ORGANIZATIONAL ASSESSMENT PROCESSES FOR ENTERPRISE TRANSFORMATION

by

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Abstract

Enterprise transformation is a dynamic process that builds upon and affects organizational processes. Organizational assessment plays critical role in planning and execution of enterprise transformation. It allows the assessment of an enterprise's current capabilities as well as for identification and prioritization of improvements needed to drive the enterprise transformation process. Despite the benefits that organizational assessment has to offer, many organizations fail to exploit them due to unfavorable organizational culture, unsatisfactory assessment processes or mismatch between assessment tool and broader transformation approach.

This thesis focuses mainly on a model of organizational assessment and how it can be improved to better support enterprise transformation. We argue that the assessment process spans beyond performing the assessment itself. For the assessment to provide the expected benefit, organizations must first of all create an environment ensuring a clear understanding of the role assessment plays in the enterprise transformation process. To this end they must promote open and frequent discussion about the current state of the enterprise and future goals. The assessment process must be carefully planned to ensure it runs effectively and efficiently and that assessment results are accurate and reliable. Assessment results must be analyzed and turned into specific recommendations and action plans. At the same time, the assessment process itself must be evaluated and adjusted, if necessary, for the next assessment cycle.

Based on literature review and case studies of five large aerospace companies, we recommend a five-phase assessment process model that includes mechanisms to change organizational behavior through pre-assessment phases. It also allows for adjustment of the assessment process itself based on the results and experience of participants so that it better suits the organization's needs and practices.

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Title: Research Associate, Lean Advancement Initiative

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MIT's Lean Advancement Initiative has supported me through the studies and research. It has also provided access to industry partners, which was critical for this thesis. In particular, I thank Deborah Nightingale for sharing her incredible experience through classes, discussions and informal advice. I learned a lot from working with Tom Shields, Jayakanth Srinivasan and other LAI researchers. The whole team of fellow graduate research assistants is made up of incredibly smart and talented people, who have become good friends. I am especially grateful to Nathan Perkins for being such a great research partner. Good luck to all!

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List of Abbreviations

ANOVA	Analysis of variance
CEO	Chief Executive Officer
CMMI	Capability Maturity Model Integration model
ESAT	Enterprise Strategic Analysis and Transformation methodology
IDEAL	Initiating, Diagnosing, Establishing, Acting, and Learning
LAI	MIT's Lean Advancement Initiative
LESAT	Lean Enterprise Self-Assessment Tool
MIT	Massachusetts Institute of Technology
OA	Organizational Assessment
OAI	Organizational Assessment Instruments
PSM	Practical Software and Systems Measurement
SDM	System Design and Management
SWOT	Strengths, Weaknesses, Opportunities, Threats

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CHAPTER 1.

The Challenge of Enterprise Transformation

Nadler and Tushman (1980) refer to organizations as open systems. As such they possess important characteristics, such as internal interdependencies, capacity for feedback, equilibrium and equifinality. Organizations interact with their environment, and as the environment changes organizations must adapt by changing themselves. Adaptation is one the critical systems characteristics that allow organizations to survive in dynamic environments.

Adaptation - or, as we will call it, change or transformation - is a dynamic process that many organizations go through. It may occur naturally as an organization develops and grows. Or it may be induced (Garvin, 1998) should the organization feel the need for change that has not occurred naturally. Typically, transformation is called by changes in the external environment. Rouse (2005) identifies four main drivers of transformation, such as (i) new market and/or technology opportunities, (ii) anticipated failure due to market and/or technology threats, (iii) other players' (e.g. competitors) transformation initiatives and (iv) crises resulting from declining market performance, cash flow problems, etc. Organizations tend to adopt approaches to transformation that are oriented towards changes in strategy in response to opportunities or threats or towards changes in operational processes to create competitive advantage or overcome crisis (Rouse, 2005).

MIT-led Lean Advancement Initiative (LAI), a consortium of industry, government and academia conducting research in the field of enterprise excellence, advocates a stakeholder-centric approach to enterprise transformation. This approach involves creating the necessary balance across the needs of various stakeholders, including capital providers, employees, suppliers, customers, competitors, society, government, etc. "Each of these stakeholders contributes to the long-term sustainability of the enterprise, and ignoring any of them in the long-run can result in the rapid demise of the enterprise" (Nightingale, Stanke, & Bryan, 2008).

LAI's model holds that enterprise transformation is predicated on *seven principles of enterprise thinking* that were developed through academic research and field experience (Nightingale, 2009):

1. Adopt a holistic approach to enterprise transformation;
2. Identify relevant stakeholders and determine their value propositions;
3. Focus on enterprise effectiveness before efficiency;
4. Address internal and external enterprise interdependencies;
5. Ensure stability and flow within and across the enterprise;
6. Cultivate leadership to support and drive enterprise behavior;
7. Emphasize organizational learning.

Guiding such transformation is the Enterprise Strategic Analysis and Transformation (ESAT) methodology (Figure 1). It is an integrated analytical framework that is aimed at diagnosis and improvement of overall enterprise performance. The methodology involves qualitative and quantitative analysis of the enterprise's current state, including value flow and interactions within and across the enterprise, which allows identifying problem areas and opportunities for improvement. These lead to creation of a future state vision, actionable transformation plan and infrastructure for support of the transformation implementation (Nightingale, Stanke, & Bryan, 2008).

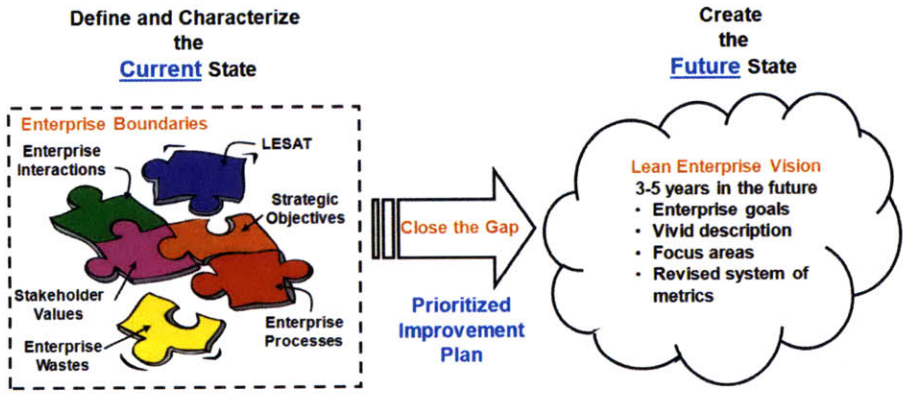

Figure 1 – Overview of ESAT Methodology (Nightingale, Stanke, & Bryan, 2008)

Organizational assessment is carried out during the analysis of the enterprise's current state. The assessment helps identify strengths and weaknesses in current performance and indicate future performance and envision a desirable future state. It provides input into future strategy and/or implementation plans.

In the course of our research we have conducted four case studies of organizations that have used specific assessment tool aimed at guiding them in the transformation process. We found that, with varying degrees of success, assessment processes in the studied organizations were not fully effective and efficient for three main reasons:

- Organizational culture and behavior during the assessment process impact assessment results;
- The assessment process requires improvements. This applies to the assessment process model prescribed in the assessment tool itself. It also applies to the assessment process that the organizations actually follow;
- Characteristics of the assessment tool make the assessment process difficult for organizations, especially when there is a mismatch with transformation roadmaps.

This thesis is an attempt to answer the question: What can enterprises do in terms of organizational assessment to better support enterprise transformation?

We will focus mainly on review of the assessment process. Our hypothesis is that, in order to achieve maximum benefit from the assessment so that it supports enterprise transformation, organizations must employ a consistent assessment process. The assessment process must be continuously improved based on past experience until it reaches the desired state, which ensures the organization benefits from the assessment. The desired assessment process may be an interim goal that evolves as the organizational behavior improves. A healthy, effective organization will continue to expand its goals for its behavior and processes.

Changes in the assessment process will lead to changes in behavior. An improved process will enable organizations to better perform in the assessment, increasing the likelihood of achieving the desired assessment outcome. The assessment also allows organizations to identify necessary improvements, thus further improving its behavior and allowing for better implementation of the assessment process. Assessment process and organizational behavior must be continually adjusted until they are fully aligned, achieving their desired states (Figure 2).

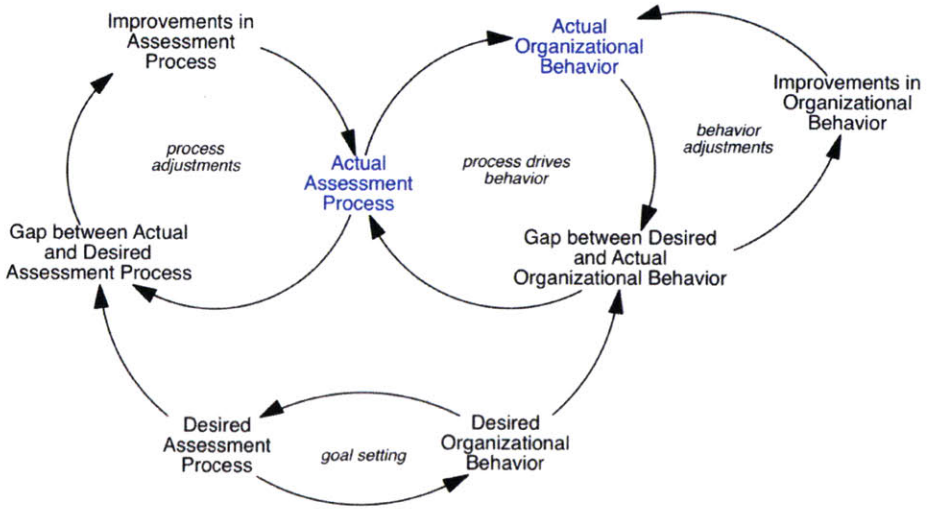

Figure 2 – Dynamic Alignment between Organizational Behavior and Assessment Process

In Chapter 2 of the thesis we will review the literature of organizational processes and organizational assessment processes. We will also compare several existing process models for organizational assessment and summarize them in a generalized process model.

Chapter 3 will provide overview of the Lean Enterprise Self-Assessment Tool (LESAT) as the assessment tool of choice. We will study the assessment process model currently prescribed for LESAT users and compare it against the generalized process model developed in previous chapter.

In Chapter 4 we will outline the research methodology utilized in this thesis. It will be followed in Chapter 5 by description of the case studies that we carried out in

order to study assessment processes that organizations using LESAT currently employ. We will compare and analyze the assessment processes and identify the ways in which organizations impact the assessment through assessment processes. Although in this thesis we will not analyze the assessment tool itself, we will mention the feedback received from organizations in the course of case studies.

Based on the literature review and the case studies, we will recommend in Chapter 6 an assessment process to be used by organizations employing LESAT. This chapter will provide detailed overview of the process.

We will conclude the thesis in Chapter 7 with suggestions for future research ideas and potential next steps.

CHAPTER 2.

Organizational Assessment Processes: A Literature Review

2.1. Organizational Assessment

2.1.1. Overview

Organizations are complex social systems made up of individuals. As part of their day-to-day activity individuals interact within and with a variety of organizations, which differ in terms of goals, functions, sizes, processes and structures. Independent of these differences, all organizations must be designed to satisfy three key criteria – effectiveness, efficiency and viability (Burton & Obel, 2004). Burton and Obel (2004) explain:

- *"Effectiveness: an organization is effective if it realizes its purpose and accomplishes its goals.*
- *Efficiency: An organization is efficient if it utilizes the least amount of resources necessary to obtain its products or services.*
- *Viability: An organization is viable if it exists over a long period of time.*

Effectiveness is contrasted with efficiency. Effectiveness is doing the right thing; efficiency is doing it right. Usually, effectiveness does not incorporate efficiency; that is, an organization can accomplish its goals but be quite inefficient in its use of resources. An efficient organization uses its resources well, but may not accomplish its goal well. Efficiency has its focus on the internal working of the organization while effectiveness addresses the organization's positioning vis a vis the environment. We want to design organizations that are both effective and efficient, as both are likely to be important for viability or long-term survivability."

To understand and analyze the effectiveness, efficiency and viability of organizations individuals engage in performance measurement and organizational assessment. There is literature available that discusses performance measurement or organizational assessment or a combination of the two. There is a vague difference between the two notions, and we will not attempt to clarify this difference or even to establish if there is any. Instead we will focus on the commonalities of these notions, specifically their role in organizations and the processes that underlie both performance measurement and organizational assessment.

Performance measurement is defined as "the process of quantifying the efficiency and effectiveness of past action" (Neely, Adams, & Kennerley, 2002). That is, performance measurement deals primarily with quantitative measures. Organizational assessment deals not only with quantitative measures of efficiency and effectiveness, but also with design of components of organizations and processes within and between components (Van de Ven, 1976). Organizational assessment can be defined as the process of measuring/quantifying efficiency and

effectiveness of past action and assessing capabilities of organization to remain viable/sustain in long term.

Organizational assessment seems to be concerned with both quantitative and qualitative measures. For this reason we will combine the two notions and use the term *organizational assessment* to represent both organizational assessment and performance measurement.

Until recently performance measurement systems were primarily financially driven, based on traditional accounting methods. The industrial revolution, and the development of industrial organizations in the late 19th century, promoted innovation in performance measurement and gave rise to sophisticated budgeting and management accounting techniques. However, by the 1980s, as technology and manufacturing processes were undergoing rapid changes, financially based measurement systems started to be criticized as encouraging short-term decision-making, being "internally focused, backward looking and more concerned with local department performance than with the overall health or performance of the business" (Bourne, Neely, Mills, & Platts, 2003).

This gave rise to development of more balanced performance measurement frameworks which "are designed to provide a balance by including measures of external success as well as internal performance, and measures which are designed to give an early indication of future business performance as well as a record of what has been achieved in the past" (Bourne, Mills, Wilcox, Neely, & Platts, 2000). The most famous examples of such framework is the Balanced Scorecard (Kaplan & Norton, 1992) and Performance Prism (Neely et al., 2002).

At the same time we see emergence of assessment frameworks that focus on organization's internal capabilities. For example, a framework developed by Van de Ven (1976) assesses components of organizations and processes within and between the components and their impact on organization's performance.

Overall the role of organizational assessment was summarized by Mahidhar (2005) as follows:

- "Monitoring: Measuring and recording actual performance.
- Control: Identifying and attempting to close the gap between expected performance and actual performance.
- Improvement: Identifying critical improvement opportunities.
- Coordination: Providing information for decision making and enabling internal communication across processes as well as external communication with stakeholders.
- Motivation: Encouraging behavior and continuous improvement."

2.1.2. Impediments to Organizational Assessment

Despite availability of various organizational assessment frameworks and tools, they cannot be used "out of the box". The frameworks and tools need to be adapted to specific needs of organization (Bourne et al., 2003). Such adaptation requires organizational processes that ensure that measurement satisfies organizational objectives and supports execution of its strategy.

Evidence suggests that 70% of attempts to implement performance measurement systems fail (Bourne et al., 2003). The two main reasons for the failure include (i) poor design of the measurement system and (ii) difficulties in implementation (Neely & Bourne, 2000).

Poor design of the measurement system often results from organization's inability to identify the right measures of performance that impact performance (Neely & Bourne, 2000) and incentivize the desired behavior. The lack of a sense of purpose or strategic objective that motivates performance measurement or the lack of reliable measurement process may also cause failure.

Yet, Neely and Bourne argue that "many people in organizations appear to find the process of designing a measurement system far easier than the process of implementing a measurement system." They further identify three types of difficulties arising during the implementation phase that may lead to failure.

The first type of difficulty – so called *political* difficulties – may arise in organizations, when measurement results are used by management "to score points" against employees or managers, i.e. to blame others for poor performance or to illustrate others' failure to perform. In such organizations, the measurement process maybe biased and results often become unreliable.

The second type of difficulty arises due to *lack of infrastructure* in organizations and, specifically, due to inability to easily collect and/or access data required to measure performance. This often results from the fact that data is spread throughout the organization and is held in unlinked databases or even on paper, i.e. not electronically stored.

The third type of difficulty the authors identify is what they call *loss of focus*. Implementation of a performance measurement system is a lengthy process that requires long-term commitment and attention to achieve sustainable change. However, people get tired, frustrated or simply bored with the process and, thus, fail to complete it. Often organizational strategy or priorities change over time and divert management attention from implementation.

Finally, Neely and Bourne conclude, "the whole process of measuring performance is completely wasted unless action is taken on the performance data that are produced".

In summary, organizations cannot leverage the benefits of organizational assessment if they lack processes or are not able to sustain processes needed to carry out organizational assessment.

Next, we turn our attention to organizational processes. We will review different types of processes, relationship between processes, impact they have on organizational assessment and the role of organizational assessment among them.

2.2. Organizational Processes

2.2.1. Overview

Organizational processes are defined as "collections of tasks and activities that together – and only together – transform inputs into outputs" (Garvin, 1998). Such inputs and outputs can be materials, information or people. Garvin provides a comprehensive review of the organizational processes and distinguishes three main types: (i) work, (ii) behavioral and (iii) change processes (Table 1).

Table 1 – An Organizational Processes Framework (Garvin, 1998)

	Work Processes	Behavioral Processes	Change Processes
Definition	Sequences of activities that transform inputs into outputs	Widely shared patterns of behavior and ways of acting/interacting	Sequences of events over time
Role	Accomplish the work of the organization	Infuse and shape the way work is conducted by influencing how individuals and groups behave	Alter the scale, character, and identity of the organization
Major categories	Operational and administrative	Individual and interpersonal	Autonomous and induced, incremental and revolutionary
Examples	New product development, order fulfillment, strategic planning	Decision making, communication, organizational learning	Creation, growth, transformation, decline

According to Garvin, *work processes* are chains of activities that enable organizations to accomplish their work. Work processes can be categorized into two groups, based on their relation to value delivery to customers. The first group, *operational processes*, includes processes that directly create, produce, and deliver products and services that customers want. Examples of such processes include product development, manufacturing, and logistics and distribution. The second group, *administrative processes* do not produce outputs that customers want, but are

necessary for running the business. Strategic planning and budgeting are examples of administrative processes. Operational and administrative processes differ in the nature of outputs. While operational processes typically result in a produce or service aimed at an external customer, administrative processes result in information and plans used internally within organization (Garvin, 1998).

The outcome of both operational and administrative work processes, however, is heavily dependent on a second type of organizational processes, which Garvin calls *behavioral processes*. These processes reflect the way an organization acts and interacts. Garvin defines as them as "sequences of steps used to accomplishing the cognitive and interpersonal aspects of work" and distinguishes among three categories of behavioral processes: *decision-making*, *communication*, and *organizational learning*. These processes do not exist on their own, but form an integral part of the work processes in which they appear.

The third type, *change processes*, includes organizational processes that "describe how individuals, groups and organizations adapt, develop and grow" (Garvin, 1998). These are dynamic and intertemporal processes, examples of which include organizational life cycle and Darwinian evolution. The change processes can be either *autonomous*, i.e. occur naturally because of the internal dynamics, or *induced*, i.e. created. Evolution of organization from start-up to a more structured, professionally managed form is an example of the autonomous change process, while enterprise transformation is an example of induced change processes.

The three types of organizational processes complement each other and are closely interconnected. For example, enterprise transformation affects other organizational processes, as it changes the way organization operates and how well it operates. At the same time, outcome of transformation depends on the organization's inclination and ability to pursue change (Rouse, 2005). These are driven by existing work and behavioral processes. Enterprise transformation requires change in behavior of organization and its members. If behavioral processes are not adjusted, they may undermine success of transformation.

Understanding different types of organizational process helps guide process improvement initiatives. However, often organizations limit improvements to operational work processes, forgetting about the importance of adjusting administrative, behavioral and change processes (Garvin, 1998). Because of the interconnectedness of the organizational processes and the fact that they shape majority of organizational activities, responsibility for the processes must be shifted to senior management of organization, who have wider control over processes (Garvin, 1998).

Organizational assessment falls under the category of administrative work processes. As such, it plays important role by providing information about effectiveness, efficiency and capabilities of organization in delivering value to customers. Organizational assessment supports enterprise transformation and

helps guide changes in other processes (Figure 3). Just as other organizational processes, assessment process must be carefully designed and regularly adjusted to ensure its integration into organizational activities and that it incentivizes desired behavior and performance of organization.

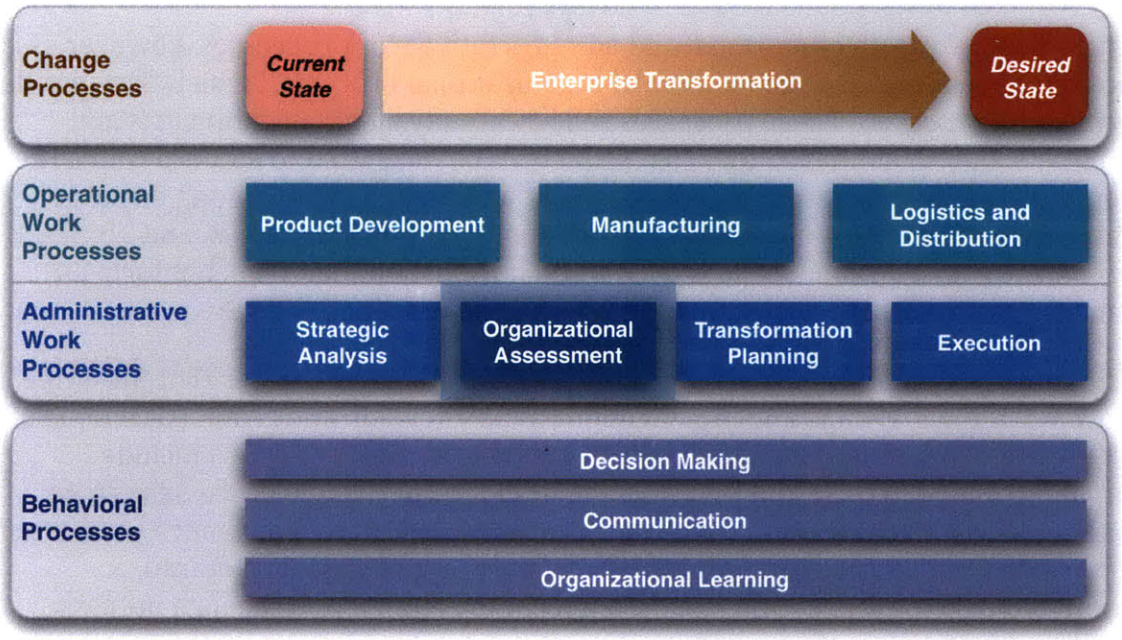

Figure 3 – Place of Organizational Assessment in Organizational Processes

2.2.2. Role of Organizational Processes

As mentioned earlier, organizational processes are a chain of activities. As such, they constitute a way for organizational leadership to get organizations moving in the right directions, align interests of diverse groups of people and harmonize goals (Garvin, 1998). This is what Bossidy and Charan (2002) call execution, i.e. the discipline of getting things done, running a company (versus conceiving and planning) and achieving goals.

Organizational processes are organizational capabilities (Baldwin & Clark, 1992) (Christensen & Overdorf, 2000) and may serve as a source of competitive advantage (Lorino & Tarondeau, 2002). The competitive advantage of processes may arise from either a particular skill or capability, which forms a basis for a process, and/or from design of the process and the way it connects activities and various processes in organization (Lorino & Tarondeau, 2002).

In addition, "processes enable tacit knowledge and capabilities to be disseminated through interactions with and observations of others and through imitation in action... Processes also allow different kinds of knowledge to be combined, resulting in new forms of knowledge, and new forms of knowledge to be assimilated through implementation and repeated practice within processes" (Lorino & Tarondeau, 2002). As such, processes enable organizational learning, both incremental (continuous improvement) and breakthrough (innovation).

Lastly, processes make organizational resources useful by mobilizing them and bringing into relationship with other resources in order to fulfill a specific function. Resources become strategically important only when they are used in processes and only in a specific context of action (Lorino & Tarondeau, 2002).

2.2.3. Stakeholders of Organizational Processes and Organizational Assessment Process

Setting up and maintaining organizational processes is not a trivial task, especially if the processes are new to an organization. They may face resistance from organizational units and managers, who view them as threat to established ways of conducting business and threats to their power (Hammer & Stanton, 1999).

Responsibility for implementing processes must lay with *senior leadership*. "The leader's personal involvement, understanding, and commitment are necessary to overcome this ... resistance" (Bossidy & Charan, 2002). The leader's role is not only to announce the introduction of the new process, but also to explain the process and its important to the organization. Leadership must demonstrate commitment to the process by actually using the process and its outcome on an ongoing basis (Niven, 2005).

However, leadership commitment may not be sufficient to transform a process from idea to reality. Such transformation is the work of *process owners*, who, according to Hammer and Stanton (1999):

- Must have end-to-end authority for individual processes, responsible for ensuring consistently high performance;
- Must have real responsibility for and authority over designing the process, measuring its performance, and training the frontline worker to perform it;
- Cannot serve as an interim project manager. Process owner must be a permanent role, because: (i) process designs need to evolve as business conditions change, and process owners need to guide that evolution, and (ii) in the absence of strong process owners, the old organizational structures will soon reassert themselves;
- Are not managers of people who perform the work. Process owner has responsibility for design of the process, but the various people who perform the process still report to the unit heads.

The role of the process owner includes establishing the process design, ensuring that the design is followed, obtaining resources that the process requires and intervening as needed to improve the process (Hammer, 2002).

2.3. Organizational Assessment Process Models

There is a substantial amount of literature that describes organizational assessment tools and frameworks. A subset of these recommends a variety of processes for designing and implementing organizational assessment. However, discussion of the

assessment process itself is very limited and fragmented. Often it is embedded in the description of the assessment design process.

We will attempt to understand the nature of assessment processes and provide an overview of the process models described in literature. Our review will be based on three approaches suggested by Van de Ven and Ferry (1980), McFeeley (1996) and McGarry et al. (2002).

2.3.1. "Organizational Assessment" Process Model

Van de Ven and Ferry (1980) developed an organizational assessment process model based on results of a research program, called *Organizational Assessment* (OA). The OA program was aimed at developing "a *framework*, a set of *measurement instruments*, and a *process* that are scientifically valid and practically useful for assessing organizations on an ongoing basis". The *Organizational Assessment Instruments* (OAI), developed under the OA research program, consist of a set of questionnaires and survey procedures for measuring "various characteristics of the context, structure and behavior of the overall organization, work groups, and jobs" (Van de Ven & Ferry, 1980).

The OA process model consists of six phases (Figure 4), which allow evaluators to ensure that evaluation deals with matters that are important for organization and maintains balance between technical quality of evaluation and acceptance of the evaluation and its results in the organization (Van de Ven & Ferry, 1980). The six phases include:

1. *Evaluation Prerequisites*: understand reasons for conducting assessment, intended use of results, scope of assessment, who will use the study, who will conduct it, available resources;
2. *Goals Exploration*: identify and prioritize effectiveness goals for the organization being assessed;
3. *Criteria Development*: develop criteria to be used for assessing the extent to which each goal is attained;
4. *Evaluation Design*: develop and pilot test a set of effectiveness measures and a procedure for assessing organization;
5. *Evaluation Implementation*: implement the study by following the procedures developed in the previous phase;
6. *Data Analysis, Feedback and Evaluation*: process and analyze data, interpret results and learn from them.

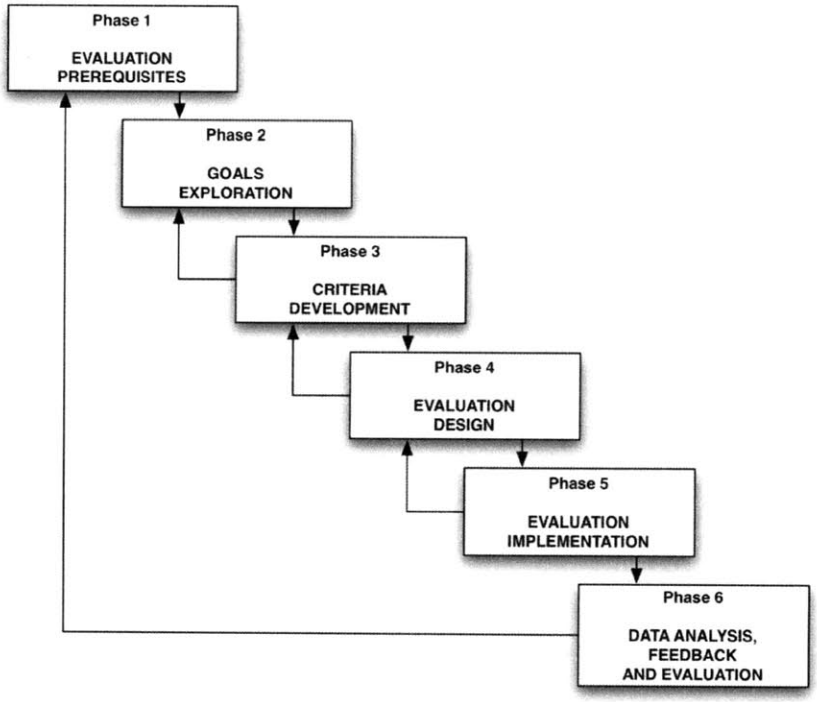

Figure 4 – "Organizational Assessment" Process Model (Van de Ven & Ferry, 1980)

The OA process model offers a comprehensive approach to organizational assessment. It recognizes the role of understanding motivation and planning for the assessment. It also includes a feedback mechanism, which allows for concurrent implementation of phases and timely adjustment of activities depending on outcomes of subsequent phases. However, the OA model does not explicitly recognize the impact that organizational behavior may have on the assessment process and, thus, does not attempt to shape the behavior in a way that would ensure assessment effectiveness.

2.3.2. IDEAL^{SM} Process Model

The IDEAL Process Model was developed under the auspices of the Software Engineering Institute at Carnegie Melon University. It is used as a guide for development, implementation and management of software process improvement programs (McFeeley, 1996). IDEAL is a suggested approach for organizations that have decided to adopt CCMI (Capability Maturity Model Integration) Model (CMMI Product Team, 2006).

The IDEAL model includes five phases (Figure 5) to be implemented iteratively:

1. *Initiating Phase*, when the improvement infrastructure is established, the roles and responsibilities are defined and initial resources are assigned. At this stage a plan that will guide the organization through further phases is developed and approved;

2. ***D**iagnosing Phase*, during which current organizational practices are appraised and results are used to develop recommendations;
3. ***E**stablishing Phase,* during which the improvement activities are prioritized and planned, including development of measureable goals, definition of metrics and commitment of resources;
4. ***A**cting Phase*, when the planned improvement activities are piloted and later fully deployed once it was determined that the organization is ready for wide adoption and institutionalization of such improvement activities; and
5. ***L**everaging Phase,* the objective of which is to make the next IDEAL cycle more effective. During this phase the strategy, methods and infrastructure of the improvement program are evaluated, so that corrections or adjustments could be made prior to the start of the next cycle.

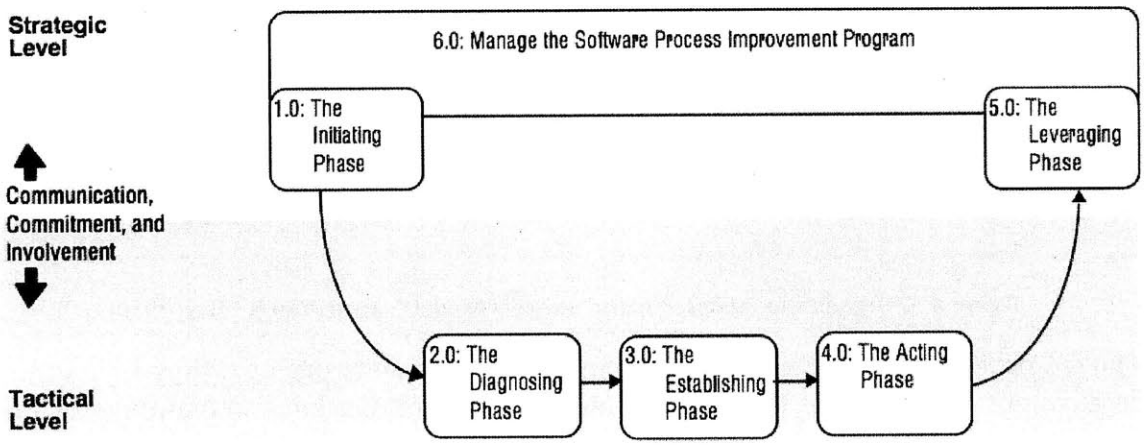

Figure 5 – IDEAL[SM] Process Model (McFeeley, 1996)

The IDEAL model recognizes two levels – strategic and tactical – of a process improvement activity, depending on the level of responsibility and oversight. At the strategic level responsibility for the process falls on senior management, while at the tactical level the process is created, executed and modified by line managers and practitioners (McFeeley, 1996). *Initiating* and *Leveraging Phases* lie on the strategic level, as they require involvement and commitment of senior management.

2.3.3. "Practical Software Measurement" Process Model

A group of software measurement practitioners (McGarry et al., 2002) developed a similar process model, which is based on the authors' experiences working in defense programs. This approach is called *Practical Software Measurement* (or *PSM*) and is used to implement software measurement on software-intensive projects. Despite the seemingly narrow focus of the measurement approach, we find the process model described therein as very relevant to any type of performance measurement.

The PSM approach is an iterative four-activity model (Figure 6), which expands beyond the core measurement activities. The four activities include:

1. *Establishing and Sustaining Commitment*, involving obtaining organizational commitment, definition of responsibilities, allocation of resources and review of the measurement program progress;
2. *Planning Measurement*, where objectives, issues, project environment, improvement actions, risk management information and new information needs lead to identification and prioritization of information needs. This is used to select and specify measures and integrate them into the project processes leading to development of a measurement plan;
3. *Performing Measurement*, where in line with the measurement plan data is collected and processed for analysis. Once the data is analyzed, given the project context, and questions are clarified, recommendations for performance improvements are made;
4. *Evaluating Measurement* involves evaluation of both performance measures and the measurement process itself in order to identify and implement improvement actions in the measurement program.

The PSM approach includes one more activity, *Technical and Management Processes*. These are the processes enterprise management uses to define objectives and capture issues and information needs that feed directly into the measurement planning. These also include decision-making processes that utilize results of the measurement.

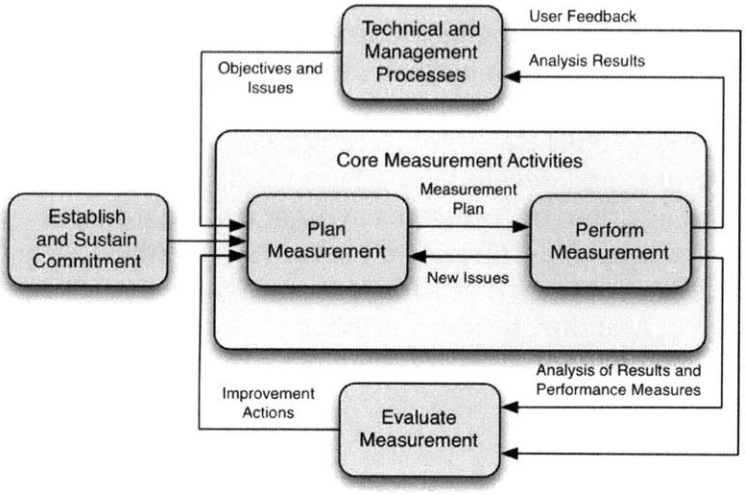

Figure 6 – "Practical Software Measurement" Process Model (McGarry et al., 2002)

PSM is a flexible approach that can be tailored to specific needs of organization. As such, it can be used at different levels in organization to assess performance of a project, enterprise or organization as whole.

2.3.4. Generalized Process Model

By comparing the three models we can identify five general phases in the assessment process (Table 2), each of which we will discuss in more detail in the next sections:

1. *Assessment Prerequisites*, which corresponds to the first phase in the OA process model and the PSM's *Establish and Sustain Commitment* activity;
2. *Plan Assessment*, which includes OA's Phases 2-4 and the PSM's *Planning Measurement* activity. The IDEAL's *Initiating Phase* involves steps which constitute both assessment prerequisites and planning activities;
3. *Perform Assessment*, which includes OA's Phases 5 and 6 and the PSM's *Performing Measurement.* This phase also includes activities that fall under the IDEAL's *Diagnosing* and *Establishing Phases;*
4. *Act on Assessment*, which includes the IDEAL's *Acting Phase*, during which the results of the assessment are translated into actionable plans and improvement activities are implemented;
5. *Evaluate Assessment*, as practical experience seems to suggest that the assessment process itself must be evaluated and adjusted, and thus both IDEAL and PSM contain additional activity called *Leveraging Phase* and *Evaluating Measurement*, respectively.

Iterative Nature of the Process

Assessment provides significantly more usefulness to an organization when it is performed periodically over time (Van de Ven & Ferry, 1980). McGarry et al. note that the iterative design of the process allows for the adaptability of the measurement system to the changing environment. Iterations also allow capturing experience learnt from previous measurement applications (McGarry et al., 2002).

Van de Ven and Ferry (1980) state that iterative assessment facilitates organizational learning and development. First of all, it allows an organization "to identify trends and examine how changes in organizational and environmental conditions affect changes in performance". Secondly, it stimulates managers to develop and implement actions that address areas where improvements were identified as needed. And thirdly, it can provide understanding of the impact of the actions taken in previous rounds of assessment.

Table 2 – Comparison of Process Models

<table>
<tr><th>Generalized Process Phases</th><th>"Organizational Assessment"
(Van de Ven & Ferry, 1980)</th><th>IDEAL^{SM}
(McFeeley, 1996)</th><th>"Practical Software Measurement"
(McGarry et al., 2002)</th></tr>
<tr><td rowspan="1">Assessment Prerequisites</td><td>1. Evaluation Prerequisites:
• Understand reason for conducting assessment, intended use of results and scope of assessment
• Define who will use the study and who will conduct it
• Determine available resources</td><td rowspan="4">Initiating Phase:
• Identify business needs and drivers for improvement
• Educate and build support
• Obtain approval and initial resources
• Establish improvement infrastructure
• Define goals
• Define guiding principles</td><td>Establishing and Sustaining Commitment:
• Obtain organizational commitment
• Define responsibilities,
• Allocate resources
• Review measurement program progress</td></tr>
<tr><td rowspan="3">Plan Assessment</td><td>2. Goals Exploration:
• Identify and prioritize effectiveness goals for the organization being assessed</td><td rowspan="3">Planning Measurement:
• Identify and prioritize information needs
• Select and specify measures and integrate them into organizational processes
• Develop a measurement plan</td></tr>
<tr><td>3. Criteria Development:
• Develop criteria to be used for assessing the extent to which each goal is attained</td></tr>
<tr><td>4. Evaluation Design:
• Develop and pilot test a set of effectiveness measures and a procedure for assessing organization</td></tr>
</table>

Generalized Process Phases	"Organizational Assessment" (Van de Ven & Ferry, 1980)	IDEAL[SM] (McFeeley, 1996)	"Practical Software Measurement" (McGarry et al., 2002)
Perform Assessment	*5. Evaluation Implementation*: • Implement the evaluation *6. Data Analysis, Feedback and Evaluation*: • Process and analyze data • Interpret results • Learn from results	*Diagnosing Phase:* • Appraise and characterize current practice • Develop recommendations and document phase results *Establishing Phase:* • Set strategy and priorities • Establish process action teams • Plan actions	*Performing Measurement*: • Collect and process data for analysis • Recommend performance improvements
Act on Assess-ment		*Acting Phase:* • Define processes and measures • Plan and execute pilots • Plan, execute and track installations	
Evaluate Assess-ment		*Leveraging Phase:* • Document and analyze lessons • Revise organizational approach	*Evaluating Measurement*: • Evaluate performance measures • Evaluate the measurement process • Identify and implement improvement actions in the measurement program

Assessment Prerequisites

McGarry et al. compare introduction of measurement to any change process within an organization. As such, it can cause anxiety and fear that results of the measurement maybe used to evaluate individual performance, rather than encourage objective opinion about the true state of the organization and problems facing it (McGarry et al., 2002). To ensure successful implementation of measurement, it must be understood and supported at all appropriate levels in organization. This requires clear understanding of objectives and benefits of measurement for the organization.

Another question, of course, concerns the scope and boundaries of the organization being measured. The selected organization must be capable of achieving effectiveness goals and maybe held accountable for achieving them (Van de Ven & Ferry, 1980).

Other important pre-requisites for sustained commitment to measurement include clearly allocated resources and responsibilities. Responsibilities include high-level oversight from organization's leadership to ensure that the measurement is integrated into other processes. They also include day-to-day tasks related to planning and performing the measurement.

Measurement comes at a cost, which depends on the scope of measurement and ability for the measurement to be integrated into existing organizational processes. Costs maybe financial, associated with investment in tools necessary to perform the measurement, training, etc. Costs may also be measured in terms of the time that leadership and employees put into planning and performing the measurement.

Training at all levels of organization involved in the measurement process is essential so that participants understand the measurement process, meaning of the measurement data and how to interpret results of the measurement analysis (McGarry et al., 2002). Van de Ven and Ferry (1980) warn that without a clear understanding of the process and content of the measurement negative side effects may outweigh positive and intended consequences, and thus lead to problems in subsequent stage of the measurement process.

The organization must regularly review progress of the measurement to ensure that it continues to meet organizational needs and objectives. McGarry et al. recommend implementing the measurement gradually, starting on a small scale and then expanding it at a pace that allows the organization to learn.

Plan Assessment

An organization may choose to use an existing measurement tool or develop its own set of measurement based on a recommended approach or framework. In any case the measurement must tailored to specific organizational needs and existing processes. The PSM approach helps organizations to design measurement based on practical implementation and empirical evidence (McGarry et al., 2002).

McGarry el al. suggest that the first stage in design of a measurement is to identify and prioritize "information needs," i.e. information about organization that allows decision-making. This maybe information about desired outcomes, or objectives, of an organizational process and areas of concern that may affect the outcomes, such as problems, risks and lack of information. The authors provide examples of information relevant to a software project, which include schedule and progress; resources and cost; product size and stability; product quality; process performance; technology effectiveness; and customer satisfaction.

Van de Ven and Ferry call such objectives effectiveness goals, "which are considered desirable or have some positive value" (Van de Ven & Ferry, 1980). The authors classify the goals into four main categories: (1) quantity and quality of inputs and outputs, (2) efficiency (ratio of output to input), (3) employee morale, and (4) impact (growth, market share, etc).

The next stage is to identify and select measures that satisfy information needs, followed by their integration into existing organizational processes. The integration stage is important for subsequent implementation of measurement. McGarry et al. highlight the following aspects of integration: periodicity; responsible individuals; source; analysis and reporting mechanisms; plans and actuals; and configuration management (i.e. to allow traceability of data).

Perform Assessment

McGarry et al. identify three basic tasks of performing the measurement: collecting and processing data; analyzing data; and making recommendations.

The first task – *collecting and processing data* – is aimed at capturing data, preparing it for analysis and storing it in an accessible manner. There are two ways of capturing data, automatic and manual, which affect cost and accuracy of the measurement (McGarry et al., 2002). The choice depends on the trade-off between the cost of developing and maintaining a system for electronic data collection and the volume of data, number of sources of data, importance of data accuracy and timely analysis. For example, electronic data collection maybe beneficial, if the data are collected from multiple sources and the measurement requires a lot of subsequent analysis. Electronic format also allows better accessibility once data have been stored.

Data analysis is the principal task of performing measurement. "This task transforms values of base measures into values for indicators, the basic building blocks of analysis. Indicators and associated decision criteria are used to make planning decisions or determine the need for corrective action... Indicators are combinations of base and/or derived measures and predefined decision or evaluation criteria." (McGarry et al., 2002). The indicators may include:

- Expected values, e.g. a plan, target or desired state;
- Actual values, e.g. actual performance or current state;

- Variance, or gap, between the expected or actual values; and
- Decision criteria that trigger further analysis, conclusion, recommendation or action. For example, a decision criterion may be set up at certain value of variance, e.g. ±20 percent.

The ultimate purpose of measurement is to help leadership make informed decision (McGarry et al., 2002). The analyzed data serves as basis for:

- Understanding the current performance of organization,
- Identification of problems and risks,
- Formulation of recommendations, and
- Identification of potential new issues that may affect the measurement process.

This is the final task in performing measurement. McGarry et al. state that "well-formulated recommendations facilitate action", and "action must be taken to realize benefit from measurement".

On the choice of assessment participants, Van de Van and Ferry suggest that participants should be "those individuals or groups who desire to use the results of a study for making decisions or taking a concrete set of actions" (Van de Ven & Ferry, 1980). They further suggest that study should be conducted by a joint team of evaluators, coming from inside and outside of organization (see Table 3 for comparative advantage and disadvantages of using only internal or external evaluators).

Collaboration of internal and external evaluators ensures more effective and objective assessment by balancing local knowledge of internal evaluators with subject-specific expertise of external evaluators. Such collaboration should be carefully managed, however, to avoid miscommunication resulting from conflicting goals and incentives of insiders and outsiders.

Table 3 – Advantage and disadvantages of using external and/or internal evaluators (adopted from Van de Ven & Ferry, 1980)

	Advantages	Disadvantages
Only external evaluator	• Increased objectivity • Ability to see things that persons connected with the organization might simply take for granted • Less ego involvement in the outcome of evaluation • Less pressure to make compromises in the research design or in the interpretation of results	• Less sensitive to the program being evaluated, to the possible disruption caused by the evaluation study, to the practicality of the recommendations that stem from the evaluation • Represents a threat to the staff of the organization
Only internal evaluators	• More informed about the organization and better positioned to know which aspects require evaluation • More readily accepted by staff, especially if the staff considers the study self-evaluation for self-improvement • More staff involvement • Greater application of the results • Higher potential for follow through • Knowledge is retained in the organization	• Difficult to maintain objectivity • Tendency to focus upon the successful aspects of the program and to overlook the "minor" weaknesses or failures • "Certain procedures that have a time-honored validity will rarely be brought to question. As a result, evaluation studies by insiders are often considered less credible." • Less likely to possess the required research knowledge and skills to conduct a professional evaluation
Collaboration of insiders and outsiders	• More effective division of labor, where insiders and outsiders serve as cross-checks upon one another to ensure that the organizational assessment remains on target to user's needs, is sensitive to practical concerns, and maintains scientific standards of objectivity and quality • Balance of local knowledge with external expertise	• Potential for miscommunication and goal misalignment • Potentially high coordination costs • "Us" versus "them" mentality

Act on Assessment

For the organizational assessment to be effective it must be "fully integrated with other organizational processes such as planning, budgeting, reporting, as well as performance reviews" (Neely, Marr, Roos, Pike, & Gupta, 2003). Assessment results will inform organizations about the actions that need to be taken in order to improve performance and also provide feedback about the impact of such actions implemented earlier (Neely et al., 2003). Integration of organizational assessment with other organizational processes also prioritizing plans and thus managing limited resources (Hallam, 2003).

Evaluate Assessment

This stage, at which measurement is evaluated, is important especially in light of the iterative nature of the measurement process. At this stage the organization evaluates measures and the measurement process and makes necessary improvements.

McGarry et al. recommend *evaluating the measures* against three main criteria:

- Accuracy: Inaccurate data may result from systematic error in the measurement procedure (e.g. poor design of the procedure), random error inherent in the underlying measurement method (e.g. ambiguities in definition of measurement methods, scales or units) or from inconsistent application of the measurement procedure;
- Usability: The basic question is whether the selected measurement is fit for purpose, i.e. does it actually measure what it is intended to measure; is it able to predict what it is intended to predict; do users understand the indicators and interpretation of results. The authors suggest that measurement is likely to be less usable if the measurement results are difficult to understand, if the language (e.g. excessive use of specific terms) is unfamiliar to users, if reports presenting the results are too lengthy;
- Reliability, i.e. "the repeated application of the measurement procedure yields consistent results."

The elements of *evaluating the measurement process* (McGarry et al., 2002) may include the following:

- Timeliness, i.e. whether measurement results are obtained in time to affect outcome of the measured activity, e.g. in time for preparation of a progress report or development of an action plan;
- Efficiency, i.e. the relationship between cost and benefit of the measurement process. As mentioned earlier, costs of the process may include tools, training and labor. The benefits may include both tangible and intangible results like cost saving or cost avoidance and improved employee morale;
- User satisfaction with, for example, quality of measurement results and the process itself.

Results of evaluating the measurement and the process are used to update the measurement activity in the future.

2.4. Summary

Organizational assessment is an organizational process that falls into the category of an administrative work process. It plays an important role in supporting and guiding the enterprise transformation process by providing information about progress of the transformation and actions needed to move transformation forward. As an organizational process, organizational assessment process must be carefully designed and be subject to continuous improvement.

At the same time, assessment process must be aligned with other organizational processes in order for it to function effectively. As with any work process, organizational assessment process is affected by behavioral processes existing in the organization. Behavioral processes may pre-determine whether organizational assessment will produce expected results and provide benefits to the organization. As such, a process model for organizational assessment should address behavioral processes as well to ensure that expectations are met.

CHAPTER 3.

Lean Enterprise Self-Assessment

3.1. Overview

Our further review and study will be based upon one particular assessment tool developed at MIT, called *Lean Enterprise Self-Assessment Tool* (LESAT). LESAT was developed in 2000-2001 by a team of government, industry and academia representatives, working jointly under LAI. LESAT was originally designed as part of the LAI's Transition to Lean Roadmap, which later was updated into the Enterprise Trasformation Roadmap (Figure 7), to enable assessment of the enterprise progress in its trasnformation journey (Perkins, Abdimomunova, Valerdi, Shields, & Nightingale, 2010).

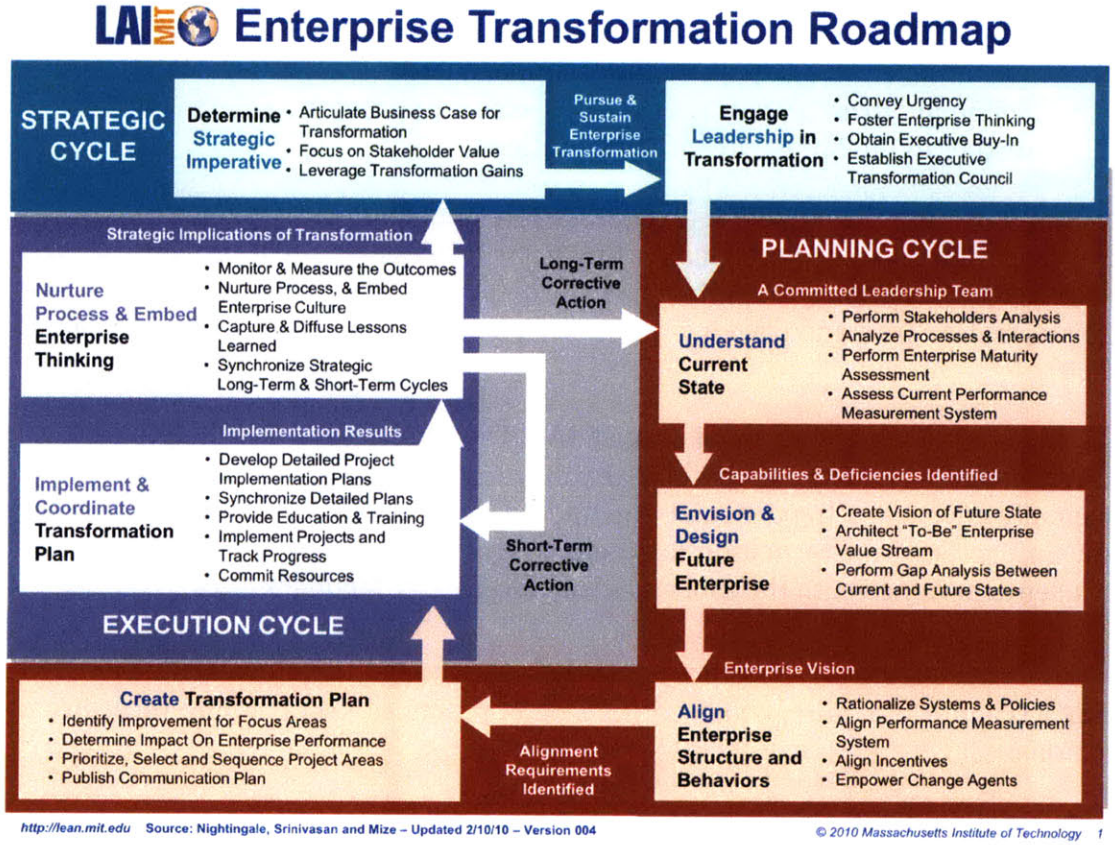

Figure 7 – Enterprise Transformation Roadmap (Nightingale, Srinivasan & Mize, 2010)

The Enterprise Transformation Roadmap recommends that enterprise transformation be approached in three main cycles: strategic, planning and execution. Enterprise transformation is an iterative process as the organization continuously adapt to the changing environment. During the strategic cycle organizations establish need for transformation and obtain leadership commitment.

Objectives of the planning cycle are to formulate vision of the state that the organization desires to attain, based on analysis of the current performance. During this cycle the organization creates transformation plan and aligns structures and behaviors so that they enable attainment of the envisioned future state. Once the transformation plan has been created and communicated throughout the organization, the execution cycle begins. This is the time to implement specific projects within the transformation plan and institutionalize improvements and lessons learnt.

LESAT assessment should be undertaken during the planning cycle of the enterprise transformation as the organization strives to understand its current state and identify what the desired state should be. The tool assesses capabilities of an enterprise in three main areas (Nightingale & Mize, 2002):

- *Lean Transformation/Leadership*, i.e. the processes and leadership attributes nurturing the transformation to lean principles and practices;
- *Life Cycle Processes*, i.e. the processes responsible for the product from conception through post delivery support; and
- *Enabling Infrastructure*, i.e. the processes that provide and manage the resources enabling enterprise operations.

By assessing both the current and desired state of the enterprise, LESAT helps identify gaps in current performance and priority areas where improvements are needed. When analyzed properly, LESAT provides valuable input into formulation of transformation plan and tracking progress in its implementation (Perkins et al., 2010).

LAI is currently working on updating LESAT. The changes are intended to reflect developments in enterprise thinking that have taken place since LESAT was originally developed. In particular, the updated tool will be directly linked to the new Enterprise Transformation Roadmap (Nightingale, 2009). It will also account for user experience with the tool and incorporate user feedback.

3.2. Structure

LESAT is a questionnaire, which consists of 54 practices, grouped into three broad sections:

- Section 1. Lean Transformation/Leadership;
- Section 2. Life Cycle Processes); and
- Section 3. Enabling Infrastructure.

The practices serve as leading indicators in the organization's transformation process (Table 4).

Table 4 – Organization of LESAT Maturity Matrices

	Sub-Sections	Lean Practices
(I) Lean Transformation / Leadership	I.A. Enterprise Strategic Planning	I.A.1. Integration of lean in strategic planning process
		I.A.2. Focus on customer value
		I.A.3. Leveraging the extended enterprise
	I.B. Adopt Lean Paradigm	I.B.1. Learning and education in "lean" for enterprise leadership
		I.B.2. Senior management commitment
		I.B.3. Lean enterprise vision
		I.B.4. A sense of urgency
	I.C. Focus on the Value Stream	I.C.1. Understanding the current value stream
		I.C.2. Enterprise flow
		I.C.3. Designing future value stream
		I.C.4. Performance measures
	I.D. Develop Lean Structure and Behavior	I.D.1. Enterprise organizational orientation
		I.D.2. Relationships based on mutual trust
		I.D.3. Open and timely communications
		I.D.4. Employee empowerment
		I.D.5. Incentive alignment
		I.D.6. Innovation encouragement
		I.D.7. Lean change agents
	I.E. Create and Refine Transformation Plan	I.E.1. Enterprise-level lean transformation plan
		I.E.2. Commit resources for lean improvements
		I.E.3. Provide education and training
	I.F. Implement Lean Initiatives	I.F.1. Development of detailed plans based on enterprise plan
		I.F.2. Tracking detailed implementation
	I.G. Focus on Continuous Improvement	I.G.1. Structured continuous improvement processes
		I.G.2. Monitoring lean progress
		I.G.3. Nurturing the process
		I.G.4. Capturing lessons learned
		I.G.5. Impacting enterprise strategic planning
(II) Life-cycle Processes	II.A. Business Acquisition and Program Management	II.A.1. Leverage lean capability for business growth
		II.A.2. Optimize the capability and utilization of assets
		II.A.3. Provide capability to manage risk, cost, schedule and performance
		II.A.4. Allocate resources for program development efforts
	II.B. Requirements Definition	II.B.1. Establish a requirement definition process to optimize lifecycle value
		II.B.2. Utilize data from extended enterprise to optimize future requirement definitions
	II.C. Develop Product and Process	II.C.1. Incorporate *customer value* into design of products and processes
		II.C.2. Incorporate downstream *stakeholder values* into products and processes
		II.C.3. Integrate product and process development
	II.D. Manage Supply Chain	II.D.1. Define and develop supplier network
		II.D.2. Optimize network-wide performance
		II.D.3. Foster innovation and knowledge-sharing throughout the supplier network
	II.E. Produce Product	II.E.1. Utilize production knowledge and capabilities for competitive advantage
		II.E.2. Establish and maintain a lean production system
	II.F. Distribute and Service Product	II.F.1. Align sales and marketing to production
		II.F.2. Distribute product in lean fashion
		II.F.3. Enhance value of delivered products and services to customers & the enterprise
		II.F.4. Provide post delivery service, support and sustainability
(III) Enabling Infrastructure	III.A. Lean Organizational Enablers	III.A.1. Financial system supports lean transformation
		III.A.2. Enterprise stakeholders pull required financial information
		III.A.3. Promulgate the learning organization
		III.A.4. Enable the lean enterprise with information systems and tools
		III.A.5. Integration of environmental protection, heath and safety into the business
	III.A. Lean Process Enablers	III.B.1. Process standardization
		III.B.2. Common tools and systems
		III.B.3. Variation reduction

The participants assess the current state of the enterprise and the desired state, which they would like enterprise to achieve. The current and desired states are determined for each of the 54 practices separately. There are five possible levels of enterprise capabilities for each practice (Figure 8), where the lowest level (Level 1) indicates that the enterprise is aware about the practice and maybe starting to undertake some improvement activities and the highest level (Level 5) represents exceptional performance (Nightingale & Mize, 2002). LESAT provides cues and examples as to what organizational behavior is typical for each level.

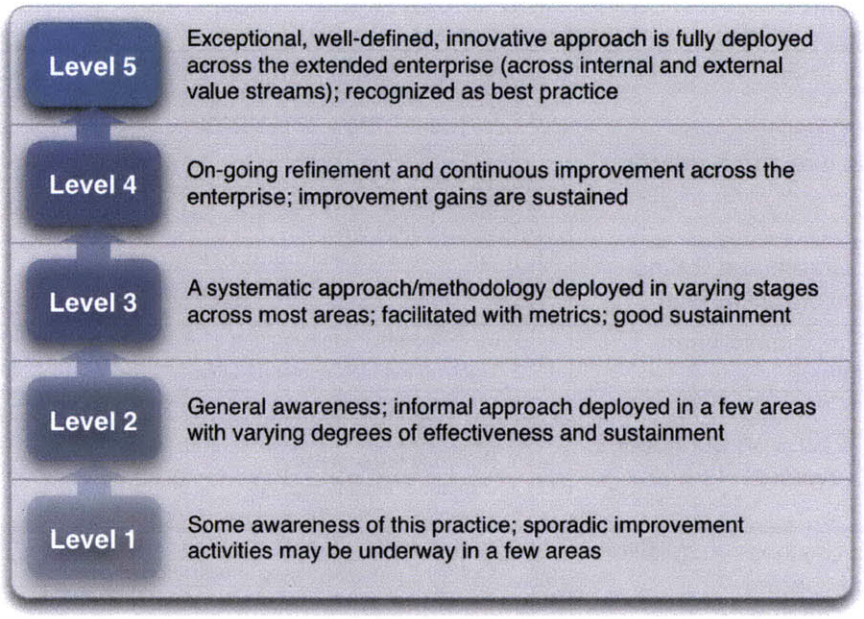

Figure 8 – LESAT Capability Levels

3.3. Assessment Approach

LESAT process was designed for self-assessment by enterprise leaders. In order for the assessment to be successful, the assessment process needs to be carefully planned and scheduled. The LESAT Facilitator's Guide (LESAT, 2001) recommends that the assessment should be preceded by *Pre-Assessment Preparation*, where key decisions about timing of the assessment, boundaries of the enterprise and time horizon for desired level determination should be made. Enterprise leadership should appoint LESAT facilitator, who will be responsible for planning, coordinating, and facilitating. At this stage the enterprise leadership and managers familiarize themselves with the Transition-To-Lean Guide and Roadmap, developed by LAI.

The Facilitator's Guide suggests *Performing Assessment* in a five-step methodology, including (1) introduction of the tool in a facilitated meeting, championed by the enterprise leader, (2) assessment by enterprise leader and staff, (3) discussion of assessment results and determination of the present maturity level,
(4) determination of desired level and gap, and (5) development of action plan and prioritization of resources.

Such methodology can be implemented through a series of meetings, starting with a kick-off session, at which participants are introduced to LESAT, its terminology, assessment process and time schedule, and anticipated use of results. Appointed LESAT Facilitator should facilitate the meeting, although all announcements should be coming from the enterprise leader, as the champion of enterprise transformation.

The Facilitator's Guide recommends that the next set of meetings be held by each LESAT participant individually with a group of his/her own direct reports or key staff. The aim of the group meetings is to reach consensus in assessing current maturity level of the enterprise and determining the capability level that the enterprise is striving to attain along each of the 54 practices contained in LESAT. LESAT Facilitator may attend or facilitate the meetings in order to provide guidance or clarification of questions.

Once all group meetings have been complete, the participants meet again for a wrap-up meeting, to discuss and analyze results of the assessment, which should have been summarized by the LESAT Facilitator by that time. Such meeting can provide with an opportunity to discuss enterprise practices having a wide range of responses or a wide gap between the current and desired state.

Concluding the assessment process, *Post-Assessment Analysis And Action Planning* is an important step in tying the LESAT results with the enterprise transformation plan. Analysis of gaps, identification of opportunities, comparison of available and needed resources can lead to formulation of improvement plans, these becoming an integral part of the Enterprise culture.

3.4. Summary

Overall current LESAT process model provides detailed description on how to approach the assessment and specific recommendations on how to plan and run meetings in order to make the assessment process easier for the LESAT facilitator. However, it seems to be missing several important components that ensure lasting results of the assessment. Table 5 summarizes proposed changes to the LESAT process model; these changes incorporate the model's missing components. The existing LESAT process model is compared with the generalized process model that was outlined in Section 2.3.4.

Besides the activities already included in the *Pre-Assessment Preparation* phase, at this time the organization also needs to ensure that assessment prerequisites, such as understanding of the purpose of the assessment and obtaining leadership support, have been satisfied. This is essential for obtaining and sustaining organizational commitment to the assessment and its results. During this phase resources needed for the assessment must be identified and secured.

Planning activities, such as assessment timeline and schedule, need to be described more explicitly to avoid future delays that may arise due to, for example, unavailability of assessment participants. Planning should also include training of

participants to ensure consistent understanding of the assessment, the tool and the process.

It would be beneficial if the LESAT process model included methods for analysis and interpretation of LESAT scores. This would assist organizations in understanding assessment results and how to incorporate them into strategic planning activities.

Finally, the LESAT process model should incorporate a mechanism for adjustment of the process itself based on experiences of the organization and assessment participants.

Table 5 – Review of the LESAT Assessment Approach

Generalized Process Phases	LESAT Assessment Approach	Necessary Changes to LESAT Assessment Approach
Assessment Prerequisites	*Pre-Assessment Preparation:* • Decide on timing and periodicity • Define enterprise boundaries • Familiarize with enterprise model and transformation roadmap • Appoint LESAT facilitator, responsible for planning, coordinating, and facilitating • Specify time horizon for achieving "Desired State"	Clearly define prerequisites, such as purpose of the assessment, leadership support, identification of stakeholder and securing necessary resources
Plan Assessment		Specify planning activities, including assessment schedule and participants' training
Perform Assessment	*Performing Assessment:* • Introduction of the tool in a facilitated meeting, championed by the enterprise leader • Assessment by enterprise leader and staff • Discussion of assessment results and determination of the present maturity level • Determination of desired level and gap • Development of action plan and prioritization of resources	Identify allocation of responsibilities among stakeholders, recommend strategies for analysis and interpretation of results
Act on Assessment	*Post-Assessment Analysis and Action Planning:* • Identify critical gaps and opportunities • Compare available and needed resources • Formulate and prioritize improvement plans	Suggest strategies for interpreting assessment results
Evaluate Assessment		Describe actions necessary to evaluate the assessment and assessment process

CHAPTER 4.

Research Methodology

The purpose of this research is to determine *how enterprises can perform organizational assessment to better support enterprise transformation.* Thus far we have established an overview of organizational assessment processes described in the literature and prescribed in the LESAT documentation. The next step is to study how organizations perform organizational assessment in practice. Such study allows us to recommend an assessment process that reflects best practices described in the literature and adjust it for the actual behavior of organizations, which perform assessments.

We have selected the case study method as it allows for collecting evidence about current processes and behaviors of organizations and summarizing them into generalizable conclusions. Case studies are best suited for answering explanatory research questions ("how" and "why"). They allow tracing events over time by using various sources of evidence, such as observation of the events, interviews of the people who were involved in them and review of documents and artifacts related to the events (Yin, 2003).

The case studies are based on several organizations that are either current or past members of the LAI and that have performed an assessment using LESAT at least once. The goal of case studies is to collect information about current assessment processes and test the hypothesis:

- *If enterprises follow the recommended process, the enterprise assessment will be more effective in ultimately supporting enterprise transformation.*

The unit of analysis chosen is an enterprise, that is a complex, highly integrated system comprised of processes, organizations, information and supporting technologies, with multifaceted interdependencies and interrelationships across their boundaries (Nightingale, 2000). Enterprise, as the unit of analysis, suits LESAT, as the latter was specifically designed with the purpose of assessing capabilities of an enterprise.

To obtain evidence for the case studies we held semi-structured interviews with LESAT facilitators at each organization, reviewed company documents, web publications and presentations and analyzed some LESAT scoring results.

We have interviewed five large aerospace companies. They represent four enterprises of different types: autonomous business units, cross-unit functional area and multi-organizational program. In preparation for the interviews, we provided interviewees with a list of questions (Figure 9). During the interviews the questions were often modified in order to gain better understanding of events.

QUESTIONS TO LESAT USERS

1. Motivation for enterprise transformation:

    a. How was your *enterprise* defined for purposes of LESAT?
    b. What was the goal of enterprise transformation?
    c. What was the "burning platform" or urgent need the drove transformation?
    d. What was the state of enterprise at that time in terms of operational performance and financial position? Please provide supporting data, if possible.
    e. How was the current state determined (i.e., were there existing assessment methodologies already in place)?

2. Organizational aspects of LESAT in your enterprise:

    a. How many people filled out the LESAT survey and what were their roles in the organization?
    b. What was enterprise leadership involvement in LESAT process?
    c. How leaders demonstrate their level of commitment?
    d. What is the role of the LESAT facilitator in the enterprise?

3. LESAT and its results:

    a. What was the reason for doing the assessment?
    b. Please provide original explanations and instructions given to LESAT participants with regard to purpose of the assessment and definition of the enterprise.
    c. What did the organization do to ensure consistent interpretation of the LESAT items across different participants?
    d. What were some challenges in using LESAT in your organization?
    e. How were LESAT results used in formulation of the enterprise transformation plan?

4. Outcome of enterprise transformation:

    a. How was success of enterprise transformation measured? What performance indicators were used?
    b. How did results of enterprise transformation affect subsequent use of LESAT (if there was such)?
    c. How did LESAT scores influence behavior in the enterprise?

5. Are there any other observations related to LESAT implementation in your organization that should be noted? (We are looking for specific examples, stories, anecdotes, heuristics, etc. to improve the future version of LESAT).

Figure 9 – Interview questions to LESAT users

One of the studied organizations was able to provide LESAT scoring results that were obtained during a planned self-assessment exercise. This organization chose to involve four different levels of management within the enterprise in the assessment. Respectively, the data provided by the organization includes LESAT scores provided by respondents representing different levels of management, Level 1 being the highest and Level 4 the lowest. This allowed us to perform statistical analysis of the data using analysis of variances (ANOVA).

We formulated the following null hypothesis: "LESAT scores are independent of the respondent's level of management".

The critical value is set at 5%, meaning that if the probability of a chance event in the measurement is less than 5%, then the null hypothesis can be rejected. Independent variable, *MgmtLevel,* represents the respondent's level of management. The variable can take values 1, 3 or 4 corresponding to Levels 1 and 2, Level 3 or Level 4, respectively. Dependent variables are scores assigned by respondents to each of 54 LESAT practices. As such, there are 54 dependent variables, which can take values between 1 and 5. The values of dependent variables correspond to the organization's capability maturity level, as specified in LESAT.

Case studies and results of the score analysis are presented in Chapter 5.

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CHAPTER 5.

Case Studies

In this chapter we will describe the four case studies conducted during the research. We will also attempt to summarize our findings in terms of the observed uses of LESAT and analyze the assessment process applied by each enterprise.

5.1. Case Study A

Company A is a multi-billion corporation in the defense and aerospace industry, which operates through several autonomous business units. It has a well-defined system for continuous improvement, which focuses on cost reduction, maximization of customer value and cultivation of knowledge-based processes. The continuous improvement process is led by a dedicated team of Lean Six Sigma experts.

The company started using LESAT in 1994 in one of its business units. The company found LESAT principles appealing and rolled out the assessment across the company. Soon the company realized that LESAT did not sufficiently measure manufacturing specifics, so they added 11 new principles to LESAT's original 54, resulting in a total of 65 practices. The original LESAT practices were not changed. Currently the modified tool is commonly used as interim assessment project to improve performance within certain manufacturing processes.

At Company A, the enterprise is defined as a business or program entity, which is relatively independent in its operation and possesses all supporting functions.

The assessment pursues several objectives. The company views it as a learning event, where enterprises learn about communication between business units, exchange ideas and learn from other enterprises. The assessment helps promote the continuous improvement process that the company is pursuing by establishing a common language for enterprise transformation, reinforcing principles and improving real business results. Since each enterprise is reassessed within one year of initial assessment, it allows the company to track performance and results of the improvement process at each enterprise.

Usually assessment is initiated at the corporate level by the corporate Lean Six Sigma team, experts of which act as in-house consultants. However, the team ensures commitment from the enterprise leadership upfront, as it is the leadership who will implement the transformation.

The modified assessment tool is used differently than LESAT. Unlike the self-assessment process that is central to LESAT, the modified tool uses so called "managed assessment", which is performed by a diagnostic team, consisting of representatives of various business units and external consultants. Results are discussed with the leadership of the assessed enterprise. In early years the intended

self-assessment process was used a couple of times, but it was difficult, due to the time commitment required from the leadership to learn the principles, understand the procedure and objectives, go through all principles, and discuss them without "getting anywhere/seeing results." The modified tool is rather a gap analysis, involving a tour of facilities and interviews. It became more controversial than LESAT, as the enterprise leadership is presented with views of outsiders and may have different opinion about performance of his/her entity.

Once the assessment is complete, the enterprise leadership puts together a transformation plan, based on the results of the gap analysis. The enterprise is fully responsible and accountable for the implementation of the plan. The corporate Lean Six Sigma team provides expert consultation during the process.

5.2. Case Study B

Company B is a large autonomous business unit in a multi-billion multi-industry corporation. The corporation is implementing a Lean Six Sigma initiative, which focuses on process improvements throughout various manufacturing and non-manufacturing functions, reduction in process variation and waste.

The company used LESAT just once, in 2003. The initiative was led by the company CEO and Vice President, who both personally participated in development of the tool. However, LESAT was not applied to the company as a whole. Instead, management chose three autonomous operations located in different geographic regions, each of them constituting a separate enterprise.

The purpose of the assessment was to gain insight into the current state of each enterprise and identify a baseline. The process was facilitated by an expert, who reported directly to company leadership and carefully planned the assessment procedure. The participants involved senior executives, including the enterprise leader and heads of each major function in the enterprise, and a group of principal officers. The facilitator maintained close communication and coordination among participants throughout the assessment process with the involvement of the enterprise leadership.

At the onset of the assessment, all participants gathered for a two-hour briefing, where the facilitator explained the purpose and importance of the assessment, the tool itself and the subsequent process. From there each senior executive held a separate session with his/her team with the purpose of deriving a single consensus-based set of scores for the group. The facilitator was responsible for collating results, which he presented at a wrap-up meeting to the enterprise senior executives along with the gap analysis. The facilitator made sure not to get into the post-assessment analysis and discussion of action plans, as these were identified as responsibilities of the enterprises themselves. The whole assessment process took about four to six weeks at each enterprise.

At Company B, LESAT was used on a stand-alone basis, and no immediate follow-up actions resulted from the gap analysis. In 2006 the CEO left the company, and LESAT has never been used again. With the support of the new CEO, the company moved to a managed assessment, performed by a third party or an internal expert team, which tied in better with the Lean Six Sigma philosophy and the company's goal to be recognized by Shingo Prize.

Lean Six Sigma initiatives took over and formal training was established. Employees were encouraged to identify and implement improvement projects through award of "Bronze," "Silver," and "Gold." Their performance in implementation of improvement projects was reflected in the overall job performance assessment.

5.3. Case Study C

Company C is a joint venture established by several large corporations in the defense and airspace industry. The company is implementing an enterprise transformation initiative focusing on safety, quality, efficiency and flexibility of its operations. In the initial years, the continuous improvement process was based on manufacturing and six sigma methods, but a few years ago the company adopted a wider, whole-enterprise view.

The company implemented the transformation initiative in stages, starting from small-scale improvements and gradually increasing the scope of transformation. In the middle of the process, the company decided to make an assessment of how the transformation is going. Having considered few assessment tools, the final choice was made in favor of LESAT. Before proceeding to the assessment, the team of facilitators, all experts in Lean Six Sigma, tested LESAT to better understand the tool and the process.

For the purposes of LESAT, enterprise was defined as an operational activity, comprising of several business units. LESAT was used independently in each of the business units with the purpose of assessing each business unit within the enterprise. The purpose of the assessment was to determine the progress of transformation and improvement plans for the next stage of transformation as well as to involve enterprise leadership into the company transformation process.

At each business unit, the assessment was made in groups of 15-20 people, representing different levels of unit management. The scoring was done section by section, after a facilitator introduced each section. Each participant filled out the questionnaire individually. The LESAT results were collated and analyzed by the team of facilitators, who provided feedback to the management team on the progress of enterprise transformation and who developed the next stage transformation plans. At the time of this study, the company was considering second assessment using LESAT.

5.4. Case Study D

This case study is based on a program, undertaken by several large companies in the defense and airspace industry. Each company, including the client, together called program partners, is using its own advanced Lean Six Sigma frameworks focusing on quality, efficiency, waste reduction and supplier integration. During the program development stages, the client established a dedicated lean team with the objective of reducing costs. The team included lean practitioners from each program partner.

The enterprise was defined as the program as whole, comprising relevant business units from each program partner and supplier. LESAT started to be used on a regular basis since 2001. It was chosen as a common assessment tool that each program partner was familiar with due to the earlier involvement in the development of the tool. Each program partner participated in the assessment, while suppliers, who formed part of the enterprise, were not involved. At each company LESAT was used only for the purposes of the program.

Assessment was conducted at each program partner separately, facilitated by program partner staff. There were discrepancies in how the assessment was conducted at each partner. For example, at one of the program partners the assessment covered only the company's business units participating in the program, rather than the program as whole. At other program partners, the assessment covered the whole enterprise.

There were differences in how the assessment process was organized. One company chose to have a facilitated session, where LESAT principles were explained to participants before the scoring started. In another the forms were mailed to participants for individual assessment, while the facilitators were available on the phone for clarifications. Others held group sessions where participants had a chance for discussion during the assessment progress.

Based on the results of assessment at each program partner, the dedicated lean team came up with a single score for the enterprise, which was used to track program performance over time. Initially the scores indicated improvement, however over time the score leveled up and remained stable from year to year. The lean team concluded that the LESAT is not capable of capturing the improvement and decided to discontinue using it. There are no plans to use another assessment tool either, as in the opinion of the lean team there is no other tool that can measure the whole enterprise.

5.5. Summary of Observed Uses

The case studies led us to some interesting observations. First of all, we found that none of the studied companies used LESAT in the way it was designed to be used. In each studied case, LESAT was used on a stand-alone basis, not as part of the enterprise transformation framework developed at LAI, but rather within the continuous improvement frameworks developed within each studied company. Let

us look at some other observations. Summary and comparison of the case studies are in Table 6.

Table 6 – Summary and Comparison of Case Studies

	Case Study A	Case Study B	Case Study C	Case Study D
Enterprise	Autonomous business units	Autonomous business units	Cross-unit functional area	Multi-organizational program
Mode of LESAT use	On regular basis; continuing	Single time; discontinued	Single time; possibly continuing	On regular basis; discontinued
Motivation for assessment	Continuous improvement	Trial; cross-unit comparison	Continuous improvement	Customer requirement
Type of assessment	Managed (external) assessment	Self-assessment	Self-assessment	Self-assessment
Role of facilitator	Enabler/ Consultant	Process facilitator	Change agent	Process facilitator
Use of LESAT scores	Input to transformation plan	Analysis of scores; no follow up	Input to transformation plan	Tracing overall score year to year

Types of Enterprises

LESAT can be used for different types of enterprises. In our studies, the scope of each enterprise was different. We came across a "functional" enterprise, which focuses on a particular functional area, while being comprised of many business units within the company, demonstrated by case study C. Another type of enterprise was a separate full-fledged business entity, responsible for a particular commercial line of business, like we observed in case studies A and B. We found "program" enterprises, in some cases these being programs within a single organization and in other cases a cross-organizational program, like in case study D.

Mode of Use and Motivation

The context of using LESAT is not constrained: it can be used single time (case studies B and C) or on ongoing basis (case studies A and D). We also found that it can be used as a learning experience (case study B) or embedded in the continuing

enterprise transformation process (case studies A, C and D). In the latter instance we also found differences in the motivation for the assessment. In some cases, the enterprise was genuinely interested in the results of the assessment and used them to define future improvement plans. A good example is provided by case study C. In other cases, the assessment was made because of the client's requirements. The results were not properly analyzed and thus the enterprise found limited value in the assessment. This was demonstrated in case study D.

Leadership Commitment

Not only the original motivation for the assessment, but also continued commitment of the leadership plays a role in the effectiveness of the process, as in any enterprise initiative. Case study A demonstrated that leadership buy-in is an important milestone prior to the start of the assessment process. Another case study (B) demonstrated how change in leadership could affect the scope and focus of the assessment process, as well as the whole enterprise transformation process.

Participants

It was interesting to observe who participated in the assessment. You will note that the LESAT Facilitator's Guide actually does not specify in detail who the participants should be and how they should be selected. Each of our studied companies approached this in their own ways. In some companies assessment was carried out by enterprise senior leadership only. In other cases, participants included randomly selected representatives of three levels of enterprise management. In some companies the assessment was made by lean practitioners (black and/or green belts), who represent any level of management or are not part of a management team at all. It was interesting to notice that one enterprise comprised suppliers as well, but the suppliers were not invited to participate in the assessment. This suggests a mismatch between the scope of the enterprise and the participants.

Role of Facilitator

Surprisingly, we found that the role that LESAT facilitators play in the assessment process has an impact on the value of the assessment. We identified three roles that the facilitators played in our studied companies. The first role is that of the "process" facilitator, or a person who is responsible for organizing the process, collating results and presenting them to the participants. The second role is that of the "enabler" or "consultant." These facilitators provide the necessary advice on the tool and the process, actively assist the enterprise leadership in every possible way throughout the assessment process, help analyze results and incorporate them into transformation plans. However, these facilitators do not own the transformation plan and do not carry direct responsibility for outcomes of the assessment. They effectively provide services to the enterprise. The third role is that of the "transformation" facilitator, who has direct interest in the assessment. These people are responsible for development and implementation of transformation plans.

Use and Interpretation of LESAT Scores

Another interesting observation concerns the use and interpretation of LESAT scores, which range from use of simple averages to thorough analysis of symptoms that caused low scores. The example of simplest use of LESAT score is averaging out scores across all LESAT practices. Basically, performance of the enterprise across 54 different practices is averaged into a single score. A more sophisticated use of scores includes comparison of results across practices. This allows assessment of the enterprise performance on various LESAT dimensions and identification of weak spots. The best example includes a thorough analysis of not only the scores, but also of reasons that led to low scores, high gaps and high variance in scores, as well as identification of actions that should follow each score level.

LESAT Architecture

Based on the interviews with the studied companies, we noticed that architecture of LESAT itself poses certain difficulties for users. LESAT was specifically developed as a self-assessment tool, however all, but one, studied companies found this an impediment. The size of the tool and the amount of time needed to understand it and carry out the assessment was considered a challenge. For these reasons, in three cases the cycle time for completion of assessment was reported as several months. In case study A, the company managed to shorten the cycle time by replacing self-assessment with managed assessment, where the scoring is done by a group of external experts, rather than by enterprise leadership.

Some studied companies considered the language used within the LESAT practices to be too academic, and found value in conducting facilitated sessions, where the facilitator was available in the room to answer questions and provide clarifications. It also helped the participants to discuss the practices and the enterprise performance on these practices as the assessment was going on. However, we also found instances in which the assessment process was not facilitated and participants were requested to return completed assessments to facilitators.

The size and complicatedness of the tool, in terms of the language used, for example, create high barriers for use of LESAT. Prior to engaging their enterprise into the assessment process, the LESAT facilitators must understand the value of LESAT and various aspects of its use to be able to convey the tool to the enterprise leadership and organize the process effectively. Participants of the LESAT assessment process must understand the LESAT principles and various levels of enterprise maturity in relation to each principle in order to carry out effective assessment of their enterprise. In order to realize value of the assessment, both enterprise leadership and facilitators must be able to interpret the assessment results and use them to develop an improvement plan. Another difficulty that users point out when discussing the use of LESAT is the inconsistency of the maturity levels between different principles, which complicates scoring.

5.6. Evaluation of the Assessment Process

In order to ensure that assessment produces useful results and that the assessment process is efficient and effective, the LESAT users need to adopt the same approach as is required for any enterprise transformation.

Our case studies have demonstrated that some companies are more successful in carrying out the assessment than others. By success we understand deriving value from the exercise in form of meaningful results and an actionable plan of transformation measures. We found that in our case studies the success depended not only on the factors described earlier, but also on the assessment process that was followed.

In our case Companies A and C undertook each of the five process activities that we have identified based on literature review, while in Cases B and D only core measurement activities, such as Plan Measurement and Perform Measurement, were implemented (Table 7). As a result the first two companies appreciated the value of LESAT and are able to use the results in their transformation journey.

Table 7 – Overview of Assessment Processes Identified in Case Studies

	Case Study A	Case Study B	Case Study C	Case Study D
Assessment Prerequisites	Performed	Not performed	Performed	Not performed
Plan Assessment	Performed	Performed	Performed	Performed, but not in full
Perform Assessment	Performed	Performed, but not in full	Performed	Performed, but not in full
Act on Assessment	Performed	Not performed	Performed	Performed, but not in full
Evaluate Assessment	Performed	Not performed	Performed	Not performed

Assessment Prerequisites

Company C started the process by evaluating various assessment tools with the purpose of identifying the one that would satisfy their organizational needs, specifically to assess the progress of the ongoing transformation process. LESAT was selected as the tool that would allow the company not only to assess the current progress, but also to identify focus areas for the next phase of the transformation. LESAT also allowed the company to involve leadership into the assessment and understand how the enterprise transformation can be coordinated with other initiatives undertaken in the company.

To ensure assessment consistency across business units, participating in LESAT, Company C coordinated the work of LESAT Facilitators in terms of facilitator role, process followed, interpretation of practices, LESAT participants, etc. The coordination continued throughout the assessment process, until the final results were understood and transformation plans developed.

The same group of facilitators, each of them a Black Belt or Master Black Belt lean practitioner, designs and overlooks the transformation process in the company and ensures regular re-assessment of the progress.

In Company A, a dedicated team of Lean Six Sigma experts from corporate headquarters facilitates the assessment process. Several business units undergo the assessment every year, and the first task for facilitators is to ensure buy-in of the leadership of that business unit in which the assessment should be held. While the assessment is initiated at the higher corporate level, it is the leadership of the unit that owns and implements the transformation within. For this reason a push to start the assessment without the involvement of the entity leadership is a recipe for hiding things.

Plan, Perform and Act on Assessment

Company B, perhaps, was the most diligent in planning and performing the measurement. The facilitator outlined the whole assessment process and explained it to the participants at the start. The facilitator also ensured that participants understand the tool methodology, lean practices and maturity matrix. Supported by company leadership, the assessment process was completed within weeks, as opposed to months in case of other studied companies. On the downside, however, the company did not go beyond review of the score results. The score results were not analyzed and, thus, no transformation plans followed. As the result, the company has not appreciated the value of LESAT and discontinued using it.

The enterprise in Case study D did not attempt to understand the LESAT scores either. The assessment converted to a single average score for the enterprise, which was used to track progress from year to year. When after the initial years, the average current state score stopped growing from the previous year's level, the enterprise concluded that the assessment tool was faulty and decided to discontinue using it. In case of LESAT, the average current state score is a composite of average scores for 54 practices; each average score reflects individual scores provided by each participant. Lack of change in average score does not necessary mean lack change in individual scores; nor does it mean lack of variance in scoring. By avoiding careful review and analysis of the LESAT results, the enterprise did not allow itself to identify strong and problem zones or future areas of improvement.

The planning phase of the enterprise in Case study D was not exemplary either. As mentioned earlier, the enterprise was a program that involved several large organizations. There was little coordination of the assessment process between

organizations and no consistency in the level of guidance provided to the participants.

We have demonstrated the methodology that Company C has developed to analyze the LESAT results. One of the facilitators mentioned that trying to understand the results was a lengthy process; however, once the analysis was complete, the company found the results useful and was able to incorporate them into transformation plans.

Evaluating Assessment

Having tried LESAT, Company A re-evaluated it and decided to modify the tool so that it better reflects the actual operational processes. The company changed the nature of the assessment from self-assessment to managed assessment performed by a diagnostic team. They also expanded LESAT by adding practices we described earlier.

Company C is re-evaluating assessment tools that they will use for the next round of transformation. LESAT is one of the candidates, but not the only one.

5.7. Analysis of LESAT Scores

One studied company shared scoring results obtained in one of the business units in which LESAT was held. While this data represents a single occurrence and thus cannot be generalized, we would like to highlight several interesting observations resulting from analysis of this data.

Self-assessment involved 22 respondents, representing four levels of management as follows: highest level (or referred hereafter as Level 1) – 2 respondents, Level 2 – 2 respondents, Level 3 – 7 respondents and the lowest level (Level 4) – 11 respondents. We analyzed scores of the group as a whole, and in addition we analyzed scores of four sub-groups, each corresponding to a level of management. Figure 10 presents overall LESAT scores for the whole group as well as for each sub-group. In the figure, "L1" corresponds to Level 1 management, "L2" to Level 2 and so forth.

Given the difference in the number of respondents representing each sub-group, the overall group score is driven by the respondents in the Level 3 and Level 4 sub-groups.

It is interesting to note that the higher the respondents' level of management, the more conservative their assessment of the current state of the enterprise capability level. Both Level 1 and Level 2 managers assess the current state below the average score given by the whole group, while Level 4 managers tend to give higher scores on each LESAT section.

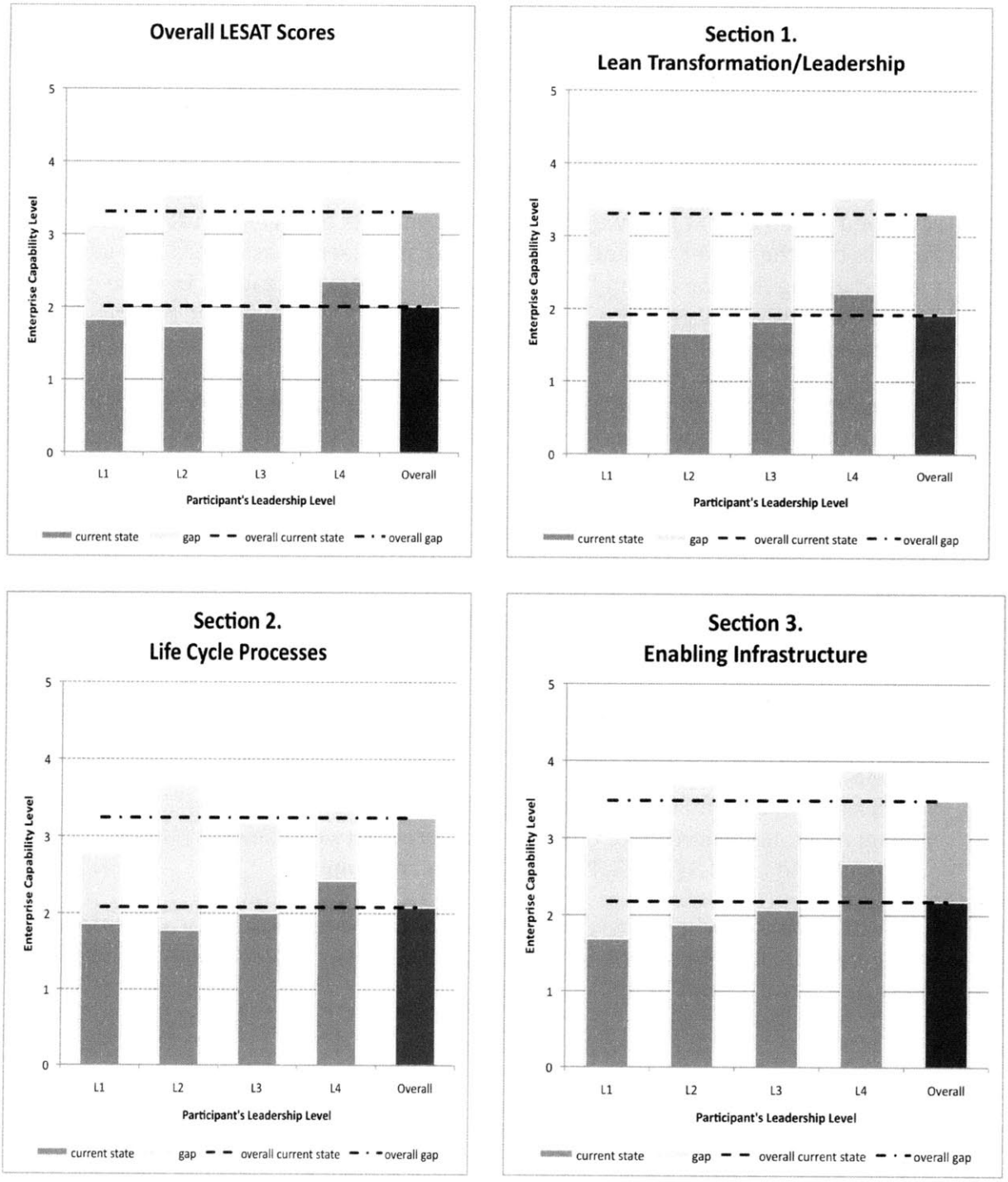


Figure 10 – Overview of LESAT Scores in Company C

Another interesting observation is that Level 2 managers, while conservative in assessing the current state of the enterprise, assign high scores for the desired state, which results in the highest gap between the current and desired states.

We notice that scores assigned by the respondents of the lower level of management are characterized by higher range of scores and higher variance. This could be, partially, due to the higher number of respondents in these subgroups. Having reviewed the comments provided by the respondents to various practices it also appears that the higher variance is affected by such factors as differences in understanding the practice and how it applies to the organization. In some cases respondents don't encounter a practice in their work and thus have troubles assigning a score.

Respondents' degree of participation in the organization's management might affect the scores that the respondent assigns to each LESAT practice, but this effect differs across different levels of management. A one-way analysis of variance (ANOVA) tested the LESAT scores assigned by respondents, who represent three levels of management: Levels 1 and 2 (combined together due to low number of respondent in each sub-group) (n = 4), Level 3 (n = 11) and Level 4 (n = 7).

The analysis revealed that in most cases the differences in scores between different levels of management are not statistically significant (see Table 8 and Table 9 for results). Only in few instances the difference was significant. For example, such difference was significant for the practice "I.D.2 Relationships based on mutual trust" for both current and desired state, $F(2,19) = 4.5$, $p = .025$ and $F(2,18) = 4.1$, $p = .035$, respectively. For this practice, in current state the scores differed significantly between Level 3 ($M = 1.55$, $SD = 0.69$) and Level 4 ($M = 2.43$, $SD = 0.54$) management. In desired state the scored differed between Level 2 ($M = 4.25$, $SD = 0.50$) and Level 3 ($M = 3.09$, $SD = 0.94$) management.

In all the instances where current state scores differed significantly across levels of management, Level 4 respondents tended to assign significantly higher scores than Level 2 or Level 3 respondents.

Table 8 – Results of the Analysis of Variances for Current State

	Overall		Levels 1,2		Level 3		Level 4		Analysis of Variances			
Lean Practice	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.	df1	df2	F	Sig.
I.A.1. Integration of lean in strategic planning process	2.09	0.87	1.50	0.58	2.09	0.70	2.43	1.13	2	19	1.53	.24
I.A.2. Focus on customer value	2.32	1.04	2.00	0.82	1.91*	0.83	3.14*	1.07	2	19	4.22	.03
I.A.3. Leveraging the extended enterprise	2.05	0.90	2.00	0.82	1.82	0.98	2.43	0.79	2	19	.99	.39
I.B.1. Learning and education in 'lean' for enterprise leaders	1.86	0.57	1.50	0.58	1.91	0.54	2.00	0.63	2	18	1.01	.38
I.B.2. Senior management commitment	1.59	0.85	1.00	0.00	1.64	0.81	1.86	1.07	2	19	1.36	.28
I.B.3. Lean Enterprise Vision	1.68	0.84	1.00	0.00	1.91	0.83	1.71	0.95	2	19	1.88	.18
I.B.4. A sense of urgency	1.27	0.46	1.00	0.00	1.36	0.50	1.29	0.49	2	19	.93	.41
I.C.1. Understanding the current value stream	2.14	0.65	2.00	0.82	2.00	0.63	2.50	0.55	2	18	1.29	.30
I.C.2. Enterprise flow	1.91	0.68	2.00	0.82	1.82	0.60	2.00	0.82	2	19	.18	.84
I.C.3. Designing the future value stream	1.27	0.46	1.00	0.00	1.36	0.50	1.29	0.49	2	19	.93	.41
I.C.4. Performance measures	1.36	0.49	1.00	0.00	1.45	0.52	1.43	0.53	2	19	1.39	.27
I.D.1. Enterprise organisational orientation	2.00	0.93	2.00	0.00	1.82	0.60	2.29	1.50	2	19	.52	.60
I.D.2. Relationships based on mutual trust	1.86	0.71	1.75	0.50	1.55*	0.69	2.43*	0.53	2	19	4.49	.03
I.D.3. Open and timely communications	2.41	0.91	2.00	0.00	2.18	0.60	3.00	1.29	2	19	2.57	.10
I.D.4. Employee empowerment	2.64	0.90	2.00*	0.82	2.45	0.82	3.29*	0.76	2	19	3.86	.04
I.D.5. Incentive alignment	1.77	0.53	1.50	0.58	1.91	0.54	1.71	0.49	2	19	.94	.41
I.D.6. Innovation encouragement	1.64	0.79	1.00	0.00	1.73	0.79	1.86	0.90	2	19	1.77	.20
I.D.7. Lean change agents	1.64	0.66	1.75	0.50	1.45	0.52	1.86	0.90	2	19	.86	.44
I.E.1. Enterprise level lean implementation plan	1.71	0.56	1.50	0.58	1.64	0.50	2.00	0.63	2	18	1.20	.32
I.E.2. Commit resources for lean improvements	2.52	0.68	3.00	0.00	2.27	0.47	2.67	1.03	2	18	2.06	.16
I.E.3. Provide education and training	2.19	0.60	2.00	0.00	2.09	0.54	2.50	0.84	2	18	1.16	.33
I.F.1. Development of detailed plans based on enterprise plan	1.29	0.46	1.25	0.50	1.18	0.40	1.50	0.55	2	18	.92	.41
I.F.2. Tracking detailed implementation	2.30	0.80	2.75	0.50	2.00	0.77	2.60	0.89	2	17	1.92	.18
I.G.1. Structured continuous improvement process	2.29	0.85	2.50	1.00	2.09	0.70	2.50	1.05	2	18	.59	.57
I.G.2. Monitoring lean progress	2.11	0.74	2.50	1.00	1.89	0.60	2.17	0.75	2	16	.98	.40
I.G.3. Nurturing the process	2.05	0.62	1.75	0.50	1.89	0.60	2.50	0.55	2	16	2.82	.09
I.G.4. Capturing lessons learned	2.26	0.65	2.00	0.00	2.20	0.79	2.60	0.55	2	16	1.04	.38
I.G.5. Impacting enterprise strategic planning	1.90	0.77	1.75	0.50	1.64	0.67	2.50	0.84	2	18	3.08	.07
II.A.1. Leverage lean capability for business growth	1.52	0.75	1.00	0.00	1.64	0.92	1.67	0.52	2	18	1.24	.31
II.A.2. Optimise the capability and utilisation of assets	1.95	0.67	2.00	0.00	2.18	0.75	1.50	0.55	2	18	2.29	.13
II.A.3. Provide capability to manage risk, cost, schedule and performance	2.24	1.00	1.75	0.50	2.18	1.08	2.67	1.03	2	18	1.06	.37
II.A.4. Resource and empower programme development efforts	2.40	0.88	2.25	0.50	2.09	0.94	3.20	0.45	2	17	3.53	.05
II.B.1. Establish a requirements definition process to optimise lifecycle value	1.81	0.81	1.75	0.50	1.55	0.69	2.33	1.03	2	18	2.02	.16
II.B.2. Utilise data from the extended enterprise to optimise future requirement definitions	2.10	0.89	1.25	0.50	2.18	0.87	2.50	0.84	2	18	2.97	.08
II.C.1. Incorporate customer value into design of products and processes	2.68	0.75	2.25	0.50	2.70	0.82	3.00	0.71	2	16	1.13	.35
II.C.2. Incorporate downstream stakeholder values into products and processes	2.26	0.81	2.00	0.00	2.45	0.93	2.00	0.82	2	16	.71	.50
II.C.3. Integrate product and process development	2.05	0.69	2.00	0.00	1.90	0.57	2.33	1.03	2	17	.74	.49
II.D.1. Define and develop supplier network	1.90	1.07	2.00	0.00	1.80	1.32	2.00	1.10	2	17	.08	.92
II.D.2. Optimise network-wide performance	2.37	1.01	2.00	0.00	2.00	1.05	3.17	0.75	2	16	3.48	.06
II.D.3. Foster innovation and knowledge-sharing throughout the supplier network	1.94	0.83	1.67	0.58	1.78	0.97	2.40	0.55	2	14	1.13	.35
II.E.1. Utilise production knowledge and capabilities for competitive advantage	2.20	0.83	1.75	0.50	2.09	0.83	2.80	0.84	2	17	2.23	.14
II.E.2. Establish and maintain a lean production system	1.89	0.81	1.25*	0.50	1.80	0.63	2.60*	0.89	2	16	4.49	.03
II.F.1. Align sales and marketing to production	1.88	0.89	1.33	0.58	1.89	0.78	2.25	1.26	2	13	.91	.43
II.F.2. Distribute product in lean fashion	2.13	0.89	3.00	0.00	2.00	0.82	2.00	1.15	2	13	1.14	.35
II.F.3. Enhance value of delivered products and services to customers and the enterprise	2.14	0.85	1.75	0.50	1.91	0.83	2.83	0.75	2	18	3.50	.05
II.F.4. Provide post delivery service, support and sustainability	1.72	0.75	1.75	0.96	1.60	0.70	2.00	0.82	2	15	.38	.69
III.A.1. Financial system supports lean transformation	1.53	0.77	1.25	0.50	1.30	0.67	2.20	0.84	2	16	3.23	.07
III.A.2. Enterprise stakeholders pull required financial information	1.60	0.68	1.75	0.50	1.30	0.48	2.00	0.89	2	17	2.42	.12
III.A.3. Promulgate the learning organisation	1.68	0.67	1.00*	0.00	1.60	0.52	2.40*	0.55	2	16	10.01	.00
III.A.4. Enable the lean enterprise with information systems and tools	2.43	0.93	1.75	0.50	2.45	0.82	2.83	1.17	2	18	1.78	.20
III.A.5. Integration of environmental protection, heath and safety into the business	3.25	1.16	3.00	0.00	2.90	1.37	4.00	0.89	2	17	1.97	.17
III.B.1. Process standardisation	2.62	0.97	2.50	0.58	2.64	1.21	2.67	0.82	2	18	.04	.97
III.B.2. Common tools and systems	2.19	0.87	1.50	0.58	2.18	0.98	2.67	0.52	2	18	2.46	.11
III.B.3. Variation reduction	2.19	1.08	1.50	1.00	2.18	1.08	2.67	1.03	2	18	1.47	.26

* The difference between marked pairs of scores is significant within 95% confidence level

Table 9 – Results of the Analysis of Variance for Desired State

	Overall		Levels 1,2		Level 3		Level 4		Analysis of Variances			
Lean Practice	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.	df1	df2	F	Sig.
I.A.1. Integration of lean in strategic planning process	3.73	0.98	3.25	0.96	3.45	0.93	4.43	0.79	2	19	3.23	.06
I.A.2. Focus on customer value	3.60	1.14	3.25	0.96	3.45	1.29	4.20	0.84	2	17	.96	.40
I.A.3. Leveraging the extended enterprise	3.27	0.88	3.50	0.58	3.09	1.14	3.43	0.53	2	19	.45	.64
I.B.1. Learning and education in 'lean' for enterprise leaders	3.35	0.75	3.25	0.50	3.36	0.81	3.40	0.89	2	17	.04	.96
I.B.2. Senior management commitment	3.10	0.83	3.00	0.82	3.09	0.83	3.17	0.98	2	18	.04	.96
I.B.3. Lean Enterprise Vision	3.24	0.89	2.75	0.50	3.45	0.93	3.17	0.98	2	18	.94	.41
I.B.4. A sense of urgency	2.81	0.60	2.50	0.58	2.91	0.54	2.83	0.75	2	18	.66	.53
I.C.1. Understanding the current value stream	3.36	0.49	3.50	0.58	3.18	0.40	3.57	0.53	2	19	1.62	.22
I.C.2. Enterprise flow	3.55	0.83	4.00	0.82	3.18	0.75	4.00	0.71	2	17	2.92	.08
I.C.3. Designing the future value stream	2.76	0.94	2.75	0.50	2.73	1.01	2.83	1.17	2	18	.02	.98
I.C.4. Performance measures	2.86	0.73	2.75	0.50	2.82	0.87	3.00	0.63	2	18	.16	.85
I.D.1. Enterprise organisational orientation	3.41	1.01	4.00	0.82	3.09	1.04	3.57	0.98	2	19	1.37	.28
I.D.2. Relationships based on mutual trust	3.52	0.87	4.25*	0.50	3.09*	0.94	3.83	0.41	2	18	4.07	.03
I.D.3. Open and timely communications	3.68	0.82	3.75	0.50	3.50	0.85	4.00	1.00	2	16	.61	.56
I.D.4. Employee empowerment	3.81	0.87	3.75	0.50	3.64	1.12	4.17	0.41	2	18	.71	.51
I.D.5. Incentive alignment	3.19	0.98	3.25	0.96	3.30	1.16	3.00	0.82	2	18	.19	.83
I.D.6. Innovation encouragement	3.10	1.00	3.00	0.82	3.09	1.14	3.17	0.98	2	18	.03	.97
I.D.7. Lean change agents	3.00	0.84	3.50	0.58	2.73	0.90	3.17	0.75	2	18	1.49	.25
I.E.1. Enterprise level lean implementation plan	3.10	0.64	3.00	0.00	3.00	0.77	3.40	0.55	2	17	.71	.51
I.E.2. Commit resources for lean improvements	3.90	0.64	3.75	0.50	3.82	0.60	4.20	0.84	2	17	.73	.50
I.E.3. Provide education and training	3.50	0.83	3.25	0.50	3.36	0.81	4.00	1.00	2	17	1.28	.30
I.F.1. Development of detailed plans based on enterprise plan	2.95	0.76	3.25	0.50	2.82	0.87	3.00	0.71	2	17	.46	.64
I.F.2. Tracking detailed implementation	3.26	0.73	4.00	0.82	3.00	0.67	3.20	0.45	2	16	3.39	.06
I.G.1. Structured continuous improvement process	3.50	0.79	4.00	0.82	3.22	0.67	3.60	0.89	2	15	1.49	.26
I.G.2. Monitoring lean progress	3.37	0.76	3.75	0.50	3.10	0.88	3.60	0.55	2	16	1.42	.27
I.G.3. Nurturing the process	3.26	0.73	3.25	0.50	3.00	0.82	3.80	0.45	2	16	2.26	.14
I.G.4. Capturing lessons learned	3.40	0.60	3.50	1.00	3.27	0.47	3.60	0.55	2	17	.56	.58
I.G.5. Impacting enterprise strategic planning	3.05	0.91	3.25	0.50	2.70	0.82	3.60	1.14	2	16	1.92	.18
II.A.1. Leverage lean capability for business growth	2.84	0.69	3.00	0.82	2.70	0.67	3.00	0.71	2	16	.42	.66
II.A.2. Optimise the capability and utilisation of assets	3.17	0.92	3.75	0.96	3.00	0.71	3.00	1.22	2	15	1.03	.38
II.A.3. Provide capability to manage risk, cost, schedule and performance	3.28	0.83	3.50	0.58	3.20	0.92	3.25	0.96	2	15	.17	.84
II.A.4. Resource and empower programme development efforts	3.53	0.51	3.50	0.58	3.30*	0.48	4.00*	0.00	2	16	4.22	.03
II.B.1. Establish a requirements definition process to optimise lifecycle value	2.95	0.78	3.50	0.58	2.70	0.82	3.00	0.71	2	16	1.62	.23
II.B.2. Utilise data from the extended enterprise to optimise future requirement definitions	3.11	0.81	2.75	1.26	3.00	0.67	3.60	0.55	2	16	1.48	.26
II.C.1. Incorporate customer value into design of products and processes	3.53	0.77	3.50	1.00	3.55	0.82	3.50	0.58	2	16	.01	.99
II.C.2. Incorporate downstream stakeholder values into products and processes	3.39	0.92	3.75	0.96	3.40	0.52	3.00	1.63	2	15	.64	.54
II.C.3. Integrate product and process development	3.25	0.64	3.50	0.58	3.27	0.65	3.00	0.71	2	17	.67	.52
II.D.1. Define and develop supplier network	2.89	0.88	3.25	0.50	2.82	0.98	2.75	0.96	2	16	.40	.68
II.D.2. Optimise network-wide performance	3.50	0.79	3.33	0.58	3.30	0.82	4.00	0.71	2	15	1.48	.26
II.D.3. Foster innovation and knowledge-sharing throughout the supplier network	2.89	0.76	3.33	0.58	2.78	0.67	2.83	0.98	2	15	.60	.56
II.E.1. Utilise production knowledge and capabilities for competitive advantage	3.25	0.72	3.50	0.58	3.00	0.67	3.50	0.84	2	17	1.25	.31
II.E.2. Establish and maintain a lean production system	3.05	0.78	2.33	0.58	3.30	0.67	3.00	0.89	2	16	1.99	.17
II.F.1. Align sales and marketing to production	2.71	1.05	2.00	1.00	2.90	0.99	2.75	1.26	2	14	.84	.45
II.F.2. Distribute product in lean fashion	3.12	0.93	3.50	0.71	3.09	0.83	3.00	1.41	2	14	.19	.83
II.F.3. Enhance value of delivered products and services to customers and the enterprise	3.16	0.76	3.00	0.00	3.00	0.82	3.60	0.89	2	16	1.15	.34
II.F.4. Provide post delivery service, support and sustainability	2.74	0.99	2.25	1.50	2.91	0.83	2.75	0.96	2	16	.62	.55
III.A.1. Financial system supports lean transformation	2.89	0.74	3.00	0.82	2.70	0.82	3.20	0.45	2	16	.80	.47
III.A.2. Enterprise stakeholders pull required financial information	2.95	0.60	3.00	0.00	3.00	0.63	2.80	0.84	2	17	.19	.83
III.A.3. Promulgate the learning organisation	3.00	0.55	2.75	0.96	3.00	0.45	3.17	0.41	2	18	.67	.52
III.A.4. Enable the lean enterprise with information systems and tools	3.89	0.88	4.25	0.50	3.60	0.97	4.20	0.84	2	16	1.23	.32
III.A.5. Integration of environmental protection, heath and safety into the business	4.00	0.91	3.75	0.50	3.78	1.09	4.60	0.55	2	15	1.63	.23
III.B.1. Process standardisation	3.84	0.90	3.75	0.96	3.60	0.84	4.40	0.89	2	16	1.41	.27
III.B.2. Common tools and systems	3.37	1.07	2.75	0.96	3.30	1.16	4.00	0.71	2	16	1.70	.21
III.B.3. Variation reduction	3.26	0.87	3.50	0.58	3.00	0.82	3.60	1.14	2	16	.97	.40

* The difference between marked pairs of scores is significant within 95% confidence level

Having analyzed the scores and the comments provided by some respondents for various practices, the possible *sources of variance* in scores include the following *characteristics of respondents*:

- *Managerial role*: The scope of the respondent's view of the organization and his/her participation in decision-making process impact the assessment of organizational maturity. This was demonstrated by the scoring example above, where we evidenced difference in scoring results provided by respondents representing different levels of management;
- *Functional role*: It is possible that the respondent's range of functional responsibilities also affect scores. Respondents representing different functional units (e.g. manufacturing vs. accounting) may have different views of how the organization performs and where it needs to be. We found also that some respondents are not regularly exposed to all practices included in LESAT, which also affects scoring;
- *Reporting bias*: As we noticed in our analysis, respondents representing lower level of management tend to assign higher scores as compared to higher-level respondents. This may be an indication of a reporting bias, where respondents overestimate current performance to avoid managerial reprisal and impact results of their performance review;
- *Risk attitude*: Some respondents tend to systematically underestimate or overestimate performance due to their personalities. Such respondents will typically assign scores that are consistently lower or consistently than those of other respondents;
- *Interpretation of practice and scoring system*: Review of respondents' comments to individual practices provided evidence that in some instances respondents assigned scores without fully understanding the meaning of the practice or confusing it with another one. Such behavior may result from lack of understanding of practices and scoring system by respondents, which can be addressed through training and assistance of facilitator.

Brief analysis of the LESAT scores provides us with the following insights:

- *Participants representing various levels of management* provide a richer range of scores, which can help identify areas requiring more common understanding within an organization. This also allows to see differences in the views of participants depending on their position in organization;
- *Size of subgroups representing different levels of management should be even* to avoid biases in the overall results. As we saw in the case of Company C, greater representation of the lower level of management skewed the overall results towards those provide by Level 3 and Level 4 subgroups;
- *Careful analysis of the overall scores and scores for each subgroup* provides better insight into the current state of the enterprise and understanding of how the transformation affects various levels of employees within the organization.

5.8. Impact of the Organization on the Assessment Process

We have discussed the benefits that proper assessment provides to an organization and the role that it can play in enterprise transformation. However, we believe that organizations themselves impact assessment both before it even starts and throughout the process. This may indirectly determine whether assessment is going to benefit the organization or simply be a waste of resources.

The factors that impact the assessment include, for example:

- Organizational motivation,
- Leadership buy-in,
- Commitment at all levels within the organization,
- Choice of participants,
- Respondents' bias,
- Role of the assessment facilitator, and
- Education and training of participants.

The first important factor to consider is the motivation that drives the organization to perform assessment. The organization should have genuine interest in assessment results and understand the benefits that they will provide. We sometimes see cases when organizations engage in the assessment just because of requirements imposed by a higher-up entity or by a client. In case of lack of motivation, organizations are tempted to forgo important steps in the assessment process, such as pre-assessment preparation or post-evaluation of the assessment results.

Another important factor, which is widely discussed in management literature (Kotter, 2007; Bossidy & Charan, 2002), is the buy-in of the organizational leadership. Leadership should not only understand the benefits of the assessment and support it. It should play a primary role throughout the process, starting from the preparatory stages. During pre-assessment preparation, with the help of facilitators, leadership should determine process plan and guidelines, the list of participants, resources required to carry out the process effectively and efficiently and a communication plan to ensure the process is complete within specified time and scope.

Our discussions with LESAT users revealed that many users perceive LESAT as a time consuming exercise, which is often being delayed by other more important and urgent activities. While it is true that assessment may not always be the priority activity at the organization, allocation of time that participants can spend on the assessment and its recognition by the leadership as value-added (in timesheets, for example) may help to keep the assessment cycle time as short as possible, thus leading to results that are relevant in terms of their timing. It may be beneficial to keep in mind that LESAT is a self-assessment, i.e. it allows the organizations to save on external consultancy fees. This thought may help organizations to more willingly commit internal resources in order to exert full benefit from the assessment.

As mentioned earlier, the leadership should maintain their involvement and primary role throughout the assessment process and even after it is complete. The assessment process is meaningful only in case its results have been properly analyzed and incorporated into the organization's transformation plan. As development and implementation of the transformation plans is the leadership responsibility, their understanding of the assessment results and implications for the organization will result in more meaningful follow-up actions.

Success of the assessment requires support from not only the leadership, but at all levels within the organization (McGarry et al. 2002). LESAT participants, independent of their position within the organization, need to understand how the assessment will benefit their work. This should result in more accurate scoring and more meaningful commentary on the practices.

Scoring is also affected by the choice of participants in LESAT assessment. LESAT requests participants to assess not only the current state performance of the organization, but also the desired state. Assessment of the desired state can be more realistic, and thus more meaningful, if participants understand and are able to evaluate resources needed to achieve that desired state.

To improve accuracy and reliability of assessment results the leadership must identify and address potential biases in respondents' assessment. This can be done by ensuring that assessment results are not misused to affect the performance review process and also by establishing an environment promoting open and frank communication and discussion among respondents regarding organizational performance.

We believe that role of facilitators in the assessment process, and facilitator responsibilities within the organization, have an impact on the outcome of the assessment. In our case studies we found that facilitators may play different roles in the process. They are (1) "process" facilitators whose responsibilities are limited to organizing the process and collating the results; (2) "enablers", or "consultant", who actively assist throughout the assessment process, help analyze the results and incorporate them into the transformation plans, but do not own neither the plans nor outcomes of the assessment; and (3) "transformation" facilitators, who are responsible for all aspects of the assessment as well as for development and implementation of transformation plans. The evidence suggests that role of the "process" facilitator is not sufficient for success of the assessment, especially if the organization is lacking motivation and leadership commitment.

Assessment results are affected by participant familiarity with enterprise terminology and principles. We mentioned earlier that as over time participants become more familiar with the enterprise culture, their scoring of the organization might in fact go down, as their understanding of LESAT practices improves and not because of the changes in the organization. From this point of view, it is important to ensure that the organization provides with the necessary education and training

in enterprise thinking and LESAT practices before and during the assessment process. This will ensure more realistic scoring of the organizational performance.

CHAPTER 6.

Recommended Assessment Process

Presented below is a recommended process for assessing organizational maturity using LESAT. When developing this process architecture, the objective was to recommend a high-level process framework that includes elements that, based on literature review and case studies, we found important for successful implementation of an assessment process.

By recommending a high-level framework we essentially provide organizations with freedom to carry out specific process steps as they fit culture, policies and practices of a particular organization.

Although LESAT was designed to be used as part of the Enterprise Transformation Roadmap, in the cases that we studied we found that LESAT was used autonomously of the roadmap. Given that, we have developed a process framework that is rather autonomous and can be used wither within as part of the Enterprise Transformation Roadmap, a part of a corporate continuous improvement framework or a part of strategic planning cycle.

6.1. Guiding Principles

In developing the assessment process we have tried to follow four guiding principles:

- Shared understanding of objectives and benefits;
- Same-level knowledge of underlying principles;
- Frequent communication;
- Open discussion.

Shared understanding of objectives and benefits

All stakeholders of the assessment process must understand objectives and benefits of assessment. The key stakeholders include enterprise leadership, assessment facilitator, users and participants of assessment. Such understanding of objectives and benefits, rather than an order from above, should act as the main motivator for assessment, laying the basis for continued commitment to the process.

Shared understanding is best developed through deliberation among stakeholders about possible objectives and benefits. It is further strengthened through continuous communication where the objectives are benefits are reiterated and refined.

Same-level knowledge of underlying principles

In our case studies we found differences in the stakeholders' understanding of the enterprise principles and practices underlying LESAT. Overall, stakeholders from

enterprises, which are more advanced in their transformation journey, are more familiar with the notions and terms used in the assessment tool. However, there is evidence that not all stakeholders share the same level of knowledge and understanding. Lack of the same-level knowledge affects accuracy of the assessment and usability of the results.

To achieve same-level knowledge the enterprise must invest into training of stakeholders. In the early stages of enterprise transformation, training is the responsibility of senior leadership and transformation process owners, including assessment facilitator. In the later stages, however, training tasks can be distributed throughout the enterprise, where more advanced members of the enterprise can exchange knowledge with their colleagues. The training does not need to be limited to special training sessions. It can be maintained through on-the-job demonstration, daily means of communication (e.g. visual boards, newsletters, etc.) and through day-to-day behavior of enterprise leadership and members of the enterprise.

Frequent communication

Continuous and frequent communication is very important in sustaining commitment to the assessment, planning and implementing each of the assessment tasks and distributing results.

Communication with assessment stakeholders and enterprise as whole is one of the important tasks of the enterprise leadership. While the assessment facilitator may be responsible for ensuring that frequent communication is maintained by preparing messages, for example, in most cases communication should come from the enterprise leader as a demonstration of personal commitment.

Communication can be maintained through any means available at the enterprise, such as e-mails, newsletters, personal meetings, visual boards, organized events, etc. More importantly, communication must provide a consistent message indicating progress in the assessment and demonstrating exemplary stakeholder behavior.

Open discussion

Current LESAT users note than one of the greatest benefits of the assessment lies in discussions. They allow stakeholders not only to arrive at consensus results, but also to identify problems and obstacles underlying the transformation process that have not been obvious before.

Once the initial assessment scores are obtained, participants may discuss causes of variances in scores or unusually high or low scores. Such discussions may reveal differences in stakeholder views of the enterprise, its progress in the transformation process and new goals. They may reveal the need for further training or greater communication.

6.2. Assessment Process Architecture

The recommended process consists of five key phases, each of equal importance, including:

- *Assessment Prerequisites*: obtaning organizational commitment through understanding of objectives and benefits of the assessment, allocation of required resources and use of assessment results;
- *Plan Assessment*: preparing for assessment by laying out the process, identifying and training participants;
- *Perform Assessment*: carrying out the assessment itself by collecting and analyzing scores;
- *Evaluate Assessment Results and Process:* ideantifying areas for improvement in organization based on evaluation of assessment results as well as identifying necessry improvments to the assessment process;
- *Develop Action Plan and Prioritize Resources*: putting assessment results to work by incorporating them into organizational plans.

The key phases have to be implemented in sequence (Figure 11), as output of each phase serves as input for the next. For example, the assessment plan must be developed in line with the objectives identified in the first phase and utilizing the resources that were made available; improvement actions cannot be formulated until assessment results have been analyzed and evaluated.

It is also important to stress that the recommended process is not only sequential, but also iterative. Each new cycle of assessment benefits from the outputs obtained previously, as they are being acted upon.

In the following sections we will describe each of the key phases in detail, trying to identify main steps and activities as well as roles of various process stakeholders.

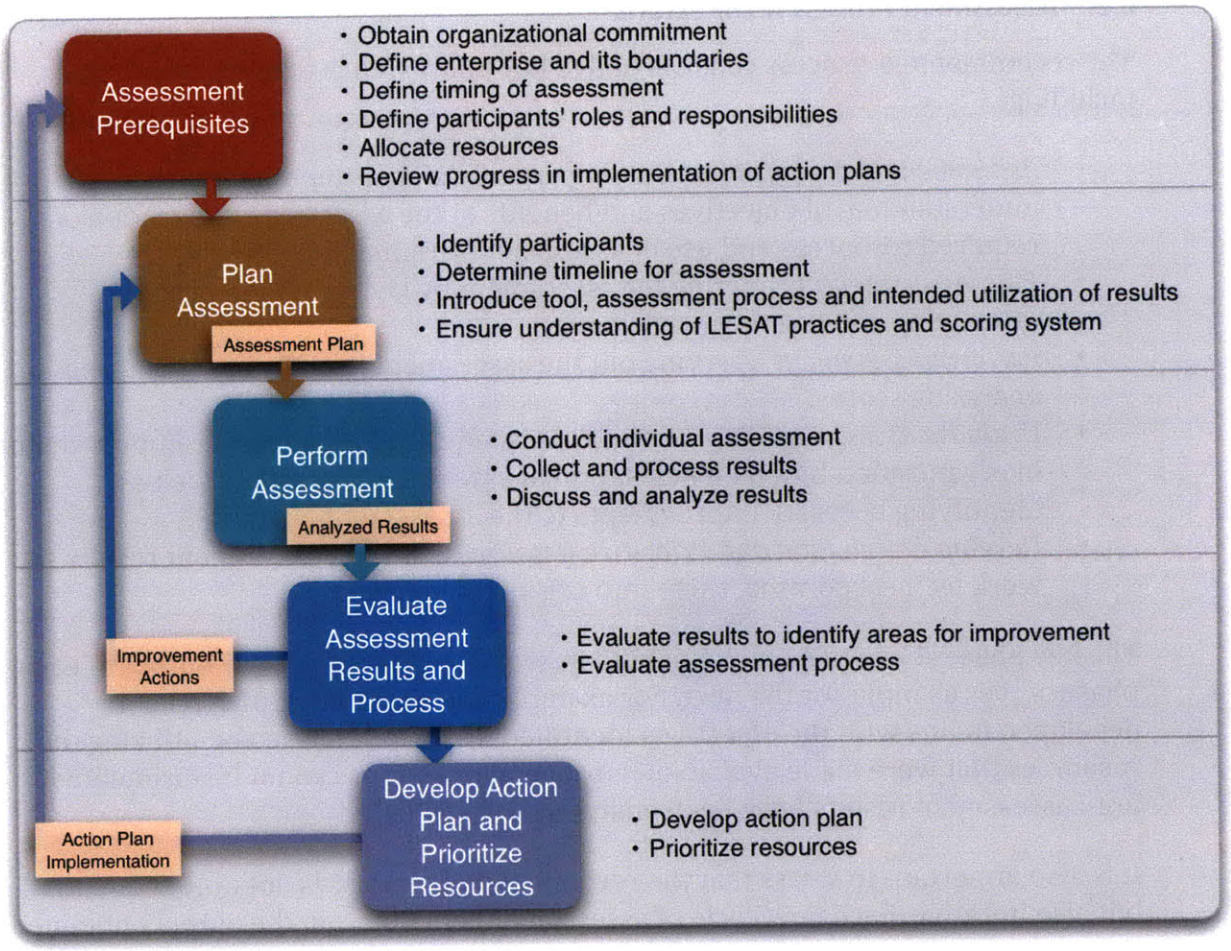


Figure 11 – Overview of the Recommended Assessment Process

6.3. Assessment Stakeholders

Participants in the assessment process may perform different roles. We have identified four main roles in the LESAT process, such as *enterprise leader*, *LESAT facilitator*, *user* and *respondent*.

Enterprise leader provides oversight, communication and continued commitment throughout the whole process. Enterprise leader typically has an overall responsibility for the performance of the enterprise to be assessed. He/she is the primary beneficiary of the assessment, as the enterprise leader is accountable for the transformation process and development of the strategic and implementation plans.

LESAT Facilitator is the assessment process owner with end-to-end responsibility for and authority over the process. The role of the LESAT facilitator is very involved. Typically, this is not a full-time, although a permanent role, which an individual performs while the assessment is employed by the organization. The LESAT facilitator does not gave direct functional control over other assessment stakeholders. However, it is important that the status of the LESAT facilitator is

clear to all assessment stakeholders and that the facilitator is provided with sufficient authority to ensure the assessment remains on track.

In particular, the LESAT facilitator is responsible for:

- Ensuring continued leadership commitment;
- Planning assessment process;
- Providing training to respondents and users;
- Organizing and facilitating meetings;
- Ensuring timeliness of assessment;
- Collating results and ensuring first-level analysis;
- Facilitating discussions of results and follow-up actions;
- Carrying out the assessment and the process;
- Maintaining contact with LESAT developers (LAI) for necessary training, advice and to ensure proper feedback and necessary adjustments to the tool.

User typically is an enterprise employee who benefits from assessment results and uses them to develop transformation plans and carry out improvement activities. Users may include the enterprise leader, management and/or transformation champions, depending on specifics of the organization.

Respondent is an individual who participates in scoring, discussions and analysis of results. The respondent maybe an enterprise employee or a stakeholder in the extended enterprise. Joint assessment by respondents, who are internal and external to the enterprise, provides additional benefits as it ensures more effective and objective assessment. An important characteristic is that both internal and external respondents must have an interest in performance of the enterprise, either being responsible for it or benefiting from it.

In order to ensure consistent assessment results, internal respondents must have enterprise-wide views and responsibilities, i.e. be accountable for performance of the enterprise as a whole, rather than parts of it. The assessment will also benefit from a range of views from different perspectives within the enterprise. As such, the respondents may represent various life-cycle and enabling processes and functions, including product development, manufacturing, distribution, finance, human resources, etc.

External respondents may include representatives of other enterprises and/or functions within the organization as well as representatives of suppliers and customers. This would allow assessing enterprise along the whole value chain and obtaining objectives views.

The above four roles are not mutually exclusive, as various individuals may perform multiple roles in the assessment process. Enterprise leader is likely to be both assessment user and respondent. Some or all of the assessment users may be involved as respondents as well (Figure 12).

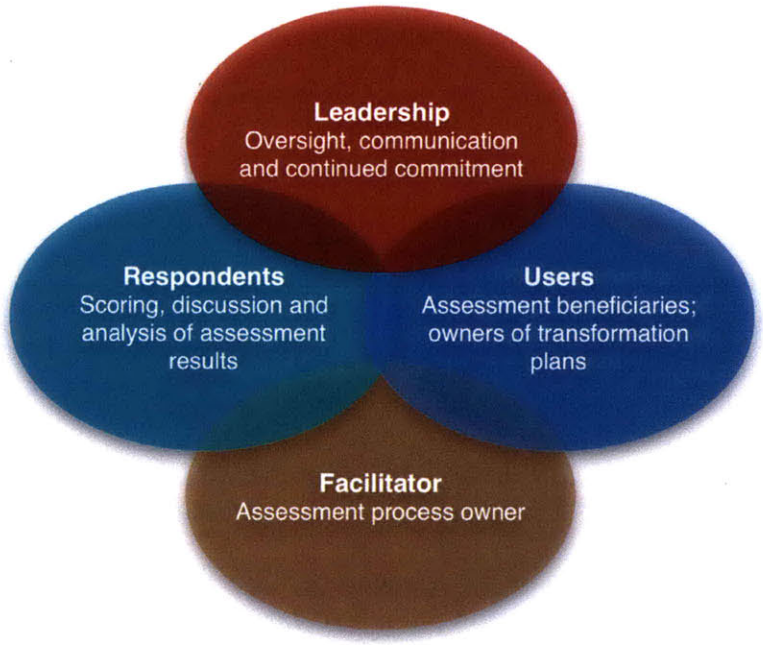


Figure 12 – Assessment Stakeholders and Their Roles

6.4. Phase One: Assessment Prerequisites

The objective of the first phase of the assessment process is to create an environment that would ensure the organization takes advantage of the benefits provided by assessment. In such an environment organization approaches assessment motivated by the benefits that assessment could provide. Assessment is also a long-term exercise, performed in cycles, and requires continued commitment.

The first phase of the assessment process consists of six following steps, each discussed in more detail below:

- Obtain organizational commitment;
- Define enterprise and its boundaries;
- Define timing of assessment;
- Define participants' roles and responsibilities;
- Allocate resources;
- Review progress in implementation of action plans.

6.4.1. Obtain Organizational Commitment

Objective: Gain commitment throughout the enterprise leadership based on shared understanding of objectives and benefits of assessment.

Key Activities:

- Understand objectives of assessment, its benefits and intended use of results
- Communicate this understanding to wider enterprise leadership

- Gain support from wider enterprise leadership
- Identify and remove potential biases

Roles of Stakeholders: Responsibility for this step lies solely with enterprise leader.

Description of Key Activities

Objectives of the assessment may vary depending on the needs of organization. In our case studies we have seen examples in which assessment was performed in order to satisfy customer requirements to have an assessment or to compare current state maturity across a number of enterprises. In our opinion, LESAT is best to be used in order to track progress in implementation of transformation plans and identify areas for improvement in the future.

Perkins et al. (2010) identified the following benefits that can be provided by LESAT:

- *Track enterprise-level progress in implementation of transformation plans*: comparison of scores against original goals and targets in the transformation plan or between the current and previous assessment cycle allows to see in which areas the progress has been achieved and where it is still lagging behind;
- *Prioritize transformation tasks*: given that LESAT provides quantitative measures of maturity across a number of practices, it allows ranking of practices based on the current state scores, desired state scores, gaps between current and desired state or any other decision criteria to be established (see 6.7.1 for examples of decision criteria);
- *Track consistent view of enterprise among participants* as measured by variance. Research shows that variance may increase as practice maturity level increases due to a broader range of possible performance levels (Hallam, 2003). High score variance may also indicate varying view of the enterprise among participants as result of poor enterprise-wide or cross-functional communication and cohesion;
- *Distribute and track enterprise knowledge*: Assessment using LESAT requires understanding of the underlying enterprise principles and practices. Training in the enterprise principles and practices is essential for preparation for assessment, and as such can be used to distribute the enterprise knowledge among assessment stakeholders. In the later assessment cycles assessment results can demonstrate how the enterprise knowledge has matured. Research indicates that often in the later assessment cycles LESAT scores decrease as participants become more proficient in enterprise thinking;
- *Drive enterprise behavior* by sharing assessment results with members of the enterprise. Knowledge of the assessment results may motivate employees to adjust their behavior in line with the goals and improvement areas that have been identified as a result of assessment;

- *Enable better decision-making* by using LESAT results as guides and justifications for decisions. Basing decisions on insights provided by LESAT may allow leadership to make more objective decisions that are beneficial for enterprise as whole;
- *Motivate transformation* by enabling the enterprise to identify and focus on priority tasks. By assessing current performance of the enterprise, trends in its past performance and desired future state, enterprise may define its future goals and identify priority tasks that will become focus areas for enterprise transformation.

The objectives of the assessment may be formulated by the senior enterprise leadership and then communicated to the wider enterprise leadership, or they may be formulated based on discussions among wider group of enterprise leadership. In any case, it is important that the objectives are well communicated among enterprise leadership, understood and supported by them.

By senior enterprise leadership we mean leaders who are directly responsible for all aspects of the enterprise. Depending on the level of the enterprise, this may be a general manager of a company or program who directs and his/her deputies. The wider enterprise leadership includes individuals who are responsible for key aspects of the enterprise, such as life cycle processes and enabling support functions, such as, for example, chief engineer, product development manager or finance director.

To ensure that assessment is as objective as possible, enterprise leadership must identify and eliminate potential sources of bias on the side of assessment participants. As Perkins et al. (2010) summarize, biases may result from fear of managerial reprisal, a lack of anonymity, self-reporting bias, confirmation bias or system-justification bias. It is the responsibility of the senior enterprise leadership that assessment results are used as a basis for productive discussion and formulation of transformation plans, rather than evaluation of individual or department performance.

Biases maybe eliminated by creating an environment that supports and encourages open communication and discussion among assessment stakeholders (Perkins et al., 2010), where each stakeholder feels free and safe to express his/her opinion about performance of the enterprise, results of assessment and the assessment process itself without fear of reprimand by seniors.

Another way to eliminate bias is to ensure anonymity of scores provided by each participant. However, anonymity maybe both beneficial and detrimental to the assessment process (Perkins et al., 2010). On one hand, anonymity encourages participants to provide more unbiased scoring. On the other hand, it prevents open discussion of assessment results and limit analysis of the scores.

6.4.2. Define Enterprise and Its Boundaries

Objective: Determine the scope of the enterprise to be assessed.

Key Activities:

- Define enterprise
- Define enterprise boundaries

Roles of Stakeholders: Enterprise leader defines scope of the assessment, depending on its objectives.

Description of Key Activities

The scope of the assessment is the enterprise. If assessment is performed as part of the Enterprise Transformation Roadmap, then the enterprise should be defined in the same way as it was defined for the purpose of the roadmap. If assessment is performed autonomously, then the leadership must define enterprise and its boundaries.

According to Black's Law Dictionary, an enterprise can be defined as "one or more organizations having related activities, unified operation, and a common business (business is used here generically to include any sector or combined sectors of the economy) purpose" (Nightingale, Stanke, & Bryan, 2008).

Valerdi, Nightingale and Blackburn (2008) provide review of definitions of an enterprise and its boundaries. In summary, an enterprise may take one the three following forms:

- *Program enterprise*, an enterprise that "is organized around a single product, process, or service". A program enterprise may function within an organization, responsible for a product line, e.g. the student banking division in Bank of America or Tide detergent product unit in Procter & Gamble. A program enterprise may span across organizational boundaries of several companies to form a multi-organizational program enterprise, like an aerospace industry program F-22.
- *Multi-program enterprise*, an enterprise "that serves to execute multiple programs". Examples of a multi-program enterprise include Personal Banking division in Bank of America and Fabric and Home Care business unit in Procter & Gamble.
- *International enterprise*, an enterprise that spans across geographic boundaries and involves international participants, customers and suppliers. Valerdi et al. provide examples of international enterprises, such as the International Aerospace Enterprise and Joint Strike Fighter.

The scope of an enterprise may also vary depending on the involvement of stakeholders and relationships between them. Murman et al. (2002) distinguish

between the "core" enterprise and the "extended" enterprise, where the *core enterprise* refers to "entities tightly integrated through direct or partnering relationships" and the *extended enterprise* consists of the "less tightly coupled customers, suppliers, and government agencies".

When defining boundaries of an enterprise (Figure 13), it is useful to remember its distinguishing characteristics (LESAT, 2001), such as:

- An enterprise should have *profit/loss* or another *performance accountability*;
- An enterprise usually includes the *life cycle core processes*, e.g. program management, requirement definition, product development, supply chain, production and support;
- An enterprise usually includes the *enabling processes*, e.g. finance, human resources, information systems, etc.

Enterprise boundaries may not necessarily fit within the organizational boundaries or areas of direct responsibility of the enterprise leadership. In an extended enterprise, the leadership may not have direct control over customers or suppliers, however the latter play important role in ensuring stable value delivery within an enterprise.

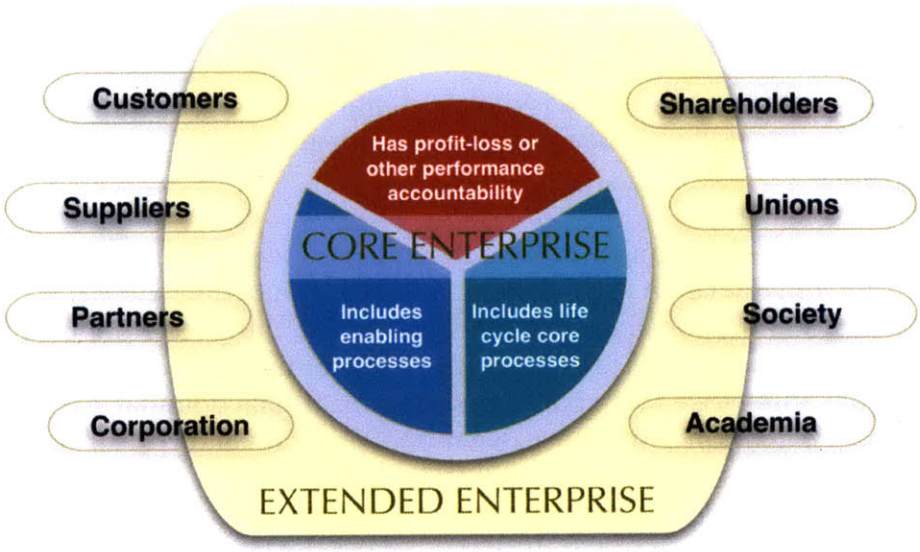


Figure 13 – Defining Enterprise Boundaries

6.4.3. Define Timing of Assessment

Objective: Determine when and how often the assessment will be performed.

Key Activities:

- Determine when the assessment will be performed in calendar terms and with regard to other organizational processes
- Determine how often the assessment will be performed

Roles of Stakeholders: Enterprise leader bears responsibility for this step.

Description of Key Activities

Use of LESAT helps organizations to determine desired state of the enterprise as well as the gaps that the enterprise needs to address in order achieve the desired state. As such, LESAT should be used as part of the organization's planning cycle. Should LESAT be used within the framework of the Enterprise Transformation Roadmap, the assessment should be performed during the first phase of the planning cycle *Understand Current State* (Figure 14).

Through our case studies we found that organizations may use LESAT independently of the Enterprise Transformation Roadmap. In such cases, the assessment could be performed in preparation for the annual business planning exercise (LESAT, 2001). This would allow organizations to assess their current performance as well as identify and prioritize improvement objectives for the next business period.

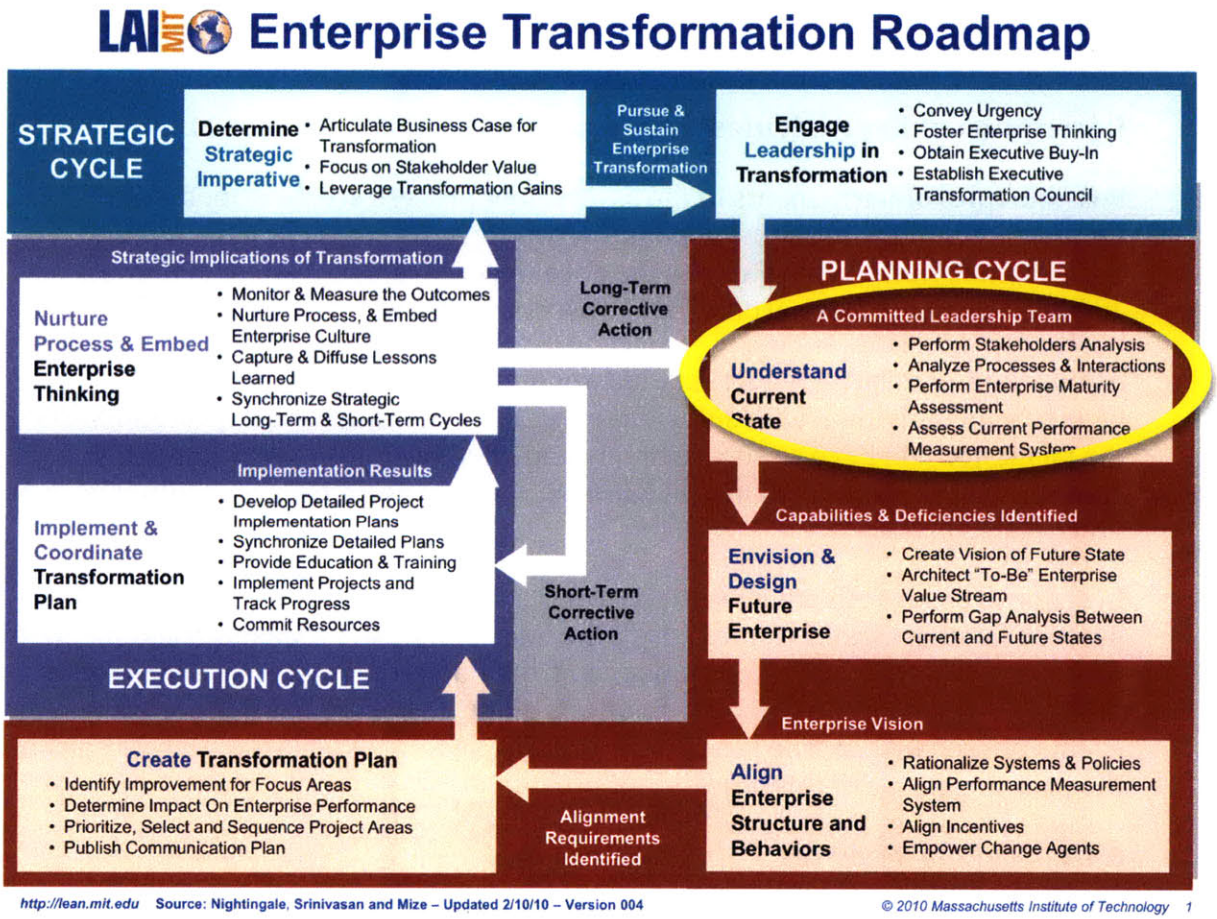


Figure 14 – Place for LESAT within the Enterprise Transformation Roadmap (Nightingale, Srinivasan & Mize, 2010)

In order to exploit the full value of LESAT, the assessment should be performed periodically, e.g. on an annual basis or as a new transformation cycle begins. Iterative assessment will allow organizations to monitor changes in assessment results over time and in organizational conditions during the assessment process. This will help identify trends in enterprise performance, understand impact of the improvement actions taken previously and adjust the assessment process based on previous experience.

6.4.4. Define Participants' Roles and Responsibilities

Objective: Define roles and responsibilities of assessment stakeholders.

Key Activities:

- Identify assessment stakeholders
- Define their roles and responsibilities
- Appoint LESAT facilitator
- Ensure training of the facilitator

Roles of Stakeholders: Responsibility for definition of roles and responsibilities lies with enterprise leaders.

Description of Key Activities

Possible roles of participants in the assessment process are described in section 6.3. Roles and responsibilities may change depending on specific practices within the organization. Additional roles may be developed, such as assistant facilitators or analysts to provide support during the assessment and analysis of results.

At this time, enterprise leaders should appoint a LESAT facilitator. Ideally, this would be an individual with sufficient expertise and influence in the organization, as the facilitator will have to ensure timely and effective implementation of the assessment process, which may require exercising a certain level of authority over other participants.

In order to ensure effective facilitation of the assessment process, the facilitator must be familiar with the enterprise principles, the LESAT tool and recommended process. Such familiarity can be obtained from books on enterprise and systems thinking, from LESAT user and facilitator's guide as well as training materials and events offered by LAI. The facilitator's training should be finalized prior to start of the planning phase of this assessment process.

6.4.5. Allocate Resources

Objective: Identify and allocate resources to ensure effective and efficient performance of assessment and analysis of results.

Key Activities:

- Identify and allocate necessary resources
- Obtain commitment of stakeholder responsible for providing the resources

Roles of Stakeholders: Enterprise leaders are responsible for identifying and allocating the resources.

Description of Key Activities

Due to the nature of LESAT as self-assessment, the main resources required are non-material: people and time. Involvement of the assessment participants in planning, scoring, discussion of results and development of improvement plans is central to the LESAT assessment. These activities will require time commitment from all participants. Thus it will be important that enterprise leadership recognizes participation in assessment as a value-added task.

Additional resources may be required depending on the needs of the organization. Such resources may include funding for training of the facilitator and other participants, production of training materials and score sheets, travel expenses for participants, etc. In case the organization would like to perform an automated assessment, in contrast to pen-and-paper process, it will need to ensure availability of personal computers for scoring and analysis of results.

6.4.6. Review Progress in Implementation of Action Plans

Objective: Ensure that the assessment and assessment process have been improved based on past experience. Ensure progress in implementation of action plans developed as result of the preceding assessment cycle in those cases in which assessment has been previously been conducted.

Key Activities:

- Review progress in implementation of improvement actions plans developed as result of the previous assessment cycle
- Review progress in improvement of the assessment and assessment process as result of evaluation in the previous cycle

Roles of Stakeholders: Enterprise leaders, LESAT facilitator and assessment users will perform the review.

Description of Key Activities

This step is relevant for the second and subsequent assessment cycles. By this time the improvements identified as necessary as result of the previous assessment should have been either completed or be on track to completion. This is a good chance to review whether the action plan is reasonable, whether improvements have been possible, and whether allocated resources were sufficient and adequate.

Such review will be useful when a new improvement action plan is developed at the end of the current assessment cycle.

Review of the assessment tool and assessment process at this time will help to determine whether the assessment continues to satisfy needs of the organization and whether the assessment process is efficient and effective.

6.5. Phase Two: Plan Assessment

6.5.1. Identify Respondents

Objective: Select respondents, who would provide balanced and objective scoring allowing for meaningful analysis of results and development of actionable improvement plans.

Key Activities:

- Determine the number of respondents
- Identify respondents and ensure their participation

Roles of stakeholders: Enterprise leaders, with facilitator's help, will decide who respondents will be. They will ensure that the selected respondents are available and ready to participate in the assessment.

Description of Key Activities

LESAT is not an objective performance measurement model, i.e. it does not rely on absolute measures like, for example, financial performance indicators. LESAT relies on subjective opinion of respondents and thus is prone to bias. In order to decrease, if not to eliminate, the effect of such subjectivity and in order to make LESAT results more objective the number of participants should be sufficient. Moreover, a larger number of respondents will decrease statistical error and allow inter-group comparison.

Generally, as the number of respondents increases, the standard error of mean scores decreases. The standard error reduces significantly as the number of respondents increases from one to five. Beyond five respondents, the error reduces only slightly. Once the number of respondents reaches thirty, any significant reduction of the error requires quadrupling the number of respondents (Hubbard, 2007).

Given that, we suggest that the number of respondents is kept between five and thirty. If the organization wishes to perform statistical analysis of scores provided by different groups of respondents, e.g. various levels of management or functional areas, the number of respondents representing each group should not be less than five.

Respondents must have enterprise-level responsibility and represent various life-cycle processes and functions. Organizations may find it useful as well if respondents represent different levels of management within the enterprise. While senior enterprise leadership has better understanding of overall strategy, policies and practices of the enterprise, middle-level management is better equipped to assess impact of these on enterprise employees. Inclusion of representatives of different levels of management and functional areas into the assessment would allow capturing a variety of perspectives and identifying areas requiring open discussion and continued education.

As the assessment continues iteratively, it maybe beneficial to use the same respondents or respondents with similar profiles (same responsibility, same functional role) during each assessment cycle. This will not only ensure comparability of results from assessment to assessment, but will also allow monitoring development of respondents' understanding of enterprise principles and their application to the particular enterprise.

6.5.2. Determine Timeline

Objective: Determine assessment timeline to ensure efficient and effective assessment process.

Key Activities:

- Establish clear deadlines and deliverables for each assessment activity
- Identify required commitment (number and length of meetings) and communicate to participants
- Obtain time commitment from participants

Roles of stakeholders: Enterprise leaders and LESAT facilitator are responsible for these activities. Assessment respondents and users must understand the time requirements and provide their commitment to the proposed timeline before the assessment starts.

Description of Key Activities

One of the main objectives of the recommended assessment process is to ensure that organizations obtain timely results, which can be effectively incorporated into the strategic planning activities. Often organizations find this difficult to achieve, as LESAT assessment requires participation from senior enterprise leaders, each with busy schedules and myriads of other priority responsibilities and tasks. Coordinating busy schedules once the assessment has started may not be easy and straightforward. Thus, the assessment timeline should be developed at early stages of the planning process.

The assessment may be performed in a series of consecutive sessions over a 2-3 days period or with intervals as needed. In the sample assessment timeline,

depicted in Figure 15, the assessment is performed during three full days. In the first day, all assessment participants go over introduction of the assessment and training in the enterprise principles, LESAT and assessment process followed by a session during which respondents perform individual assessment using LESAT score sheets. At the end of the day, the facilitator collates results from individual score sheets and carries out initial analysis, which includes calculation of mean scores, variances and gaps.

In the second day, the facilitator presents results of the initial score analysis to respondents and facilitates a discussion among respondents aimed at achievement of consensus-based final scores. During the same day, respondents discuss the assessment process and recommend necessary improvements.

The third day can be devoted to interpretation of assessment results and prioritization of improvement needs identified as result of the assessment. The outputs generated during this day will feed into the strategic planning activities.

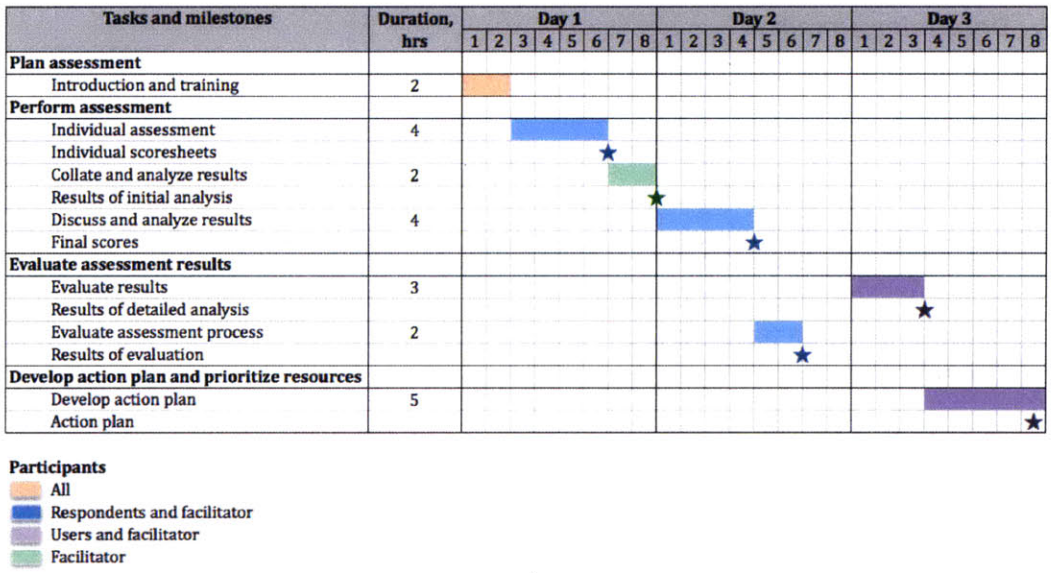


Figure 15 – Sample Assessment Timeline

6.5.3. Introduction and Training

Objective: Ensure that LESAT participants are familiar with enterprise concepts and principles and understand the assessment tool and process.

Key Activities:

- Provide training in the following aspects:
  - Enterprise concepts and principles
  - Role and place of assessment in transformation process
  - LESAT practices and scoring system
  - Assessment process
  - Scope of assessment (enterprise boundaries)

- Analysis and use of results

Roles of stakeholders: LESAT facilitator organizes the training. Both respondents and users must attend the training.

Description of Key Activities:

The main purpose of the training is to ensure that participants understand how the assessment can be useful in the enterprise transformation process. The training provides several benefits, as it:

- Popularizes enterprise concepts in the enterprise,
- Decrease biases among participants,
- Ensures consistent scoring among respondents,
- Improves efficiency of the assessment process,
- Ensures usability of assessment results for development of improvement plans.

While conducting the case studies we noticed that respondents often do not fully understand the true meaning of practices being assessed. Training helps ensure that all participants have common understanding of the assessment tool, thus improving validity of scores.

6.6. Phase Three: Perform Assessment

6.6.1. Conduct Individual Assessment

Objective: Obtain assessment scores from each respondent.

Key Activities:

- Conduct assessment by obtaining from each respondent:
  - Current state scores for each of 54 practices
  - Desired state scores for each of 54 practices
  - Comments, evidence and opportunities for each practice

Roles of stakeholders: Respondents conduct the assessment with assistance of the facilitator, who provides clarifications and answers questions. Respondents submit the score sheets to the facilitator by the requested due time.

Description of Key Activities:

Each respondent performs the assessment either individually or with a group of direct reports. Ultimately, each respondent submits one score sheet. In case of group assessment, ultimate scores reflect consensus opinion within the group, which has to be formed on basis of discussion.

The assessment can be carried out during a joint session of all respondents or individually in respondent's sites. However, it is more efficient to perform the assessment during a joint session. This allows all respondents to equally benefit from clarifications and explanations provided by facilitator. It also helps facilitator minimize time necessary to collect scores from all respondents and summarize the results.

Typically respondents fill out detailed LESAT score sheets (Figure 16), which provide description of the practice, its five capability levels and examples. The score sheets allow respondents to choose current and desired capability levels of the enterprise and provide commentary about evidence and opportunities relative to the practice.

SECTION I: LEAN TRANSFORMATION/LEADERSHIP

Definition: Develop, deploy, and manage lean implementation plans throughout the enterprise, leading to: (1)- long-term sustainability, (2)- acquiring competitive advantage, and (3)- satisfaction of stakeholders; along with a continuous improvement in all three parameters.

I.A. Enterprise Strategic Planning - the decision to pursue a lean transformation is strategic in nature. Its impact throughout the enterprise is profound and pervasive, affecting all business practices and processes. The lean enterprise will behave in a fundamentally new manner, significantly eliminating waste and enhancing relationships with all stakeholders.

Diagnostic Questions	• **Are enterprise leaders familiar with the dramatic increases in competitiveness that many companies have realized as a result of transitioning to lean?** • **Are enterprise leaders fully aware of the potential opportunities (i.e. greater growth, profitability and market penetration) that can be realized within their own organization as a result of transitioning to lean?** • **Has a suitable strategy for growth been identified to utilize resources freed up by improvements?** • **Does "customer value" strongly influence the strategic direction?** • **Has full leverage of the extended enterprise stakeholders been incorporated into the strategic plan?**

LP #	Lean Practices	Capability Levels				
		Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
1.A.1.	**Integration of Lean in Strategic Planning Process** *Lean impacts growth, profitability and market penetration*	Concepts and benefits of lean principles and practices are not evident in culture or business plans. C D	Lean is recognized, but relegated to lower levels of the enterprise and application is fragmented. C D	The growth implications of lean are understood and lean implementation plans are formulated, but not integrated into the strategic plan. C D	Transitioning to lean is adopted as a key enterprise strategy and included in the strategic plan. C D	Strategic plans leverage the results of lean implementation to achieve growth, profitability and market position. C D
	Lean Indicators (Examples)	• Lean implementation is included explicitly in the enterprise strategic plan. • Strategic planning makes allowance for anticipated gains from lean improvements.				
	Evidence					
	Opportunities					
1.A.2.	**Focus on Customer Value** *Customers pull value from enterprise value stream*	Means of defining value to customer(s) is informal and unstructured. C D	Structured process for defining value is applied to selected customers. C D	How the enterprise can best contribute to customer's success is well defined and incorporated into most projects/programs. C D	Customer definition of value strongly influences the strategic direction. C D	Competitiveness is enhanced, as customer value becomes the predominant driving force throughout the extended enterprise. C D
	Lean Indicators (Examples)	• Enterprise employs a formal process for determining customer value. • The enterprise understands what constitutes success for its customers. • A formal process exists to measure and assess customer satisfaction. • Customer value strongly influences policies, practices and behavior.				
	Evidence					
	Opportunities					

Figure 16 – Sample LESAT Score Sheets

It is useful to note scores on a summary score sheet (Figure 17 or Figure 18). This helps to see all scores in one place and makes it easier for the facilitator to collate results submitted by all respondents. In case an enterprise uses an electronic version of LESAT, there is no need to fill out the summary sheet, as it may be generated automatically.

Some enterprises use summary sheets instead of detailed score sheets, as a way to save time on the assessment. We would not recommend doing that as without the detailed score sheets the respondents may not fully understand the meaning of the practice or each of the capability levels, which would affect accuracy and reliability of the assessment. Respondents' commentaries provide a way to capture examples of the current state of the enterprise as well as ideas about the improvements that could be introduced or how to introduce them. They also provide a valuable check

about respondent's understanding of the practice. When compared over time, the respondent's commentaries from various assessment cycles serve as an indicator on shift in respondent's understanding of the practice and its application within the enterprise.

SECTION I SUMMARY SHEET - LEAN TRANSFORMATION/LEADERSHIP

Process Definition: Develop and deploy lean implementation plans throughout the enterprise leading to (1) long-term sustainability, (2) acquiring competitive advantage and (3) satisfaction of stakeholders.

TTL Link		Lean Practice	Lean Characteristic	CAPABILITY LEVEL Current	Desired
I.A. Enterprise Strategic Planning	I.A.1	Integration of Lean in strategic planning process	Lean impacts growth, profitability and market penetration		
	I.A.2	Focus on customer value	Customers pull value from enterprise value stream		
	I.A.3	Leveraging the extended enterprise enterprise to suppliers	Value stream extends from customer through the		
			Average		
I.B. Adopt Lean Paradigm	I.B.1	Learning and education in "Lean" for enterprise leaders	"Unlearning" the old, learning the new		
	I.B.2	Senior management commitment	Senior management leading it personally		
	I.B.3	Lean enterprise vision	New mental model of the enterprise		
	I.B.4	A sense of urgency	The primary driving force for Lean		
			Average		
I.C. Focus on the Value Stream	I.C.1	Understanding current value stream	How we now deliver value to customers		
	I.C.2	Enterprise flow	"Single piece flow" of materials and information		
	I.C.3	Designing future value stream	Value stream to meet the enterprise vision		
	I.C.4	Performance measures	Performance measures drive enterprise behavior		
			Average		
I.D. Develop Lean Structure and Behavior	I.D.1	Enterprise organizational orientation	Organize to support value delivery		
	I.D.2	Relationships based on mutual trust	"Win-win" vs. "we-they"		
	I.D.3	Open and timely communications	Information exchanged when required		
	I.D.4	Employee empowerment	Decision-making at lowest possible level		
	I.D.5	Incentive alignment	Reward the behavior you want		
	I.D.6	Innovation encouragement	From risk aversion to risk rewarding		
	I.D.7	Lean change agents	The inspiration and drivers of change		
			Average		

Figure 17 – Sample LESAT Summary Score Sheet - Sample 1

LESAT SUMMARY SHEET

(I) LEAN TRANSFORMATION / LEADERSHIP

Sub-Sections	Lean Practices	Lean Competence Level 1	Level 2	Level 3	Level 4	Level 5
I.A. Enterprise Strategic Planning	I.A.1. Integration of lean in strategic planning process					
	I.A.2. Focus on customer value					
	I.A.3. Leveraging the extended enterprise					
I.B. Adopt Lean Paradigm	I.B.1. Learning and education in "lean" for enterprise leadership					
	I.B.2. Senior management commitment					
	I.B.3. Lean enterprise vision					
	I.B.4. A sense of urgency					
I.C. Focus on the Value Stream	I.C.1. Understanding the current value stream					
	I.C.2. Enterprise flow					
	I.C.3. Designing future value stream					
	I.C.4. Performance measures					
I.D. Develop Lean Structure & Behavior	I.D.1. Enterprise organizational orientation					
	I.D.2. Relationships based on mutual trust					
	I.D.3. Open and timely communications					
	I.D.4. Employee empowerment					
	I.D.5. Incentive alignment					
	I.D.6. Innovation encouragement					
	I.D.7. Lean change agents					
I.E. Create & Refine Transformation Plan	I.E.1. Enterprise-level lean transformation plan					
	I.E.2. Commit resources for lean improvements					
	I.E.3. Provide education and training					
I.F. Implement Lean Initiatives	I.F.1. Development of detailed plans based on enterprise plan					
	I.F.2. Tracking detailed implementation					
I.G. Focus on Continuous Improvement	I.G.1. Structured continuous improvement processes					
	I.G.2. Monitoring lean progress					
	I.G.3. Nurturing the process					
	I.G.4. Capturing lessons learned					
	I.G.5. Impacting enterprise strategic planning					

Figure 18 – Sample LESAT Summary Score Sheet - Sample 2

6.6.2. Collect and Process Results

Objective: Carry out initial analysis of results to prepare for discussion and finalization of assessment scores.

Key Activities:

- Collect respondents' score sheets
- Collate results
- Carry out initial analysis, including:
  - Calculate average score and variance for current and desired states for each practice
  - Calculate gaps between current and desired state for each practice
  - Calculate average scores, variances and gaps for each section as well as over all three sections
  - Rank practices based on high/low score, variance and/or gap

Roles of stakeholders: Facilitator collects results from respondents, collates them and carries out initial analysis.

Description of Key Activities:

Once respondents have completed individual assessment and turned in their score sheets to the facilitator, the facilitator carries out initial analysis of the data in order to enable productive discussion among respondents in the next step of the assessment process. The initial analysis allows comparing scores provided by all participants, discover capability levels of the enterprise for each practice, and identify agreement or disagreement among respondents on any practices.

In order to make the process of collecting and analyzing results easier and quicker, the organization may choose to use a software application, which could collate and analyze the result automatically. For example, Nathan Perkins, Graduate Research Assistant at LAI, has developed a web-based application that allows respondents to familiarize themselves with the tool, find definitions of terms in the glossary, enter scores and view preliminary assessment results based on aggregated scores collected from all respondents.

In the next few paragraphs we will go over an established process that LESAT facilitators currently use. In order to help users LAI has developed LESAT Calculator, an Excel workbook available on the LAI's website (http://lean.mit.edu/products/lean-enterprise-self-assessment-tool-lesat). The workbook relies on the facilitator to enter current and desired state scores provided by all respondents for all practices. Excel makes further calculations using formulas. A sample data entry sheet for the first three LESAT practices is provided in Figure 19. In this example, 23 respondents participated in the assessment. Note that the presented data is anonymous to eliminate a source of possible bias, as discussed in section 6.4.1.

		RESPONDENT NUMBER																						
Lean Practice	**State**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
I.A.1. Integration of lean in strategic planning process	Current	2	1	3	2	4	1	2	2	1	4	3	2	2	2	2	2	3	2	2	2	1	1	2
	Desired	4	3	4	4	5	3	3	5	2	5	5	4	3	5	4	4	4	4	2	4	3	2	4
I.A.2. Focus on customer value	Current	1	1	2	3	4	3	2	3	1	3	2	3	2	1	1	4	3	4	1	1	2	2	3
	Desired	3	4	3	5	5		3	4	2	4	4	5	3	3	3		5	5	1	2	3	4	4
I.A.3. Leveraging the extended enterprise	Current	2	1	3	2	2	1	1	3	1	3	1	4	2	2	2	3	2	3	1	1	2	2	3
	Desired	3	3	4	4	3	3	2	4	2	4	3	5	3	3	3	4	4	3	1	3	3	4	4

Figure 19 – Sample View of a LESAT Data Entry Sheet[1]

The first step in the initial analysis is to summarize assessment for each practice by calculating average (mean) current state and desired state scores, mean gap between current and desired state scores, ranges, variances and tallies (sample summary of such calculations is presented in Figure 20):

- *Mean current state score* is the simple average of scores provided by all respondents for current state for each practice. The mean score can vary

[1] Blank cells indicate that respondent has not provided a score for the practice.

between the values of 1 and 5, where 1 will indicate a low capability level and 5 – a high capability level;

- *Mean desired state score* is the simple average of scores provided by all respondents for desired state for each practice. The mean score can vary between the values of 1 and 5, where 1 will indicate a low capability level and 5 – a high capability level;
- *Mean gap* is the simple average of the gap between current state and desired state scores provided by all respondents for each practice. The mean gap may vary between the values of 0 and 4, where 0 will indicate no difference between the current and desired states and 4 will indicate the maximum difference between the current state of 1 and the desired state of 5;
- *Range* is the difference between the highest and the lowest scores provided by all respondents for each practice. The range may vary between the values of 0 and 4, where 0 will indicate unanimity in the assessment by all respondents (i.e. all respondents have assigned the same score to the practice) and 4 will indicate the maximum disagreement among the respondents (i.e. some respondents have assigned the lowest score and some assigned the highest score to the same practice);
- *Variance* is the measure of how widely the scores provided by each respondent are spread around the mean score for each practice. The variance may have a value between 0 and 5, where 0 will indicate unanimity in the assessment by all respondents (i.e. all respondents have assigned the same score to the practice) and a high value will indicate disagreement among the respondents (i.e. respondents have assigned varying scores between the minimum and the maximum levels to the same practice);
- *Tallies* demonstrate how many respondents assessed the enterprise at each capability level. Tallies help visualize how opinions of respondents are distributed across capability levels.

					TALLIES				
Lean Practice	**State**	**Mean**	**Variance**	**Range**	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
I.A.1. Integration of lean in strategic planning process	Current	2.1	0.7	3	5	13	3	2	0
	Desired	3.7	0.9	3	0	3	5	10	5
	Gap	1.7	0.5	3	8	12	2	0	0
I.A.2. Focus on customer value	Current	2.3	1.1	3	7	6	7	3	0
	Desired	3.6	1.3	4	1	2	7	6	5
	Gap	1.4	0.5	3	11	8	1	0	0
I.A.3. Leveraging the extended enterprise	Current	2.0	0.6	2	7	10	6	0	0
	Desired	3.3	0.7	4	1	2	11	8	1
	Gap	1.3	0.5	3	13	7	1	0	0

Figure 20 – Sample View of a LESAT Calculator Sheet

The next step is to summarize assessment for each LESAT section and subsection and for all three sections by calculating mean current state and desired state scores, mean gap between current and desired state scores, ranges and variances. Such analysis results in a snapshot (see sample in Figure 21) of aggregated LESAT scores, allowing for quick view of the overall capability level of the enterprise and its capabilities in each LESAT section. Users must be cautious, however, not to stop the analysis at this point, as average scores serve only as a quick guide and do not allow

pinpointing specific areas for improvement. It is important that users discuss and evaluate results of the assessment and the initial analysis, as suggested in the following steps of this assessment process.

	Section I - Lean Transformation/Leadership			Section II - Life Cycle Processes			Section III - Enabling Infrastructure			Overall LESAT Score		
	Mean	Variance	Range	Mean	Variance	Range	Mean	Variance	Range	Mean	Variance	Range
Current State	1.9	0.5	2.3	2.1	0.7	2.9	2.2	0.8	2.9	2.0	0.6	2.6
Desired State	3.3	0.7	3.1	3.2	0.7	2.8	3.4	0.7	2.8	3.3	0.7	2.9
Gap	1.4	0.4	2.4	1.2	0.4	2.4	1.3	0.5	2.6	1.3	0.4	2.5

Figure 21 – Sample View of A LESAT Section and Overall Scores Summary Sheet

If the group of respondents comprises representatives of different management levels and functional areas, the facilitator may choose to compare assessment results across different groups (Figure 22). Such comparison will enable discussion on views of the enterprise from different perspectives and illustrate how evenly the transformation process affects the enterprise.

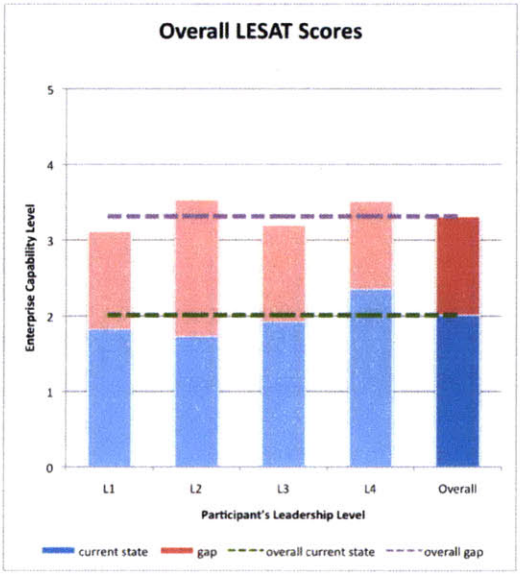
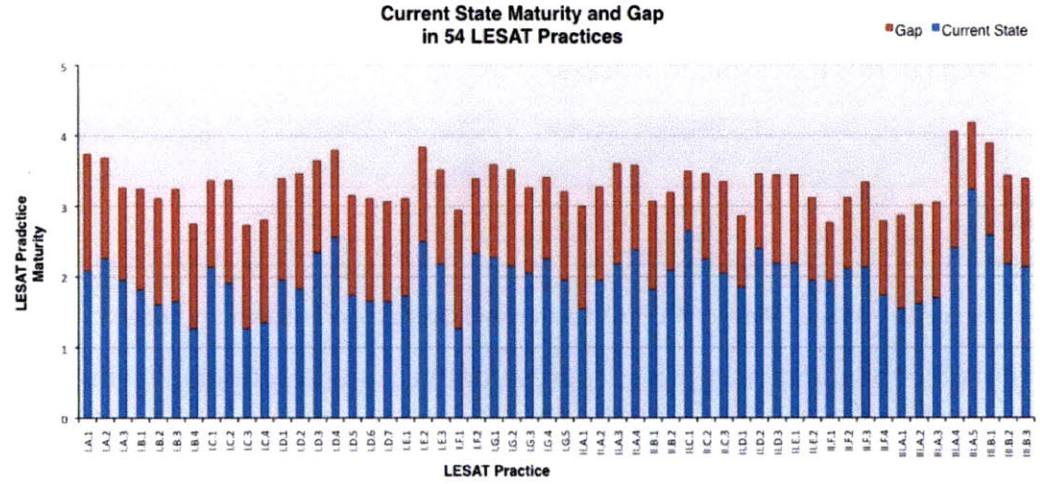


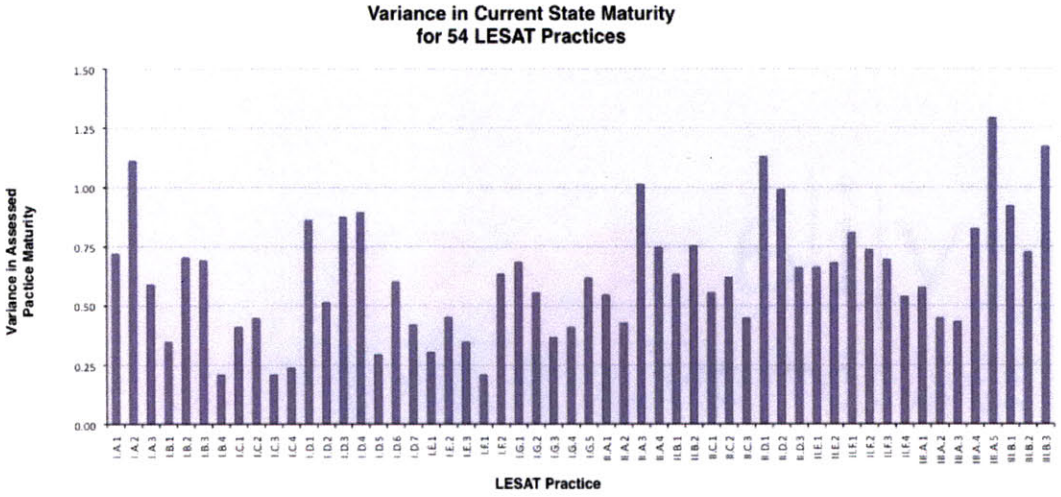
Figure 22 – Sample Comparison of LESAT Scores Across Different Management Levels

It maybe useful to present results of the initial analysis in form of graphs that visually demonstrate distribution of scores and variance for each practice. Some sample graphs are presented in Figure 23.

For example, the top and bottom graphs in Figure 23 demonstrate current state maturity and gap scores (the top graph is in the order of practices, while the bottom graph ranks practices by current state score). Such graphs allow for visualization of average maturity of enterprise across all practices, identification of practices with high and low scores and size of gaps relative to current state scores.

The middle graph demonstrates variance in current state scores and allows for visual identification of practices with high or low variance.





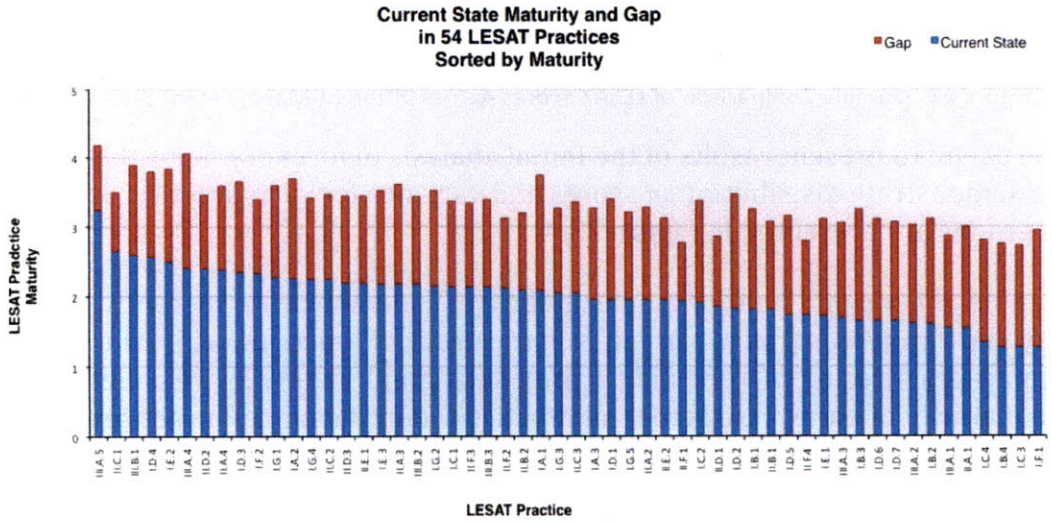


Figure 23 – Sample Graphs of LESAT Results

6.6.3. Discuss and Analyze Results

Objective: Finalize the assessment by arriving at results that reflect consensus view of the respondents.

Key Activities:

- Discuss results of individual assessment and initial analysis
- Identify reasons for high/low scores, high variance and any outliers
- Arrive at final assessment results

Roles of stakeholders: The facilitator presents results of the initial analysis and assists discussion among the respondents. Respondents discuss assessment results.

Description of Key Activities:

The discussion of results among respondents is perhaps the most important step in Phase Three of the assessment process. First of all, it provides a way to identify reasons for high variance in scores and unusually high or low scores for certain practices. By "unusual" we mean scores that are substantially different from scores for the majority of practices or those that are substantially different from the expected level given the current stage of the enterprise in the transformation process.

Secondly, the discussion may serve to improve accuracy and reliability of the assessment results. Through discussion, respondents will be able to compare their understanding of practices and affairs in the enterprise with those of other respondents. This may help eliminate mistakes that could have resulted from misunderstanding.

The role of the facilitator is to create an environment that will ensure honest and constructive exchange of opinions among the respondents.

6.7. Phase Four: Evaluate Assessment Results and Process

6.7.1. Evaluate Assessment Results

Objective: Identify LESAT practices that require improvement actions.

Key Activities:

- Select and agree on decision criteria
- Apply decision criteria to the assessment results to identify areas for improvement

Roles of stakeholders: Users evaluate the assessment results with support of the facilitator.

Description of Key Activities:

This is perhaps one of the most important steps in the assessment process, as it allows translating quantitative scores into action. We suggest that users start discussion with determining and agreeing upon the decision criteria to be applied in order to tie in scores with actions. Moreover, the decision criteria must be agreed upon upfront, before users start to identify improvement areas. This would ensure validity of the outcome of this step. It will also help avoid unnecessary disputes among the users later on.

Decision criteria are used to categorize practices and identify areas that require action. They can be based on the current state scores, gaps, variances or other metrics that the organization deems appropriate. Users must agree on the number thresholds that would correspond to particular type of action.

Below we will provide few examples of decision criteria that have been developed by some LESAT users in the past. In our example, we will mainly address relativity of scores, e.g. high scores and low scores. As with all interpretation strategies, the definition of a high and a low score depends on the particular scoring results within the organization. The terms *high* and *low* should be interpreted in relative terms vis-à-vis other scores across the full set of practices.

Example 1: Decision criteria based on current state scores and gaps

This method allows determining actions required for practices based on both their current state scores and gaps in categories of a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. This method allows identification of current strengths and weaknesses in the organization, as well as the opportunities and threats that it is facing.

Figure 24 illustrates application of this method. The underlying graph is a scatter diagram, which plots 54 practices against current state scores (horizontal axis) and gaps (vertical axis) (Perkins et al., 2010). Instead of 54 practices, average scores for LESAT sections or subsections can be used.

Practices with the highest current state performance represent existing strong areas of the organization. If such practices also have low gaps, i.e. small difference between the current and desired state, they can be considered *Strength*. In the illustration, we grouped practices into this category, if their current state score exceeds 2.0 and the gap is below 1.3 (see the lower right quadrant in Figure 24). In the future the organization must maintain high performance on such practices, however no improvement actions are required.

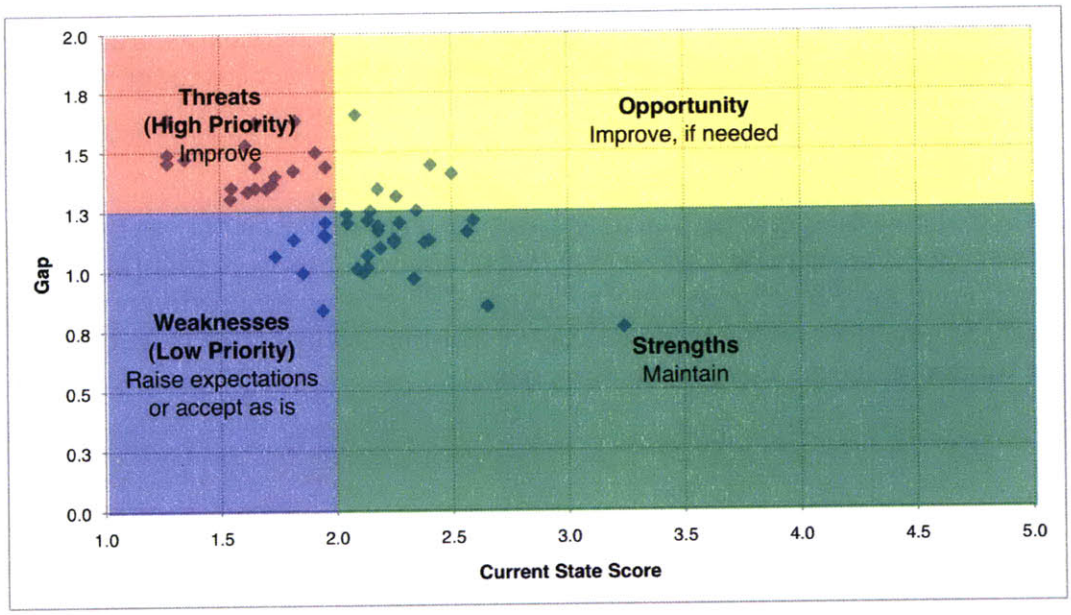


Figure 24 – Mapping of Current State Scores vs. Gaps

A combination of high current performance (above 2.0 in the illustration) and high gap (above 1.3) indicates that the organization has high aspirations with regard to the assessed practice, while the current state suggests that certain progress is being achieved in the enterprise transformation. Such practice presents an *Opportunity* for improvements (see top right quadrant), as the organization has already begun work on them and is committed to achieving a higher level. Due to this, improvements on these practices may be easier to achieve, benefiting from past improvement efforts and strong commitment. On the other hand, as performance increases, organizations will face a plateau effect, where further improvements become more difficult (Godard, 2004).

High priority practices are those that have both low current scores (below 2.0) and high gaps (above 1.3). They can pose a *Threat* for the organization (see top left quadrant), if not dealt with. The low current state score indicates that the organization was either unaware of the practice or have not paid attention to it so far. It suggests substantial room for improvement, and hence substantial opportunities for gains. However, the high desired state score might suggest that there is a realization about the important role and the potential gains of the practice in the transformation process. By focusing transformation exercises on such practices, the organization has substantial opportunities for improvement with a strong level of buy-in. At the same time, achieving the high desired state may be a challenge due to the high gap. It may require additional resources and time as well as overcoming resistance within the organization.

Finally, practices with the lowest current performance (below 2.0) and low gap (below 1.3) can be interpreted as *Weaknesses* that present low priority for the organization due to the low aspirations on their desired state (see bottom left quadrant). Due to their low priority, such practices do not require immediate

improvement. Alternatively, the organization may choose to increase aspirations by raising the desired state score, which is likely to move such practices to the *Threats* category associated with high priority and call for improvement.

Example 2: Decision criteria based on variances and gaps

This method allows categorizing practices based on a combination of both their variances and gaps, in order to address the most beneficial practices first (Montoya, Schofield, Chowdhury, & Lehman, 2009). Figure 25 illustrates application of this method. All 54 practices are plotted in a scatter diagram against their respective variance (horizontal axis) and gap (vertical axis).

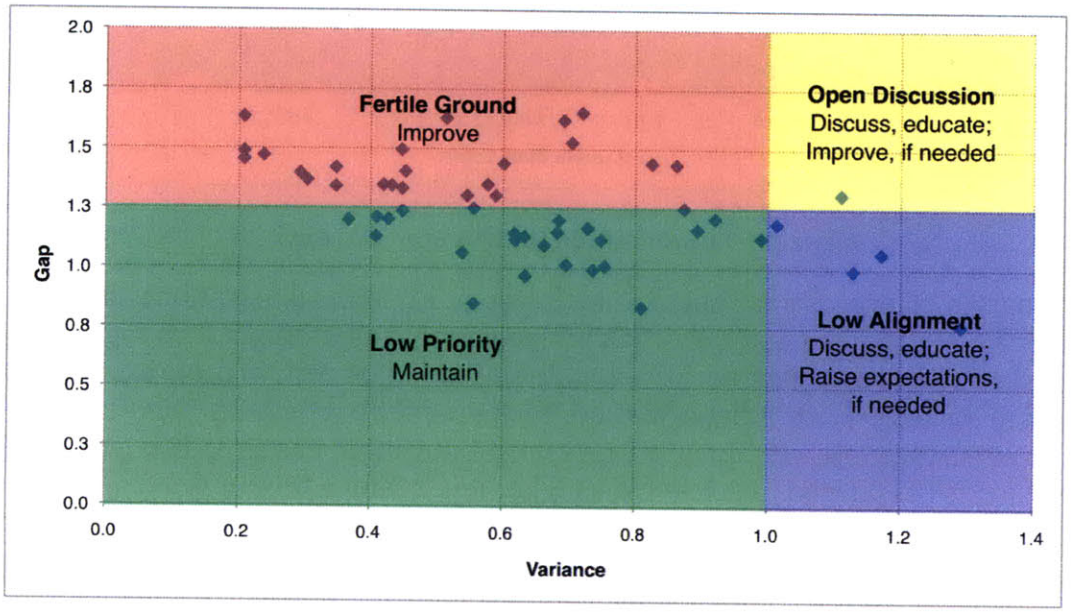


Figure 25 – Mapping of Variances vs. Gaps

Practices with high gaps (above 1.3 in the illustration) and low variance (below 1.0) are considered *Fertile Ground* (see top left quadrant in Figure 25), as there is a high level of consensus regarding the need for improvement. Immediate improvement actions are likely to receive the necessary support in the organization.

If there is a high gap (above 1.3) and high variance (above 1.0), the practice needs further *Open Discussion* or may benefit from additional training in order to create better alignment between respondents (see top right quadrant). Improvement actions maybe planned for such practices once better alignment is created.

If the gap is low (below 1.3) and there is a high level of variance (above 1.0), the practice can be categorized as a *Low Alignment* (see bottom right quadrant). Such practices are low priority for transformation, but are good areas to increase knowledge and understanding among respondents.

Finally, practices with both a low gap (below 1.3) and a low variance (below 1.0) are *Low Priority* in general (see bottom left quadrant). These practices need to be

maintained to ensure continued alignment among respondents and monitored should opportunities for improvement arise.

The LESAT Facilitator's Guide provides additional examples of interpretation strategies used by LAI members. Organizations may choose to use each of the described methods or their combination.

6.7.2. Evaluate Assessment Process

Objective: Identify changes needed to improve the assessment process.

Key Activities:

- Review and discuss the assessment process
- Identify areas that require improvement
- Develop action plan and allocate resources, if necessary

Roles of stakeholders: All stakeholders evaluate the assessment process and recommend improvement.

Description of Key Activities:

The assessment process can be evaluated along several main criteria, such as effectiveness, timeliness, efficiency, choice of respondents, accuracy and validity of results, obstacles, etc.

Effectiveness. One of the first questions to ask is whether the process was effective, i.e. whether the objectives for the assessment have been met. As the assessment process is being completed, LESAT participants must be able to say whether the assessment helped them to identify where the enterprise currently stands in terms of its capabilities and which areas require improvements. If the assessment is used as part of a strategic planning exercise, it should have generated inputs for enterprise strategy going forward.

Our case studies have demonstrated the difference between those enterprises that were genuinely interested in the results of the assessment and those who were just trying to check off customer requirements. The former were able to exploit benefits of the assessment and produce actionable improvement plans based on LESAT scores. The latter have not generated any insights and eventually abandoned the assessment for being "meaningless".

Timeliness. Were the assessment results received at the time when they were needed? The assessment should be carried out during a period when the organization analyzes its past performance and changes in the operating environment so that the results are available in time for formulation of strategic plans. If assessment is carried out outside the planning cycle, organizations may find it difficult to incorporate assessment results in strategic or transformation action

plans or may end up having a plan, which is not properly aligned with other initiatives.

Efficiency. Were the resources made available for the assessment spent efficiently while generating the expected result? As discussed earlier, the time that LESAT participants spent in relation to the assessment is the biggest resource. However, participants often view the assessment as a time-consuming exercise undertaken at the expense of other more important and urgent activities, for example, those directly related to functional responsibilities of a participant. In our case studies, we saw examples when the assessment process continued for several months because the facilitators found it nearly impossible to coordinate busy schedules of LESAT respondents.

Choice of respondents. Were the respondents able to provide an assessment that represents the view of the enterprise as a whole? Have they represented a wide variety of views that allows comparing assessment results from multiple perspectives? Based on the answers to these questions and comparison of the respondents' scores, the organization may decide to change their criteria for choosing respondents.

Accuracy and validity of results. Have the assessment produced accurate results that truly represent state of the enterprise? Has the organization been able to use the results in order to develop actionable improvement plans? The accuracy of results depends on the ability and willingness of respondents to provide honest and accurate scores. Based on the case studies, we identified several factors that affect accuracy of results, such managerial and functional role of respondents, their reporting bias, risk attitude and understanding of practices and scoring system (see section 5.7). The organization needs to address such factors through choice of respondents, elimination of biases and structure and scope of training provided to respondents ahead of the assessment.

Obstacles. What other factors prevented achieving effectiveness and efficiency of the assessment process? Such factors may include allocation of responsibilities among assessment participants, timing of the assessment, sustained commitment to the assessment and use of results, integration of the assessment process into other organizational processes, etc.

Based on the above analysis and discussion, participants with the support of the facilitator must identify the necessary improvements and agree on an action plan and timeline for achieving such improvement. Each new assessment cycle must start with the review of the progress of improvements in the assessment process.

6.8. Phase Five: Develop Action Plan and Prioritize Resources

Objective: Put results of the assessment to action by developing actionable improvement plans and supporting them with necessary resources.

Key Activities:

- Prioritize improvement areas
- Identify tasks and resources needed to implement improvements
- Prioritize tasks and resources

Roles of stakeholders: Users with the support of the facilitator develop the action plan.

Description of Key Activities:

The action plan should be based on areas for improvement identified in the previous stages. However, the action plan needs to focus only on few (typically five) areas that are critical for achieving enterprise strategic objectives while leveraging existing capabilities and limited resources.

The action plan will clearly identify tasks that the organization needs to undertake to achieve improvements, timeline and essential milestones in order to monitor progress as well as people and organizational units responsible for each task. The action plan should also determine the resources necessary for each task.

Finally, tasks and resources must be prioritized and sequenced to ensure best utilization of the company resources that ensures effectiveness of the outcome and avoids competition between different areas and tasks of the action plan for the same resources.

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CHAPTER 7.

Conclusion

Enterprise transformation is a dynamic process that builds upon and affects other organizational processes. Organizational assessment plays an important role in enterprise transformation. It allows for assessment of an enterprise's current capabilities as well as for identification and prioritization of improvements needed to drive the enterprise transformation process.

Despite the benefits that the organizational assessment has to offer, many organizations fail to derive benefit, for a variety of reasons. Firstly, organizational culture and behaviors during the assessment process impact the assessment results. Secondly, the assessment process model, or the way it was implemented in practice, may be unsatisfactory. And finally, characteristics of the assessment tool itself made the assessment process difficult to implement.

This thesis focuses on the model of the organizational assessment process and how it can be improved in order to better support enterprise transformation. We started with the study of the existing assessment process model in order to identify components that are critical to achieve successful outcome of the assessment.

We found that the assessment process spans beyond performing the assessment itself. In order for the assessment to provide the expected benefit, the organization first of all must create an environment that ensures consistent understanding of the role of the assessment in the enterprise transformation process and promotes open and frequent discussion about the current state of the enterprise and future goals. The assessment process must be carefully planned to ensure that it runs effectively and efficiently and that the assessment results are accurate and reliable. Once the assessment is performed, assessment results must be analyzed and turned into specific recommendations and action plans. At the same time, the assessment process itself must be evaluated and adjusted, if necessary, for the next cycle of assessment.

Organizational assessment is an organizational work process, which is affected by other existing work processes and behaviors of the organization. Through the case studies of organizations and their approaches to the assessment process we determined that organizational behavior affects its ability to benefit from the assessment. Organizations impact the assessment process in a number ways, including:

- *Organizational motivation*, or objectives that the organization attempts to achieve by performing the assessment;
- *Leadership buy-in*, or commitment of the leadership to the assessment process expressed through continued oversight, provision of necessary

resources, communications of results and use of results to develop improvement plans;

- *Commitment at all levels within the organization* which ensures more accurate scoring results and effectiveness of the process itself;
- *Choice of participants* that should match enterprise boundaries in order to provide overview of the enterprise as a whole and identify reasonable and achievable desired state;
- *Respondents' bias* that must be minimized so that respondents are able to provide honest opinion which ensures accuracy and viability of assessment results;
- *Role of the assessment facilitator*, which should not be limited to process facilitation; instead, assessment facilitator should serve as an agent of transformation providing continued motivation to the assessment participants and ensuring that assessment achieves its goals in the transformation process; and finally
- *Education and training of participants* that is essential for establishing consistent understanding of the assessment, methodology and process across the organization needed for maximizing effectiveness of the assessment process.

An assessment process model must be designed in way that drives and incentivizes desired behavior of the organization and results in the expected assessment outcome. It needs to be integrated into other organizational work and behavioral processes. Based on the literature review and case studies, we have recommended an assessment process model, which includes the following main phases:

- *Assessment Prerequisites*: obtaining organizational commitment through understanding of objectives and benefits of the assessment, allocation of required resources and use of assessment results;
- *Plan Assessment*: preparing for assessment by laying out the process, identifying and training participants;
- *Perform Assessment*: carrying out the assessment itself by collecting and analyzing scores;
- *Evaluate Assessment Results and Process:* ideantifying areas for improvement in organization based on evaluation of assessment results as well as identifying necessry improvments to the assessment process;
- *Develop Action Plan and Prioritize Resources*: putting assessment results to work by incorporating them into organizational plans.

The recommended assessment process includes mechanisms to change behavior of the organization through pre-assessment phases. It also allows adjusting the assessment process itself based on the results and experience of participants so that it better suits needs and practices of the organization.

We suggest that the assessment process recommended in this thesis be applied to actual organizations in order to test its validity.

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