Learning Lessons for Organizational Learning, Process Improvement, and Innovation

Susan G. McIntyre
Defence Research and Development Canada, Canada

ABSTRACT

The Lessons Learned process provides a methodology for groups and organizations of any size to become better at what they do. Its beauty is in its simplicity and versatility. It can be used by individuals, small or medium sized teams, and any sized corporations. What makes it differ from other process improvement or evaluation methods is the focus on the capturing and analysis of lessons by the very people who experienced the learning situations and those people who will benefit from future adaptations. As such, the Lessons Learned process is linked to Organizational Learning and, at its very best, will inspire innovational changes that lead to excellence. This chapter defines and scopes Lessons Learned; describes the basic methodology, applications, and types; and provides anecdotal examples of three scales of the process.

INTRODUCTION

Organizational learning and improvement can take many forms. Processes can often report to be about "Lessons Learned", whereas in reality many are not. As we will see in this chapter, Lessons Learned involves much more than identifying what went wrong and what could be better; it requires an organization and personnel engaged in the learning process. The need to avoid previous mistakes and do something better in the future seems obvious.   But how does one start? How do you *do* it? What exactly is the objective of the process? What are the steps? Who initiates, who leads and who participates? What results and impact are desired? How can we be assured that the lessons are really "learned" and not resting on the proverbial shelf? All these questions need to be explored up front, long before the event, project or activity takes place. How they are answered will point to the methodology to use.

There are many ways to skin a cat, as the saying goes, and learning lessons is no different. Firstly, it is wise to determine early on whether this is the best track to follow for a given organization or requirement. This chapter will look at what Lessons Learned are and can accomplish and what they are not; sometimes the need is for an outside evaluation, a legal inquiry, or process improvements. Next, in determining the desired outcomes, it is important to know what you are looking for. There is no point in addressing shortcomings with recommendations for improvements or change if all the organization wants to hear in the end are best practices or success stories. If, however, the need is for a way to gather, analyze, recommend and galvanize action, there are a number of ways to proceed.

The beauty of the Lessons Learned methodology is that it can be adapted for any situation and number of participants. It can be done in an honest and introspective fashion by individuals, small informal groups, large formal groups, corporations and even by meta-organizations (an organization of organizations).[i] Often the process has to be adapted according to cultural or cross-cultural parameters because what works in one organization might seem trite in another. Whatever the style, the methodology is based on similar

and simple premises: 1) open and honest input from those who were involved; 2) a collective desire to learn and improve; 3) a no-fault approach, i.e., no one is blamed for errors; and 4) the commitment from decision-makers in management to make meaningful changes based on the recommendations. Various methodologies of the Lessons Learned process will be described and compared, followed by three anecdotal examples of how some of these have been used in situations of varying levels of complexity and numbers of participants. The objective of the chapter overall is to provide the reader with an understanding of *which* Lessons Learned methodologies can be and should be used for organizational learning, process improvement and innovation.

BACKGROUND

Definitions of Lessons Learned have been adequately collected elsewhere (Milton, 2010) and do not require re-examination here. In general, however, it is agreed that a lesson is not really "learned" until organizational behaviour has changed indefinitely. The lesson itself is the result of identifying desired effects and outcomes by analyzing observations from experience. Perhaps it is more useful to describe, as NATO has done, the purpose of the overall process:

> *The purpose of a Lessons Learned procedure is to learn efficiently from experience and to provide validated justifications for amending the existing way of doing things, in order to improve performance, both during the course of an operation and for subsequent operations. This requires lessons to be meaningful and for them to be brought to the attention of the appropriate authority able and responsible for dealing with them. It also requires the chain of command to have a clear understanding of how to prioritise lessons and how to staff them. (*NATO, 2011, p. 1).

Lessons are, after all, about learning: what one comes to know or understand as a result of study, experience and reflection. When the learning is commonly accepted or acknowledged, it becomes corporate "justified true belief"[ii] or knowledge. The literature in the domain of learning is rich, deep and cannot be adequately discussed in this chapter. However, an introduction to experiential learning provides a basis for understanding how learning lessons actually happens and how the process can be facilitated at the individual, group and organizational levels.

"Learning is the process whereby knowledge is created through the transformation of experience." (Kolb, 1986, p.38). Kolb's Learning Theory is rooted in those of Lewin, Dewey and Piaget. Lewin's Experiential Learning Model was a four-stage cycle of: experience; observation and reflection; formulation of abstract concepts and generalizations; and testing implications of concepts in new situations. What made this theory compelling to Kolb (and to the application in the Lessons Learned process) was the emphasis on personal experience to validate ideas created during the learning process, as well as the use of feedback processes for the individual learner. John Dewey's Model of Learning is similar in that it posits that learning is a complex intellectual operation that converts experience into purposeful action through three stages: 1) observation of surrounding conditions; 2) knowledge of past experience or that of others; and 3) judgment, which converts the original impulse of action into purpose. (Dewey,1938).

Finally, Jean Piaget's Model of Learning and Cognitive Development (Piaget, 1970) describes how learning takes place through a balance between "accommodation", or altering existing schemas as a result of new information, and "assimilation," i.e., incorporating information into existing mental models. Similar to those of Lewin and Dewey, this model is a process of four stages: 1) a sensor-motor relationship between stimuli and response; 2) representational (manipulation of observations and images); 3) symbolic developmental (development of inductive powers, relying on concepts and theories to understand experience; and 4) formal operations, engaging in hypothetico-deductive reasoning.

The similarities in these three foundational models led to Kolb's Theory of Learning Styles, in which learning is a processing continuum, also in four stages: 1) concrete experience; 2) reflective observations of others' or one's own experiences; 3) abstract conceptualization, or creation of theories to explain observations; and finally 4) active experimentation, which tests theories to solve problems or make decisions. (Kolb, 1986) Further, Kolb defined Experiential Learning as having the following characteristics:

- An emergent process, rather than focused on outcomes;
- A continuous process grounded in experience;
- A resolution of conflicts of modes of adaptation;
- An holistic process of adaptation to the world;
- The interaction between individuals and the environment; and
- The process of creating knowledge.

These models of individual learning help to understand how processes must be designed to enable employees to learn so that the organization can grow and improve. The learning organization is defined as "an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights." (Garvin, 1993, p. 51). This definition incorporates these individual and other organizational learning theories. Peter Senge (2006) included "team learning" as one of the five essential disciplines for the learning organization. While he admits that not enough is known about how teams actually learn, he recognizes that group learning begins with the basics of a shared vision, individual learning and personal mastery. For teams to learn, they must be able to think collectively about complex issues, without falling prey to group decision-making biases (e.g., groupthink). The learning team must also be able to act together in a coordinated, trusted way. It must also be interconnected with other teams to foster broader practices and skills. Senge (2006) explained that two types of discourse must be present for "continual generative learning" of teams: discussion, which involves debate, and dialogue, which requires openness to exploring new ideas.

Other theories about organizational learning that are relevant to Lessons Learned include that of Argysis and Schon who differentiated between single and double-loop learning. S*ingle-loop learning* is where "the error detected and corrected permits the organization to carry on its present policies or achieve its present objectives." (Argysis and Schon, 1978, p. 2) In other words, it is assumed that any error was a mistake made in the execution of the process rather than in the organization's values, doctrine or mission. *Double-loop learning,* on the other hand, "occurs when error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies and objectives." (ibid., p. 3) This implies analysis leading to organizational change and openness to seeing issues from a broader, even complex perspective. Boyd (1986) introduced the similar concept of the OODA (Observe-Orient-Decide-Act) Loop as a learning and analysis approach in military operational research. The OODA cycle is not unlike the other theories, in which one learns from the assessment of experience.

Nonaka and Takeuchi (1995) also provided an organizational learning model, which added the dynamic dimensions of tacit (unexpressed or inexpressible) and explicit (codified or expressed) knowledge. The SECI (Socialization, Externalization, Combination and Internalization) model describes four facets of learning in the organization. Beginning with the *socialization* phase, team members learn implicitly through shared social experiences, working side-by-side with others or experientially as in apprenticeships. They then codify the unexpressed or impressible in the *externalization* process. Often, this codification is not expressible except through models, metaphors or other representational means of reflecting the knowledge. This is not to discount that there are elements of tacit or implicit knowledge that can never be expressed (Polanyi, 1967). In the SECI model, however, once the knowledge is documented,

it can then be reorganized, shared, or interpreted through a *combination* process, in which explicit knowledge can be made useful and usable in multiple forms. Finally, through the process of *internalization* the individual or team can assimilate or accommodate the new knowledge through relevant literature or training materials. Once assimilated or learned, the knowledge has once again taken a tacit form, albeit altered through the experience, conversion, and possible innovation.

Extrapolating from these theories, Lessons Learned processes will be most effective if they include the following learning principles. They should:

1) Align the participants through a shared vision and common purpose towards the desired goals.
2) Focus on the mutual experiences or shared actions of the team, the organization or organizations, in which learning was initiated.
3) Draw upon the experiences, skills, observations, reflections and knowledge of the participants in a trusted and open environment, with insight into assumptions, while avoiding the potential for groupthink or for laying blame.
4) Assess observations to create corrective actions, new concepts or innovative solutions. Use discussion and dialogue as a means to explore the options collectively.
5) Test the resulting concepts through validation, experimentation, or in operations.
6) Integrate a learning loop by building in the continuous experience, observation, assessment, and creation of new approaches.

As we will see below, not all organizational learning approaches include these principles.

OTHER OPTIONS FOR ORGANIZATIONAL LEARNING

Because "Lessons Learned" is an often misused term that is freely used to describe collected observations about how an event or situation transpired, other processes may be confused as methodologies. Although they have similar intentions for process improvement, they differ by their approaches. Fundamental to what makes it a lesson learned is: the involvement and the willingness of the participants to share their experiences and their common goals, the double learning loop, and the completion of the process to test, implement and validate the lessons. The following examples, while appropriate in their own place, do not share these characteristics.

Monitoring and Evaluation
Monitoring and evaluation are common business practices that focus on the outputs and outcomes of projects and programs with objectives of improving performance and achieving results. They are generally conducted by independent or external professionals who are neither directly involved in the subject nor impacted by the results. Evaluations, while tailored to the specific needs of the organization, typically focus on two main aspects: relevance and performance. Evaluations most often look at costing issues, such as value for money. While monitoring is an ongoing process of collecting and analyzing data to ensure progress is being made according to plans, evaluation is a specific rigorous process accompanied by standard procedures. The United Nations defines it as follows:

> **Evaluation** *is a selective exercise that attempts to systematically and objectively assess progress towards and the achievement of an outcome. Evaluation is not a one-time event, but an exercise involving assessments of differing scope and depth carried out at several points in time in response to evolving needs for evaluative knowledge and learning during the effort to achieve an outcome. (*United Nations Development Programme, 2002, p. 6.)

"Evaluation" in this sense encompasses a professional body of knowledge requiring training, education, credentials, certification, and adherence to ethical standards within its membership. The Canadian

Evaluation Society (2010), for example, has five expected evaluator competency domains for their professionals, each with numerous competencies. These include reflective, technical, situational, management and interpersonal practices. Professionals must adhere to the Canadian/United States Joint Committee on Standards for Educational Evaluation.

This is not to suggest that evaluation and Lessons Learned processes cannot benefit from one another's experiences and observations. Lessons can be derived from monitoring and evaluation, just as observations and lessons can be fed into an evaluation process. The differences are that the evaluation process must be *independent* to be valid and must adhere to a professional set of standards and practices, while Lessons Learned involves the participants and is adaptable to the situation.

Inquiries
Inquiries, whether public or organizational, are legal entities that are tasked with finding causes for serious incidents and to provide advice to governments. As legal proceedings, they are led by appointed commissionaires and work semi-independently, although the governments tasking public inquiries are under no obligation to accept or act upon recommendations. In Canada, for example, Commissions of Inquiry are led by distinguished citizens or judges and have powers to subpoena witnesses. Participants can be compelled to participate and while truth and honesty are legal and ethical expectations, the concept of "no-fault" as found in Lessons Learned practices is not recognized.

Government organizations usually have their own mechanisms for investigating serious incidents, in addition to legal investigations, to provide background and advice to decision-makers. Military Summary Investigations and Boards of Inquiry, for example, can compel witnesses and make recommendations for corrective action, discipline and other serious consequences. The Transportation Safety Board of Canada is another example where an organization has independent responsibility to investigate accidents and make recommendations for improved safety. While the participants are interviewed for their experiences and insights, the Board is independent and responsible for finding causes and future solutions. Private businesses and corporations also have internal inquiry processes that are designed to find and correct problems. The difference, therefore, from Lessons Learned is that there are legal requirements which may find fault. The participants do not have influence over the proceedings.

Business Process Improvement
While it would appear that the Lessons Learned process is all about Business Process Improvement (BPI), in fact each is a different approach to organizational change. BPI is about making systematic changes to processes for improved organizational performance and results. Business processes are defined as identifiable entities with inputs, resources, information or resource flow, and outputs. (Harrington,1991). BPI and its more robust and dramatic cousins, Business Process Renewal and Business Process Re-engineering, use various step-by-step methodologies, tools, techniques and models. There are literally hundreds of such approaches and they range from the simple (brainstorming, mind-mapping) to mathematical (algorithms, flowcharts) to large-scale (Six Sigma, ISO 9000).

Although approaches vary, in general the steps involved in BPI include: 1) setting improvement objectives; 2) establishing performance measures; 3) mapping, flowcharting or otherwise documenting the existing process; 4) collecting, organizing and analyzing statistical or other types of data; 5) identifying anomalies and root causes of process weaknesses; 6) identifying options for change; 7) mapping, flowcharting or documenting the new process; 8) trialing the change and collecting data; 9) accessing the success of the change; and implemementing and monitoring the change. Both Lessons Learned and BPI have compatible objectives. It is conceivable that during the analysis, the Lessons Learned process could identify the need for BPI to improve a particular workflow or process as a result of the participants' experiences, but BPI is above all a process structured to gather and evaluate inputs. It is not focused on the learning aspects of the team or its members.

Best Practices or Success Stories
Occasionally, managers will ask for a Lessons Learned exercise in order to capture best practices or "success stories" so that they might spread the good news about how well an event or a project unfolded. It is possible to contribute to the process of establishing best practices or to derive feel-good stories out of a Lessons Learned process, but it is not the ultimate objective.

Best Practices have been defined by the U.S. Department of Homeland Security's Federal Emergency Management Agency as *peer-validated techniques, procedures, and solutions that have demonstrated their effectiveness in operations, training, and exercises across multiple jurisdictions or organizations.* (US DHS FEMA, n.d., para 20). The Lessons Learned process offers the opportunity to determine whether afore known best practices have indeed held up during operations. It also provides an occasion to identify techniques, procedures, or solutions that have the potential to be intentionally tested and validated as an organizational tried-and-true practice.

Similarly success stories may rise to the top during Lessons Learned processes. There is, in turn, the opportunity to highlight these and recommend them for communications opportunities, but to strictly look for "good stories" would miss the point of the learning process. FEMA defines these as stories that *describe successful, innovative programs and initiatives developed by a jurisdiction that others may wish to emulate.* (ibid., para 20). In fact, other organizations with similar challenges or problems do turn to Lessons Learned reports to seek out potential solutions and they are important tools for knowledge transfer between individuals or organizations.

Action Learning
Action Learning was a concept devised by Reginald Revans in the mid-20th century as an alternative to conventional educational approaches. Action Learning is based on the premise that adaptive learning is essential to meet and survive the challenges of rapid change. The result of the learning experience must result in action. To accomplish this, the learners must open themselves up to the "freedom to pose fresh questions." (Revans, 1979, p. 3) There is a differentiation between the "programmed" knowledge of subject matter experts as acquired through traditional educational approaches and that of the action learning leaders of "learning communities" who learn through three conditions: 1) attacking real problems in which solutions will require change; 2) benefitting from the criticism, support and advice of all members within the "set," i.e., a small group; and 3) providing one's own criticism, support and advice to the other members of the set.

Action Learning can be used as an institutionalized organizational learning technique or to address problems in external institutions or in cross-functional or cross-sector situations. It can draw upon the diverse skills and knowledge of set members to address particularly difficult problems or to look for new and innovative solutions. Action Learning in itself does not serve as a Lessons Learned approach, although, as a technique it might contribute to the analysis and subsequent recommendations in some processes. As a problem identification and solution technique, it could be employed to freely analyze the issues arising from lessons identified.

LESSONS LEARNED PROCESSES
Collecting and analyzing Lessons Learned requires intentional process that will facilitate the learning of the participants and by extension, the organization. The following techniques have consistent characteristics: shared vision and objectives, a focus on sharing experience for mutual learning, and a complete learning cycle. Lessons Learned processes are applicable at tactical, operational and strategic levels, in other words, at varying levels of complexity and numbers of participants.

After Action Reviews
The *After Action Review (AAR)* is the most common technique for gathering and analyzing lessons in an immediate and tactical way. Formalized by the military for learning in training exercises, it is also referred to commonly as a "Hot Wash", "Hot Wash-Up", or "De-brief." What makes it a Lessons Learned process is the involvement of those who were specifically involved and whose behaviour could change as a result of the analysis.

AARs can be formal or informal, with the formal version being structured in its facilitation, stages and objectives. In general, the facilitator is also the leader of the action and aims to learn whether or not training or mission objectives were met and how to proceed to accomplish the team's goals.

The process involves a number of steps:

1. Introduction of the AAR and ground rules for participation. This often includes the "no fault" caveat.
2. Overview of the mission and objectives and what the desired outcomes were expected to be.
3. Review of the actual performance and gathering of the ground truth, i.e., what actually happened.
4. Observations as to what went well and how to sustain these aspects in the future.
5. Observations as to what did not go well and how to correct in the future.
6. Summation of the results, identification of actions, timings and taskings.

In a military context, there may be a review of the relevant doctrine, procedures, or techniques before the discussion of what happened, as well as comments from observers and/or controllers (who collect data and provide additional feedback) during a training exercise (US Army, 1993). In the military situation, an AAR can occur at the end of daily operations, at the end of a training scenario, and at the end of the overall exercise or operations. Usually in the formal AAR, there is documentation of the discussion for future references.

Informal AARs can happen at any time and are used as opportunities for learning within smaller teams. These are useful for determining whether the team is meeting objectives, identifying their strengths and weaknesses, and determining how they may improve mid-event. These informal AARs are not necessarily recorded, although if there is a need to make changes to procedures, they may be and should be documented.

The need to establish ground rules from the onset is the basis for the trust that will make the AAR open and useful. This suggested introduction outlines the rules that make the AAR a problem-solving process with the objective of mutually agreed upon solutions:

> *An AAR is a dynamic, candid, professional discussion of training which focuses on unit performance against the Army standard for the tasks being trained. Everyone can, and should, participate if they have an insight, observation, or question which will help the unit identify and correct deficiencies or maintain strengths. An AAR is not a critique. No one, regardless of rank, position, or strength of personality, has all of the information or answers. After-action reviews maximize training benefits by allowing soldiers, regardless of rank, to learn from each other. An AAR does not grade success or failure. There are always weaknesses to improve and strengths to sustain. (US Army, 1993, p. 16)*

Before Action Review
A variation on the AAR is the Before Action Review (BAR) as described by Darling, Perry and Moore (2005). This is a process that happens before work commences to review and incorporate learnings from

past events and to avoid making similar mistakes. The BAR has four questions: 1) what are the desired results and how are they to be measured; 2) what challenges can be anticipated; 3) what has been learned in similar situations; and 4) what will lead to success this time? The authors suggest that the answers to these questions will both result in a successful plan and provide the framework for conducting the subsequent AAR.

Cultural Variations of the AAR
The AAR can be adapted for different situations and cultures to achieve the same results. The 2-5-1 Storytelling approach was created by Karuna Ramanathan (2009) of the Singapore Army to encourage reticent Southeast Asian participants to share their learning. It is a simple process using the fingers of one hand and allows each individual to speak uninterrupted and freely. Participants are asked to present in a 2-5-1 sequence:

2. Tell the group two things:

- State who you are.
- Summarize your experience.

5. Using each of your fingers, answer the following questions:

- Little finger – What parts of the effort did not get enough attention?
- Ring finger – What relationships were formed; what did you learn about relationship building?
- Middle finger – What did you dislike; what or who made you frustrated?
- Pointer finger – What would you do better next time around; what do you want to tell those who were in charge about what they could do better?
- Thumb (up) – What went well or what was good?

1. Say what your most important takeaway from the effort was?

This illustration shows how other facilitation methods might be adapted for groups with different dynamics or cultural norms, providing of course that they are based on the same Lessons Learned principles. An example might be the pod, or interview, facilitation approach, which is designed to encourage dialogue and interaction in small groups. It starts with a one-on-one interview technique and is formatted to ensuring that all members contribute. This works well in situations where shyness or reticence might be a factor.

Domain Specific Approaches
In some fields, learning lessons is not a choice: the welfare of employees, patients, passengers and the public is at stake. In areas such as flight, medical and high risk environments, where health and safety are paramount; continuous learning is mandatory.   In these cases, reports and reporting systems are key tools for contributing, collecting, and sharing data. Industry and international reporting guidelines and standards exist in many sectors. In general, they follow the same principles as highlighted previously: 1) improvement of outputs and outcomes; 2) no recriminations from reporting; 3) meaningful analysis and recommendations for change; and 4) resources to support the learning process. (World Health Organization, 2005) Reporting can create large data sets and requires a rigorous approach to system design, data collection and analysis. All this work would be for naught if the system could not identify and disseminate alerts, trends, hazards, insights into underlying failures and recommendations for improvement. It is even more critical to have standardized approaches for the sharing of data and lessons in national and international situations, such as nuclear or flight safety.

Operational Field Recovery of Lessons

When an organization is looking at a larger scope, such as a major project, a military operation, a large event or organizational process, a more robust approach to Lessons Learned planning, collection and analysis is required. Since the success and the importance of the situation in question are of vital concern to senior management, the impetus is command or leadership driven. In the military context, there are four main stages to the process in an operational Lessons Learned context (Canadian Forces, 2013):

1. Establishment of a Critical Topics List or Critical Success Factors, i.e., those issues upon which the success of the operation or organization's future operations are dependent. This list evolves with time, presumably as problem issues are mitigated. A Critical Topics List includes both standing topics, which are core to the business, and focused topics which are more time and situation dependent.
2. Lines of Inquiry, or those questions and methodologies that will elicit the responses required, determine how the organization is managing within the context of the Critical Issues.
3. Collection of observations through surveys, questionnaires, interviews, emailed observations or other mechanisms.
4. Validation, which broadly speaking is the concatenation and analysis of the observations by subject matter experts with the objective of influencing doctrine, policy or procedures. This can result in briefings to senior officials, reports with preliminary results, formal reports, databases or other forms of recording.

Project Process Review

Project management requires the collection of Lessons Learned as a standard process as indicated in the Project Management Body of Knowledge or PMBOK® (2013). A Project Process Review (PPR), sometimes referred to as a "Postmortem" or Postmortem Analysis (PMA), retrospective or even the Santayana Review[iii] (Godfrey, 1999), is a common operational form of Lessons Learned in the project management domain. While the term is somewhat unfortunate in its implication that the patient cannot be revived, the intent is to capture at the end of a project that knowledge which is tacit and for individuals, groups and the organization overall to learn and improve processes. Like other lessons learned processes, this technique has the main stages of: data collection, analysis, and reporting. In engineering circles, the PMA involves analysis during the data collection stage, as well as exploring the roots of the issues right from the beginning using semi-structured interview techniques, facilitators, and group analysis methodologies (Birk, 2002).

Although the methodologies and scope vary according to complexity and size of project and individual organizational practices, they all include five stages, as defined by Collier, DeMarco and Fearey (1996):

1. Project survey, which is the collection of subjective data, in a confidential manner, about how the project was performed. This requires an investment in survey design to ensure that the correct questions are being asked to elicit appropriate information. It also requires tabulation and evaluation, which in itself requires an outlay of time and resources.

2. Collecting objective project information i.e., costs, scheduling, quality, and other factual details about the project health. Metrics are useful in assessing areas of most significant weakness and in comparison across projects within an organization or for benchmarking. "Hard data focuses discussion," according to the authors. (ibid., p. 68). It represents ground truth, which cannot be passed as opinion.

3. Conducting a debriefing meeting, to collect any other information from the entire project team. The meeting is an opportunity to begin to dissect root causes as well as serve as a cathartic

session for the participants. The issues for discussion originate from the initial analysis of the first two stages. In general, the literature indicates that these sessions are most successful when led by a facilitator from outside of the team, who must employ techniques to establish a positive environment and stay focussed on the issues at hand.

4. Project history day, which involves a smaller, analytical group (generally six to eight individuals) to assess the data arising from the earlier stages. The key players commence the session only after having studied all of the evidence. Led by a facilitator, they perform root cause analysis of the issues, employing such techniques as affinity diagram tools.

5. Publishing the results in a report to guide organizational improvement. The authors suggest that the reported results are categorized, assigned to responsible authorities and presented to management to encourage change and improvement. Desouza, Dingsoyr, and Awazu (2005) suggested that stories or narrative, while being more costly to produce, have a higher organizational impact and communicate better the learnings from the Postmortem than a standard report.

After Event Review: Meta-Organizational Lessons
The power of the Lessons Learned process has not been lost on officials with a desire to understand and learn from large-scale strategic events. When the event or situation does not involve just one individual organization but rather it encompasses cooperation and coordination among multiple organizations, different approaches are required. Defence Research and Development Canada devised a process for which they coined the name: the *After Event Review* or AER. (McIntyre and Kaminska, 2011) This approach brings an operational analysis approach while still maintaining the intent to learn from participants in large, complex situations. The AER follows these steps:

1. Engage the authority or owner to determine the objectives or desired outcomes of the process. At this point, it is appropriate to determine a preliminary list of anticipated critical topics. Some important questions to consider may be: *What did the senior leadership see as issues that should be explored during the course of the process? Who are the key players from whom observations should be collected? How will the final results be used for future, similar events? What form of reporting of the lessons should be taken?* It is also good to determine the level of willingness to be receptive to any requirement for corrective actions.

2. Articulate the main research question and subequent lines of inquiry. Defining the problem space requires adequate time and reflection to ensure that the questions will provide the type of useful answers that are desired. It is at this point that the strategic approach differs from the simpler AAR. In addition to gathering the observations of participants, there may be additional research approaches to support and understand what happened. For example, Social Network Analysis (SNA) has been used with good results to understand meta-organizational operations and to clarify or explain the anecdotal input of interviewees. It provides data that can substantiate or refute impressions of how individuals and organizations actually worked together. Another example might be economic modelling to support or counter the claims or "hunches" of participants in a complex environment, e.g., did a strategic or policy approach actually result in cost savings?

3. Gather the observations of the participants. Unlike an AAR, where all participants are on the ground and can contribute to the discussion, an AER is looking at complex issues that cannot be easily discussed in one sitting. Additionally, in a strategic situation, the participants are looking at issues from a broader view and are often dispersed across locations or organizations. If the participants are senior in rank, the researchers would likely have to go to them to acquire their

input. Interview protocols for confidentiality, recording and transcription must be followed to ensure quality and integrity of data. An additional step required in the AER is the review of documentation that may have been created prior to or during the event. This will provide context and evidence from which to draw during subsequent interviews and analysis.

4. Analyze the results of the interviews or other methodologies. This step is undoubtedly one of the most challenging and requires rigour to ensure that the results are valid. A coding scheme must be devised based on the team's understanding of the objectives and the emerging themes of the interviews. Once the results are either manually entered or captured employing software devised for the process, the analysts then code the interview results, and sort them for themes to analyze. The observations then become "evidence" of the issues, root causes, successes, and failures. Triangulation, i.e., verification of a point from two or more sources, is critical to the validity of the results. Outliers are either discarded or explored within a larger context. In this stage, other scientific analyses may be put to use to provide additional insights, e.g., indicators from the SNA.

5. Compile and validate the results and recommendations. It is very important to obtain the critical feedback of the subject matter experts who have been involved in the event itself or who will have to implement the recommendations or be impacted by them. Their review will also serve as a test of the assessment and flag any issues which may require more evidence or analysis. Presenting the results to the senior authority or business owner for an initial review will also help to ensure their receipt and consideration upon completion.

6. Submit and present the final results to the owner and decision-makers. The recommendations should be presented in such a way, that they can be parsed for individual implementation. Because of the complex nature of the subject matter, the results may not "belong" to one entity and may not be easily actioned.

Three Examples

As indicated previously, Lessons Learned processes can be used in any scale of organization or event, but they must be adapted to the situation in order to achieve the desired results. Two variations of an AAR in informal and formal situations are presented anecdotally, as well as within a more complex example, all based on the author's experience in facilitation of Lessons Learned. The examples have been selected to illustrate the flexibility of the process.

Informal
The Dragon Boat has been part of an ancient team racing tradition in southern China for thousands of years. In recent times, it has found its way to other parts of the world in festivals and charity events. In 2012, the author was a member of a standard Dragon Boat team: 20 rowers, one drummer, and one steersperson. After the first race in the competition, the team was pulled together in a circle and an AAR was conducted. *What went well?* "The front four paddlers, or the 'engine' of the team, dug deep and got us off to a strong start." *What do we need to better in the next race if we want to advance?* "The rest of the team is out of sync in their paddling and we could not maintain the pace." The leaders of the team then met to analyze the results and the AAR feedback. They determined that some of the middle paddlers should be replaced in the next race by stronger, more consistent team members. Sadly for the author, she sat out the next race. The leaders then briefed the team on how their observations were going to be implemented in the next race. They did not go on to win, but the team's performance improved.

Formal
The author's organization had determined that it would replace its existing collaboration tool with an updated version, but the staff responsible for this project recognized that the first system had not been as

successful as they hoped the next implementation would be. The author facilitated a BAR workshop based the work of Marilyn Darling and colleagues (Signet, 2007). This methodology allows the participants to use their previous experiences to determine how they want to proceed in a new initative. The workshop consisted of managers, programmers, users, and information management specialists. The BAR began with the identification of the intended results of the former system and those of the proposed system. The workshop then captured the anticipated challenges based on those of the former system; the group gatherered a list of what aspects did not work so well and were able to identify such needs as better defined governance and metadata schemas. Throughout, the participants from various backgrounds were able to bring forth their experience and knowledge from similar situations. Next they discussed what had worked well and what elements should be included in the future requirements to ensure success. These included such elements as the need for user flexibility to manage their own communities, balanced with the requirement for strong user authentication. The end-result of the BAR was an initial list of requirements, which the team was then able to use as a starting point for the new project.

Meta-Organizations

The 2010 Winter Games in Vancouver provided the federal government security and safety community with a unique opportunity to collaborate and assist one another in planning and operations. Once the event had reached its successful conclusion, the author led a team to provide an After Event Review of whole-of-government collaboration efforts. This involved compiling a team of researchers, who interviewed 40 key participants, researched three case studies of challenging scenarios with creative results, and undertook a Social Network Analysis of participants. The analytical framework used a capability-based model to assess successful approaches and identify areas where improvement would be required in future similar operations. Themes emerged which were consistent with challenges in managing meta-organizational events. The analysis and resulting recommendations were validated by subject matter experts prior to being presented to decision-makers.

FUTURE RESEARCH DIRECTIONS

The literature on Lessons Learned is not vast. There are more publications dedicated to identifying what lessons should be learned than either how to identify them or learn from them.   There is no known research to indicate whether any of the above approaches actually work or whether or not they represent sources of organizational change and improvement. The only indicators of effectiveness are anecdotal. The field would benefit from two future research directions.

Firstly, research should focus on how Lessons Learned processes can be optimized to ensure individual, team and organizational learning can occur. This would require the joint efforts of educational pychologists and business owners. This calls for a sound knowledge of learning theory applied to specific business processes. Testing of methodologies would further the utility of the Lessons Learned approaches.   Researchers should also consider exploring how to incorporate other methods of gathering observations and analysis, some of which may be derived from other process improvement methodologies. Secondly, further research is required into whether existing Lessons Learned processes actually produce the desired organizational learning and change results. Multiple aspects should be considered including: whether formal organizational and doctrinal changes occur as a result; if tacit individual, team or cultural changes transpire as a result; and whether the process itself is an indicator of a healthy learning organization.

CONCLUSION

This chapter began by briefly describing the theoretical basis for learning as it relates to the methods of Lessons Learned for organizational learning and improvement. As individuals are the initial organizational receptors for learning, the process must be conducive to their personal experience. However, group learning, as well as organizational learning, has specific characteristics to leverage

individual learning within the social structures of the larger whole. The Lessons Learned process is based on the notion of experiential learning, whereby individuals and groups act and then observe and assess those actions, theorize and act upon those theories. It is the full involvement of the participants in the learning cycle that gives the methodology its strength.

Organizations have many options for business or operational improvements and some of these have been presented. While the misnomer "lessons learned" is often used to describe the findings of evaluations, inquiries, investigations, they differ in technique, primarily by not leveraging the experiential learning process. The Lessons Learned process is not yet robust with established best practices or broad doctrine. Much work is left to do in the gathering and testing processes for effectiveness, documenting best practices, and developing new methodologies. In the meantime, good practices that can be emulated for both quick and in-depth organizational learning do exist.

REFERENCES

Argyris, C. & Schon, D. (1978). *Organizational learning: A theory of action perspective.* Reading MA: Addison-Wesley.

Balanced Scorecard Institute. (1996). *Handbook for basic process improvement*. Retrieved May 9, 2014 from https://balancedscorecard.org/Portals/0/PDF/bpihndbk.pdf

Birk, A., Dingsoyr, T., & Stalhane, T. (2002). Postmortem: Never leave a project without it. *IEEE Software.* May/June: 43-45.

Boyd, J. (1986). *Organic design for command and control.* Unpublished slides. Retrieved April 29, 2014 from http://www.dnipogo.org/boyd/pdf/c&c.pdf

Canadian Evaluation Society. (2010). *Competencies for Canadian evaluation practice.* Retrieved 8 January 2014 from http://www.evaluationcanada.ca/txt/2_competencies_cdn_evaluation_practice.pdf

Canadian Forces. (2013). The lessons learned (LL) process. *Canadian Forces Joint Doctrine Note* 04/08.

Collier, B., DeMarco, T., and Fearey, P. (1996). A defined process for project postmortem review. *IEEE Software*. 13(4):65-72.

Darling, M., Parry, C., & Moore, J. (2005). Learning in the thick of it. *Harvard Business Review*. July-August. Reprint.

Desouza, K., Dingsoyr, T., & Awazu, Y. (2005). Experiences with conducting project postmortems: reports vs. stories. *Software Process Improvement and Practice*, 10 (2): 203-215.

Forehand, M. (2005). Bloom's taxonomy: Original and revised. In M. Orey (Ed.), *Emerging perspectives on learning, teaching, and technology*. Retrieved October 23, 2013 from http://projects.coe.uga.edu/epltt/

Garvin, D. (1993). Building a learning organization. *Harvard Business Review on Knowledge Management.* Boston, MA: Harvard. July: 47-80.

Gettier, E. (1963). Is Justified True Belief Knowledge? *Analysis.* 23: 966.

Godfrey, A.B. (1999). The Santayana Review. *Quality Digest*. Retrieved 3 January 2014 from http://www.qualitydigest.com/feb99/html/body_godfrey.html

Harrington, H.J. (1991). *Business Process Improvement: the breakthrough strategy for total quality, productivity and competitiveness.* New York, NY: McGraw-Hill.

Kolb, D. (1984). *Experiential learning: experience as the source of learning and development.* Englewood Cliffs, NJ: Prentice-Hall.

McIntyre, S., & Kaminska, K. (2011). *Capturing Lessons that should be learned: an after event review for whole-of-government security planning and operations.* Paper presented at the European Conference on Knowledge Management, Passau, Germany.

Milton, N. (2010). *The Lessons learned handbook: Practical approaches to learning from experience.* Oxford: Chandos.

NATO. (2011). Allied Joint Doctrine for the Conduct of Operations, AJP-3(B).

NATO. Joint Analysis and Lessons Learned Centre (2011). The NATO lessons learned handbook. (2nd ed.). Retrieved October 23, 2013, from http://www.jallc.nato.int/newsmedia/docs/Lessons_Learned_Handbook_2nd_edition.pdf

Nonaka I., & Takeuchi, H. (1995). *The knowledge creating company.* New York, NY: Oxford.

Polanyi, M. (1967). *The tacit dimension.* New York, NY: Anchor Books.

Project Management Institute. (2013). *A guide to the project management body of knowledge (PMBOK guide).* Newtown Square, PA: Project Management Institute.

Ramanathan, K. (2009). 2-5-1 Storytelling. *KMWorld 2009.* Retrieved January 3, 2014 from http://swanthinks.wordpress.com/2009/11/23/2-5-1-storytelling/

Revans, R. (1979). Action learning: its terms and character. *Management Decision Journal.* 21(1). Retrieved on May 9, 2014 from http://www.revanscenter.com/files/Download/reg-revans-manuscripts.pdf

Santayana, G. (1905). Reason in common sense. *The life of reason.* Retrieved May 24, 2014 from http://www.gutenberg.org/files/15000/15000-h/vol1.html.

Senge, Peter. (2006). *The fifth discipline: The art and practice of the learning organization.* New York, NY: Doubleday.

Signet Research and Consulting. (2007). *After action reviews and the action review cycle™ (ARC).* Retrieved on 10 May 2014 from http://www.signetconsulting.com/downloads/AAR%20Fact%20Sheet.pdf

United Nations Development Programme Evaluation Office. (2002). *Handbook on monitoring and evaluating for results.* New York, NY: UNDP. Retrieved on May 24, 2014 from http://web.undp.org/evaluation/documents/HandBook/ME-Handbook.pdf

United States Army. (1993). *A leader's guide to after action reviews.* Training Circular 25-20. Washington, DC: United States Army.

United States Department of Homeland Security/Federal Emergency Management Agency. (n.d.). *Lessons Learned Information Sharing Program.* Retrieved May 9, 2014 from https://www.llis.dhs.gov/content/frequently-asked-questions#anchor_53.

World Health Organization. World Alliance for Patient Safety. (2005) *WHO draft guidelines for adverse reporting and learning systems: from information to action.* (WHO/EIP/SPO/QPS/05.3). Retrieved May 9, 2014 from http://www.who.int/patientsafety/events/05/Reporting_Guidelines.pdf

ADDITIONAL READING SECTION

Bloom, B.S., & Krathwohl, D.S. (1956). *Taxonomy of educational objectives: The classification of educational goals, by a committee of college and university examiners. Handbook 1: Cognitive domain.* New York, NY: Longmans.

Canada Public Service Agency. (2007). *A Primer on the learning organization.* Ottawa ON: Canada Public Service Agency. Retrieved October 23, 2013 from http://www.tbs-sct.gc.ca/dev/dwnld/lapn-eng.pdf

Jamali, D., Khoury, G., & Sahyoun, H. (2006). From bureaucratic organizations to learning organizations: An evolutionary roadmap. *The Learning organization,* 13(4): 337-352.

Yarbrough, D. B., Shulha, L. M., Hopson, R. K., &Caruthers, F. A. (2011). *The program evaluation standards: A guide for evaluators and evaluation users.* (3rd ed.). Thousand Oaks, CA: Sage.

KEY TERMS & DEFINITIONS

After Action Review: A facilitated discussion designed to improve future actions based on gleaning successes and obstacles from past experience.

After Event Review: A facilitated study of a significant, strategic event to determine how future, similar events could be managed for improved performance.

Learning: The ability of an individual, group or organization to sense, assess, and adapt to the environment in such a way that behaviour and understanding is changed.

Learning Organization: An organization that recognizes the need for continuous growth and improvement and thus strives to embed mechanisms for its employees and structures to learn and adapt.

Lessons Learned: An organizational learning process that draws upon the experience and knowledge of the participants to collect, analyze, recommend and implement sustainable and improved processes.

Meta-organization: An organization whose membership consists of other organizations and which has an umbrella governance, e.g., NATO, the United Nations.

Organizational Learning: The ability of the organization to change and adapt doctrine, procedures, culture and behaviour through systematic and adaptable processes.

Process: A series of stuctured actions designed to achieve a result, product or service.

<hr>

[i] Use here in the broadest context. NATO and the United Nations are meta-organizations with heavy governance, but they can exist in less structured forms.
[ii] Attributed to Plato (Gettier, 1963).
[iii] George Santayana (1905) Reason in Common Sense: "Those who cannot remember the past are condemned to repeat it."

Submitted for publication in:

McIntyre, Susan et. al. (2015). Utilizing evidence-based lessons learned for enhanced organizational innovation and change. Hershey PA: IGI Global.