



IMPLEMENTATION OF LESSONS LEARNED PROGRAMS

Implementation of Lessons Learned Programs

Prepared by the Construction Industry Institute

Effective Management Practices and Technologies for Lessons Learned Programs Research Team

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Executive Summary

Organizations in the engineering and construction industry cannot afford to make repetitive mistakes on major projects. Conversely, great benefits come from repeating positive project experiences. This need for institutional memory is amplified by the reality that in the course of normal turnover and retirement, people with years of experience leave their organizations.

An effective lessons learned program is a critical element in the management of institutional knowledge; it will facilitate the continuous improvement of processes and procedures and provide a direct advantage in an increasingly competitive industry. For organizations that have already developed a lessons learned program, this publication provides a **Maturity Model Matrix** and **Self-Assessment Questionnaire** to determine its effectiveness with respect to seven key program characteristics. For organizations without a current program or those wanting to re-examine their existing one, it offers a **Jump Start Guide** with recommended steps for the development of a program. In addition, a sample **Transactional Work Flow Diagram** is provided and serves as a roadmap for typical lessons learned transactions. Together, the tools form a framework for organizations to integrate a lessons learned program into their current work processes. When organizations are able to transfer knowledge through a lessons learned program, they can increase project efficiency—an important capacity in the fast-paced engineering and construction industry.

Chapter 1: Introduction

Organizations that implement effective lessons learned programs (LLPs) as part of their larger knowledge management systems demonstrate a commitment to continuously improving their service to stakeholders and customers (Figure 1). Competencies, skills, and experience acquired by members of project teams must remain within an organization, even as employees move on or retire. An effective lessons learned program allows organizations to document project experiences so an organization as a whole can learn from one person's experiences.

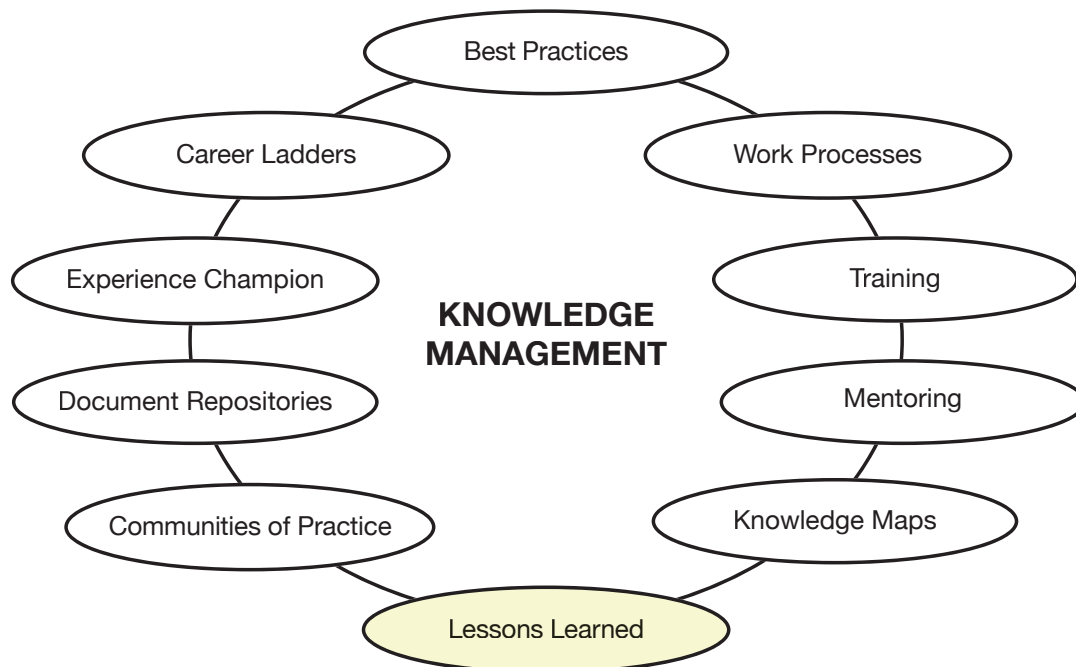


Figure 1. Lessons Learned Context Diagram

Definition of a Lesson Learned

A **Lesson Learned (LL)** is defined as knowledge gained from experience, successful or otherwise, for the purpose of improving future performance. Examples include:

- A lesson that is incorporated into a work process.
- A tip to enhance future performance.
- A solution to a problem or a corrective action.
- A lesson that is incorporated into a policy or a guideline.
- An adverse situation to avoid.

Some lessons learned should be incorporated into organizations' work processes, while others should be shared to improve organizational performance. It is important to develop a definition of lessons learned to fit the needs of each organization. Regardless of the definition used, lessons learned should be used to help an organization achieve its business needs and goals.

A lessons learned program fosters the accumulation of wisdom within an organization. Many individuals associate lessons learned with mistakes that produced undesirable results in the past. Naturally, organizations want to avoid repeating such missteps. However, it is equally important for organizations to recognize lessons learned derived from positive experiences. These are the practices that organizations should promote in order to repeat past successes.

Definition of Lessons Learned Program

A lessons learned program (LLP) involves the people, processes, and tools that support an organization's collection, analysis, and implementation of validated lessons learned. *People* are the source of organizational knowledge, and their support and involvement determine the program's success. *Processes* within the organization must be structured to allow people to easily collect, analyze, and share knowledge. Finally, program *tools* must effectively allow knowledge transfer between individuals. Organizations must strive to focus equally on all three components to properly balance their program.

The Lessons Learned Process

The lessons learned process includes three key steps: collection, analysis, and implementation. These actions are illustrated in Figure 2.

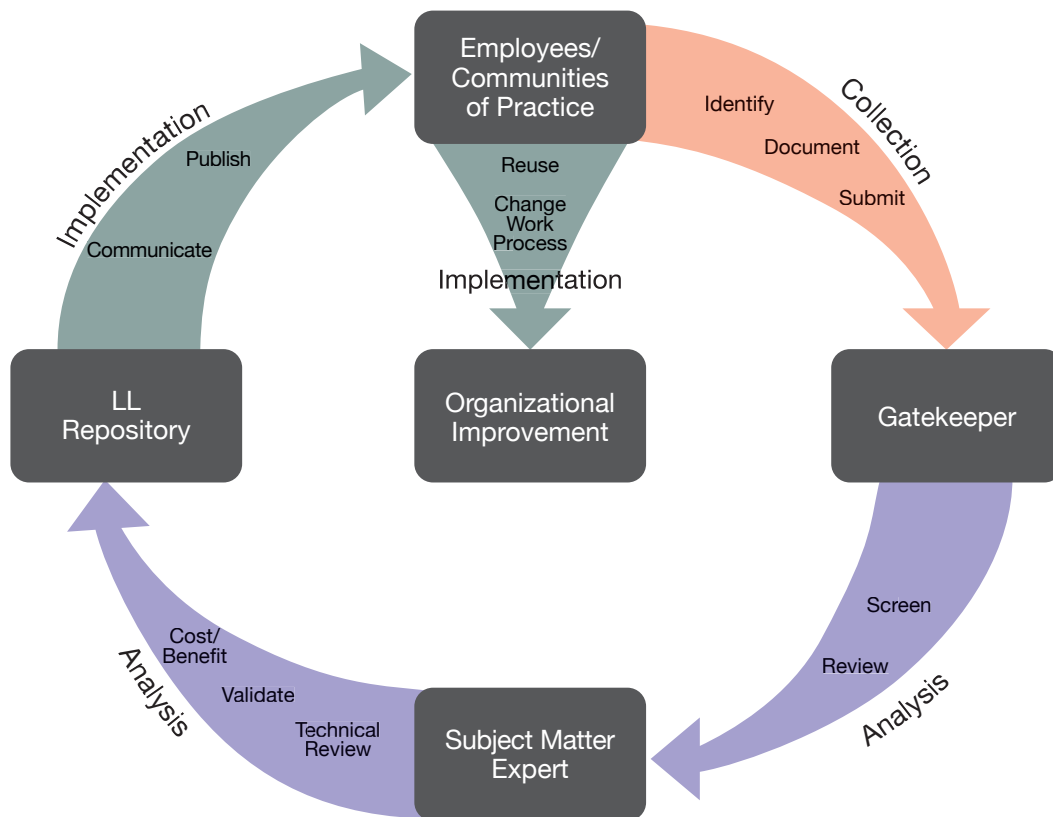


Figure 2. Lessons Learned Flow Diagram

Collection entails gathering data and generating information on the experiences of individuals and teams in the organization. Individuals may submit lessons by electronic means or by sharing them in formalized workshops. Collection can be conducted at various stages of project execution by different members of the organization; however, after lessons are collected, they must be analyzed and validated before they are disseminated through the organization.

Analysis can be performed by a team or by one nominated individual who is regarded as a subject matter expert (SME). This crucial portion of the lessons learned process guarantees that the information shared throughout the organization is relevant, correct, and easily understood.

Finally, the lessons must be implemented. Lessons can only help an organization if they are put directly into action. *Implementation* can take many forms, ranging from publication of lessons in an electronic database to changes in practices and procedures that are derived from lessons learned.

Key Characteristics of a Lessons Learned Program

Seven key characteristics, described in detail in Appendix A, affect the success of lessons learned programs:

- Leadership
- Lesson Collection
- Lesson Analysis
- Lesson Implementation
- Resources
- Maintenance and Improvement
- Culture

Each of the seven characteristics can be assessed in terms of four levels of maturity within an organization. Each maturity level characterizes how developed an organization's lessons learned program is for each of the bulleted items above. The higher the maturity level, the more fully the lessons learned program has been embedded into the organization's culture and daily work processes. For example, Level 1 maturity is the lowest rating and indicates an immature program characteristic, and Level 4 is the highest rating, indicative of a mature characteristic.

Chapter 2: Self-Assessment Process

The first step in analyzing or developing an effective lessons learned program is self-assessment based on the seven key characteristics. The Maturity Model Matrix functions as a high level self-grading system, and the Self-Assessment Questionnaire rates an organization's maturity based on pre-defined questions.

Maturity Model Matrix

The **Maturity Model Matrix** (Appendix B) is designed to enable an organization to assess the level of maturity or the stage of development of their lessons learned program categorically. The Maturity Model Matrix examines the seven key program characteristics that are fundamental to the successful implementation of an effective lessons learned program. A simplified version of the Maturity Model Matrix for lessons learned is shown in Figure 3. In the full matrix, each cell of the chart includes a description of how the maturity of each characteristic is defined at each level.

CHARACTERISTICS	MATURITY LEVELS			
	Level 1	Level 2	Level 3	Level 4
Leadership				
Lesson Collection				
Lesson Analysis				
Lesson Implementation				
Resources				
Maintenance and Improvement				
Culture				

Figure 3. Lessons Learned Maturity Model Configuration

The Maturity Model Matrix provides a means for an organization to quickly assess its lessons learned program's maturity by aligning the program's characteristics to those described in the model matrix. To accomplish this, an organization only needs to read the criteria of each level for each characteristic and rate their organization accordingly. After completing this task for all seven characteristics, the organization gets an overarching view of its lessons learned program. Assessment using the Maturity Model Matrix provides a subjective evaluation of an organization's LLP.

Self-Assessment Questionnaire

In addition to the subjective assessment elicited by the descriptions in the maturity model, an organization can use the Self-Assessment Questionnaire and accompanying score sheet found in Appendix C to determine quantitatively the maturity level of each characteristic of the lessons learned program. The responses to the questionnaire, when scored and averaged, can be categorized into one of the four maturity model levels. For example, consider the following hypothetical answers to the *culture* portion of the Self-Assessment Questionnaire, as shown in Figure 4 (next page).

CULTURE

32. Individuals participate in your LL program because they understand the value of the system.
a) ☐ Strongly Disagree b) ☐ Disagree c) ☒ Agree d) ☐ Strongly Agree
33. Communities of practice encourage their members to use your LL program to avoid/solve project problems or enhance performance.
a) ☐ Strongly Disagree b) ☒ Disagree c) ☐ Agree d) ☐ Strongly Agree
34. The Lessons learned process is an ingrained part of day-to-day activities for all individuals.
a) ☐ Strongly Disagree b) ☐ Disagree c) ☐ Agree d) ☒ Strongly Agree

Figure 4. Example Answers to Culture Questions for Self-Assessment

Once all questions are answered, the responses are assigned a numeric value, as shown in Figure 5.

a) ☐ Strongly Disagree 1 pt.	b) ☐ Disagree 2 pts.	c) ☐ Agree 3 pts.	d) ☐ Strongly Agree 4 pts.
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Figure 5. Numerical Scores for Self Assessment

After the assessor has scored each question, each characteristic score can be calculated as the mean of the numerical scores in the category, as shown in Figure 6. For instance, since the *culture* score is equal to the mean of the numerical score generated in questions 32 through 34, the *culture* score equals 3.0. That is:

$$\frac{3 + 2 + 4}{3} = 3.0$$

Question #	Response	Points
32.	c	3
33.	b	2
34.	d	4
Total Sum:		9
LLP Culture Score (divide sum by # of questions in category):		3.0

Figure 6. Numerical Scores for Self Assessment Example

An organization can calculate a score for each characteristic in the same manner. The assessor can then determine each category's corresponding level of maturity using the calculated categorical score and the levels provided in Table 1. The maturity levels are divided into four, evenly-split numerical ranges as seen in Table 1.

Table 1. Numerical Ranges for Evenly Split Maturity Levels

Maturity	Numerical Range
Level 1	1.00–1.74
Level 2	1.75–2.49
Level 3	2.5–3.24
Level 4	3.25–4.00

When using this method to determine the numerical range of each level, the example answers would indicate that the *culture* characteristic is at a Level 3 in the organization.

What the Results Mean

Table 2 illustrates a research sample. More than half of the organizations in the research study were assessed at Level 2 for the *leadership* characteristic of their lessons learned program. For an organization aiming to be a top performer, this table can be used to benchmark an organization and focus in on areas that need improvement. See Chapter 6 for a post-assessment process for program levels desired and the steps necessary to reach those levels.

Table 2. Current State of Surveyed Organizations

Characteristic	Percentage of Organizations per Maturity Level			
	Level 1	Level 2	Level 3	Level 4
Leadership	0%	56%	33%	11%
Lesson Collection	3%	33%	36%	28%
Lesson Analysis	8%	36%	31%	25%
Lesson Implementation	3%	31%	44%	22%
Resources	11%	47%	34%	8%
Maintenance and Improvement	25%	39%	19%	17%
Culture	8%	36%	42%	14%

