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Effective Management Practices and Technologies for Lessons Learned Programs

**Prepared by
Construction Industry Institute
Effective Management Practices and Technologies
for Lessons Learned Programs Research Team**

**Research Summary 230-1
May 2007**

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Executive Summary

Many organizations in the engineering and construction industry recognize the importance of a Lessons Learned Program (LLP) as a vital asset that plays an essential role in knowledge management systems. In these organizations, project team members generally acquire new knowledge as their careers progress. This knowledge, which includes both successes that organizations want to repeat and problems they do not want repeated, may not be routinely disseminated throughout the organization. The value of optimizing the dissemination of this gained knowledge warrants spending resources on a formal lessons learned program.

CII formed the Effective Management Practices and Technologies for Lessons Learned Programs Research Team to investigate the current status, implementation, and performance of lessons learned programs in both its membership and beyond. During the course of its work, it conducted over 100 surveys, 10 case study assessments, and involved 70 organizations. It defined a “lesson learned” as: *knowledge gained from experience, successful or otherwise, for the purpose of improving future performance.*

Among its findings, the research team observed that lessons learned programs today are more prevalent and formal than during CII’s previous research in 1998. Formal lessons learned programs are typically organization-wide systems with lessons collected at the time they occur and with a dedicated coordinator to oversee the effort. No commercially available lessons learned computer applications were identified. Lessons learned programs can present a variety of legal concerns to an organization if not addressed proactively. All respondent organizations recognize the inherent value of lessons learned; however, no organization has successfully quantified the direct value of their LLP.

Key characteristics of lessons learned programs were assessed and measured, leading to a characterization of the maturity state of all studied organizations. The research team developed a Lessons Learned

Maturity Model Matrix for assessing an organization's current LLP using seven characteristics: Leadership, Lesson Collection, Lesson Analysis, Lesson Implementation, Resources, Maintenance and Improvement, and Culture. The corresponding assessment results will allow an organization to understand its current status versus a sample of 36 CII member organizations and to plan improvement. Details of this tool and improvement methods are discussed in this summary and provided in depth in CII Implementation Resource 230-2, *Implementation of Lessons Learned Programs*.

In summary, every organization should move forward in developing or improving a lessons learned program. The reader should consider the following tenets of success in developing or managing its LLP:

- Leadership, top-level and tactical, is probably the most important prerequisite for success of these programs.
- Organizations should become “teaching” organizations, rather than organizations that only collect or learn from the past in an ad hoc or passive manner.
- Organizations should adopt an active implementation strategy for ensuring that lessons are used.
- Although technology is important in developing and using an LLP, the importance of organizational culture should not be underestimated.
- The quality of lessons learned is more important than the quantity of lessons in the database.
- Both owners and contractors can benefit from lessons learned programs. Necessarily, the captured lessons learned will be focused in different areas based on the business needs of the organization.

Introduction

Problem Statement

Each person on a project team learns a great deal during the course of a project. To allow others to benefit from those experiences, organizations need to develop an effective way to identify, analyze, and implement the knowledge of what worked well and what needs improvement.

Optimally, organizations want personnel evenly spread across age in order to supply their workforce pipelines. Unfortunately, this is not the case as the average age of the industry's workforce is high and many employees are rapidly approaching retirement. Capturing, sharing, and utilizing the combined knowledge of the current workforce is essential so that the industry and organizations avoid losing a vital, valuable asset—corporate knowledge.

Significant advancements in technology are allowing organizations to improve their collection, analysis, and implementation of lessons learned. Although many organizations have put lessons learned programs in place, they may not know how to evaluate the effectiveness of the programs. Finally, legal implications are perceived by some organizations as a barrier to maintaining a lessons learned program.

A Lessons Learned Program is a vital component of knowledge management in organizations.

Organizations with strong, effective knowledge management utilize several independent components that form a strong program to capture and share the accumulated wisdom of its employees. A Lessons Learned Program is an important compliment to the other knowledge management programs such as training, mentoring, communities of practice, and work processes. The importance of lessons learned in the context of a knowledge management program is illustrated in Figure 1 (next page).

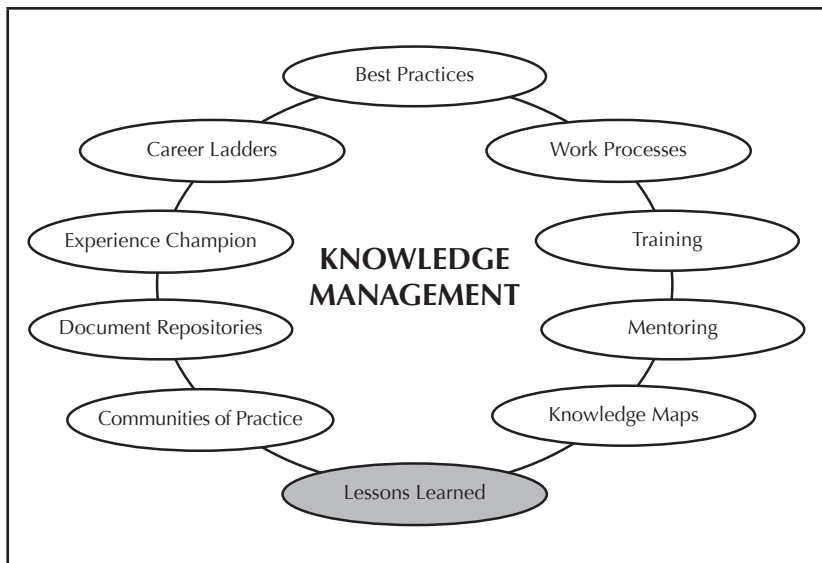


Figure 1. Lessons Learned Context Diagram

CII formed Effective Management Practices and Technologies for Lessons Learned Programs Research Team to update previous work done by the CII Modeling Lessons Learned Research Team and to present “best in class” methods and tools currently being used to implement lessons learned programs. The research also presents new knowledge that the team has acquired about such programs.

Purpose

The primary purpose of this research was to provide definitive recommendations, guidelines, and tools for the development of a successful Lessons Learned Program. The research team, comprised of academic researchers, owners, and EPC contractors, was chartered to conduct research surveys and industry case studies in order to:

1. Develop a road map that will help others implement Lessons Learned Programs.
2. Identify effective methods for gathering and communicating lessons learned.
3. Determine how information technology resources are being used.

4. Determine whether metrics exist to measure the value or success of a Lessons Learned Program.
5. Evaluate differences in implementation by owners and contractors, including insight into staffing requirements.
6. Identify legal issues that pose barriers to implementation.
7. Develop a tool for CII members to determine the maturity of their Lessons Learned Programs.
8. Refresh or update previous research performed by CII on Lessons Learned Programs.
9. Document case studies and performance data.

Method to Achieve Purpose

The research team conducted a literature review to identify new developments in Lessons Learned Programs since the publication of the CII research conducted on the topic in the late 1990s. The review was conducted through extensive library and Internet searches for data relating to lessons learned.

The previous research team's survey was used as a basis for the development of the Phase I Survey and was revised with the help of the academic researchers. The Phase I Survey was distributed to all CII member organizations (see Appendix A). This short survey was used to collect preliminary information on lessons learned practices, barriers, and tools used by member organizations. The results of the Phase I Survey allowed the researchers to begin to identify effective practices, implementation barriers, current information technology tools, and other special considerations for lessons learned.

When the results were analyzed, it became evident that legal issues have a significant impact on lessons learned. For this reason, the researchers developed a legal issues questionnaire, which was distributed to research team members. This questionnaire provided a better understanding of the legal issues hindering Lessons Learned Programs.

Results from the Phase I Survey and the legal issues questionnaire prompted an investigation into the methods for determining the maturity

levels of Lessons Learned Programs. To accomplish this, the research team distributed a Phase II Survey to each CII organization that was operating an active Lessons Learned Program. This survey provided in-depth information about organizational lessons learned practices and procedures. The Phase II Survey results enabled the selection of organizations for case study interviews.

For those interviews, a structured interview guide developed by the researchers was used. The resulting information helped to identify the most effective management practices and technologies for lessons learned and provided the basis for various research products. The research team also updated the Lessons Learned Transactional Work Process Model generated in the original research and created a Lessons Learned Maturity Model (Appendix C). The transactional model is contained in CII Research Report 230-11 and CII Implementation Resource 230-2.

**During the course of this research investigation,
data were gathered from 70 organizations.**

Assumptions

The following assumptions and constraints apply to this research:

- There is value in managing organizational knowledge using a Lessons Learned Program (LLP).
- The organizations participating as sample populations in the surveys and case studies are a fair representation of the CII membership.
- The research findings may not be applicable, with 100 percent certainty, to the industry as a whole because the research team was not able to survey all industries and all CII member organizations.
- Organizations that use Lessons Learned Programs benefit from their efforts and realize improvements in their operational effectiveness.

Definitions

Lessons Learned:

CII defines lessons learned as “knowledge gained from experience, successful or otherwise, for the purpose of improving future performance.” See Appendix B for some alternative definitions. Lessons learned facilitate the collection and implementation of knowledge gained on past projects and enhance the learning process.

After evaluating the many definitions found in literature, the research team chose the definition from previous CII research and provided specific examples. The definition of what may constitute a “lesson learned” is given below:

A Lessons Learned is 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**
- **Collective knowledge of “soon to retire” employees**

Lessons learned are often equated with negative consequences of past behavior. However, the most valuable lessons learned may be positive lessons from successful projects.

Lessons Learned Program:

A Lessons Learned Program is comprised of the people, processes, and tools that support an organization’s collection, analysis, and implementation of validated Lessons Learned. The ultimate goal is to add value to the organization by promoting the communication of information.

The use of a Lessons Learned Program helps to implement knowledge management within the organization through the collection and dissemination of information and experiences. People are the source of organizational knowledge, and their support and involvement in the program generates results. Processes and practices within the organization must be arranged to enable easy knowledge collection and sharing. Furthermore, appropriate technologies must facilitate knowledge transfer between individuals. Too much emphasis on any one of these areas will cause an imbalance in the program, which means that organizations must strive to focus on all three areas equally.

A Lessons Learned Program typically includes the processes illustrated in Figure 2. For more information, refer to CII Implementation Resource 230-2.

Formal vs. Informal Lessons Learned Program:

Lessons Learned Programs can be classified as formal or informal. A formal program is part of a funded, standardized, documented work process which is consistent across an organization and includes written reporting. Informal programs are generally manual or rely on word-of-mouth, anecdotes, and individual efforts to gather data. In an informal program, no specific mechanism ensures the process is working, which means it is often inconsistent and ad hoc. These informal programs may even be grassroots connections promoted by small groups of committed employees.