

Teaching Strategies

- The two vignettes in this chapter address the lessons students should have learned during a project in which they participated. The lessons learned should be recorded as the project progresses so they are not forgotten by the time the project is finished. **(See Premium Deck for Slides.)**
- Becoming accustomed to recording and reflecting on lessons learned from each project can be an invaluable way to help save expenses on the next project. It can help project managers avoid making the same mistakes twice and can help them to implement time saving processes.
 - Have students identify lessons learned that can help them in this course or in other courses they are taking.
- Have each student describe a project on which he or she has been a team member. For each project, have the student describe the best lesson learned from the project and one thing that should have been done differently. Record these lessons to create a best practices list for projects and a list of how to improve future projects.

Optional Supplemental Activities

- Have the students read the real-world vignettes and research the Internet for other articles about the two projects covered in the vignettes.
- Have them read the chapter and answer all of the Reinforce Your Learning questions and the end-of-chapter questions. **(See Premium Deck for Slides.)**

- Have students present a summary of an article from the project management journal found in the Internet exercise. If possible, have the students contact the author of the article to discuss the contents.

Chapter Concepts

- Actions that should be taken when closing a project
- Conducting a post-project evaluation
- The importance of documenting lessons learned
- The need to organize and archive project documents
- Obtaining feedback from the customer about the project
- Early termination of projects

Chapter Concepts

- This chapter discusses the various activities involved in the process of closing the project. After project work is completed, and all the deliverables are accepted by the customer, the performing phase of the project ends. The project then moves into the fourth and final phase of the project life cycle—closing the project.

Based on the material in this chapter, students will become familiar with:

- Actions that should be taken when closing a project
- Conducting a post-project evaluation
- The importance of documenting lessons learned
- The need to organize and archive project documents
- Obtaining feedback from the customer about the project
- Early termination of projects

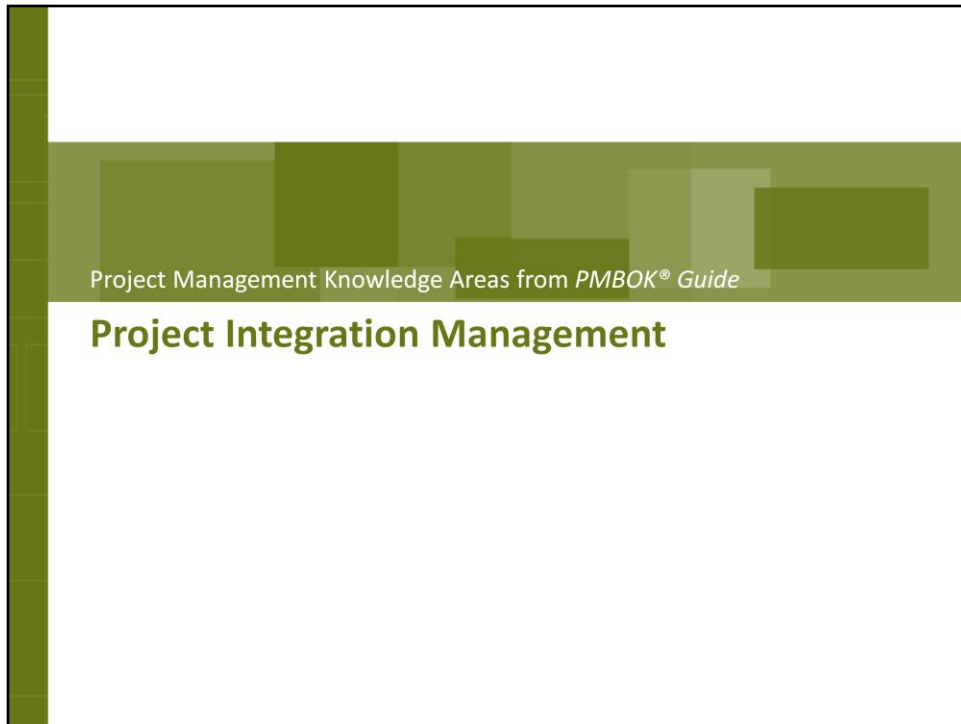
Learning Outcomes

- Identify actions that should be taken during the process of closing a project
- Conduct a post-project evaluation
- Discuss the value and use of lessons learned
- Explain the importance of organizing and archiving project documents
- Obtain customer feedback about the project
- Describe situations that could result in early project termination

Learning Outcomes


After studying this chapter, students should be able to:

- Identify actions that should be taken during the process of closing a project
- Conduct a post-project evaluation
- Discuss the value and use of lessons learned
- Explain the importance of organizing and archiving project documents
- Obtain customer feedback about the project
- Describe situations that could result in early project termination



Project Management Knowledge Areas from PMBOK® Guide

Concepts in this chapter support the following Project Management Knowledge Areas of the *PMI Guide to the Project Management Body of Knowledge (PMBOK® Guide)*:
Project Integration Management



Analyzing Schedule Delay of a Mega Project: Lessons Learned from Korea Train Express

<h3>Background</h3> <ul style="list-style-type: none"> ■ More than 11,000 different activities <ul style="list-style-type: none"> ▪ Plan: \$5.8 billion, 7 years ▪ Actual: \$18.4 billion, 12.5 years ■ Complex railway roadbed ■ 26 different sections of railway line ■ Urban areas created greatest delays ■ Portions of repetitive sections can be built concurrently 	<h3>Lessons Learned</h3> <ul style="list-style-type: none"> ■ High-speed railway construction is different from traditional railway construction ■ Project management skills are highly important <ul style="list-style-type: none"> ▪ Manage risks before delays ▪ Cope with the crises after the delays ■ Must consider social and political factors
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Vignette A: Analyzing Schedule Delay of Mega Project: Lessons Learned from Korea Train Express

- More than 11,000 different activities were involved in constructing the 412-km Korean high-speed railway Korea Train eXpress (KTX), which operates from Seoul to Busan.
- The proposed budget for the KTX was \$5.8 billion at the start, with a duration of 7 years.
 - Obstacles led to huge increases in cost and time, raising the budget to \$18.4 billion and the duration to 12.5 years.
- The complex railway roadbed is 39 percent long railway tunnels, 34 percent special bridges, and 27 percent other earth works.
- Higher quality of construction and higher safety standards were part of the strict guidelines for the entire route of railway to support an average train speed of 300 km/h (186.4 miles per hour).
- The 26 different linear sections of railway line passed through three different segments of construction.
- The urban areas posed the greatest delays because of problems with land use permissions and acquisition of land.
- All large-scale projects—such as railway, oil pipeline, or highway construction—can be broken down into portions of repetitive sections that can be built concurrently.

Lessons learned:

- One primary lesson learned was that high-speed railway construction was fundamentally different from traditional railway construction; one could inform the other, but the technical requirements are much different.
- A second lesson learned was the importance of having project management skills to manage risks before delays and to cope with the crises after the delays.

- A third lesson learned was that project managers must consider social and political factors to manage the project successfully.



Building Green: Potential Impacts to the Project Schedule

<h3 style="color: #6b8e23;">Background</h3> <ul style="list-style-type: none"> ■ Goal of green building <ul style="list-style-type: none"> ▪ Reduction of life-cycle building costs for owners ▪ Reduced environmental impact during construction ■ LEED certification ranging from silver to platinum through the inclusion of specific techniques <ul style="list-style-type: none"> ▪ Impact to the environment is lower during construction ▪ Operation is supposed to be cost efficient 	<h3 style="color: #6b8e23;">Lessons Learned</h3> <ul style="list-style-type: none"> ■ Increased time in early phases <ul style="list-style-type: none"> ▪ 20% to 50% more time to the planning and design ■ Construction time was nearly the same for green and conventional <ul style="list-style-type: none"> ▪ More time in early phases ■ Difference occurred in the <ul style="list-style-type: none"> ▪ Costs of construction ▪ Additional staff members were needed to perform the longer tasks ▪ Purchasing regional materials often more expensive
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Vignette B: Building Green—Potential Impacts to the Project Schedule

- Two of the goals of green technology and green building and the reduction of life-cycle building costs for owners and reduced environmental impact during construction.
- LEED certification is one way of signifying a that a building is energy efficient. The levels of certification range from silver to platinum and are achieved through the inclusion of specific techniques defined by the U.S. Green Building Council for Leadership in Energy and Environmental Design (LEED).

Lessons learned:

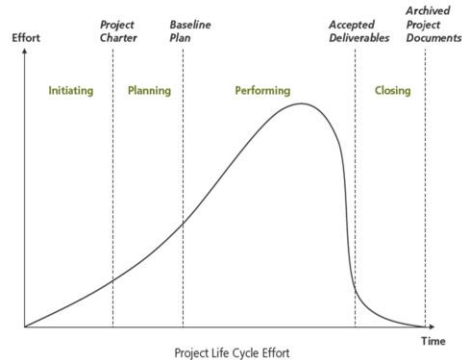
- Even though the impact to the environment is lower during construction, and the building operation is supposed to be cost efficient, green building projects take more time in the initial planning and design phases.
 - Project managers for green building projects required 20 to 50 percent more time to plan and design buildings compared to conventional building projects
 - They also required slightly more activity duration time for construction.
- When completing a green development project, most of the increased time was in the early phases of the project.
- From start to finish, the construction time for green building and conventional building was nearly the same.
- There were differences in the costs of construction; additional staff members were needed to perform the longer tasks, and purchasing regional materials was often

more expensive than purchasing from overseas.

Project Closing Actions

- Collect and make final payments
- Recognize and evaluate staff
- Conduct post-project evaluation
- Document lessons learned
- Organize and archive project documents

FIGURE 9.1 Project Life Cycle



Project Closing Actions

- The process of closing the project involves various actions, including:
 - Collecting and making final payments
 - Recognizing and evaluating staff
 - Conducting a post-project evaluation
 - Documenting lessons learned
 - Organizing and archiving project documents
- Activities associated with closing the project should be identified and included in the project baseline plan. The figure shown in this slide depicts the project life cycle. We will discuss each of these steps in more detail in the upcoming slides.

Final Payments

- Payments from customer
 - Have activity listed to perform collection
 - Assure that all the payments have been received
- Payments to others
 - Verify all payments have been made
 - Record actual costs
- Account closing
 - Perform financial analysis on the project
 - Compare actual costs versus baseline budget

Final Payments

- Assuring that all payments have been collected from the customer is an activity that must be performed during the closing phase.
- Project managers must also verify that all payments have been made to anyone else involved in the project
 - Such as subcontractors, consultants, vendors, or suppliers for any purchased materials or services
- Once all payments have been received and made, the project “books,” or accounting records, can be closed.
 - A financial analysis of the project can be made in which final actual costs are compared to the project baseline budget.

Staff Recognition And Evaluation

- End project with recognition and celebration
 - Recognize team members for contributions
 - Celebrate the success of the project
- Prepare individual performance evaluations
 - Mention how knowledge expanded during project
 - Identify areas where need further development
 - Share during individual meetings or give to supervisor

Staff Recognition And Evaluation

- Successful projects should end with some type of recognition and celebration.
 - This helps boost the morale of the team members through recognizing their work.
 - It also helps to celebrate a successful project.
- The project manager should prepare a written performance evaluation of each member of the project team.
 - It should mention how each has expanded her or his knowledge as a result of the project assignment
 - It also identifies areas where he or she needs to develop further.
 - These evaluations should be shared during individual meetings with the team members, or given to their supervisor to share with them.

Post Project Evaluation

FIGURE 9.2 Post-Project Evaluation Team Meeting Agenda

- Review and evaluate project performance
- Identify improvements
- Hold individual meetings with members
- Hold project team meeting
- Prepare written report with lessons learned and recommendations

POST-PROJECT EVALUATION Team Meeting	
Agenda	
1. Technical performance	• Work scope • Quality • Managing Changes
2. Budget performance	
3. Schedule performance	
4. Project planning and control	
5. Risk management	
6. Customer relationships	
7. Team relationships	
8. Communications	
9. Problem identification and resolution	
10. Lessons learned	
11. Recommendations for future projects	

Post Project Evaluation

- The post-project evaluation stage, which occurs during the closing phase, is an important time to review the project and identify areas that went well and where improvements are necessary.
- Hold individual meetings with team members to give feedback on each one about their performance and to get feedback from them on how to improve future projects.
- At the group meeting with the project team, the project manager should lead a discussion of what happened during performance of the project and solicit specific recommendations for improvement.
- As you can see in the list on this slide, topics to be discussed at group meetings can include.
 - Technical performance
 - Budget performance
 - Schedule performance
 - Project planning and control
 - Risk management
 - Customer relationships
 - Team relationships
 - Communications
 - Problem identification and resolution
 - Lessons learned
 - Recommendations for future projects
- The project manager should prepare a written report of project performance

including lessons learned and recommendations.

Lessons Learned

- Purpose of identifying and documenting
 - Capitalize on knowledge and experience gained
 - Improve performance on future projects
- Knowledge base system or repository
 - Retrieve lessons learned from prior projects
 - Easily access information by category or subject
- Record keeping throughout project
 - Capture lesson at time of lesson instead of end of project
 - Have as agenda topic at meetings and in training sessions

Lessons Learned

- The purpose of identifying and documenting lessons learned is to capitalize on the knowledge and experience gained from the project.
 - This practice helps to improve performance on future projects.
- The project organization should establish a knowledge base system that includes an easily accessible information storehouse that encourages project managers and teams to retrieve lessons learned and information from previous projects.
 - The system should organize information so that it is easily retrievable by category or subject of lesson learned or by key words.
- The project team should not wait until the end of the project to capture and document lessons learned.
 - It should be done on an ongoing basis throughout the planning and performing phases of the project.
 - Have lessons learned be an agenda topic on a new project and include in project management training.

Archive Project Documents

- Organize, file, and archive appropriate documents
- Organize system to make information easily retrievable
- Create database of common data elements
 - Analyze elements for trends
 - Examine records for bidding, planning, and performing future projects

Archive Project Documents

- During project closing, the project team or contractor should ensure that copies of appropriate project documentation are properly organized, filed, and archived.
- Good organization helps make information readily retrievable for future use.
- It can be valuable to create a database of common data elements from past projects.
 - Helps to analyze and determine if there are trends or correlations between projects
 - Can be helpful in bidding, planning, and/or performing future projects
 - This should be done as part of, or in addition to, the documents in the archive

Customer Feedback

- Post-project evaluation meeting with customer
 - Determine if provided the expected benefits
 - Assess the level of customer satisfaction
 - Obtain any feedback with open-ended questions
 - Discuss future opportunities
 - Secure permission to use as reference
- Participants
 - Key project team members
 - Key customer representatives
 - Project manager

Customer Feedback

- Having a post-project evaluation meeting with the customer or sponsor is just as important as having the internal post-project meetings within the project team members.
- The purposes of this meeting is to:
 - Determine whether the project provided the customer with the expected benefits
 - Assess the level of customer satisfaction
 - Obtain any feedback that would be helpful in future business relationships with this customer or with other customers
 - Discuss future opportunities
 - Secure permission to use that customer as a reference
- Meeting participants should involve the:
 - Key project team members
 - Key representatives of the customer's organization who were involved with the project
 - Project manager
- The project manager should schedule the meeting for a time when the customer is in a position to determine whether the project met expectations and achieved the anticipated benefits.

Post-Project Customer Evaluation Survey

- Analyze for trends
- Seek permission for reference

FIGURE 9.3 Post-Project Customer Evaluation Survey

Post-Project Customer Evaluation Survey										
Please complete this brief survey to help us evaluate and improve our project management performance. If more space is needed for responses, please attach additional pages.										
Project Title: _____										
	Degree of Satisfaction									
	Low 1 2 3 4 5 6 7 8 9 10 High									
1. Completeness of Work Scope										
Comments _____										
2. Quality of Work										
Comments _____										
3. Schedule Performance										
Comments _____										
4. Budget Performance										
Comments _____										
5. Communications										
Comments _____										
6. Customer Relations										
Comments _____										
7. Overall Performance										
Comments _____										
What benefits did you _____ actually realize or _____ anticipate as a result of this project?										
A. Quantitative Benefits										
B. Qualitative Benefits										
Suggestions on how we can improve our performance on future projects:										
Name: _____ Date: _____										

Post-Project Customer Evaluation Survey

- The figure in this slide depicts a post-project customer evaluation survey.
- The evaluation survey can be valuable.
 - Analyze it for trends between projects
 - Provides an opportunity for ask permission for reference from the client

Early Project Termination

- May terminate a project before completion:
 - If research shows costs will be much more than originally anticipated
 - If there is a change in a company's financial situation
 - Because of dissatisfaction of the customer
- Avoid early termination due to customer dissatisfaction by monitoring customer satisfaction continually and taking corrective action

Critical Success Factors

- **Recognize** the project team and celebrate accomplishments throughout the project.
- **Regularly ask the customer** about the level of **satisfaction** with the performance and progress of the project and take corrective action at the first hint that the customer is not satisfied.
- After the conclusion of a project, the **project performance** should be **evaluated** to learn what could be improved if a similar project were to be done in the future. Feedback should be obtained from the customer and the project team.
- **Capture and document** lessons learned **throughout** the performance of the project.
- **Establish a knowledge base** of lessons learned and ensure that they are communicated and used on future projects.
- **Organize** and **archive** project documentation and **analyze** key data that could be helpful in bidding, planning, or performing future projects.
- **Retain customer evaluation and feedback** information that could be valuable in developing proposals for other projects for the same customer in the future.

Critical Success Factors

- *Recognize* the project team and celebrate accomplishments throughout the project.
- *Regularly ask the customer* about the level of *satisfaction* with the performance and progress of the project and take corrective action at the first hint that the customer is not satisfied.
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- *Establish a knowledge base* of lessons learned and ensure that they are communicated and used on future projects.
- *Organize* and *archive* project documentation and *analyze* key data that could be helpful in bidding, planning, or performing future projects.
- *Retain customer evaluation and feedback* information that could be valuable in developing proposals for other projects for the same customer in the future.

Summary

- The fourth and final phase of the project life cycle is closing the project.
- An important project closing action is staff recognition and evaluation.
- Conduct post-project evaluation meetings within the project team or organization with individual team members and a group meeting with the project team to gather team feedback for improved future performance.
- Identify and document lessons learned to capitalize on the knowledge and experience gained on the project in order to improve performance on future projects.
- The project team or contractor should ensure that copies of appropriate project documentation are properly organized, filed, and archived so that they can be readily retrieved for future use.
- Conduct a post-project evaluation meeting, or distribute a customer evaluation survey to the customer or sponsor to determine whether the project provided the customer with expected benefits; assess the level of customer satisfaction; and obtain any feedback that would be helpful in future business relationships with this customer or with other customers.
- Projects may be terminated before completion for various reasons.

Summary

- The *fourth and final phase* of the project life cycle is *closing* the project.
- An important project closing action is *staff recognition and evaluation*.
- *Conduct post-project evaluation meetings* within the project team or organization with individual team members and a group meeting with the project team to gather team feedback for improved future performance.
- Identify and document lessons learned to *capitalize on the knowledge and experience gained* on the project in order to improve performance on future projects.
- The project team or contractor should ensure that copies of appropriate project *documentation* are properly *organized, filed, and archived* so that they can be readily retrieved for future use.
- Conduct a *post-project evaluation* meeting, or distribute a customer evaluation survey to the customer or sponsor to determine whether the project provided the customer with the expected *benefits*; assess the level of customer *satisfaction*; and obtain any *feedback* that would be helpful in future business relationships with this customer or with other customers.
- Projects may be *terminated before completion* for various reasons.