

16.660 / 16.853 / ESD.62J Introduction to Lean Six Sigma Methods  
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# Virtual Assessment of Lean User Experience (VALUE)

A Guide to Assessing Your Level of Lean Enterprise Knowledge

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**Approximately 30 minutes or less will be needed to read these instructions and complete a VALUE self-assessment**

## 1. Introduction

### 1.1 Purpose

The LAI Lean Academy™ Virtual Assessment of Lean User Experience (VALUE) assists LAI Lean Academy students in quantitatively assessing their level of proficiency in twelve Lean Enterprise Knowledge Areas. By providing a quantitative measure of proficiency, an individual may communicate their capability to others using a simple metric characterizing their lean knowledge at any point in time.

### 1.2 Usage

VALUE has several usages, including:

- Assessing a student's proficiency before enrolling in a LAI Lean Academy.
- Assessing a student's proficiency at the completion of a LAI Lean Academy.
- Assessing the LAI Lean Academy graduate's continuing growth in proficiency, e.g. during a summer internship, after a period of employment, or after continuing education.
- Communicating to other stakeholders the material covered in a LAI Lean Academy and the expected level of proficiency achieved by the graduates.

VALUE is not intended to be a “grade report” or other device for evaluating the performance of a student taking the LAI Lean Academy course.

### 1.3 Expectations

It is expected that students completing a LAI Lean Academy will have a VALUE level of at least 2 in all the Lean Enterprise Knowledge Areas, and in many of these to have reached a level 3. This would give an over all VALUE level in the mid 2 range for a typical LAI Lean Academy graduate.

Entering LAI Lean Academy students will have a range of VALUE levels depending on their previous exposure to, and experience with Lean principles. In some cases students may have had no exposure at all and will have an entering VALUE level close to zero. This is quite acceptable, as the LAI Lean Academy curriculum assumes no prior knowledge in the subject area. On the other hand, if an entering student has a VALUE level higher than 2, they should consider if their time will be well spent by enrolling in the course.

### 1.4 Scope and Organization

The Lean Enterprise Knowledge Areas used in the VALUE are covered in Section 2.

Proficiency Levels that measure student capability in each Lean Enterprise Knowledge Area are described in Section 3.

Section 4 contains instructions for individuals to complete a self-assessment of their proficiency in the Lean Enterprise Knowledge Areas using the score sheet.

## 2. Lean Enterprise Knowledge Areas

Twelve Lean Enterprise areas are covered in nineteen LAI Lean Academy instructional modules, plant tours, and guest speaker curriculum elements.

- 1 Context for Lean implementation
- 2 Definition of Lean
- 3 Process concepts
- 4 Five fundamental principles of Lean Thinking
- 5 Lean tools and concepts
- 6 Lean office principles
- 7 Lean engineering principles
- 8 Lean supply chain management principles
- 9 Lean enterprise principles
- 10 Quality and Six Sigma
- 11 Role of people and organizations
- 12 Lean implementation

## 3. Proficiency Levels

Proficiency levels used in the VALUE are based upon MIT's Conceive Design Implement Operate (CDIO) Syllabus<sup>1</sup>. They are<sup>2</sup>:

- 0 UNAWARE To have no exposure to or knowledge of
- 1 AWARE To have experienced or been exposed to
- 2 READY To be able to participate in and contribute to
- 3 CAPABLE To be able to understand and explain
- 4 SKILLED To be skilled in the practice or implementation of
- 5 EXPERT To be able to lead or innovate in

## 4. Instructions for VALUE usage

The VALUE is a guide for YOU to use to track your progress on gaining and using Lean Enterprise knowledge. It is important that you be careful and thoughtful when deciding on your proficiency level in each area to accurately represent your capability. Be honest with yourself as you think about your capability. It is better to err on understating your capability rather than misleading yourself, thinking that you are more proficient than you really are. A fundamental tenant of Lean is continuous improvement. Everyone – even the experts – can always improve.

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<sup>1</sup> Crawley, E, "CDIO Syllabus: A Statement of Goals for Undergraduate Engineering Education", CDIO Report 1, MIT Department of Aeronautics and Astronautics, Jan 2001 Available at <http://web.mit.edu/aeroastro/www/> (select CDIO from menu)

<sup>2</sup> The CDIO Syllabus contains five proficiency levels. Proficiency level zero as been added since entering students may have no proficiency in a given Lean Enterprise Knowledge Area. Names for each level have also been added.

The recommended approach for using the VALUE is to complete the self-assessment on your own, and then subsequently discuss your results with a person such as a supervisor, mentor, LAI Lean Academy instructor, or peer. Start by going through the Lean Enterprise Knowledge Areas one at a time, using the score sheet and referring to the rubrics on the left to gauge your level of proficiency. Each knowledge area contains many topics and you will have to “integrate” your knowledge over these topics to arrive at a single measure of proficiency for that area. Thoughtfully reflect on the proficiency levels, asking yourself questions such as those listed on the score sheet. When you arrive at a measure of your proficiency, write it in the appropriate box. You may use a first decimal, but don’t go beyond that level of detail. For example, if you think your knowledge is close to a 2 in some topics of the knowledge area, but at a 3 in others, you might write down 2.4 on the worksheet.

After you have evaluated yourself in each of the 12 knowledge areas sum up your total and divide by 12. Write this down as your “Average Level”. You will be asked to turn in your pre and post LAI Lean Academy proficiency levels. A separate worksheet sheet is provided for that purpose. Keep the original score sheet for your own records.

#### Suggestion

After completion, take time to discuss this with someone as a “closure” step to your self-assessment. Also discuss with your reviewer ways to improve your proficiency levels such as: participating in a Lean improvement activity; obtaining more instruction; reading literature from the LAI Lean Academy module Reading List; or attending a Lean workshop. Keep the self-assessment for future reference, and occasionally revisit it to see how your proficiency has changed.

## LAI Lean Academy® VALUE Score Sheet

<u>LEVEL</u>	<u>KNOWLEDGE AREA</u>
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**LEVEL 0 – UNAWARE:**

**To have no exposure to or knowledge of**

- Have I never heard about these topics at all?
- Have I only heard about these topics in casual conversation?

**LEVEL 1 – AWARE:**

**To have experienced or been exposed to**

- Have I had some organized introduction or instruction to these topics?
- Have I used some of these topics in my work?
- Can I tell myself what these topics really mean?

**LEVEL 2 – READY:**

**To be able to participate in and contribute to**

- Do I know enough about these topics that I can comprehend what other people mean?
- Can I participate in give-and-take dialog on these topics?
- Have I ever participated in an event when this topic was used?
- Did I contribute to the discussion or action surrounding this topic?

**LEVEL 3 – CAPABLE:**

**To be able to understand and explain**

- To whom could I explain these topics?
- What would I actually tell them?
- Have I ever actually explained any of these topics to someone else?
- Have I written something about these topics?
- Have I given a presentation where I explained these topics or needed these topics to explain about a lean activity?

**LEVEL 4 – SKILLED:**

**To be skilled in the practice or implementation of**

- Have I applied my knowledge in this area? How did I apply it?
- Was I able to improve enterprise value creation by applying my knowledge in this area?
- Have I applied my knowledge more than once?
- Did I learn new things about this area by applying my knowledge?

**LEVEL 5 – EXPERT:**

**To be able to lead or innovate in**

- Have I ever lead a lean activity in this area?
- Have I taught someone else about these topics?
- Have I discovered new knowledge that has improved lean practices in this area?

**Context for Lean implementation:** External factors driving change; transformation challenges; relationship to other industries; demonstrated benefits

**Definition of Lean:** Definition of lean; 7 wastes; internal/external customers; value

**Process concepts:** process elements; process maps; lead & cycle time; capacity; throughput; balancing; process capability

**Five fundamental principles of Lean Thinking:** value, 3 types of waste, value stream mapping, flow, pull, perfection

**Lean tools and concepts:** VSM; 5S; 5 whys; takt time; setup reduction; single piece flow; andon; kanban; standard work; JIT

**Lean office principles:** value of removing time from administrative processes; identify and apply lean thinking and analysis tools to office processes

**Lean engineering principles:** customer value; product lifecycle; lean engineering tools; IPTs, info wastes PDVSM, DFSS

**Lean supply chain management principles:** supplier added value; make-buy; supplier certification; tiers; vendor-managed inventory; 3PL; IT integration; suppliers as partners

**Lean enterprise principles:** stakeholders; core, extended and lean enterprises; lifecycle and enabling infrastructure processes; lean enterprise management

**Quality principles:/Six Sigma** product & process quality; 7 basic quality tools; DFSS; SPC; impact of quality on flow, Cp & Cpk

**Role of people and organizations:** employee satisfaction; organizational structure; culture; leadership & management; 3 elements of collaboration; matrix organization; IPT

**Lean Implementation:** Kaizen; continuous improvement; DMAIC

**TOTAL**

**AVERAGE = TOTAL / 12**