



Technology optimization and change management for successful digital supply chains

Chapter 6: Establishing the Program Management Office:
A key enabler for digital supply chain transformation

Technology Optimization and Change Management for Successful Digital Supply Chains

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A volume in the Advances in Logistics,
Operations, and Management Science (ALOMS)
Book Series



Published in the United States of America by

IGI Global
Business Science Reference (an imprint of IGI Global)
701 E. Chocolate Avenue
Hershey PA, USA 17033
Tel: 717-533-8845
Fax: 717-533-8661
E-mail: cust@igi-global.com
Web site: <http://www.igi-global.com>

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Library of Congress Cataloging-in-Publication Data

Names: Sabri, Ehap H., 1967- editor.

Title: Technology optimization and change management for successful digital supply chains / Ehap Sabri, editor.

Description: Hershey, PA : Business Science Reference, [2019]

Identifiers: LCCN 2018036426 | ISBN 9781522577003 (hardcover) | ISBN 9781522577010 (ebook)

Subjects: LCSH: Business logistics--Technological innovations. | Production control--Technological innovations.

Classification: LCC HD38.5 .T435 2019 | DDC 658.7--dc23 LC record available at <https://lccn.loc.gov/2018036426>

This book is published in the IGI Global book series Advances in Logistics, Operations, and Management Science (ALOMS) (ISSN: 2327-350X; eISSN: 2327-3518)

British Cataloguing in Publication Data

A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

For electronic access to this publication, please contact: eresources@igi-global.com.

Chapter 6

Establishing the Program Management Office: A Key Enabler for Digital Supply Chain Transformation

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ABSTRACT

This chapter covers the importance of the program management office (PMO) in a digital supply chain transformation. The objective of this chapter is to discuss the key issues in digital supply chain transformations in terms of managing the PMO, followed by a discussion of the solutions and best practices for mitigating these issues and ensuring the PMO is a value-added function and key enabler of a digital supply chain transformation. The reader should have a good understanding of the activities that the PMO should perform, the skills required for PMO resources, and the process of building the business case and using it to track the benefits to prove the transformation was effective.

INTRODUCTION

PMOs can sometimes be perceived as unnecessary overhead for already expensive supply chain transformations. In reality, the opposite is true, and if they are not constructed, supported or structured properly, the project will fail. The author's intent in this chapter is to describe in detail what the challenges are in managing the PMO and what the best practices are to lead and operate a successful PMO.

BACKGROUND

Supply chain transformations are very complex projects that require coordinated activities in finance, operations, supply chain, procurement, engineering, product development and leadership functions. The Program Management Office (PMO) is responsible for the coordination of activities between

DOI: 10.4018/978-1-5225-7700-3.ch006

these groups of people. Its essential objective is to actively support and partner with senior business leaders to ensure the transformation will deliver the expected value while not significantly disrupting the day-to-day operations. It does this by identifying and prioritizing the issues and risks, identifying the complex interdependencies that exist between workstreams, managing the communication process with the stakeholders and making decisions on behalf of the project sponsors. In terms of executing the work, the PMO does not handle that. That responsibility resides with the individual workstreams. For a digital supply chain transformation, examples of workstreams would include Demand Planning, Supply Planning, Inventory Management, Integration, Master Data Management, etc. When designed and set up correctly, the PMO provides a competitive advantage for firms undergoing a transformation. If the PMO is set up sub-optimally, projects tend to fail. In the Project Management Institute's Pulse of the Profession survey from 2018, only 58% of organizations fully understand the value of project management. The organizations that undervalued the PMO for driving change reported an average of 50% or more of their projects failing outright (PMI, 2018). The focus of this chapter is to highlight the specific challenges of the PMO and how the team can solve them.

MAIN FOCUS OF THE CHAPTER

Issues Necessitating PMO Excellence in Supply Chain Transformation

There are several issues that make supply chain transformations challenging. Most of these issues are the result of so many organizational functions being involved at the same time, while tasking them with both transforming their operation and continuing their operation at the same time. The intent of this section is to emphasize and cover in detail the specific issues below.

1. On-going operations can de-prioritize the project and steal resources.
2. Scope creep results in unbudgeted and non-value-added work.
3. Lack of single integrated project plan prevents overall coordination.
4. Competing initiatives or interdependencies within the transformation cause confusion.
5. Lack of dedicated, supported and skilled PMO resources cause overall poor execution.

On-Going Operations Steal Resources and Deprioritize the Project

Executing a digital supply chain transformation is like completely renovating a 1930's era mansion with the latest smart appliances, HVAC, security and energy monitoring, all the while expecting the family to still live in the house and perhaps even expecting year over year improvements in home efficiency and overall enjoyment. Let us suppose that during this operation there was a critical point in the schedule in which the home contractor needed the homeowner to be available to decide on a number of critical set points in the main controller, but the home owner was unavailable for this because he or she had to address a project that was not going as well (e.g., the family car had broken down). As a result, the HVAC would not cool below 80 degrees, the outdoor lighting turned off at the wrong times, and the security system would not function. This caused the homeowner to have the contractor install window A/C units in every window, convert the lighting back to manual controls, and hire a full time security service to

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monitor the house. Obviously, this has resulted in unnecessary costs and schedule setbacks, and it was the result of a project stakeholder reacting to a competing priority.

In the same fashion as this fictional home renovation example, organizations very often reallocate resources based on operational issues with perceived higher priority because their consequences are immediate. When this occurs, more harm than good can occur. The day-to-day issues may be addressed, but the firm typically continues to use antiquated non-digital ways of performing their supply chain operations. This delays the implementation of any technology implementation, which delays the resulting financial benefits to the firm. In many cases, when resources gravitate away from the transformation and back to the day-to-day operations, it is just simple resistance to change. In the 2018 Digital Supply Chain Executive Survey, 57% of manufacturers cited resistance to change as the top impediment to supply chain initiatives (JDA, 2018). How companies prevent this natural issue is covered in Solutions and Recommendations.

Scope Creep Sets In

Project scope management includes the process required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. These scope management processes include collecting requirements, defining the scope, creating the work breakdown structure (WBS), verifying the scope, and controlling the scope. Essentially, the scope defines what is and what is not part of the transformation. When work is performed outside of the originally agreed upon scope, that is referred to as scope creep. In a 2018 survey from PMI, 52% of the projects completed in the past year experienced scope creep (PMI, 2018), but this figure is conservative in the author's experience. It is important to understand that scope creep is sometimes a welcome challenge, if the new scope is an opportunity that provides significant value to the business.

Changes to projects will always happen. As discussed in the previous section, ongoing operations will create disruption and will also identify supply chain issues that the transformation could or should address. The point is not that PMOs should reject all changes; rather, there must be a process of assessing, authorizing and controlling the changes that do occur. When changes are simply worked on without approval from the PMO, the project team devotes time to the unauthorized changes. The work to incorporate these changes must often be done within the original time and budget estimates, leaving less time for approved parts of the scope. That could mean approved features don't get completed, and the end-product is not what was chartered. Or, it can mean that time and cost overruns to finish the authorized parts of the scope will occur. If cost overruns are not an option, and the budgeted investment is used, the project will have to be closed out, even if that means prematurely ending the project without achieving the benefits.

It is worth detailing the reasons this occurs in supply chain transformations.

Scope Creep Reason 1: Not Clearly Defining the Scope Boundaries

When stakeholders are developing the business case for the supply chain transformation, the scope assumptions made by the business may be different than the PMO's assumptions. It is very important to clearly identify what is in scope and what is out of scope. For example:

- Which business units are in scope? Does it include the subsidiaries, acquisitions or joint ventures?

- Which business functions? Does the transformation also include significant changes to finance, operations, procurement, HR, IT, in addition to supply chain?
- What geographies? Does it include foreign continents as well?
- What business processes? Is it supply chain strategy, planning, execution, manufacturing, logistics, or fulfillment processes? Does it include the S&OP process?

If these elements remain unclear, it will eventually become clear in a couple of inefficient ways. First, the project team will interpret the requirements and build what it thinks is right and helps the business. Secondly, the team will get details from the supply chain practitioners and subject matter experts, which will often times be misaligned with the intention of the project sponsors. As an example, if a business intends to replace its supply chain system of record, but it does not provide clear guidance on the business units, processes and geographies in scope, scope creep is bound to occur. If the project stakeholders are mostly from a single business unit and are all responsible for day-to-day supply chain execution, then the end product will be focused on that business unit's execution, and less on a planning and strategy platform for their enterprise.

Scope Creep Reason 2: Poorly Gathering and Documenting the Business Requirements

In the process of developing the charter for the project, it can be challenging to gather and fully document all the detailed requirements of the supply chain solution. As result, new requirements can be discovered during the design phases or even after go-lives. If the original requirements were not detailed enough, it will be difficult to determine if these are new requirements or were part of the original list, and will likely just be included in the scope going forward. Likewise, if the original requirement is too vague, the developers will have to make a judgment on what was intended and will potentially guess wrong, resulting in costly re-work. Even when requirements are adequately detailed, stakeholders can persuade the solution design to include elements that do not address the original list of requirements. Without the guidance provided by tracing requirements back to business and project objectives, project teams often rely on their own judgment about whether to include individual requirements. The software developers may also add product features that they think are useful, even if they were not part of the requirements. Although this may add value to the customers, it is still scope creep. This can especially happen when the project team is trying harder to satisfy the customer due to other project challenges.

Scope Creep Reason 3: Not Adequately Involving Project Sponsors in Decisions

Supply chain transformation sponsors are typically busy with other initiatives or day-to-day operations. It is often the case that they are not even aware that they are not as involved as they should be in terms of scope decisions. It could be an issue with how the PMO is communicating with the sponsor. If it is not in the preferred type of communication (e.g., email, status meeting, conference call, etc.), he or she may become disengaged. A scheduled PMO status meeting, milestone or other event such as a missed deliverable then tends to bring the project back into focus. A disengaged sponsor is more likely to hand over project decisions to the team. The more disengaged the sponsor becomes, the more likely scope creep becomes because the project team will make decisions in the absence of sponsors making them. These decisions may or may not be the correct ones, but if they bypass the change request process, or the sponsor is simply not involved in the change request process, it will result in work outside the agreed upon scope that is not authorized by the sponsor.

Scope Creep Reason 4: Accepting Too Many Changes Because the Transformation Is So Long

Supply chain transformations typically will typically take longer than a year, and they can take up to 3 years or longer. The longer a transformation is, the longer a sponsor has to change his or her mind, identify other requirements, re-prioritize capital funding, or for the overall business to change. This all causes scope creep to the original project. It simply opens the possibility for more and more product features and functions to be added by simply adding to the time stakeholders are working in it. When additional features are identified, it is imperative that they go through the change control process. Again, with longer projects there is a greater risk that additions can bypass the change control process.

The detailed solutions and recommendations to manage these scope creep issues are laid out in the Solutions and Recommendations section.

Lack of a Single Integrated Project Plan Prevents Coordination

When multiple workstreams and cross-functional groups are working on the same project, as is the case in supply chain transformations, there is a risk of disparate project plans being developed that do not necessarily work together. The individual workstreams will typically create and manage their project plan in MS Project or even MS Excel. Most of the time, teams are constantly making small changes to their plans and updating statuses and progress. It is hard to keep up with such day-to-day fluent changes. Even if the plans are stored on some common drive or web-based location like Sharepoint or a project portal, the plans are not truly connected.

In addition to the lack of single integrated plan, version control of the individual plans becomes an issue because as workstreams make updates to their individual plans, there cannot be real time updates to the overall project plan. This issue of plan proliferation will create all sorts of problems for the PMO. It will take hours of PMO staff time to update and reconcile the plans. Ultimately, there will not be one single source of the truth when it comes to the overall transformation plan. This erodes confidence in the PMO and consumes PMO resources in the administrative tasks for tying them all together.

Interdependencies Between Workstreams Create Coordination Challenges

Supply chain transformations will present many challenges in terms of sequencing activities and managing dependencies. Dependencies are the relationships that the activities or milestones have with each other that dictate their order. For example, in a supply chain transformation, it is necessary to first develop a solution design document before configuring the solution. When the dependency is between two activities that are in two different sub-projects, or workstreams, the relationship is considered to be an interdependency. An example of an interdependency in a supply chain transformation is that the master data workstream must clean and validate the master data before system integration testing for the functional areas (demand, supply, inventory) may begin. Although this interdependency is not difficult to identify, it is not easily managed between multiple workstreams. In this example, the demand, supply and inventory workstreams must recognize this interdependency in their project plans. Their plans must react to any change in the duration or end date of the master data cleaning activity in the master data management workstream. Therefore, the PMO must integrate both sets of plans into a single integrated

plan to facilitate the management of this interdependency. Details on this process are discussed in the Solutions and Recommendations section.

Lack of Dedicated, Supported and Skilled PMO Resources Cause Overall Poor Execution

In a 2013 Forrester Research poll, most organizations viewed project management as something additional to everyone's daily job. It was only the most strategic projects with the highest visibility to leadership that were assigned an actual dedicated project manager (Forrester, 2013). Simply layering on PMO responsibilities to the business or operations teams is a mistake. This approach makes two faulty assumptions: that people have time for it and that they are properly skilled for the job. Supply chain transformations deserve their own dedicated PMO. Leadership must support the PMO, hand over decision making authority to it, and then hold the PMO accountable for the expected benefits from the transformation.

SOLUTIONS AND RECOMMENDATIONS

The challenges highlighted in the previous section become exaggerated with supply chain transformation projects given the complex and organizationally broad nature of the endeavors. To prevent and combat these challenges, the authors have focused on three critical areas:

1. Firmly establish the framework for structure, routines, communication, governance and other knowledge areas of the Program Management Office.
2. Ensure a highly skilled leadership team is leading the PMO and is fully supported by the business leadership.
3. Create the business case and "burning platform" for change and then measure the improvements as soon as viable.

Establishing the PMO Framework

It is absolutely critical to create a framework for managing plans, budgets, risks, and reporting. It's important to establish program-level routines that track milestones and objectives, communicate progress and help identify issues early without putting a lot of extra work on the workstreams. The industry standard for establishing this structure is the Project Management Body of Knowledge (PMBOK). The PMBOK provides the best practices that PMOs should follow as the project progresses through its lifecycle of Initiating, Planning, Executing, Monitoring and Closing the project (PMI, 2008). This text will not comprehensively provide the details from the PMBOK, but it will discuss the specifics of each of these project lifecycle phases as they relate to digital supply chain transformations.

Initiating

The Initiating phase consists of the activities necessary to define a new project or a new phase of an existing project by obtaining authorization from the sponsor. The Project Charter is the document that authorizes a project or phase and documents the initial requirements, scope and financial resources.

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The best practice is for the sponsor to physically sign the Charter. The charter document should include at a minimum the project proposal or justification, measureable project objectives and related success criteria, high level requirements, high level project description, high level risks, a summary milestone schedule and a summary budget. Historically, PMOs have chosen to use a more comprehensive statement of work (SOW) to serve as the charter, but best practice is to summarize that to the elements described here. The project charter is a critical document that justifies the project and provides authority to the PMO to drive the transformation. It needs to be referenced when the purpose of the project is questioned.

This is also where the PMO determines the full list of stakeholders. The stakeholders include individuals or groups that have an interest, involvement or influence in the project. For a supply chain transformation, this would include a large number of cross-functional roles throughout the organization. It is important to include stakeholders not just from supply chain and operations teams, but from engineering, finance, human resources, procurement and sales as well. Keeping this cross-functional team aligned with the objectives, benefits and resource requirements of the transformation is critical to success. The stakeholder register is a document the PMO should build to list these stakeholders, their function and role in the transformation, and some general summary on how the stakeholder should be managed.

The most important outcome of the Initiating phase is to properly endorse and authorize the PMO. It's crucial to authorize and establish the PMO early as project managers often have accountability but little authority. If the PMO is developed after the Project Charter has been developed for the transformation, it will take time to ramp up their knowledge of the project background. Ultimately, this discredits the PMO, which is a critical mistake that cannot be resolved during the project. The PMO should be composed of key stakeholders that have been part of the development and socialization of the business case up to this point. Once the PMO resources are identified, the business leadership must publicly announce the launch of the project, that the PMO has the authority to run the project, and that all workstreams effectively report to the PMO (PMI, 2008).

Planning

In the Planning Phase, the total scope is detailed out, the objectives are defined and refined, and a detailed course of action is developed to attain these objectives. This takes the high level work in the Initiating phase to a detailed level. A multi-dimensional transformation like a digital supply chain transformation requires repeated feedback loops in which more project information, characteristics or events are understood, triggering a need to change some of the plans. This iterative process of changing the plan or making it more detailed based on new information is called “rolling wave planning.” This type of planning goes on throughout the transformation (PMI, 2008).

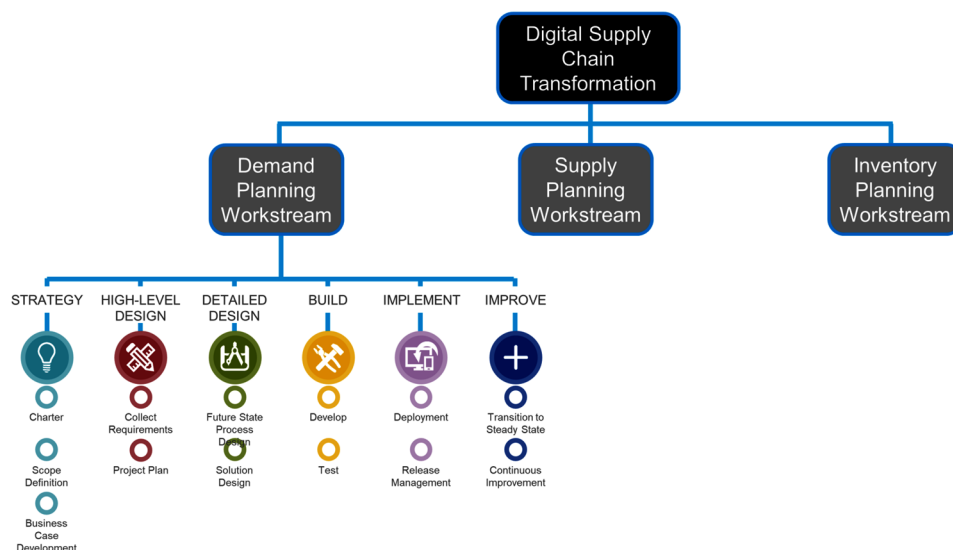
The project management plan and project documents developed as outputs from the planning phase will explore aspects of the scope, time, costs, quality, communication, change management, risk, and procurements. These documents should be updated as the project progresses and requires changes to achieve the objectives. The list below provides details on these documents, or deliverables, that are necessary in the Planning phase.

1. **List of Requirements** – The List of Requirements is a formal deliverable resulting from the exhaustive process of defining and documenting stakeholders’ needs to meet the project objectives. These requirements include the quantified and documented needs and expectations of the sponsor, customer, and other stakeholders. These requirements need to be elicited, analyzed and recorded in

enough detail to be measured once project execution begins. For technology that supports a digital supply chain transformation, these requirements would include information on technical requirements, security requirements, performance requirements, etc. An example of a requirement would be “the future process and system must provide daily updates of customer orders provided in a view that can be aggregated from days to weeks to months to years and from SKU to product family to business unit.” The process of acquiring these requirements starts with a thorough assessment of the current state process, identification of the pain points, and a summary of the process or technology requirements that would help address the pain point. This process needs to be facilitated through a series of workshops with the stakeholders. Requirements gathering should be performed only with the project stakeholders that are responsible for the strategy and execution of the supply chain processes. Care should be given when involving manufacturing, finance, engineering or other teams, as it could potentially result in scope creep since the other functions will want to add requirements that solely benefit their function (PMI 2008).

2. **Work Breakdown Structure:** The Work Breakdown Structure (WBS) is the subdivision of project deliverables into smaller, more manageable components until the work and deliverables are defined to a more tangible and actionable level. This involves identifying and analyzing the deliverables and related work, structuring and organizing the WBS, and decomposing the upper levels to the lower levels (PMI, 2008). For a digital supply chain transformation, the authors recommending breaking the WBS into major workstreams such as Demand Planning, Supply Planning, Inventory Management, Change Management Master Data Management and Integration. Underneath that, they are further divided into phases or sub-phases of work. The figure below provides an example WBS.
3. **Integrated Project Plan:** The integrated project plan is the document that organizes the WBS into distinct activities and identifies the owner, schedule, duration and any dependencies. The best practice is to display the project plan in the form of a Gantt chart (PMI, 2008). Due to the com-

Figure 1. Example work breakdown structure for a supply chain transformation (KPMG, 2017)



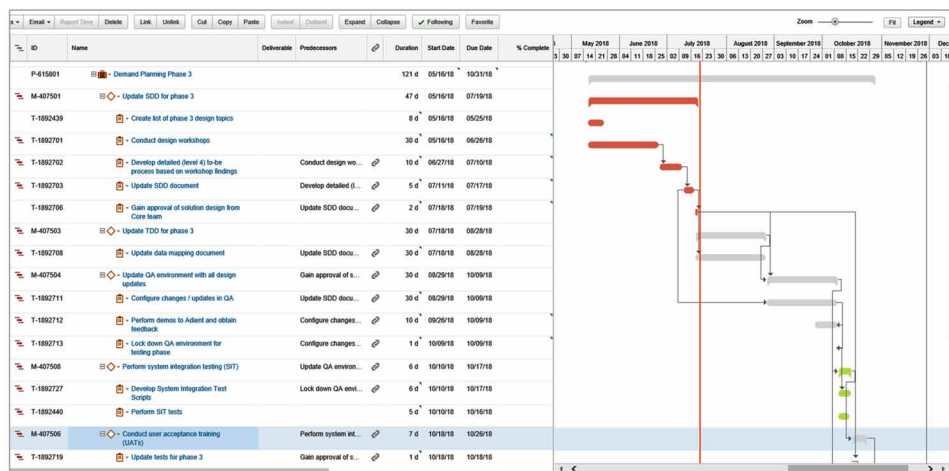
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plexity of the supply chain transformation, with multiple workstreams working simultaneously, it is always challenging to maintain an updated comprehensive project plan. For this reason, it is recommended to utilize a cloud-based project management solution that keeps all project plans in a single place with real time updates. Below is an example Gantt chart from a cloud based project management solution called Clarizen.

Project management systems are also necessary to manage the interdependencies that commonly occur between workstreams in a supply chain transformation. For example, if there are data sets that must first be cleaned and validated by the Master Data Management workstream before system integration testing in the Demand Planning workstream can occur, then the project management system must link these tasks to ensure one is dependent upon the other finishing to completion. Additionally, these systems must be capable of identifying the critical path of the overall project. The critical path is the series of tasks that must finish on time for the entire project to finish on schedule. To emphasize, these system are absolutely critical for supply chain transformation to ensure there is one version of the truth for all schedules, activities and costs across all workstreams. If every workstream is “marching to their own beat,” then the transformation will certainly fail (Brown, 2003).

4. **Cost Management Plan:** The Project Cost Management Plan is the outline of the project’s estimation, allocation and control of costs for the required resources to complete the activities in the Integrated Project Plan. It is an absolutely essential part of this planning phase because it creates the safety net that guarantees that project cost is kept within the limits of the budget. Developing and executing the Cost Management Plan involves the following key steps:
 - a. Estimating Costs – the process of developing an approximation of the funding needed for resources to conduct the activities in the Integrated Project Plan.
 - b. Determine Budget – the process of aggregating the estimated costs of individual activities or workstreams to establish an authorized cost baseline.

Figure 2. Example of a project plan in Gantt chart format (KPMG, 2017)



- c. **Control Costs** – The process of monitoring the status of the project to update the project budget and managing changes to the cost baseline.

These steps can be iterative in nature. For example, in the initial stages of the project, project cost could have a rough order of magnitude (ROM) estimate in the range of +/-25%. Later in the project, as more information is known, estimates could narrow to a range of +/-10%. Throughout the project, the PMO must monitor the actual costs versus budget and the work that has actually been completed. Additionally, it is necessary to forecast actual costs and future budget variances.

Earned Value Management (EVM) is a commonly used method of performance measurement, but its specifics are beyond the objective of this text. In summary, it integrates project scope, cost and schedule measures to help the PMO assess and measure project performance and progress. This method develops and monitors three key dimensions for each major phase of work - planned value, earned value and actual costs. Table 1 summarizes the key terms and definitions of EVM (PMI, 2008).

5. **Project Quality Plan** – A Project Quality Plan address both the management of the project and the actual product of the project. Quality control for the project must measure compliance against its various other plans (PMI, 2008). Example activities in a Project Quality Plan include:
 - a. Adherence to deliverable and milestone schedule
 - b. Monitoring variances to scope, schedule and costs
 - c. Adherence to the change control process and use of formal change requests
 - d. Control of formal PMO documentation
 - e. Updates to integrated project management plan

The Project Quality Plan also defines the quality control process for the solution itself. This is where functional unit testing (FUT), system integration testing (SIT) and user acceptance testing (UAT) will be fully defined. This will document:

Table 1. Summary of key terms for earned value management methodology

Term	Abbreviation	Definition	Formula
Planned Value	PV	This is simply the budget for a given phase or element of the WBS	-
Earned Value	EV	The value of the work completed for the WBS element. Most times it is simply the % completion of this element.	-
Actual Cost	AC	Total cost actually incurred for work performed	-
Schedule Variance	SV	Measures schedule performance. Indicates if a project is falling behind its baseline schedule.	EV-PV
Cost Variance	CV	Measures cost performance	EV-AC
Schedule Performance Index	SPI	Measure of progress achieved compared to progress planned on a project	EV/PV
Cost Performance Index	CPI	Measure of the value of work completed compared to the actual cost or progress made on the project	EV/AC

(PMI, 2008)

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- The details of what is actually being tested and how it is tested
 - The success criteria for each test
 - Who will perform the testing
 - Where the testing itself will be documented (typically a system designed for solution testing)
 - How defects will be managed and documented
6. **Human Resources Plan** – The Human Resource Plan provides guidance on how project human resources should be defined, staffed, managed, controlled and eventually released. This plan will include descriptions of the roles and their specific responsibilities and accountabilities. A common tool to summarize the purpose of roles is the RACI diagram, which succinctly describes, by role, who is responsible (R), accountable (A), consulted (C), and informed (I) for each activity in the project and future state supply chain process (PMI, 2008). An example of this tool is shown in Figure 3 below.

Figure 3. Example of a RACI for a future state supply chain process (KPMG, 2017)

		Core Team											Extended Team					
		Global Supply Chain Development / Global Planning											Demand Planning Lead					
		Supply Planning Lead											Customer Service					
		Customer Forecasting											Sales					
		Product Marketing											Product Development					
		Finance											Production (
		Logistics											IT Systems/ Data					
		Procurement																
Process	#	Activities																
Demand Planning	1	Generate a baseline (statistical) forecast																
	2	Generate Brand / Marketing forecast (quota)																
	3	Collaborate with Marketing to make any adjustments to the baseline forecast																
	4	Generate Customer forecast (ladder)																
	5	Generate Sales Field Forecast (SFF)																
	6	Publish Assumptions Package																
	7	Prepare for Consensus DP Meeting - review assumptions, forecast changes (cycle over cycle), forecast variances etc.																
	8	Conduct regional Consensus Demand Meeting - agree on an unconstrained consensus demand plan																
	9	Aggregate regional Consensus Demand Plans and publish Global Consensus Demand Plan																
	10	Update financial forecast based on the unconstrained Consensus Demand Plan (in revenue)																
Supply Planning	11	Review Consensus Demand Plan changes cycle over cycle																
	12	Review major Assumptions driving the changes																
	13	Perform Forecast Consumption from customer orders																
	14	Compare inventory against target by product, by region																
	15	Perform Rough-cut capacity planning (RCCP)																
	16	Review and analyze Demand/Supply imbalances																
	17	Develop supply planning scenarios																
	18	Create Supply Planning Meeting agenda Items																
	19	Conduct Supply Planning Meeting																
	20	Communicate initial Master Production Schedule (MPS) and Ship Plan																
Executive S&OP	21	Analyze MPS and Ship Plan and conduct detailed capacity planning to investigate other constraints																
	22	Collaborate and adjust MPS and Ship Plan based on new constraints																
	23	Analyze variances between original and adjusted MPS and Ship Plan																
	24	Publish Final MPS, Ship Plan																
	25	Create trade-off scenarios with financial impact based on published demand and known supply constraints																
	26	Prepare for pre-S&OP meeting, develop draft S&OP deck																
	27	Conduct pre-S&OP meeting & publish new actions																
	28	Prepare for Executive S&OP meeting																
	29	Conduct Executive S&OP meeting																
	Weekly S&OP	30	Receive demand change signals (i.e.: orders, market changes)															
31		Apply business rules to filter the key exceptions																
32		Communicate key exceptions to supply planning																
33		Determine feasibility of satisfying key exceptions																
34		Consolidate changes to supply plan for Weekly S&OP meeting review																
35		Create Weekly S&OP Meeting agenda items																
36		Conduct Weekly S&OP Meeting - Discuss and resolve short term demand / supply imbalances																

Another key component of the Human Resources Plan is the staffing plan. The staffing plan identifies the number of hours per week required per role (or % dedication), how many individuals are in the role, when the role starts and stops, and overall cost of that role. The staffing model will need to be revisited and updated to react to resource and operations challenges of the supply chain transformation. The example staffing model in Figure 4 was used to show the percent dedication (expressed in decimals) by quarter, by role, by workstream, by phase for a supply chain transformation. The staffing plan is also a critical component of the Cost Management Plan.

The Human Resources Plan is also responsible for outlining the team location and segmentation of the PMO itself. PMO headquarters should have a single location, but for global transformations, additional PMO teams may be located in other countries. Proctor and Gamble executed this multiple location strategy in their massive 2009 replacement of their ordering, shipping and billing system and processes. P&G established a PMO in each country head office, but collocation was required for critical weeks such as training and integrated testing. The project ultimately proved successful for the \$84 billion business (PMI, 2013).

7. **Communications Management Plan** - A communication plan is an approach to providing stakeholders with information. The plan formally defines who should be given specific information, when that information should be delivered and what communication channels will be used to deliver the information.

An effective communications management plan anticipates what information will need to be communicated to specific audience segments. The plan should also address who has the authority to communicate confidential or sensitive information and how information should be disseminated (email, websites, printed reports, and/or presentations). Finally, the plan should define what communication channels stakeholders will use to solicit feedback and how communication will be documented and archived.

Communication plans play an important role in the Change Management workstream. An effective communication strategy can help break down resistance to change by getting everyone on the same page and helping stakeholders become engaged and endorse the need for change and the steps being taken to

Figure 4. Example of a high level staffing plan (KPMG, 2017)

		Phase 1		Phase 2		Phase 3			Phase 4		Phase 5			
Workstream	Roles	Q3 17	Q4 17	Q1 18	Q2 18	Q3 18	Q4 18	Q1 19	Q2 19	Q3 19	Q4 19	Q1 20	Q2 20	Total
PMO	Engagement Partner	0.0	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.1	0.1	0.1	3.0
	Program Manager and SME	0.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.5	0.5	9.2
	Delivery Project Executive	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
	Project Manager - Support	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	1.8
Business Process	Business / Functional Consultant - DP	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	11.5
	Business / Functional Consultant - SP & SC	0.5	2.0	1.0	1.0	1.0	1.0	1.0						7.5
	Business / Functional Consultant - S&OP							0.7	1.0	1.0				2.7
MDM	Data Analyst		1.0	1.0	1.0									3.0
	MDM and Integration Program Architect		1.0	1.0	1.0									3.0
Configuration	Solution Architect		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		10.0
	Technical Architect		1.0	0.3				1.0						2.3
	Application Consultant	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	11.5
	Technical Consultant	0.5	1.0	1.0										2.5
Change Mgmt.	Change Management Consultant		1.0	1.0	1.0	1.0	1.0	1.0						6.0
	Training Lead			0.2				0.1				0.1		0.3
Grand Total		2.6	11.3	10.1	8.6	6.6	6.6	8.3	5.5	6.3	3.9	3.8	2.8	

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bring it about. Standardization is important to communication management (PMI, 2008). To establish the standard methods, channels and audiences a table like Table 2 below should be constructed.

It is important to understand that these meetings must have strict schedules with the minimal resources necessary to be as efficient with time as possible. A 2014 study at a large company determined that a single weekly executive committee meeting consumed over 300,000 people-hours per year to support when it included all of the meetings, prep time and resources necessary to support it (Mankins, 2014).

8. **Risk Management Plan** - A risk management plan is a document that a project manager prepares to foresee risks, estimate impacts, and define responses to issues. A risk is “an uncertain event or condition that, if it occurs, has a positive or negative effect on a project’s objectives.” Risk is inherent with any project, and project managers should assess risks continually and develop plans to address them. The risk management plan contains an analysis of likely risks with both high and low impact, as well as mitigation strategies to help the project avoid being derailed should common problems arise. Risk management plans should be periodically reviewed by the project team to avoid having the analysis become stale and not reflective of actual potential project risks. The single document that houses all risks along with their details is called the Risk Register (PMI, 2008).
9. **Procurement Management Plan** – A Procurement Management Plan documents the process and policies necessary to acquire the supporting supply chain technology. This plan will have to specify the process by which technology vendors bid against a Request for Proposal (RFP) if required. Additionally, it will detail the selection criteria that the PMO will use to determine the best fit for the project. It is very important to link the selection criteria back to the original list of requirements to ensure the vendor is capable of meeting the business requirements (PMI, 2008).

The key concept in this Planning phase is to think the whole project through in advance to the extent possible. Doing so requires creating a variety of plans and considering all of the things that could potentially go wrong (risks). These plans provide the overriding governance of the transformation, and

Table 2. Summary of suggested meetings for supply chain transformation

Communication Type	Objective of Communication	Frequency	Audience	Owner
Kickoff Meeting for Phase	Introduce the project team and the project. Review project objectives and management approach.	Once per phase	<ul style="list-style-type: none"> • Project Sponsor • Project Team • Stakeholders 	PMO
Workstream Status Reports	Review status of the project with each workstream	Weekly	<ul style="list-style-type: none"> • Project Team 	PMO
Project Status Reports	Report the status of the project including activities, progress, costs and issues.	Weekly or Monthly	<ul style="list-style-type: none"> • Project Sponsor • Project Team • Stakeholders • PMO 	PMO
Technical Design Meetings	Discuss and develop technical design solutions for the project.	As Needed	<ul style="list-style-type: none"> • Project Technical Staff 	Technical Lead
Steering Committee	Report on the status of the project to management.	Monthly	<ul style="list-style-type: none"> • Project Sponsorship 	PMO

(PMI, 2008)

provide much needed structure to the complexity of a supply chain transformation. Poor quality planning in this stage results in the age old adage: “Fail to plan, and you plan to fail.”

Executing

In the Executing Phase, the team executes the plan and does the work to implement the technology, process and organizational changes for a supply chain transformation. The individual workstreams (e.g., Demand Planning, Supply Planning, etc.) actually do the work, while the PMO coordinates these resources.

A key role for the PMO during the execution phase is the management of the entire team. The PMO, working collaboratively with the Change Management workstream, must work to keep stakeholders engaged and working together as a team. This will require team building activities and constant communication to ensure alignment and trust. For digital transformations, in which concepts may be entirely new to the organization, the PMO is responsible for educating the team and making recommendations and judgements on key technology or configuration decisions that will affect the future state process. In stages where the technology is being implemented, the PMO will need to bridge the gap between the strictly technology-focused resources or contractors and the business users. This is going to require the workstream leads to constantly translate the information from solution and technical architects to the business and vice versa.

In the Executing Phase, the majority of work is performed and, therefore, the majority of the budget is spent. It is imperative to execute the Cost Management Plan to ensure project cost is tracking to budget. Additionally, change requests must go through the change control process, because as the project advances, changes are more expensive to adopt and implement. Not doing so will certainly result in scope creep. As the project is executed, it is important for the PMO to monitor the schedule and costs and adjust the plans if necessary based on how the project is progressing or any other issues going on with the business (PMI, 2008).

Monitoring and Controlling

The Monitoring and Controlling Phase is composed of processes to track the progress and performance of the project, identify any changes that need to occur to the plans, and then initiate the changes through the change control process. Digital supply chain transformations have many challenges to staying on track. Therefore, PMOs must have good processes for monitoring the schedule, cost, scope and deliverable production of the project and then make adjustments to the plans. To emphasize, all changes to these plans must go through the change control process which is ultimately governed by the PMO (PMI, 2008).

A key aspect of this part of the PMO governance is the routine status reports. These reports should be performed at the highest level of the Work Breakdown Structure. So, in the case of supply chain transformation, that would include separate status meetings for Demand Planning, Supply Planning and so on. The best practice is for these meetings to report out on progress against milestones in the schedule, report any risks that they are facing, and provide an overall self-assessment of where they are in terms of project schedule, resources and costs. The PMO must provide a common language for reporting status. A typical approach is to simply use a red, yellow and green rating for the entire workstream. PMOs should challenge workstreams to justify their rating. High visibility projects like supply chain transformations tend to result in too many overly optimistic green ratings, and the PMO will need to identify these situations and ensure the status definition is being applied fairly. However, PMOs must ensure they are not

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punishing those with red status. There is no greater example of this than at Ford Motor Company in 2006. During a difficult time of a program launch for the Ford Edge, Mark Fields showed the program status for the new Ford Edge as red. Historically, the program teams at Ford showed green statuses, even when there were issues, because of the history of consequences for showing red status. Fields' act drew praise from the CEO, and it is credited with being the tipping point for a turnaround at Ford, known as the "The Way Forward." Fields would later become CEO of Ford Motor Company (Sellers, 2013).

Closing

Closing the project is a formal process that involves getting sign-off and acceptance from the customer, performing a final reconciliation of cost actuals and budgets and rolling resources off the project. The PMO should formally close the project by archiving records, holding a lessons learned session, and celebrating the completion of the project. Additionally, all operational processes that had been performed by the project resources should be transitioned to the team that will perform the duties on a day-to-day basis. This certainly needs to include the management of an operational scorecard that tracks the savings or benefits from the transformation. These procedures should be fully documented, and a RACI should be delivered to document these responsibilities. The lessons learned should be documented and stored as a formal deliverable for future transformations (PMI, 2008).

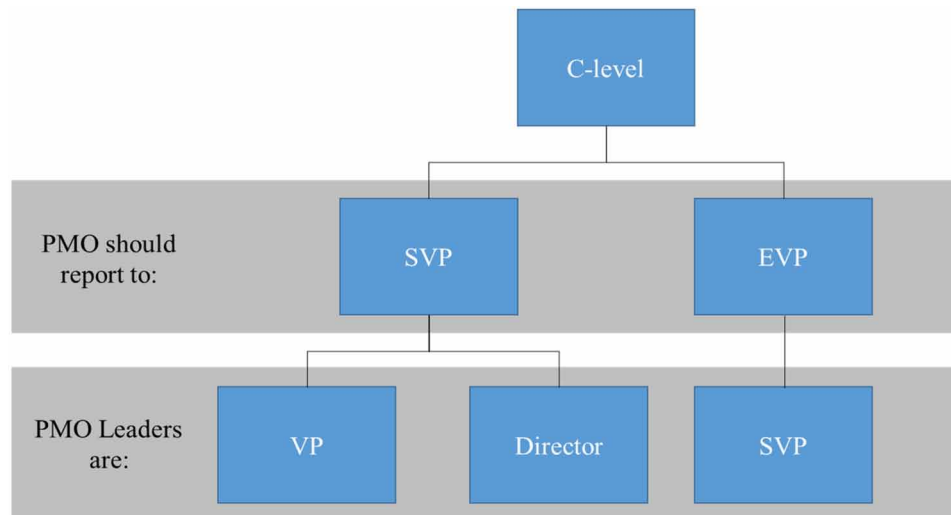
Ensure a Highly Skilled Leadership Team Is Leading the PMO and Support It

It is an absolute must for PMOs to have executive support of the business. In a 2018 survey from PMI, one in four organizations reported that inadequate sponsorship was the root cause of a project's failure (PMI, 2018). Senior executives must publicly state the need for the structure of the PMO and the value it provides. In exchange for this support, executive leadership must hold the PMO accountable for delivering the improvement that is expected. To formalize this relationship between PMO and business leadership, the PMO should report directly into senior leaders. Companies have even started using the title "Chief Projects Officer," a position which can report directly to the CEO (Forrester, 2013). Below is a representation of the recommended level of the PMO leaders and to whom they report.

The organizational structure sets the tone in terms of support and authority by the PMO, but it is equally important to establish the PMO early on in the process and not after the charter has been established. It is much more effective to have the PMO play an integral role in the development of the business case and the set-up of the overall program resources and activity schedule. The PMO team should consist of individuals that are knowledgeable of both the overall business and its supply chain. Only high potential resources should be moved into and out of PMO roles. The PMO roles should be considered a high visibility career builder for the resource. Companies should never consider low or marginal performers for PMO roles. All of this ultimately helps to establish credibility for the PMO and to ensure it is not perceived as unnecessary overhead by the supply chain stakeholders.

After organizational alignment, it is important to understand the skills and training necessary for PMO resources. For a supply chain transformation, the competencies required are both in the realm of project management and supply chain management. For project management skills, it should be expected for leadership to have skills and accreditation in this area. The Project Management Professional (PMP) certification is an internationally recognized designation based on the Project Management Institute's Project Management Body of Knowledge (PMBOK). It is considered the best project management

Figure 5. Recommended alignment of PMO with senior leadership for digital supply chain transformation



accreditation in the world. In a survey, 72% of PMO leaders felt certification is very relevant for mid-career project managers (PMI, 2018). There are other certifications available such Program Management Profession (PgMP), and Portfolio Management Professional (PfMP), but PMP is the most recognized and most popular. It is not entirely necessary for PMO leaders to possess the PMO designation, but it guarantees a high level of project management knowledge.

PMOs act as a central hub in an organization by interacting and building relationships inside and outside the business. They work with clients, senior leaders, rank and file managers, vendors and others, so they will need advanced communication skills. Yet, this is an area that is often neglected when it comes to professional development. It should be emphasized that the PMO have skills and experience with stakeholder management, negotiation, communication, presentation, group facilitation and coaching. These softer skills are every bit as important as the more technical project management, supply chain or digital transformation skills (Woerner and Aziz, 2007).

Create the Business Case and “Burning Platform” for Change

Projects like digital supply chain transformation that are long, complex and difficult will cause people at some point to ask the question “Why are we even doing this.” The term “digital supply chain transformation” returns 31.7 million links when searched on Google, so clearly it is a popular topic, but it is important for firms to understand the value it drives to the actual business. Understanding and measure this value is a process known as benefits realization management. Once the PMO is able to quantify the savings in areas like inventory, premium freight, overtime and direct labor, they need to build a scorecard to actually measure them to ensure the savings are occurring after implementation has occurred. Then, this responsibility of measuring and managing the metrics has to be assigned to an actual person in the PMO. Finally, the metrics need to be built into the performance management process of leadership and supply chain stakeholders. Below are the details on each of these steps.

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1. The first step is to identify the areas of the operation in which savings can actually occur. For supply chain initiatives, typical areas of expense saving are freight, premium freight, overtime or direct labor for planning, warehousing, logistics or other areas with redundancy. Growth metrics like service levels or on-time-in-full (OTIF) are areas that are difficult to translate into savings, but should be tracked nonetheless. Working capital, specifically inventory, should also be considered as a potential source of savings. The carrying cost of inventory (a minimum of 10%) should be considered an expense savings. The PMO must understand and quantify these baseline levels of expense and inventory and then estimate the percent improvement that can be made after the transformation is implemented. Operational budgets are often times used as baselines, but the authors urge caution here because budgets can sometimes vary significantly from actual performance. Therefore, it is recommended to develop these baselines based on the actual historical performance of these metrics. From the baseline, percent improvements are estimated. One way to generate these improvement estimates is to quantify the benefit associated with prior success stories using less sophisticated or home grown tools and then extrapolating to the entire scope of the operation. For example, if a plant or business unit recently developed an offline full truck load (FTL) optimizer spreadsheet to optimize truckloads, then the freight savings from this operation could be applied proportionally to the rest of the business, assuming the digital supply chain transformation will be providing this benefit as well. Once these savings are fully estimated, their realization should be scheduled based on the project plan. In the author's experience, at least 6 months should be planned between when the transformation is deployed to a certain scope element (e.g., business unit, geography, plant, etc.) and when that scope element actually starts to experience some savings. Additionally, the benefits need to be ramped up to their full estimation over a period of at least 1 year. As an example of a potential ramp-up schedule, if a solution was deployed to a business in January of 2018, benefits should not be scheduled to be realized until July of 2018, and full realization of steady state benefits will not occur until July of 2019. Once the schedule of benefits is understood, the PMO should perform the discounted cash flow analyses necessary to determine the Net Present Value (NPV) and the Internal Rate of Return (IRR). These are two very key values necessary to obtain and maintain support for senior C-suite level leadership.
2. Based off this quantified business case, an operational scorecard should be built to track these metrics. Operational KPIs for supply chain improvements must be kept simple. Developing too many KPIs will only dilute the message of the important few. Additionally, charts should be kept simple, straightforward and easy to understand. There should be absolutely no question as to what is being measured, what the values are and if it is improving. Once this scorecard is developed, it needs to be built into the overall balanced scorecard of the organization. If there is not a balanced scorecard established, the PMO must work to integrate these metrics into the overall DNA of the organization. Examples of ways to do this include building it into the monthly leadership message, posting it to an intranet portal or just scheduling meetings routinely to review it. The figure below is an example of an operations scorecard for a supply chain transformation.
3. Instead of just off-loading the responsibility of updating and managing the scorecard to a financial analyst, it needs to be owned specifically by someone in the PMO. In the largest of transformations, there are actual Benefits Realization Managers. In small projects, this is formally assigned to a project manager or other PMO staff. Once the transformation is completely implemented, this responsibility needs to be handed off to a specific supply chain stakeholder who will own the process of updating it and managing it going forward. 94% of highly mature organizations always formally

Figure 6. Example operations scorecard for benefits from supply chain transformation (Wiseman, 2018)



identify person(s) accountable for achieving business benefits versus 19% with low maturity (PMI, 2018). The key enabler for this accountability is owning the scorecard.

4. The final step of creating the burning platform for the digital supply chain transformation is to build these new metrics of supply chain improvements into the actual performance management process of leadership and supply chain stakeholders. If supply chain management is important enough to a firm to launch a digital supply chain transformation, then it needs to be reflected in what the organization considers important. To truly drive behavior that supports and owns the new capabilities from the transformation, the organization has to measure people in new ways that are aligned with the intended benefits of the project.

This process of benefits realization management is critical to achieving the transparency and credibility of the transformation. Symcor, a leading financial process services provider, measures projects based on the criteria in their corporate objectives: revenue, cost reductions, efficiencies and growth. Their Enterprise Project office then measures the achievement of these criteria against the cost to operate the project, and publishes the results in a document they call the business case analysis (BCA). Once a month, the BCA for each project in their portfolio is reviewed, allowing them to prioritize projects based on their return on investment. In some cases, projects were actually cancelled because they were operating at a loss. Symcor has attributed their benefits realization management process as a main reason for over \$72 million in cost reductions and their overall strategic growth in recent years. Although their service is clearly different than that of a supply chain, they are recognized as a benchmark for benefits realization management (PMI, 2017).

FUTURE RESEARCH DIRECTIONS

Digital transformations are fundamentally different than other projects because the capabilities in data science have changed so much. The skills necessary to lead the PMO have therefore changed as well. As a result, PMO resources will eventually need to be proficient with predictive analytics, artificial intelligence (AI), machine learning and other advanced data science concepts. Project management systems themselves are actually starting to use AI to automate certain tasks like matching resources with tasks or compiling the knowledge management system for the project.

CONCLUSION

To summarize this chapter, the PMO is an integral part of major transformations. They become even more critical for supply chain transformations given the complexity, the number of functions involved, and the opportunity for significant reductions in working capital and expenses or improvements in service levels. If the PMO is constructed or managed poorly, it can be perceived as unnecessary overhead to an already expensive project. If it is not managed right, other initiatives within the organization can steal resources or funds away from the transformation. Additionally, poor change control processes can allow the project to take on unintended scope, which will result in the transformation not being able to address the objectives in the charter and ultimately running out of funding before the implementation is complete. A final key challenge reviewed here is the situation where there is a lack of integration between the workstreams, resulting in multiple independent “sub-projects” with minimal synchronization. To combat these challenges, the PMO must develop a highly structured set of deliverables to guide the project through the Initiating, Planning, Executing, Monitoring and Controlling, and Closing phases of the transformation. All along the way, it is critical that a highly skilled and trained PMO is perfectly aligned to the transformation sponsors and senior leadership. Finally, the PMO must build a solid business case and operational scorecard to socialize, track and ultimately prove that the transformation has been a success to the business.

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KEY TERMS AND DEFINITIONS

Critical Path: The series of tasks that must finish on time for the entire project to finish on schedule. Each task on the critical path is a critical task. A project can go no faster than the critical path.

Integrated Change Control: Process performed by the PMO to evaluate new requirements or enhancements and then determine if they will be added to the scope of the project.

Integrated Project Plan: Document that contains all the activities necessary to perform the transformation. Typically, each workstream has its own project plan, but they are integrated into a single plan by the PMO.

Interdependencies: The relationships among tasks in different workstreams which determine the order in which activities need to be performed. Relationships between activities in the same workstream are dependencies, but if the activities are in different workstreams, they are referred to as interdependencies. There are four types of dependency relationships: finish to start, start to start, finish to finish, and start to finish.

Program Management Organization (PMO): A team of project managers and staff responsible for the centralization and coordination of the entire project. PMO can also stand for project management office when the project has a smaller scope and it can stand for Portfolio Management Office when the PMO is managing multiple projects or programs at the same time.

Project Management Body of Knowledge (PMBOK): A very comprehensive set of project management best practices published by the Project Management Institute. The PMBOK is the definitive standard for establishing and running PMOs.

Scope Creep: The phenomenon of adding features, functionality, geographies, business units, or anything else to the project that broadens the originally agreed upon scope that is documented in the charter. Scope creep occurs when the scope is not properly defined, or the change control process is not being enforced or it is incapable of detecting or monitoring the project.

Workstream: A work package of the project with its own resources, scope and objectives. Workstreams are the major components of a work breakdown structure. Typical workstreams for a digital supply chain transformation include demand planning, supply planning, inventory management, change management master data management, and integration.



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