



A monthly newsletter of the Energy Facility Contractors Group's Project Delivery Working Group

Issue 27

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Fall is a Good Time for Reflection

Greetings fellow "Practitioners"! Fall is fully upon us and our environment is changing once again. Sunlight arrives later and disappears earlier, leaving us to adapt and hopefully get the most out of each changing day.

Speaking of "Environment", in last month's issue we shared a few agenda items from the PDWG Project Controls Subgroup (PCSG) meeting held September 20, 2021. We looked at an overview of our collective (DOE/EFCOG) mission to improve the approach of assessing and improving earned value management systems.

In this month's issue we provide a more comprehensive look at the background of the study as first published in the March and April 2021 "DOE Project Management News" two-part series, "Improving the Maturity and Environment of the Earned Value Management System (EVMS): Development of an EVMS Rating Index" authored by David Kester, Office of Project Controls (PM-30). Our look back is in anticipation of moving ahead with a broader implementation of the "maturity" and "environmental factors" approach in conducting EVMS reviews.

Development of an EVMS Rating Index

Part 1

Background:

Since late 2018, the Department has been collaborating with Arizona State University, major contractors, and other federal agencies including Department of Defense (DoD), National Aeronautics and Space Administration (NASA) and the National Reconnaissance Office (NRO), in a study to identify the factors that contribute to a mature, effective, and reliable earned value management system (EVMS). The study also assessed the association between the maturity of the EVM System and project outcomes; namely, whether there is a positive correlation between the effectiveness EVMS, its cost, and the success of a project.

The EVMS integrates the work scope, schedule, and budget with technical, quality, and safety parameters through systematic planning and effective controls during a project's life cycle. The EIA-748 standard defines the qualities and characteristics of a compliant EVMS. It looks to objectively measure the actual performance of work scope and the associated cost and schedule performance against an agreed-to baseline plan. It follows a disciplined means of change control for documenting any changes to the agreed-to baseline plan.

Continues on next page

Development of an EVMS Rating Index

Continued from previous page

Purpose:

The purpose of an EVMS and the requirements of the EIA-748 standard are not opposing narratives. Both expect an intelligently designed and well-implemented EVMS to develop credible plans, schedules, and budgets, and to assess emerging project issues in a timely and transparent manner to support informed decision making. Its sole purpose is to position the project (and its team) for success. And while the EVMS (formerly known as Cost/Schedule Control System Criteria) has been leaned on heavily by the government and industry alike since the mid-1960s, its contributions to a project's success remains a legitimate question by its users.

In November 2018, a research study was initiated by the Office of Project Management (PM) to answer the question of whether an effective/compliant EVMS can contribute to a project's success in meeting its technical, safety, and quality objectives on schedule and budget. Is there a positive correlation between the effectiveness of the EVMS, its cost, and the success of a project? The research study includes the systematic collection and analysis of data related to the field of project management and the implementation of the EVMS following a proven research methodology with the primary goal to design and produce an EVMS Maturity Model and rating index.

The envisioned EVMS maturity model, currently referred to as the EVMS Maturity and Environment

Total Rating (EVMS METR, now called the

Integrated Project/Program Management [IP2M] Maturity and Environment Total Risk Rating [METRR]), assesses the current state of maturity and environment of an EVMS to utilize data and information for those capital asset projects requiring compliance with EIA-748, and for those other projects seeking a reliable project management approach. The EVMS maturity and environment levels consider multiple attributes and factors, leading to a consistent, effective, and reliable EVMS assessment. The research study is scheduled to be complete in December 2021.

Research studies typically begin with a question or an inquiry about a specific problem or topic. For subject matter experts (SMEs) studying the effectiveness of EVMS implementation, the question pursued in this research study was spurred by the need to elevate the worth and utility of the EVMS through unbiased scientific research with the assistance of Arizona State University (ASU).

With the active participation of multiple departments and agencies, the envisioned EVMS maturity model considers a broad and diverse range of perspectives on the topic thus enabling its acceptance by federal and non-federal projects alike.

As part of the solution to the inquiry, the research study is developing an automated software tool that enables projects to define EVMS effectiveness/compliance based on expected attributes to calculate a weighted EVMS rating index (much like a Fair Isaac Corporation (FICO) score) that provides

“Does an EVMS provide the insights and benefits as advertised, and if so, do they outweigh its costs?”

The PRACTITIONER

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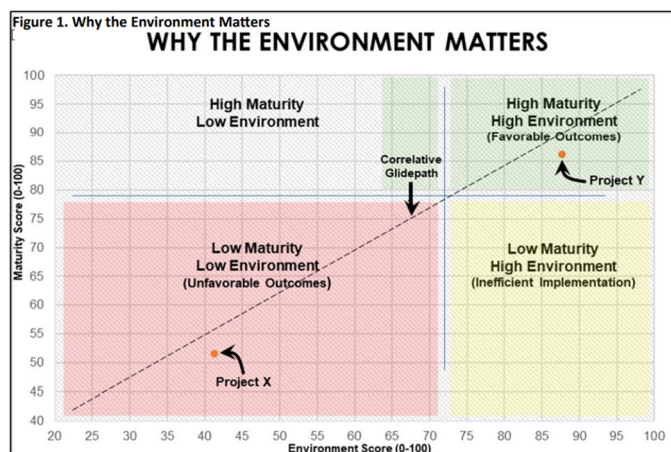
Development of an EVMS Rating Index

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insights into implementation outcomes. Much like FICO scores which are calculated from many different pieces of credit data in an individual’s credit report, an EVMS rating index will quantify the reliability of management processes and distinct attributes of the EVMS, individually and collectively. *Note: Fair Isaac Corporation, the first company to offer a credit-risk model with a score. Bill Fair and Earl Isaac are the founders.*

The EVMS METR generates two separate EVMS rating index scores: A maturity score and an environment score, both normalized to a 0-100 scale and then plotted on a matrix. The maturity score coming from the rating index will quantify the effectiveness of each EVMS process and its attributes, whereas the environment score will quantify the conditions in which the EVMS operates, including culture and leadership, team cohesion and competence, operating practices, and resource availability. Figure 1 shows the expected positive correlation between EVMS maturity and the environment in which it operates.

For example, Project X hypothetically records a suboptimal score for having a low maturity driven by a low environment resulting in poor performance outcomes. Conversely, Project Y hypothetically records an optimal score for having a high maturity driven by a high environment resulting in favorable performance outcomes.



Participants in the EVMS Research include Arizona State University, U.S. Department of Energy (DOE) to include the National Nuclear Security Agency (NNSA), U.S. Department of Defense (DoD) Acquisition Data and Analytics Office, Defense Contract Management Agency (DCMA), National Aeronautics and Space Administration (NASA), National Reconnaissance Organization (NRO), Mission Support Alliance, Lockheed Martin Co, BAE Systems, Washington River Protection Solutions, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratory, Raytheon Corp., CACI International, Fluor, and Jacobs.

Part 2

The EVMS maturity and environment levels consider multiple attributes and factors, for consistent, effective, and reliable IPM and EVMS implementation to position projects for success by meeting technical and quality objectives on budget and schedule.

Maturity Attributes

EVMS maturity templates have been developed by the research study and are being utilized in PM-30 EVMS reviews to assess the maturity of a contractor’s EVMS. Results to date appear to corroborate that low environment scores (e.g., an environment not fully embracing the rigors of implementing the EVMS) result in low maturity with numerous process incidents or data quality errors. Fifty-six (56) weighted maturity templates are used to appraise the maturity of the EVMS management processes and attributes. Similar to how FICO scores are weighted to place special emphasis on the different pieces of credit data in the credit report, the EVMS maturity level/score reflects how important a management process and attribute is for

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Development of an EVMS Rating Index

Continued from previous page

the level of risk and type of work being performed. Each maturity template defines at Level 4 the operating characteristics necessary for compliance with EIA-748 requirements. A primary benefit of the EVMS maturity level/score is to identify the gaps and provide an actionable result to achieve Level 4 for attributes scored at a level lower than 4. An example maturity attribute template is provided below.

Typical Maturity Attribute Template

SUB-PROCESS A: ORGANIZING	Maturity Level				
	LOW		MEDIUM		HIGH
	1	2	3	4	5
A.1. Product-Oriented Work Breakdown Structure (WBS)					
<p>A product-oriented Work Breakdown Structure (WBS) is developed for a given project and extended to the control account level, as a minimum, and lower levels (e.g., work package/planning package) as necessary for management control. A WBS displays and defines the products, and/or services, to be developed and/or produced. It is a product structure and not an organizational structure. Only one WBS exists.</p> <p>A WBS is a decomposition of all the work necessary to complete all authorized project scope including any revisions resulting from authorized changes and modifications. It uses nouns and adjectives to define work and is arranged in a hierarchy. It is constructed to allow for clear and logical groupings, either by activities or deliverables. The WBS should represent the work identified in the approved Project Scope Statement or Statement of Work (SOW)/Statement of Objectives (SOO) and serves as an early foundation for effective schedule development and cost estimating and map to the authorization documentation. Programs typically will develop a WBS as a precursor to a detailed project schedule. The WBS is accompanied by a WBS Dictionary, as required, which lists and defines WBS elements.</p> <p>The goals of developing a WBS are to define the work elements 1) for the project team to proactively and logically plan out the project to completion, 2) to collect the information about work that needs to be done for a project, 3) to organize activities into manageable components that will achieve project objectives, 4) facilitates data collection and traceability, and 5) provides a control framework for integrated project/program management. The number of levels of the WBS should be determined by management needs, project/program risk and complexity, and similar driving factors.</p> <p>Items to consider include:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Singularity of Work Breakdown Structure (WBS) <input type="checkbox"/> WBS tied to the project/program SOW/SOO <input type="checkbox"/> Traceability matrix (e.g., SOW, design requirements and build specifications) to WBS <input type="checkbox"/> WBS reflects base contract and modifications <input type="checkbox"/> WBS descriptive documents, such as a WBS dictionary, index, or similar document(s), that reflect and expand on the contract SOW/SOO <input type="checkbox"/> Work Authorization Documents (WADs) based on the dictionary pages (optional) <input type="checkbox"/> Other <p>The WBS should be integrated with the Planning and Scheduling process, Budgeting and Work Authorization process, Change Control process, Accounting Considerations process, and Analysis and Management Reporting process.</p> <p><i>References:</i> NDIA EVMS EIA-748-D Intent Guide GL 1; DoD EVMSIG GL 1; DOE CAG GL 1; EIA 748-D; NDIA PASEG; MIL STANDARD 881 Rev E; ISO 21508:2018(E); ANSI PMI 19-006-2019</p>	Not yet started.	<p>A singular, high-level product-oriented WBS is established. WBS does not decompose to capture all work requirements.</p>	<p>Processes to require a singular, product-oriented WBS are established. WBS is traceable, and decomposed to the appropriate levels for effective project/program management. The WBS includes most of the authorized work scope / requirements.</p>	<p>Processes requiring a singular, product-oriented WBS are established and approved. WBS is traceable, encompassing all authorized work and decomposed to the appropriate levels for effective project/program management and external reporting. The required WBS is validated through internal checks per approved processes annually.</p>	<p>The singular product-oriented WBS is reviewed, revised and validated annually or more frequently as needed, with revision history, per approved processes, through in-process internal checks.</p>
		<p>The process to establish a singular, product-oriented WBS has started, but is not documented. The hierarchical WBS is not fully traceable to the SOW and is missing SOW scope. The WBS is functionally oriented and lacks product orientation. Products often do not fulfill project/program requirements.</p>	<p>The process to establish a singular, product-oriented WBS that accurately reflects the products, services, and deliverables required to complete the project/program has been developed. No internal checks are in place to validate that the WBS meets requirements. Most products fulfill project/program requirements.</p> <p>The WBS hierarchy initially is product-oriented, but the WBS as extended to lower levels becomes functionally oriented in an organizational or functional orientation.</p> <p>The WBS is coordinated with the Planning and Scheduling process, Budgeting and Work Authorization process, Change Control process, Accounting Considerations process, and Analysis and Management Reporting process.</p>	<p>The process to establish a singular, product-oriented WBS that accurately reflects the products, services, and deliverables required to complete the project/program has been developed, documented and approved.</p> <p>Internal checks are in place to validate that the WBS meets project/program requirements. Checks may be outside the WBS process flow. The project/program ensures that the WBS is verified as product-oriented, with corrections performed as required during project/program start-up. Products fulfill all project/program requirements. If required, WBS descriptive documents such as a WBS dictionary, index, or similar document(s) have been developed.</p> <p>The WBS is fully integrated with the Planning and Scheduling process, Budgeting and Work Authorization process, Change Control process, Accounting Considerations process, and Analysis and Management Reporting process.</p>	<p>The WBS is optimized to streamline management of the project/program. Internal checks are in place to validate that the WBS meets project/program requirements within the WBS process flow.</p> <p>Automated testing ensures that the established WBS is a product-oriented hierarchical decomposition of hardware, software and services. Necessary corrective actions are implemented, completed, and recurring issues resolved.</p> <p>Routine surveillance results of the WBS are fully disclosed with all key stakeholders, who maximize use of these results.</p> <p>The WBS is continuously improved and optimized.</p>

If following assessment and scoring of all 56 attributes the Capability Maturity Model Integration (CMMI) Levels of Capability and Performance are applied as a way to characterize a contractor’s EVMS Maturity results, a maturity index score approaching 0.6 would fall within the “Defined Stage” as depicted by the blue needle in the figure on the next page. At this stage, there are sets of defined and documented standard processes established that are subject to some degree of improvement over time. While these standard processes are in place, they have not been systematically or repeatedly used. If a contractor’s EVMS is already EIA-748 certified, it should be operating at the “Managed Stage” where the EVMS is capable of effectively using process metrics to achieve programmatic objectives evidenced across a range of conditions as depicted by the range of green needles.

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Development of an EVMS Rating Index

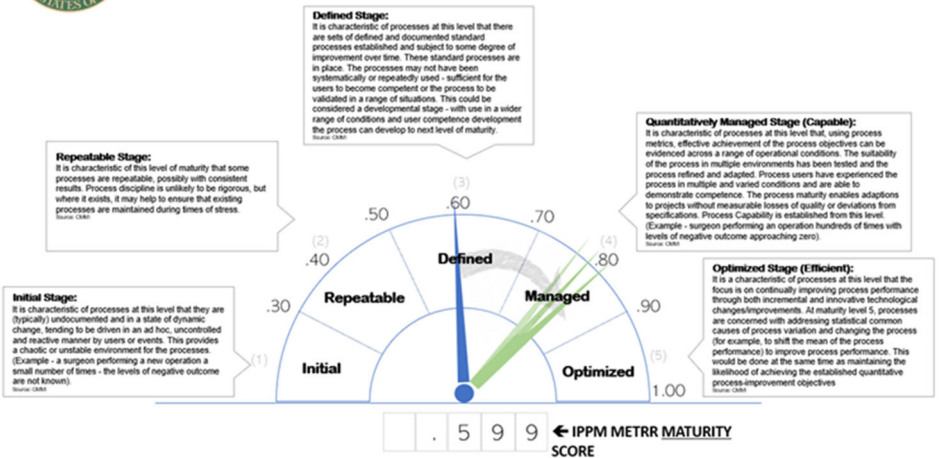
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Environmental Factors

The "Environment" refers to events, factors, people, systems, structures, and conditions, both internal and external to a project, that influence the implementation of the EVMS. Culture, people, practices, and resources are elements typically associated with an environment that will influence a project's activities, decisions, behaviors, and the attitudes of team members responsible for implementing the EVMS. Environment factor templates are used to appraise the internal and external influences on the implementation of the EVMS. Figure 3 shows the environment factor template for the assessment of "Culture." The highlighted areas of the template describe the factors affecting an organization and project culture. Each factor is assigned a weighted score based on the results of numerous surveys and workshops conducted by ASU as part of the research study.



EVMS Maturity Scoring - Stages Defined



Typical EVMS Environmental Factors and Factor Descriptions Template

EVMS Environment Assessment	
EVMS Environment Factors and Factor Descriptions	
Total of 27 Factors: Culture (7 factors), People (6 factors), Practices (8 factors), and Resources (6 factors)	
1. Culture (7 factors)	
<i>Culture is, by definition, the display of behaviors. Organizational culture is a system of common assumptions, values and beliefs (or the lack thereof) that governs how people behave in organizations. Organizational values and beliefs should align with the development and outcomes of a successful EVMS. The project/program culture can enable or hinder the effectiveness of the EVMS.</i>	
1a.	The contractor organization is supportive and committed to EVMS implementation, including making the necessary investments for regular maintenance and self-governance.
1b.	The customer organization is supportive and committed to the implementation and use of EVMS.
1c.	The project/program culture fosters trust, honesty, transparency, communication, and shared values across functions.
1d.	Effective teamwork exists and team members are working synergistically toward common project/program goals.
1e.	The project/program leadership effectively manages and controls change using EVMS, including corrective actions and continuous improvement.
1f.	Alignment and cohesion exist among key team members who implement and execute EVMS, including common objectives and priorities.
1g.	Project/program leaders make timely and transparent decisions informed by the EVMS.
2. People (6 factors)	
<i>People denotes the individuals who represent the interests of their respective stakeholders (e.g., project business manager, project control analyst, project schedule analyst, acquisitions/subcontracts, control account manager, Integrated Project/Program Team (IPT) or line/resource management) and are adept in the relevant subject matter, in order to contribute to the process that leads to favorable project control outcomes.</i>	
2a.	The contractor team is experienced and qualified in implementing and executing the EVMS.
2b.	The customer team is experienced in understanding and using EVM results to inform decision-making.
2c.	Project/program stakeholder interests are appropriately represented in the implementation and execution of the EVMS.
2d.	Project/program leadership is defined, effective, and accountable.
2e.	Team members responsible for the EVMS implementation and execution phases are co-located and/or accessible.
2f.	Professional learning and education of key individuals responsible for EVMS implementation and execution, is appropriate to meet project/program requirements.

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Development of an EVMS Rating Index

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Forming, Storming, Norming, Performing

The four stages of group development (Forming, Storming, Norming, Performing) can be used as a reference to place environment factor index score in perspective. These stages were originally defined by Bruce Tuckman (in the 1960s) who believed that there are four phases for teams to go through for them to grow and deliver results and to overcome challenges, tackle problems, find solutions, and plan work. For example, an Environment

Factor index score approaching 0.6 would indicate the project's environment is in the later stage of "Storming" as depicted by the blue needle in the figure at right. This stage is a period marked by conflict and competition as individual personalities emerge. Team member performance decreases in this stage because energy is put into unproductive activities.

Members may disagree on team goals, and subgroups and cliques may form around strong personalities or areas of agreement. To get through this stage, members must work to overcome obstacles, to accept individual differences, and to work through conflicting ideas on team tasks and goals. Teams can get bogged down in this stage. Failure to address conflicts may result in long-term problems. The storming stage is the most difficult and critical stage to pass through.

For a project well over 50% complete, the expectation should be that a project team is operating at the later stage of "Norming" or preferably the beginning stage of "Performing" where conflict is resolved, and some degree of unity emerges, as depicted by the range of green needles.

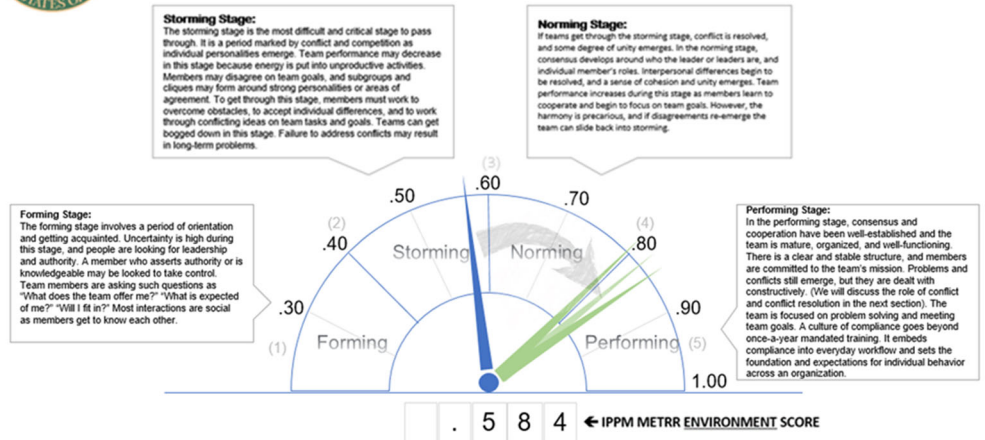
In the "Norming" stage, a consensus develops around who the leader or leaders are, and individual member's roles. Interpersonal differences begin to be resolved, and a sense of cohesion and unity emerges. Team performance increases during this stage as members learn to cooperate and begin to focus on team goals.

Getting to the "Performing" stage is of paramount importance where problems and conflicts still emerge, but they are dealt with constructively and promptly. A culture of compliance goes beyond once-a-year mandated surveillance and training. It embeds the use of the EVMS into everyday workflow and sets the foundation for individual behaviors.

PM-30 is currently finalizing the maturity and environment content and weightings based on previously conducted survey's, workshop observations and results, lessons learned incorporation from previously performed EVMS reviews where the tools were piloted, and ongoing testing and field implementation the EVMS METR. Being able to think differently is a basic definition of innovation and is also a definition of how to be smart about the implementation of the EVMS. The communication of research study results and field of the



EVMS Environment Scoring - Stages Defined



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Development of an EVMS Rating Index

Continued from previous page

automated tool and use of the rating index across departments and agencies will be important first steps in explaining and promoting the relationship of EVMS maturity to the environment in which it operates. By establishing statistically meaningful evidence taken from the research study, project managers will know how to best utilize the EVMS to its full potential towards meeting work scope, schedule, and budget objectives. By doing so they take the first of many important steps towards creating the right environment for success.

Please join PM-30 and EFCOG in attending an upcoming "Getting the Word Out" WebEx session currently scheduled for December 7th and the 14th. A link to register will be provided in an upcoming communication.

It is Not One World — What We Do and How We Do it Matters!

What Are Lessons Learned in Project Management

By Anne Meick – October 25 & 26, 2021

The lessons learned review held as part of a project close is an important and valuable experience for all project members. No matter the size or subject of the effort, there are always things that went well and things that could have gone better. Understanding the complete picture helps project managers and project teams learn from the experience and take those lessons to apply them to future work.

Traditionally, the lessons learned review is held at the end of a project. It is a discussion of the knowledge gained from the process of conducting a project, the successes and failures as a team, and an effort to repeat the positive aspects and not repeat the mistakes. This is also called a post-mortem, after-action review, wrap-up, project success meeting, or a retrospective in agile.

Benefits of Discussing Lessons Learned

There are many benefits to be had when reviewing a project as a whole, and revisiting project facts such as goals, timeline, budget, milestones, and success metrics. Diving into the details makes clear what the goal was, what occurred and why, what worked and what did not. Put things into context by addressing these questions:

- What did you set out to do?
- What actually happened?
- Why did it happen?
- What are you going to do next time?

How to Host a Lessons Learned Meeting

Create and share an agenda beforehand that includes the following sections to be covered within a certain timeframe, usually 60 to 90 minutes:



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What Are Lessons Learned in Project Management

Continued from previous page

- Brief welcome
- Project overview, including milestones and timeline
- What did you learn?
 - Successes
 - Challenges
 - Other Insights
- Priorities: What matters most?
- Changes to make and action planning
- Identify the items to take into future projects
- Closing and thank you

Encouraging Engagement

Begin by focusing on the positive outcomes. This can be borrowed from an agile retrospective and applied to any project. Regardless of what you discover, understand and truly believe that everyone did the best job they could given what was known at the time, and taking into account skills and abilities, resources available, and the situation at hand. At the end of a project everyone knows so much more. Naturally you will discover decisions and actions you wish you could do over. This is wisdom to be celebrated, not judgement used to embarrass.

Include a check-in activity. In roundtable style, ask what is one word that they can use to describe how the project went. The first word that comes to mind is usually pretty honest and accurate.

The main course. This is the opportunity to gather data, check on individual morale, discuss positive aspects, recognize people, and seek improvements. Drive the team to reflect about the given context, reinforce a shared vision, and generate insights. This is the point where team members feel heard. Each individual is acknowledged and is visible to the whole team for their five minutes of fame. If the team expresses frustration or brings up blockers, you can channel this energy into a discussion about how to do better going forward.

Actionable items. Create specific action items from the lessons learned review and continue to work on the backlog. Send out meeting notes to the team they can use as a reference for future work and to recall specifics.

Questions to Ask During a Lessons Learned Review

There are many questions to ask during a lessons learned meeting to get the valuable information you want. Often, it may be helpful to ask the same questions in different ways — this can help team members see the topic in a different light. The table below offers examples of questions to ask, separated by topic. Use this list to guide your discussions:

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What Are Lessons Learned in Project Management

Continued from previous page

<u>Topic</u>	<u>Question</u>
Reviewing the plan	<p>What was supposed to happen?</p> <p>What actually happened?</p> <p>What did you set out to achieve?</p> <p>What was your plan to achieve this?</p> <p>How did the plan change as you progressed?</p>
What worked	<p>What worked really well during this project?</p> <p>What should we make sure we do again in the future?</p> <p>Which tools or techniques proved to be useful?</p> <p>What did we do well, that if we don't discuss we might forget?</p> <p>Which of our methods or processes worked particularly well?</p>
Challenges	<p>Where did we run into challenges?</p> <p>What was painful but necessary?</p> <p>Where did we get lucky?</p> <p>What can we do to ensure we succeed if we aren't so lucky next time?</p> <p>What was unexpected?</p> <p>Which tools or techniques were not useful?</p> <p>What was the biggest impediment?</p> <p>Which of our methods or processes were difficult or frustrating to use?</p>
People	<p>Who helped you on this project?</p> <p>What did you learn about working with this client?</p> <p>What conflicts occurred?</p>
Introspection	<p>Are you proud of our finished work? Why or why not?</p> <p>What compromises were made?</p> <p>What was the most gratifying or professionally satisfying part of the project?</p> <p>What helps us to be successful as a team?</p> <p>Are there any lessons for you personally?</p>
Results	<p>Did we get the results we wanted?</p> <p>Did this project make an impact?</p> <p>What important decisions were made during this project?</p> <p>What should we have learned from this project a year from now?</p> <p>What advice would you give yourself if you were to go back to the start of the project?</p>
Unfinished business	<p>What's still keeping you awake at night?</p> <p>What did we leave unresolved?</p> <p>What still puzzles us?</p> <p>What else could we do better next time?</p>

Project managers have the power to encourage their teams to learn from mistakes and successes. Put emphasis on what the team did correctly, as this can segue naturally into what was not done well and could use improvement. The goal should be to provide meaningful and constructive feedback and lead by example.

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What Are Lessons Learned in Project Management

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Why the Lessons Learned Phase Is Often Skipped

There are many reasons the lessons learned may be skipped. Often it is due to time pressure, immediate positive results, burnout over a long period of time, or the challenge of getting everyone together one more time.

Not everyone sees the benefit of revisiting something that was just completed, especially if there is a post-launch monitoring phase or pilot in progress. Sometimes it is simply that too much time has passed before lessons learned are considered at all. You will achieve the best results immediately following the project end if you include lessons learned as part of the closing process.



Anne Meick

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<https://project-management.com/lessons-learned-project-management/>

UPCOMING EVENTS

- 📅 **2021 Decommissioning Strategy Forum**
November 1-2, 2021, JW Marriott Las Vegas Resort & Spa, Summerlin, NV
[2021 Decommissioning Strategy Forum - Choose Registration \(eventscloud.com\)](#)
- 📅 **2021 RadWaste Summit**
November 3-5, 2021, JW Marriott Las Vegas Resort & Spa, Summerlin, NV
[2021 RadWaste Summit - Choose Registration \(eventscloud.com\)](#)

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“Trying to manage a project without project management is like trying to play a football game without a game plan.”

— Karen Tate



Just for Fun: October's Notable Events and Famous Birthdays

1 — Yosemite National Park was established (1890), President Jimmy Carter was born (1924), the People's Republic of China was established (1949), Roger Maris broke Babe Ruth's single-season home run record with his 61st (1961), and 58 people were killed in a mass shooting in Las Vegas (2017).

2 — The Texas Revolution began (1835), Bob Gibson set the World Series single-game strikeout record with 17 (1968), TV personality Kelly Ripa was born (1970), and actor Rock Hudson died of AIDS (1985).

3 — Thanksgiving became an official holiday (1863), Iraq became an independent nation (1932), Britain successfully tested an atomic bomb (1952), and O.J. Simpson was acquitted of murder (1995).

4 — President Rutherford B. Hayes was born (1822), construction of Mount Rushmore began (1927), the Soviet Union launched *Sputnik*, the first artificial satellite, into orbit (1957), and Pope Paul VI became the first pope to visit the U.S. (1965).

5 — President Chester Arthur was born (1829), President Harry Truman delivered the first televised presidential speech (1947), the New York Yankees won a record fifth consecutive World Series title (1953), **the first NC-17 film rating was given for *Henry & June*** (1990), and Apple founder Steve Jobs died (2011).



6 — The first train robbery in the U.S. was staged (1866), and the Yom Kippur War between Israel and Egypt/Syria began (1973).

7 — The assembly line made its debut in a Ford factory (1913), East Germany was established (1949), rock star John Mellencamp (1951) and music judge Simon Cowell (1959) were born, and Operation Enduring Freedom began in Afghanistan (2001).

8 — Automobile inventor Frank Duryea was born (1869), the Great Chicago Fire began (1871), civil rights leader Jesse Jackson (1941) and actor Chevy Chase (1943) were born, Don Larsen pitched the only perfect game in World Series history (1956), actor Matt Damon was born (1970), and impeachment proceedings against President Bill Clinton began (1998).

9 — Hoover Dam began transmitting electricity (1936), and Beatle John Lennon was born (1940), but EV guru J. Greg Smith had not been born yet.

10 — The U.S. Naval Academy was established (1845), the first major operation of the Vietnam War began (1965), quarterback Brett Favre was born (1969), and stock car racer Dale Earnhardt Jr. was born (1974).



11 — Quarterback Steve Young was born (1961), the first manned Apollo mission launched (1968), and **Saturday Night Live debuted** (1975).

12 — Christopher Columbus reached the New World (1492), and singer John Denver died in a plane crash (1997).

13 — The Continental Navy was established (1775), the cornerstone of the White House was laid (1792), singer/songwriter Paul Simon (1941) and rocker Sammy Hagar (1949) were born, Bill Mazeroski hit the first ever World Series-winning walkoff home run (1960), and football Hall of Famer Jerry Rice was born (1962).

14 — General and President Dwight Eisenhower was born (1890), USAF Capt. Chuck Yeager broke the sound barrier (1947), the Cuban Missile Crisis began (1962), and rapper/singer Usher was born (1979).



15 — **TV chef Emeril Lagasse was born** (1959), and Wayne Gretzky broke the NHL career scoring record with 1,851 points (1989).

16 — Dictionary author Noah Webster was born (1758), China successfully tested its first nuclear bomb (1964), "Baby Jessica" was rescued from a well on live TV (1987), and 84 people died in a stampede at a World Cup match in Guatemala (1996).

17 — Motorcycle daredevil Evel Knievel (1938) and rapper Eminem (1972) were born, OPEC enacted an oil embargo on the U.S. and other nations (1973), and a 7.1 magnitude earthquake hit the Bay Area, postponing Game 3 of the World Series for 10 days (1989).

18 — The Mason-Dixon Line was established (1767), the U.S. took possession of Alaska (1867) and Puerto Rico (1898), singer Chuck Berry (1926), and NFL coach Mike Ditka and JFK assassin Lee Harvey Oswald (1939) were born.

19 — The American Revolutionary War ended with the British surrender at Yorktown, Va. (1781), and Maurice Richard became the first NHL player to score 500 goals (1957).

20 — The Louisiana Purchase was ratified (1803), baseball Hall of Famer Mickey Mantle (1931), rocker Tom Petty (1953) and rapper Snoop Dogg (1972) were born, and three members of Lynyrd Skynyrd died in a plane crash (1977).

21 — Jazz trumpeter Dizzy Gillespie (1917) and actress Carrie Fisher (1956) were born, and **about 100,000 antiwar protesters marched on the Pentagon** (1967).



22 — Actor Christopher Lloyd was born (1938), the U.S. suffered its first casualties in Vietnam (1957), President John F. Kennedy ordered a blockade of Cuba (1962), and Lance Armstrong was stripped of his 7 Tour de France titles (2012).

23 — TV personality Johnny Carson (1925) and musical parodist Weird Al Yankovic (1959) were born, and a car bomb exploded at the U.S. Marines barracks in Beirut, Lebanon, killing 241 (1983).

24 — The first transcontinental telegraph line was completed (1861), the United Nations was formally established (1945), Toronto won Canada its first World Series title (1992), and the supersonic Concorde jet made its last flight (2003).

25 — Artist Pablo Picasso was born (1881), and the U.S. invaded Grenada (1983).

26 — The Erie Canal opened (1825), the Shootout at the OK Corral occurred (1881), TV gameshow host Pat Sajak and politician Hillary Clinton (1947), and actor Dylan McDermott (1962) were born, and President George W. Bush signed the Patriot Act (2001).

27 — President Theodore Roosevelt was born (1858), New York's subway system began operation (1904), the Cuban Missile Crisis ended (1962), and **the Boston Red Sox won their first World Series title in 86 years** (2004).



28 — The Statue of Liberty was dedicated (1886), Congress overruled President Wilson's veto and enacted Prohibition (1919), rich guy Bill Gates was born (1955), actress Julia Roberts was born (1967), and the Digital Millennium Copyright Act was signed (1998).

29 — The stock market crashed, touching off the Great Depression (1929), actor Richard Dreyfuss was born (1947), the Suez Crisis began when Israel invaded Egypt (1956), and guitarist Duane Allman died in a motorcycle crash (1971),

30 — President John Adams was born (1735), "The War of the Worlds" was broadcast, causing a nationwide panic (1938), actor Henry Winkler was born (1945), and **Muhammad Ali beat George Foreman for the heavyweight title in the "Rumble in the Jungle"** (1974).



31 — Nevada became a state (1864), Magician/escape artist Harry Houdini died (1926), Earl Lloyd broke the color line in the NBA (1950), rapper Vanilla Ice was born (1967), and Indian prime minister Indira Gandhi was assassinated (1984).

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