

# Applying Lean Methods in Real World Projects<sup>1</sup>

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## ABSTRACT

Different companies may see projects differently. In working for non-PMO firms who are looking to keep costs down while providing optimal project support, Lean has become a successful tool in the arsenal of achievement. Lean allows for stabilizing, standardizing, and simplifying procedures and processes that eliminate wasted time, resources, and costs. Lean has also served to build understandable models to communicate how the procedure or process relates to the products and/or services provided to customers.

The three case studies cover different real world projects from start to finish merging lean ideas into each because of a corporate culture more inclined toward Six Sigma, Lean, or other methodologies. Instead of digging PMP trenches to battle for the best method, being adaptable opened communication within teams, opportunities to update, and paths to successful completion.

These diverse case studies cover technology for a wireless services optimization project, procurement for a capital approval procedure, and business operations for a real estate selection workflow and tracker. The paper will illustrate by being flexible to take ownership of a project, the teams met the corporate vision and advanced their project management capabilities.

## LEAN BACKGROUND

Lean approaches problems like a scientist seeking knowledge through research. Merriam-Webster defines the Scientific Method as “principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment, and the formulation and testing of hypotheses.”<sup>1</sup>

In a similar manner with Lean, the knowledge of the problem has been recognizing “Muda”, or waste, in production. Taiichi Ohno pursuit of eliminating waste starts with asking why five times to uncover the root of the problem for to formulate, test and observe solutions, or “how” to be more productive. He defines this with the simple equation of

$$\text{Present capacity} = \text{work} + \text{waste}^2$$

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<sup>1</sup> *Second Editions are previously published papers that have continued relevance in today's project management world, or which were originally published in conference proceedings or in a language other than English. Original publication acknowledged; authors retain copyright. This paper was originally presented at the [10<sup>th</sup> Annual UT Dallas Project Management Symposium in August 2016](#). It is republished here with the permission of the authors and conference organizers.*

The Toyota Production System he developed sought to identify and eliminate waste completely when discovered. The areas of wastes are:

- Overproduction
- Waiting
- Transportation
- Processing
- Inventory
- Movement
- Defects<sup>3</sup>

Taiichi Ohno summarizes it simply in an interview. “All we are doing is looking at the time line from the moment the customer gives us an order to the point when we collect the cash. And we are reducing that time line by removing the non-value-added wastes.”<sup>4</sup>

The start was slow as Mr. Ohno’s implementation was contained in the production line within his responsibility at Toyota. Management and workers outside of his line were skeptical but one key element allowed him to move forward, leadership acceptance to allow him to make improvements. It was not until his promotion to a general manager role did it begin to expand into other production lines due to leadership recognizing his achievements and assigned more responsibilities.<sup>5</sup>

## **PRACTICE**

In taking knowledge from formal and informal education, the bottom line is putting into practice what is learned and continue learning throughout life. In the Nicomachean Ethics, Aristotle wrote – “For the things we have to learn before we can do them, we learn by doing them.”<sup>6</sup>

In learning and doing, it is important to see a personal role as a brand or company, and then the place or area of work as the customers. This opens the door to be innovative for the “customer”, whether that customer is internal as a “department” or external to a company. With this in mind, remember to be realistic in offering a deliverable so a “customer” expectation is not missed. Tom Peters points out that it is about customer perception in his book, Thriving On Chaos – “Customer Perception (CP) equals Delivery (D) divided by Expectation (E).”<sup>7</sup>

Before earning the PMP and Lean certifications, I followed the Scientific Method and Lean concepts like Plan-Do-Act-Check to create my own RADAR for a relatable business use:

- Recognize a customer need or want
- Analyze why the need or want exists
- Develop choices on how to satisfy the need or want
- Apply the customer selected choice as best as possible
- Review to see if the choice worked well or if more can be done as the customer is willing

In each need or want from the case studies, it was a matter of diving into the middle of an undocumented or nonstandard operational practice or process where it was important to identify the waste for a lean way to improve and then document for a baseline for future improvements.

With each case, the choices were related to what the company does in order to make these more tangible. In the case of the wireless services optimization, it was related to how cost reductions equaled the profit of building additional homes in a development. For the procurement for a capital approval procedure, it was related to the existing policy and workflow known within the company. Finally, with the real estate project, it was redesigned to mimic a production line like building a home or appliance.

## **WIRELESS SERVICES OPTIMIZATION**

### **Situation**

While contracting at a home builder for billing analysis, service agreement compliance, and other telecommunication support, a renewal contract for outsourcing wireless services billing was included in the agreements to update. Instead of having direct billing for the wireless providers, each division or region negotiated local deals to have wireless based on best local access. The bills were forwarded to a wireless billing consultant firm for review, optimization, coding, and then forwarded as a consolidated invoice to accounts payable for processing by paying the consultant firm.

In asking why, the following was learned:

1. Wireless services were needed to conduct sales, coordinate vendors/contractors, and other field operations with construction being done at any location at any time.
2. Field business divisions were given autonomy for purchasing from local suppliers for some materials for better deals where available and the same process was applied to acquiring wireless services.
3. To not overburden accounting with 3 to 4 bills or more per division as there were 21 divisions, the outsource firm offered analysis and consolidation to optimize for savings and then rebill back in one billing to the home builder at a fee.
4. No one understood the billing systems with the wireless carriers where the consultant was seen as an expert.
5. No one offered to review the billing system to see if there is a better way.

As part of the agreement review, a simple question asked – “would you consider the idea of direct billing if it will create a simpler process for billing and achieve more savings?” “Yes.”

### **Relevancy**

In presenting an internal consideration, the following points were brought forward:

1. Wireless providers have carrier access billing systems for electronic reporting of service usage and billing, very similar to local and long distance providers.
2. The data can be pulled into Excel or Access to be reviewed and there are billing structures to allow consolidation between divisions to distinguish by cost centers.

3. The usages may be analyzed and compared with past and current plans to optimize pooling programs and save on the fees from the consultant firm.
4. Phone equipment are recorded as an asset and tracked for replacement or repair.
5. Consolidating identifies opportunities for volume discounts due to the number phones and usage.
6. Relate the concept of creating savings to the average profit margin of selling additional homes in the developments of the division.

To test the concept, one division with predominately one carrier with just over 670 employees using wireless services agreed to join the program. The initial results over what the consultant firm projected for costs were as follows:

- Moved all users into one billing for pooling just over 390,000 minutes, set up by cost centers
- Reduced the cost per minute from \$0.0864/minute to \$0.0589/minute
- Reduced the cost per unit (overall equipment, features, services, etc...) from \$82.76/unit to \$67.42
- Overall this saved above and beyond the outsource services just over \$10,500/month
- This equated to the profit of selling 3.5 additional entry level homes within the division for that year

### **Business Impact**

By the end of the project, the homebuilding has the largest pool program with this one carrier in the nation with over 6,000 users, pooling nearly 5.6 million minutes. The savings exceeding \$120,000/month above the baseline of what the consulting firm provided. This equaled the average profit of selling about 40 entry level homes in a fiscal year.

### **Lean/Project Impact**

The home builder saw how projects can work in parallel with ongoing operations and processes so began exploring project management options. This evolved to develop a PMO for the builder to support projects within the business.

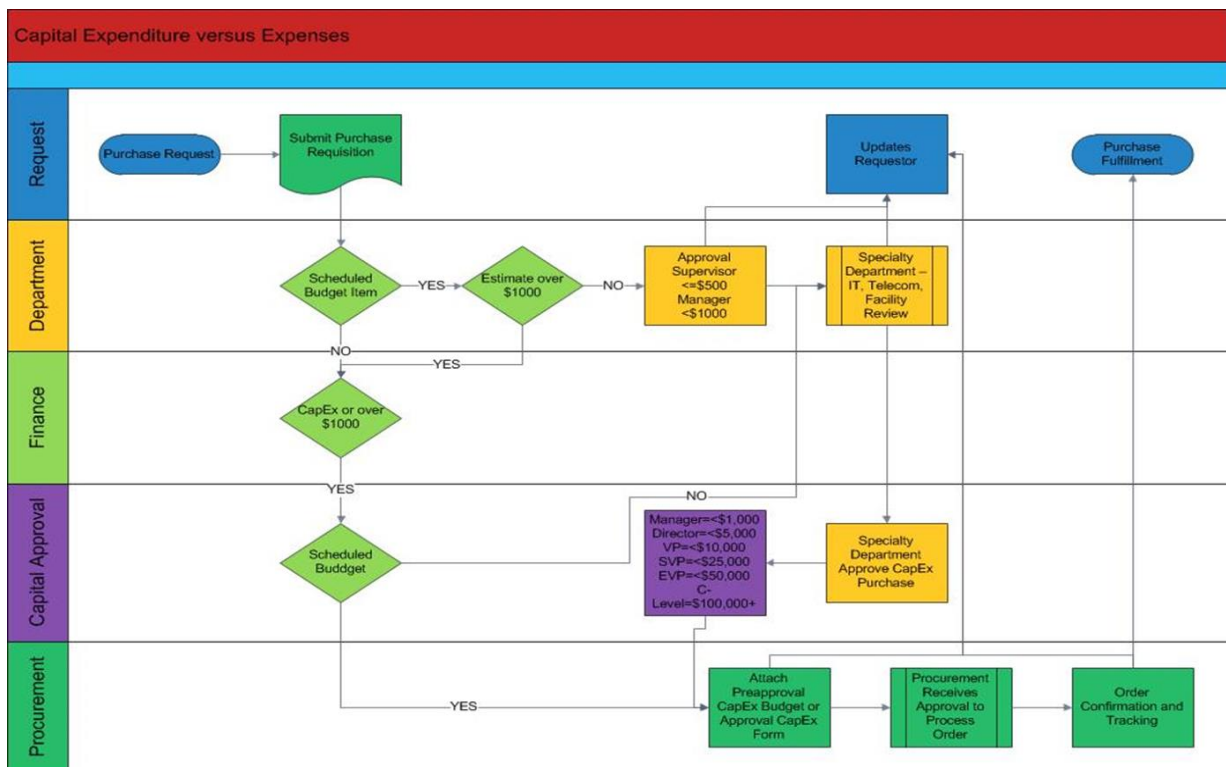
## **CAPITAL EXPENDITURE APPROVAL PROCEDURE**

### **Situation**

In a role as Facility and Asset Manager, procurement for IT hardware, furniture, and other equipment for leased spaces included completing the capital expenditure (capex) forms for new or existing sites. While the generally workflow was seen as adequate, the challenge was in the approval process. The capex form was manually completed and walked person to person for approval with an occasional email approval due to someone traveling that had to be attached to the quote and capex documents to move on to the next person.

In asking why, the following was learned:

1. The paper form was the only way to get signatures because no electronic format was known.
2. Each authorized level needed to provide an approval that could be tracked and previously proposed systems required a purchase and IT integration into existing systems.
3. No existing system was seen as capable of routing and tracking a capex approval form.
4. No review of the existing capabilities was made other than Office Suites were made.
5. It was presumed no other software was capable after reviewing Office Suites.



**Current Workflow for Capex Approvals**

Expense Type	Capital (CapEx)	Operating (OpEx)
<b>Purpose</b>	Purchase assets with useful life of more than one year and valued over \$1,000	Subscriptions, licenses, service agreements or monthly costs to operate a business
<b>Payment</b>	Lump sum or financed over term	Monthly or one-time cost under \$1,000
<b>Accounting</b>	Based on IRS asset depreciation guidelines	Current month of service or purchase
<b>Asset</b>	Property or equipment, depreciation	Operating costs
<b>Tax Report</b>	Deduct per the IRS asset depreciation guidelines	Deduct in the current tax year per IRS guidelines
<b>Exception</b>	One-time purchase approvals within IRS deductible expenses guidelines, leased equipment/property, or less than \$1,000 sale price	Special approval or scheduled into budget for operating expenses over \$1,000 sale price
<b>Approval Levels</b>	<b>Amounts</b>	<b>Amounts</b>
Supervisor	\$0.00	\$500.00
Manager	\$1,000.00	\$1,500.00
Director	\$10,000.00	\$15,000.00
Vice President	\$25,000.00	\$25,000.00
Senior VP	\$50,000.00	\$50,000.00
C-Level	\$100,000.00	\$100,000.00

**Table for Accounting Policy on Capital and Operating Expenses**

With this understanding, the question was “can we review other existing software options to see what they are capable of doing while giving a consistent feel?” “Yes.”

### Relevancy

For any solution, the current workflow and approval hierarchy had to be preserved to reflect accounting policy. The only change was to create a user-friendly, mobile accessible approval that has the capex, quotes/proposal, and supporting documents and/or links for the approval. The approving authority needed the ability to:

1. Approve the capex and it automatically forwards to the next level or procurement, or,
2. Return the capex with comments and it automatically updates the requestor and/or former approval contacts in case a clarification can be made to approve, or,
3. Reject as not approved with comments if so warranted.

The one platform that proved accessible to all employees within the firm was SharePoint with the capability to submit and route such documents with the correct design. The IT department designed the online capex form with the same appearance as the paper form, allowed attachments, and created the hierarchy for approvals based on the accounting policy on capex and operational expenses.

### Business Impact:

The solution met the need to have the look and feel of the manual process in electronic form. It was designed on an existing platform, SharePoint, so the internal team was able to design and test it through to production without added costs.

Once implemented the time for approval was reduced from weeks to days. The faster approval also allowed the business to move on special purchases from vendors during sale cycles before deadlines.

### **Lean/Project Impact**

The company explored automating other manual internal and external services through SharePoint and the existing helpdesk system. It brought in the value for change management to review and improve processes. As an added benefit, the SharePoint fed into a baseline asset management database which reduced asset loss by 90% within one year.

## **REAL ESTATE PROCESS**

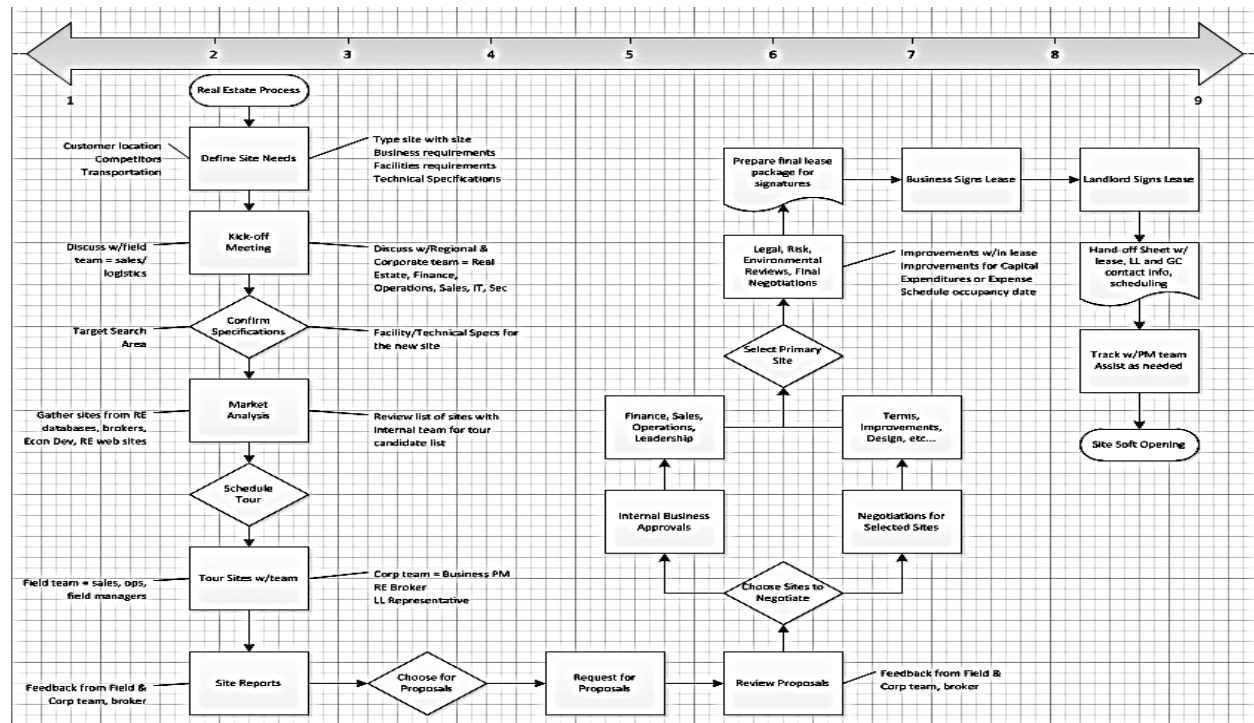
### **Situation**

Joining a real estate team to negotiate leases, design concept plans, manage general contractors where applicable, and handle projects, one of the challenges to understanding leases by the business units was how they are done.

In asking why, the following was learned:

1. The estimated time from start to finish a lease was not understood by the business units.
2. The process shows two dozen steps but not clear on dependencies or inputs and outputs.
3. With the lack of understanding, the businesses considered the estimated time an intangible number.
4. It was intangible because it does not relate to what the company builds.
5. What the company builds is tangible to track from order request to delivery.

To offer alternatives, the question then – “if a process flow can be outlined to relate it to what the company produces and create a tangible view to report progress, will that help?” “Yes.”



**Current Real Estate Process**

**Relevancy**

To understand what the design will look like, the linear flow was reworked into production milestones or modules.

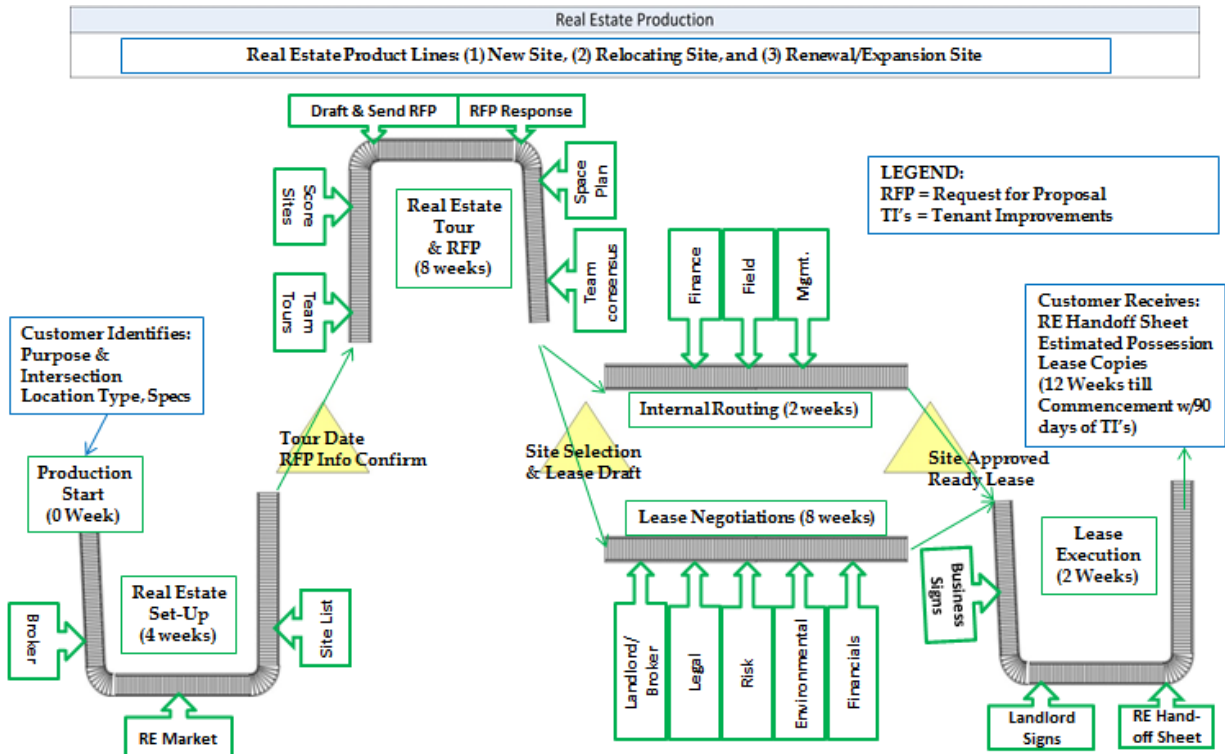


Milestone	Activities	Week Count (Cumulative)	Owner	Output
Identify Purpose and Intersection	<ul style="list-style-type: none"> <li>Affirm the site requirements (business units, sizing, operational needs, FAP, competitors/customers, etc...)</li> <li>Determine the closest intersection in the city to search a defined radius</li> </ul>	0	Business Unit (BU) Leadership	Launches Real Estate Process
Set-up Search Parameters	<ul style="list-style-type: none"> <li>Identify and contact Brokers</li> <li>Research RE market</li> <li>RE Kick-off with field and BU team</li> <li>Identify potential sites</li> </ul>	4	<ul style="list-style-type: none"> <li>Real Estate</li> <li>BU Field and Leadership Team</li> </ul>	<ul style="list-style-type: none"> <li>Schedule Tour</li> <li>Confirm RFP Parameters</li> </ul>
Tour and RFP	<ul style="list-style-type: none"> <li>Tour sites meeting criteria with BU authorized field contacts</li> <li>Score sites criteria for RFP</li> <li>Issue RFP for agreed to target sites</li> <li>Negotiating RFP responses of leading sites for final selection</li> </ul>	8 (12)	<ul style="list-style-type: none"> <li>Real Estate</li> <li>BU Field Team</li> </ul>	<ul style="list-style-type: none"> <li>Draft Selection Package</li> <li>Draft Lease</li> </ul>
Site Selection Package and Lease Negotiations	<ul style="list-style-type: none"> <li>Selection Package circulated for BU leadership approval</li> <li>Negotiate lease terms with landlord and legal teams as needed</li> </ul>	8 (20)	<ul style="list-style-type: none"> <li>BU Point of Contact</li> <li>Real Estate</li> <li>Legal</li> </ul>	<ul style="list-style-type: none"> <li>Management Site Approval Signed</li> <li>Lease Ready to Sign</li> </ul>
Lease Execution	<ul style="list-style-type: none"> <li>Submitted to BU signing authority</li> <li>Submitted to LL signing authority</li> </ul>	2 (22)	<ul style="list-style-type: none"> <li>BU Signing Authority</li> <li>Real Estate</li> </ul>	<ul style="list-style-type: none"> <li>Fully Executed Lease</li> <li>Real Estate Hand-off</li> </ul>
Commencement	<ul style="list-style-type: none"> <li>RE Hand-off for BU kick-off call</li> <li>Tenant Improvement work completed</li> <li>Access and Occupancy Scheduled</li> </ul>	12 (34)	<ul style="list-style-type: none"> <li>BU Point of Contact</li> <li>Finance</li> <li>Real Estate</li> </ul>	<ul style="list-style-type: none"> <li>Confirmation of Completion</li> <li>First Lease Payment</li> </ul>

**Real Estate Process Table**

By identifying a milestone, the rest of the process was placed into the tasks within the phase and the output was the requirement before a clean handoff for the next phase to start. This also allowed assigning “owners” within each phase who contribute to the success of the milestone along the production line.

The production flow was draw with the idea of five manufacturing lines to build three products – new leases, renewal or expansion leases, and relocation leases. The “plant” was managed by the “real estate contact” to travel where a building is needed instead of materials and production being sent to a static plant. The landlord is equal to suppliers, broker equals the sourcing representative, and customer is the business unit requesting the building.



### Future Real Estate Process

The new process flow help bring clarity to inputs, tasks within the process, and outputs to continue efficiently by:

- Clear assignments for input, such as purpose and intersection for a location to start the production line
- Show where each key person is needed on the production line to “assemble” an acceptable site build to meet the customer needs as best as possible
- Highlights where changes require returning up the line and reset the expected delivery date for the product requested
- Provides milestones that can be measurable from start to finish within the Real Estate process.

### Business Impact

The business units were able to see tangible target versus actual dates of completion. This served as a baseline to design a tracker for lessons learn and trend analysis for external and internal factors impacting the delivery of a site by milestone or production line. The overall delivery of sites, excluding external factors such as lack of available buildings in the market or higher rates in a market from economic factors, was reduced from nearly 40 weeks to about 34 weeks.

## Lean/Project Impact

The redesigned process complimented the company cultural emphasis to move more toward a lean and Six Sigma environment. It was presented and will serve as a model for other employees who desire to develop their lean skills and knowledge.

## Summary

Lean methods may integrate more readily in a non-PMO role as it looks to eliminate waste from capacity. With waste eliminated, it relates to the bottom line appeal in most companies to save time and money. Using methods like Plan, Do, Check, Act offers a cyclic path to ongoing improvements within a company culture so it meets less resistance. By relating to the product or services offered at a company, Lean solutions are more readily accepted because it is more tangible to management. Finally, Lean may open the door to project management maturity as it proves to help and not hinder progress within the company and its culture to leadership.

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## About the Author



### **Wayne Bullard, PMP**

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**Wayne Bullard, PMP, LGC** has been a practicing project professional since 1996, earning Project Management Professional certification through PMI in 2005, and earning Lean Bronze Certified in 2013 and Lean Silver in 2016. Wayne has served nonprofits and industries in finance, construction, wireless and telecommunications, community associations, event planning, and manufacturing. Wayne brings about positive changes for designing and streamlining policies and procedures, reducing waste and expenses, creating technology lifecycle trackers, leading facility and safety best practices in the workplace, managing vendor relationships, contract negotiations, and asset tracking to minimize losses. He has served roles as IT technology specialist and management, real estate specialist and project manager, facility manager, and Vice President IT Networks. Wayne currently works with corporate real estate, nonprofits, offers mentoring, and is actively planning for his Lean Gold certification.

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