGTF). Whether deliberate or rapid planning, Scrum enables planning throughout the functions of tactical-level logistics, operational core logistics functions, and their requisite subfunctions that the MCPP and the JPP do not enable. The MCPP and JPP publications provide a framework for integrating staff functions (i.e., logistics or sustainment).<sup>63</sup> These two publications identify that integration is required, but not how to develop the framework and plans needed for integration.

The Scrum framework needs to be an additional educational objective for operational-level logisticians. To thrive in the complex and uncertain environments identified by the services’ conceptual writings, operational-level logisticians require education that provides an applicable framework for how to think during both planning and execution. Scrum provides a design framework and process improvement methods that “embraces uncertainty and creativity.”<sup>64</sup> Educated with Scrum’s problem-solving framework and process improvement tools, operational-level logisticians will be better enabled to identify and categorize sources of logistics support that drive the development of adaptive solutions.

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<sup>62</sup> Ken Schwaber and Jeff Sutherland, *The Scrum Guide: The Definitive Guide to Scrum: The Rules of the Game*, (November 2020), 3, <https://scrumguides.org/docs/scrumguide/v2020/2020-Scrum-Guide-US.pdf#zoom=100>.

<sup>63</sup> Joint Functions and Marine Corps Warfighting Functions are identified differently. US Department of Defense, *Joint Logistics*, Joint Publication 3-0 identifies “sustainment” as the Joint Function, (III-1). Headquarters US Marine Corps, *Marine Corps Planning Process*, MCWP 5-10 identifies “logistics” as the Warfighting Function, (3). While a seemingly minor difference, it ultimately adds to the variance of how a Marine Corps OpLog logistician must blend MAGTF requirements with support in the joint environment.

<sup>64</sup> Sutherland, *Scrum : The Art of Doing Twice the Work in Half the Time*, 9.

Critical to Scrum's implementation is that "it places a structure around the learning process, enabling teams to assess both what they've created and, just as important, how they created it."<sup>65</sup> For logisticians, the creation of the solution is equally important as the solution itself. As operating environment factors continue to change, Scrum enables adaptation to occur rapidly because there is an understanding among the links and details in how the solution was created. Logisticians can leverage this knowledge to adjust efforts in line with effective solutions rapidly.

Scrum provides an adaptive framework to view how we devise the method needed to solve logistics problems. Schwaber and Sutherland explain that "as Scrum is being used, patterns, processes, and insights that fit the Scrum framework...may be found, applied and devised."<sup>66</sup> Since Scrum is not a "process, technique, or definitive method," it remains "malleable, adjustable" to enable applicability towards various requirements.<sup>67</sup> These multiple requirements apply when analyzing the array of components found within each function/subfunction of logistics. The educational emphasis for a logistician should not be strict adherence to how Scrum is applied. Instead, education should teach the Scrum framework to build on or modify existing MCPP, JPP, or technical logistics function SME frameworks.

Scrum drives, promotes, and enhances interaction among logistics staff members and functional SMEs. "Built upon the collective intelligence of the people using it," Scrum's team-oriented design guides interactions and relationships that support improved productivity of the team.<sup>68</sup> The MCPP and JPP express the importance of integrating experience among planning

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<sup>65</sup> Sutherland, *Scrum : The Art of Doing Twice the Work in Half the Time*, 9.

<sup>66</sup> Schwaber Sutherland, *The Scrum Guide: The Definitive Guide to Scrum: The Rules of the Game*, 1.

<sup>67</sup> Center for Adaptive Warfighting, "Military Scrum Master Course," (course handout, NavalX, Assistant Secretary of the Navy for Research, Development, and Acquisitions, 2017), 3, <https://www.secnav.navy.mil/agility/Pages/caw.aspx>.

<sup>68</sup> Schwaber and Sutherland, *The Scrum Guide: The Definitive Guide to Scrum: The Rules of the Game*, 3; Jeff Sutherland, *Scrum : The Art of Doing Twice the Work in Half the Time*, 10.

team members.<sup>69</sup> Effectively integrating logistics SME solutions can be difficult because of the variances among the sources and capabilities that are being leveraged. For example, solutions for logistics functions such as health services or mortuary affairs present unique requirements. Filling these requirements do not integrate seamlessly across both the JLEnt and globally sourced solutions. Ultimately providing a more wholistic approach, Scrum interaction tools can help identify relationships among requirements or outputs generated by each of the logistics SMEs that were not previously apparent.

Sutherland explains that “everyone on a Scrum team has to know what everyone is doing.”<sup>70</sup> However, Sutherland does not propose that the Scrum concept of having cross-functional teams is new. Instead, Scrum provides a new framework for digesting complex tasks, daily activities, and personal interactions geared towards interaction and interoperability.<sup>71</sup> These activities and actions drive team productivity and team assessment through effective engagement of functional SMEs in a manner that leverages knowledge and experience previously only aligned to solving that particular SME’s piece of the puzzle.

Various commercial organizations offer Scrum instruction and courses. NavalX, an “initiative under the Assistant Secretary of the Navy for Research, Development, and Acquisition,” has also adopted Scrum.<sup>72</sup> NavalX “facilitate[s] the rapid adoption of proven agility-enhancing methods” by offering tools and instruction tailored for warfighters.<sup>73</sup> Scrum is one of the agile-enhancing frameworks that the Center for Adaptive Warfighting (CAW) within

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<sup>69</sup> Headquarters US Marine Corps, *Marine Corps Planning Process*, MCWP 5-10 (Washington DC: Headquarters US Marine Corps, August 10, 2020), 21.

<sup>70</sup>Sutherland, *Scrum : The Art of Doing Twice the Work in Half the Time*, 61.

<sup>71</sup> Center for Adaptive Warfighting, “Military Scrum Master Course,” 11, 14-19; Schwaber and Sutherland, *The Scrum Guide: The Definitive Guide to Scrum: The Rules of the Game*, 3.

<sup>72</sup> NavalX, accessed March 27, 2021, <https://www.secnav.navy.mil/agility/Pages/default.aspx>.

<sup>73</sup> NavalX, accessed March 27, 2021, <https://www.secnav.navy.mil/agility/Pages/about.aspx>.

NavalX has accepted and designed for implementation “within the militaristic construct.”<sup>74</sup> CAW provides instructional and training materials and offers courses that teach the Scrum framework, specifically their Military Scrum Master Course.<sup>75</sup> Availability of Scrum within the Naval Service’s organizations presents a rapid opportunity for education and scaling to support Naval operational-level logisticians to include Marines. As a requirement before filling an OpLog billet, Marine Corps field-grade logisticians should attend a CAW Scrum course. The PgM framework is equally important and worthy of considerations.

Operational-level logisticians can also gain a competitive advantage through Program Management strategies. In *Program Management for Improved Business Results*, Russ Martinelli, James Waddell, and Tim Rahschulte define the output of PgM as “achieving a set of business goals through the coordinated management of interdependent projects”<sup>76</sup> In defense logistics, “interdependent projects” translate to the related concepts of support for each function of tactical logistics or joint core logistics function. These concepts of support are highly interrelated and developed by the requisite OpLog technical SME. PgM represents “business process improvements” identified in *Sustaining the Force in the 21st Century* that, if adopted, meet the requirements of an operational-level logistician.<sup>77</sup> PgM is not intended as an educational objective to replace MCPP or JPP. PgM represents another applicable problem-solving framework leveraged by operational-level logisticians to sustain tactical-level formations while simultaneously achieving campaign objectives.

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<sup>74</sup> NavalX, accessed March 27, 2021, <https://www.secnav.navy.mil/agility/Pages/caw.aspx>.

<sup>75</sup> NavalX, accessed April 26, 2021, <https://www.secnav.navy.mil/agility/Pages/caw.aspx>.

<sup>76</sup> Russ J. Martinelli, James M. Waddell, and Tim J. Rahschulte, *Program Management for Improved Business Results*, (Somerset: John Wiley & Sons, Incorporated, 2014), Accessed March 26, 2021, 5, ProQuest Ebook Central, <https://ebookcentral.proquest.com/lib/usmcu-ebooks/detail.action?pq-origsite=primo&docID=1727723>.

<sup>77</sup> Combat Development and Integration, *Sustaining the Force in the 21st Century*, 2.

PgM is described as an evolutionary output of the more well-known project management professional certification. In *Practioner's Guide to Program Management*, Irene Didinsky identifies that program management certification “was instituted in 2007, 23 years later than the [Project Management Professional] certification was instituted.”<sup>78</sup> In Michael Thiry's *Program Management*, he elaborates that project management failures occurred because of an inability “to respond to emergent situations and to ambiguity, as well as the lack of integration between strategic intent and the results generated by projects.”<sup>79</sup> An inability to adapt and align project outputs with strategic organizational goals drove the creation of a new framework in the business world that grouped relationships among projects and their outcomes to strategic goals. Operational-level logisticians encounter similar problems as they organize and plan concepts across functional areas. Logisticians need to be able to identify interrelated connections to align activities towards effective outcomes. PgM enables operational-level logisticians to remain focused on campaign objectives while sustaining supported units (i.e., MAGTF). PgM is the commercial industry equivalent representing a similar service necessity for an evolutionary framework that better aligns to the future operating environment.

In line with commercial industry research, PgM represents advanced managerial skills required by logistics managers to maintain competitiveness in complex and uncertain environments. MCDP 4 *Logistics* asserts that because of this “highly complex environment...no simple theories or easily learned management techniques can substitute for detailed knowledge of a wide variety of subjects.”<sup>80</sup> What MCDP 4 fails to consider is businesses face equally

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<sup>78</sup> Irene Didinsky, *Practioner's Guide to Program Management*, (Newtown Square, Pennsylvania: Project Management Institute, 2017), 9, <https://search.ebscohost.com/login.aspx?direct=true&db=e000xna&AN=1534676&site=ehost-live>.

<sup>79</sup> Thiry, *Program Management*, 13.

<sup>80</sup> Headquarters US Marine Corps, *Logistics*, 3-23

uncertain, adaptive, and competitive environments. Successful management techniques in business represent an aggregate of best practices in an environment that also reflects similar challenges Marine Corps logisticians face and will continue to endure. Performing in highly competitive markets requires “a comprehensive approach whose goal is to increase the effectiveness, efficiency, control, and adaptability of a given organization.”<sup>81</sup> While relatively new, PgM is beginning to demonstrate value beyond current logistics and project management techniques.

PgM competency provides a framework to overcome the challenges of distributed operations, increased tactical-level capability coupled with reduced inventory, and the competitive adversarial context described in *Sustaining the Force in the 21st Century*. Martinelli, Waddell, and Rahschulte define the competency required to “solve complex and demanding programs” as “the knowledge, skills, and qualities of effective managers used to effectively perform the functions associated with management in the work situation.” Figure 3 identifies those competencies tied to requisite skills.

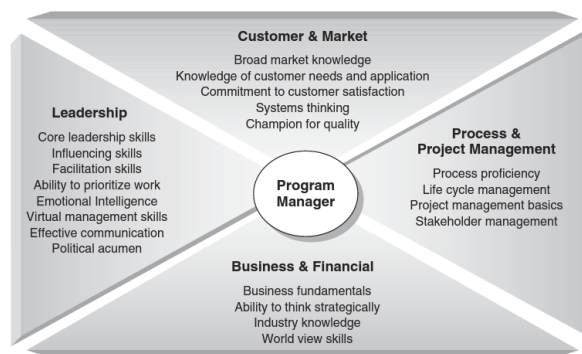


Figure 11.2 Critical program management skills.

Figure 3<sup>82</sup>

<sup>81</sup> Mitchell Springer, *Program Management: A Comprehensive Overview of the Discipline*, (West Lafayette, IN, USA: Purdue University Press, 2000), 3-4, 17, *ProQuest Ebook Central*, <https://ebookcentral.proquest.com/lib/usmcu-ebooks/detail.action?docID=3398610>.

<sup>82</sup> Martinelli, Waddell, and Rahschulte, *Program Management for Improved Business Results*, 276.

Logisticians face OpLog challenges to leverage JLEnt capabilities and resources amid service and theater priorities while designing sustainment networks that are responsive, flexible, and survivable. Figure 3 competencies and skills demonstrate the expanded knowledge currently available to logisticians in business and industry through PgM. These skills could translate to a Marine Corps OpLog PgM's increased ability to ensure the output of technical function/subfunction OpLog SMEs, JLEnt enables, and supported unit requirements.

In the United States, Project Management Institute (PMI) provides the only Program Management Professional (PgMP) certification.<sup>83</sup> Formal certification through PMI is not recommended for Marine Corps logisticians. Instead, in a similar manner to how NavalX developed a Scrum course aligned to service members, it is recommended that a learning analysis be conducted using Appendix A. Appendix A identifies PMI's PgMP domains and their corresponding tasks, knowledge, and skills details. Future study could include analysis of data in Appendix A to develop a PgM themed course.

Several methods are available for codifying PgM and Scrum education in support of OpLog logisticians. During the annual Logistics Training and Education (T&E) Operational Advisory Group (OAG), MCLOG could lead the recommendation and analysis of modifying the existing ELI T&R standards to include relevant aspects of PgM and Scrum.<sup>84</sup> These T&R modifications would ultimately translate into learning objective/outcome adjustments for EXLOC.<sup>85</sup> Another option would be to create an OpLog OAG that focuses solely on the requirements and complexities of MARFOR logistics (i.e., operational-level logistics).<sup>86</sup>

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<sup>83</sup> Sascha Wyss, "Program Management Certifications – PgMP vs. MSP, published on February 27, 2017, accessed March 27, 2021, <https://www.linkedin.com/pulse/program-management-certifications-pgmp-vs-msp-sascha/>.

<sup>84</sup> Commandant of the Marine Corps, *Marine Corps Logistics Tactics, Training, and Education Program*, 5.

<sup>85</sup> Commandant of the Marine Corps, *Marine Corps Instructional Systems Design/Systems Approach to Training and Education Handbook*, 5-10.

<sup>86</sup> Elzie, "Component Logistics: Executing operational logistics," 38.

Isolating MARFOR logistics from ELI T&R standards would drive the creation of a separate OpLog course. In this case, MCLOG could design a building block approach to OpLog education that would begin with individual education during an OpLog course which would later be followed by collective (i.e., unit) education during their existing OpLog Seminar. This OpLog course would consist of PgM and Scrum learning objectives and focus specifically on operational-level logistics planning scenarios.

OpLog logisticians require PgM and Scrum because they complement each other, but current PgM education oriented on solving military problems requires further development. The analysis conducted by CAW has already adjusted Scrum’s non-military framework to work “within the militaristic construct.”<sup>87</sup> As such, it can be immediately implemented, but requires demand for implementation from either Headquarters Marine Corps’ Deputy Commandant, Installations and Logistics (DC, I&L) or the Fleet Marine Force through the annual Logistics T&E OAG process. PgM, however, designed more specifically as business managerial tool, needs to be better informed by future concepts to align with OpLog requirements.

Future force combat formations like the Marine Littoral Regiment (MLR) and technological advances such as “advanced computing, ‘big data’ analytics, artificial intelligence (AI), autonomy, robotics, directed energy, hypersonic weapons, and biotechnology” need time to test and validate future operating environment concepts (i.e., EABO, LOCE, DMO) in order to provide usable feedback that can inform logistics concepts.<sup>88</sup> A feedback loop is critical to properly analyze and design educational objectives effectively oriented on OpLog problems that

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<sup>87</sup> NavalX, accessed April 26, 2021, <https://www.secnav.navy.mil/agility/Pages/caw.aspx>.

<sup>88</sup> Gen David H. Berger, *Force Design 2030*, March 2020, 10, [https://www.hqmc.marines.mil/Portals/142/ Docs/ CMC38%20Force%20Design%202030%20Report%20Phase%20I%20and%20II.pdf?ver=2020-03-26-121328-460](https://www.hqmc.marines.mil/Portals/142/Docs/CMC38%20Force%20Design%202030%20Report%20Phase%20I%20and%20II.pdf?ver=2020-03-26-121328-460); Combat Development and Integration, *Sustaining the Force in the 21st Century*, 3.

integrate and synthesize future force concepts and capabilities. DC, I&L and MCLOG's oversight on the OAG process can provide fleet-tested observation and a feedback loop that drives continuous updates to PgM education.

Alternate educational opportunities also exist outside of MCLOG's curriculum. Marine Corps University's Expeditionary Warfare School (EWS) presents an opportunity for exposure to Scrum and PgM. Assuming EWS logisticians fill tactical-level company commander and battalion/regiment staff billets after graduation, simple introduction and awareness of Scrum and PgM educational requirements or opportunities would be appropriate. EWS's occupational field expansion course (OFEC) provides a venue for addressing career milestones and development tied to logistics billet requirements and military occupational specialty (MOS) progression.<sup>89</sup> In this manner, OFEC could describe Scrum and PgM tenets, their applicability to OpLog billets, and the appropriate career timing for receiving these additional learning objectives.

Command and Staff College's (CSC) curriculum presents another opportunity to further expose logisticians to Scrum and PgM frameworks. CSC offers elective courses during the academic year one of which is Joint Operational Logistics Elective (JOLE). To include Scrum or PgM learning outcomes would require the removal of the current curriculum that includes education tailored to strategic and operational-level critical enablers and capabilities. Replacing this existing curriculum would degrade JOLE's effectiveness and is not recommended. Additionally, not all of CSC's matriculated logisticians are required to select JOLE as their elective.

An alternate opportunity for logisticians exists during CSC's planning and exercise continuum. Throughout the academic year, students are exposed to a series of planning

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<sup>89</sup> Marine Corps University, "Expeditionary Warfare School, Occupational Field Expansion Course," accessed April 26, 2021, <https://www.usmcu.edu/Portals/218/EWS/AY21/OFEC2.pdf?ver=2019-12-02-135744-893>.

exercises. Due to information exchange limitations about the operating environment in the exercises early in the continuum, there are corresponding limitations to logistics involvement and planning integration. These multi-day exercises present an opportunity to introduce an OFEC-like model at CSC. Applying PgM learning objectives would likely not align effectively at CSC, but diverting logisticians from one of the planning exercises to attend a CAW sponsored Military Scrum Master Course is feasible and recommended. CAW offers on-site, virtual, and potential mobile training teams to conduct the 2-3 day Military Scrum Master course.<sup>90</sup> Logisticians diverted to a Scrum course would miss out on exercise planning integration, but the benefit would be learning an alternate planning and team-leading framework that can be integrated throughout follow-on planning exercises.

EWS and CSC present opportunities for exposure and education, but MCLOG is the Marine Corps' core logistics education organization. On behalf of DC, I&L, MCLOG as the logistics education advocate, in conjunction with DC, I&L's Godfrey Chair, represents the intersection where OpLog educational demand can be identified and a thorough Scrum and PgM learning analysis can occur.<sup>91</sup> This intersection of responsibility is required to develop relevant and enduring OpLog advances in education.

## **Conclusion**

This study contends that operational-level logisticians are inadequately prepared for the future contested environment. Business and industry provide non-military alternate frameworks developed and refined educational objectives, organizational processes, and managerial skills that will enable OpLog logisticians to develop concepts of logistics support in complex and

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<sup>90</sup> Center for Adaptive Warfighting, accessed April 26, 2021, <https://mceits.usmc.mil/sites/caw/#/>.

<sup>91</sup> Commandant of the Marine Corps, *Marine Corps Logistics Tactics, Training, and Education Program*, 5-7, 9-11.

uncertain environments. Two such non-military alternate frameworks are Scrum and Program Management. Both frameworks integrate the inherent nature of change in an environment and advocate for adaptation. MCPP and JPP are foundational problem-solving processes. Scrum and Program Management frameworks build on that foundation to provide additional methods for organizing OpLog planning teams and their activities. Additionally, these frameworks promote an adaptive process that enables warfighting function integration and synthezation of logistics activities. The complexity of these logistics activities spans the JLEnt, coalition partners and allies, global industry, and the host nation. Similarly, the increased lexicon introduced by these frameworks translates to more effective integration into business and industry. Marine logisticians would be better equipped to articulate requirements to organizations not normally integrated with military operations. Global sustainment solutions across these logistics activities developed at the MARFOR can be better achieved through Scrum and Program Management knowledge and skills.

Additionally, how the Marine Corps views logistics, learning and education, and the future operating environment was analyzed. Similarly, it analyzed business and industry assessments of logistics education towards future logistics requirements. The research indicated a heavy emphasis on managerial skills and adaptive problem-solving tools. Neither Program Management nor Scrum advocate as one size fits all. Both frameworks are described as malleable tools that can be adjusted to fit the needs of the organization. Similarly, the organization needs to be willing to accept the changes that both frameworks advocate in order to further augment MCPP and JPP.

The emphasis for alternate non-military frameworks applies primarily at the operational-level. OpLog is the bridge between tactical-level combat formations and the JLEnt and strategic-

level logistics capabilities. The future contested environment identifies a need to reduce capacity and on-hand inventory of supplies at the tactical-level. Reduction at the tactical-level shifts the onus to OpLog to become more adaptable, responsive, and flexible to develop effective resourcing solutions.

Both Scrum and Program Management certification courses are available, but only Scrum currently has a modified version taught within the Naval Service. Opportunities exist for individual logisticians to seek out attendance at CAW's Military Scrum Master in conjunction with their career path to filling an OpLog billet. PgMP certification is also possible through PMI, but certification equivalency does not currently exist through the military services. As the primary organization for OpLog education, MCLOG presents the best opportunity for further analysis of both frameworks for application at the operational-level.

## Appendix A<sup>92</sup>

### **Domain 1: Strategic Program Management**

Identifying opportunities and benefits that achieve the organization's strategic objectives through program implementation

### **Domain 2: Program Life Cycle**

Activities related to:

- **Initiating.** Defining the program and constituent projects, and obtaining agreement from stakeholders
- **Planning.** Defining program scope and developing the program, including all constituent projects, and all activities that occur within the program
- **Executing.** Performing work necessary to achieve the program's objectives and deliver the program's benefits
- **Controlling.** Monitoring progress, updating program plans as required, managing change and risk
- **Closing.** Finalizing all program activities, including all constituent projects, executing transition plan, archiving, obtaining approvals, and reporting

### **Domain 3: Benefits Management**

Defining, creating, maximizing, and sustaining the benefits provided by programs

### **Domain 4: Stakeholder Management**

Capturing stakeholder needs and expectations, gaining and maintaining stakeholder support, and mitigating/channeling opposition

### **Domain 5: Governance**

Establishing processes and procedures for maintaining proactive program management oversight and decision-making support for applicable policies and practices throughout the entire program life cycle

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<sup>92</sup> Project Management Institute, "Program Management Professional Examination Content Outline," (course exam outline, Project Management Institute, April 2011), 3-16, <https://www.pmi.org/-/media/pmi/documents/public/pdf/certifications/program-management-professional-examination-content-outline.pdf?v=01eda7e8-615f-4a3e-8117-d1435bfe22bc>.

**DOMAINS, TASKS, AND KNOWLEDGE AND SKILLS  
OF PROGRAM MANAGERS**

Domain I Strategic Program Management	
Task 1	Perform an initial program assessment by defining the program objectives, requirements, and risks in order to ensure program alignment with the organization's strategic plan, objectives, priorities, vision, and mission statement.
Task 2	Establish a high-level road map with milestones and preliminary estimates in order to obtain initial validation and approval from the executive sponsor.
Task 3	Define the high-level road map/framework in order to set a baseline for program definition, planning, and execution.
Task 4	Define the program mission statement by evaluating the stakeholders' concerns and expectations in order to establish program direction.
Task 5	Evaluate the organization's capability by consulting with organizational leaders in order to develop, validate, and assess the program objectives, priority, feasibility, readiness, and alignment to the organization's strategic plan.
Task 6	Identify organizational benefits for the potential program using research methods such as market analysis and high-level cost-benefit analysis in order to develop the preliminary program scope and define benefits realization plan.
Task 7	Estimate the high level financial and nonfinancial benefits of the program in order to obtain/maintain funding authorization and drive prioritization of projects within the program.
Task 8	Evaluate program objectives relative to regulatory and legal constraints, social impacts, sustainability, cultural considerations, political climate, and ethical concerns in order to ensure stakeholder alignment and program deliverability.
Task 9	Obtain organizational leadership approval for the program by presenting the program charter with its high-level costs, milestone schedule and benefits in order to receive authorization to initiate the program.
Task 10	Identify and evaluate integration opportunities and needs (for example, human capital and human resource requirements and skill sets, facilities, finance, assets, processes, and systems) within program activities and operational activities in order to align and integrate benefits within or across the organization.

Domain I Strategic Program Management	
Task 11	Exploit strategic opportunities for change in order to maximize the realization of benefits for the organization.
	<p>Knowledge specific to Domain 1 (*Indicates knowledge is found in one other domain, shown in parentheses)</p> <ul style="list-style-type: none"> <li>• Business strategy</li> <li>• Business/organization objectives* (V)</li> <li>• Economic forecasting</li> <li>• Feasibility analysis</li> <li>• Financial measurement and management techniques</li> <li>• Funding models</li> <li>• Funding processes</li> <li>• Intellectual property laws and guidelines</li> <li>• Legal and regulatory requirements</li> <li>• Marketing</li> <li>• Portfolio management</li> <li>• Program and constituent project charter development* (II)</li> <li>• Program mission and vision</li> <li>• Public relations* (IV)</li> <li>• Requirement analysis techniques</li> <li>• Scenario analysis</li> <li>• Strategic planning and analysis* (II)</li> <li>• System implementation models and methodologies</li> <li>• Trend analysis</li> </ul>

Domain II		Program Life Cycle
Initiating the Program		
Task 1	Develop program charter using input from all stakeholders, including sponsors, in order to initiate and design program and benefits.	
Task 2	Translate strategic objectives into high-level program scope statements by negotiating with stakeholders, including sponsors, in order to create a program scope description.	
Task 3	Develop a high-level milestone plan using the goals and objectives of the program, applicable historical information, and other available resources (for example, work breakdown structure (WBS), scope statements, benefits realization plan) in order to align the program with the expectations of stakeholders, including sponsors.	
Task 4	Develop an accountability matrix by identifying and assigning program roles and responsibilities in order to build the core team and to differentiate between the program and project resources.	
Task 5	Define standard measurement criteria for success for all constituent projects by analyzing stakeholder expectations and requirements across the constituent projects in order to monitor and control the program.	
Task 6	Conduct program kick-off with key stakeholders by holding meetings in order to familiarize the organization with the program and obtain stakeholder buy-in.	

Domain II		Program Life Cycle
Planning the Program		
Task 7	Develop a detailed program scope statement by incorporating program vision and all internal and external objectives, goals, influences, and variables in order to facilitate overall planning.	
Task 8	Develop program WBS in order to determine, plan, and assign the program tasks and deliverables.	
Task 9	Establish the program management plan and schedule by integrating plans for constituent projects and creating plans for supporting program functions (for example, quality, risk, communication, resources) in order to effectively forecast, monitor, and identify variances during program execution.	
Task 10	Optimize the program management plan by identifying, reviewing, and leveling resource requirements (for example, human resources, materials, equipment, facilities, finance) in order to gain efficiencies and maximize productivity/synergies among constituent projects.	
Task 11	Define project management information system (PMIS) by selecting tools and processes to share knowledge, intellectual property, and documentation across constituent projects in order to maximize synergies and savings in accordance with the governance model.	
Task 12	Identify and manage unresolved project-level issues by establishing a monitoring and escalation mechanism and selecting a course of action consistent with program constraints and objectives in order to achieve program benefits.	
Task 13	Develop the transition/integration/closure plan by defining exit criteria in order to ensure all administrative, commercial, and contractual obligations are met upon program completion.	
Task 14	Develop key performance indicators (KPIs) by using decomposition/mapping/ balanced score card (BSC) in order to implement scope and quality management system within program.	
Task 15	Monitor key human resources for program and project roles, including subcontractors, and identify opportunities to improve team motivation (for example, develop compensation, incentive, and career alignment plans) and negotiate contracts in order to meet and/or exceed benefits realization objectives.	

Domain II		Program Life Cycle
Executing the Program		
Task 16	Charter and initiate constituent projects by assigning project managers and allocating appropriate resources in order to achieve program objectives.	
Task 17	Establish consistency by deploying uniform standards, resources, infrastructure, tools, and processes in order to enable informed program decision making.	
Task 18	Establish a communication feedback process in order to capture lessons learned and the team's experiences throughout the program.	
Task 19	Lead human resource functions by training, coaching, mentoring, and recognizing the team in order to improve team engagement and achieve commitment to the program's goals.	
Task 20	Review project managers' performance in executing the project in accordance with the project plan in order to maximize their contribution to achieving program goals.	
Task 21	Execute the appropriate program management plans (for example, quality, risk, communication, resourcing) using the tools identified in the planning phase and by auditing the results in order to ensure the program outcomes meet stakeholder expectations and standards.	
Task 22	Consolidate project and program data using predefined program plan reporting tools and methods in order to monitor and control the program performance and communicate to stakeholders.	
Task 23	Evaluate the program's status in order to monitor and control the program while maintaining current program information.	
Task 24	Approve closure of constituent projects upon completion of defined deliverables in order to ensure scope is compliant with the functional overview.	

Domain II		Program Life Cycle
<b>Controlling the Program</b>		
Task 25	Analyze variances and trends in costs, schedule, quality, and risks by comparing actual and forecast to planned values in order to identify corrective actions or opportunities.	
Task 26	Update program plans by incorporating corrective actions to ensure program resources are employed effectively in order to meet program objectives.	
Task 27	Manage program level issues (for example, human resource management, financial, technology, scheduling) by identifying and selecting a course of action consistent with program scope, constraints, and objectives in order to achieve program benefits.	
Task 28	Manage changes in accordance with the change management plan in order to control scope, quality, schedule, cost, contracts, risks, and rewards.	
Task 29	Conduct impact assessments for program changes and recommend decisions in order to obtain approval in accordance with the governance model.	
Task 30	Manage risk in accordance with the risk management plan in order to ensure benefits realization.	
<b>Closing the Program</b>		
Task 31	Complete a program performance analysis report by comparing final values to planned values for scope, quality, cost, schedule, and resource data in order to determine program performance.	
Task 32	Obtain stakeholder approval for program closure in order to initiate close-out activities.	
Task 33	Execute the transition and/or close-out of all program and constituent project plans (for example, perform administrative and PMIS program closure, archive program documents and lessons learned, and transfer ongoing activities to functional organization) in order to meet program objectives and/or ongoing operational sustainability.	
Task 34	Conduct the post-review meeting by presenting the program performance report in order to obtain feedback and capture lessons learned.	
Task 35	Report lessons learned and best practices observed and archive to the knowledge repository in order to support future programs and organizational improvement.	

Domain II		Program Life Cycle
	<p>Knowledge Specific to Domain 2  <i>(*Indicates knowledge is found in one other domain, shown in parentheses)</i></p> <ul style="list-style-type: none"> <li>• Benchmarking</li> <li>• Closeout plans, procedures, techniques and policies* (5)</li> <li>• Decomposition techniques (for example, work breakdown structure (WBS))</li> <li>• Financial closure processes* (V)</li> <li>• Logistics management</li> <li>• Performance and quality metrics* (III)</li> <li>• Phase gate reviews* (V)</li> <li>• Procurement management</li> <li>• Product/service development phases</li> <li>• Program and constituent project charter development* (I)</li> <li>• Program and project change requests* (V)</li> <li>• Program initiation plan</li> <li>• Program management plans</li> <li>• Quality control and management tools and techniques</li> <li>• Resource estimation (human and material)</li> <li>• Resource leveling techniques</li> <li>• Root cause analysis</li> <li>• Schedule management, techniques, and tools</li> <li>• Scope management</li> <li>• Service level agreements</li> <li>• Statistical analysis* (V)</li> <li>• Strategic planning and analysis* (I)</li> <li>• SWOT analysis</li> <li>• Talent evaluation</li> <li>• Team competency assessment techniques</li> <li>• Training methodologies* (IV)</li> </ul>	

<b>Domain III</b>		<b>Benefits Management</b>
Task 1	Develop the benefits realization plan and its measurement criteria in order to set the baseline for the program and communicate to stakeholders, including sponsors.	
Task 2	Identify and capture synergies and efficiencies identified throughout the program life cycle in order to update and communicate the benefits realization plan to stakeholders, including sponsors.	
Task 3	Develop a sustainment plan that identifies the processes, measures, metrics, and tools necessary for management of benefits beyond the completion of the program in order to ensure the continued realization of intended benefits.	
Task 4	Monitor the metrics (for example, by forecasting, analyzing variances, developing "what if" scenarios and simulations, and utilizing causal analysis) in order to take corrective actions in the program and maintain and/or potentially improve benefits realization.	
Task 5	Verify that the close, transition, and integration of constituent projects and the program meet or exceed the benefit realization criteria in order to achieve program's strategic objectives.	
Task 6	Maintain a benefit register and record program progress in order to report the benefit to stakeholders via the communications plan.	
Task 7	Analyze and update the benefits realization and sustainment plans for uncertainty, risk identification, risk mitigation, and risk opportunity in order to determine if corrective actions are necessary and communicate to stakeholders.	
Task 8	Develop a transition plan to operations in order to guarantee sustainment of products and benefits delivered by the program.	
	<p>Knowledge Specific to Domain III  <i>(*Indicates knowledge is found in one other domain, shown in parentheses)</i></p> <ul style="list-style-type: none"> <li>• Benefit optimization</li> <li>• Business value measurement</li> <li>• Decision tree analysis</li> <li>• Maintenance and sustainment of program benefits post delivery</li> <li>• Performance and quality metrics* (II)</li> <li>• Program transition strategies</li> </ul>	

<b>Domain IV</b>		<b>Stakeholder Management</b>
Task 1	Identify stakeholders, including sponsors, and create the stakeholder matrix in order to document their position relative to the program.	
Task 2	Perform stakeholder analysis through historical analysis, personal experience, interviews, knowledge base, review of formal agreements (for example, request for proposal (RFP), request for information (RFI), contracts), and input from other sources in order to create the stakeholder management plan.	
Task 3	Negotiate the support of stakeholders, including sponsors, for the program while setting clear expectations and acceptance criteria (for example, KPIs) for the program benefits in order to achieve and maintain their alignment to the program objectives.	
Task 4	Generate and maintain visibility for the program and confirm stakeholder support in order to achieve the program's strategic objectives.	
Task 5	Define and maintain communications adapted to different stakeholders, including sponsors, in order to ensure their support for the program.	
Task 6	Evaluate risks identified by stakeholders, including sponsors, and incorporate them in the program risk management plan, as necessary.	
Task 7	Develop and foster relationships with stakeholders, including sponsors, in order to improve communication and enhance their support for the program.	
	<p>Knowledge Specific to Domain IV  <i>(*Indicates knowledge is found in one other domain, shown in parentheses)</i></p> <ul style="list-style-type: none"> <li>• Customer relationship management</li> <li>• Customer satisfaction measurement</li> <li>• Expectation management</li> <li>• Public relations* (I)</li> <li>• Training methodologies* (II)</li> </ul>	

Domain V	Governance
Task 1	Develop program and project management standards and structure (governance, tools, finance, and reporting) using industry best practices and organizational standards in order to drive efficiency and consistency among projects and deliver program objectives.
Task 2	Select a governance model structure including policies, procedures, and standards that conforms program practices with the organization's governance structure in order to deliver program objectives consistent with organizational governance requirements.
Task 3	Obtain authorization(s) and approval(s) through stage gate reviews by presenting the program status to governance authorities in order to proceed to the next phase of the program.
Task 4	Evaluate key performance indicators (for example, risks, financials, compliance, quality, safety, stakeholder satisfaction) in order to monitor benefits throughout the program life cycle.
Task 5	Develop and/or utilize the program management information system, and integrate different processes as needed, in order to manage program information and communicate status to stakeholders.
Task 6	Regularly evaluate new and existing risks that impact strategic objectives in order to present an updated risk management plan to the governance board for approval.
Task 7	Establish escalation policies and procedures in order to ensure risks are handled at the appropriate level.
Task 8	Develop and/or contribute to an information repository containing program-related lessons learned, processes, and documentation contributions in order to support organizational best practices.
Task 9	Identify and apply lessons learned in order to support and influence existing and future program or organizational improvement.
Task 10	Monitor the business environment, program functionality requirements, and benefits realization in order to ensure the program remains aligned with strategic objectives.
Task 11	Develop and support the program integration management plan in order to ensure operational alignment with program strategic objectives.

Domain V	Governance
	<p>Knowledge Specific to Domain V  <i>(*Indicates knowledge is found in one other domain, shown in parentheses)</i></p> <ul style="list-style-type: none"> <li>• Archiving tools and techniques</li> <li>• Business/organization objectives* (I)</li> <li>• Closeout plans, procedures, techniques and policies* (II)</li> <li>• Composition and responsibilities of the program management office (PMO)</li> <li>• Financial closure processes* (II)</li> <li>• Go/no-go decision criteria</li> <li>• Governance models</li> <li>• Governance processes and procedures</li> <li>• Metrics definition and measurement techniques</li> <li>• Performance analysis and reporting techniques (for example, earned value analysis (EVA))</li> <li>• Phase gate reviews* (II)</li> <li>• Program and project change requests* (II)</li> <li>• Statistical analysis* (II)</li> </ul>

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