

White Paper: The Rules of Lean Project management

(Adapted from Claude Emond's blog entries at www.projecttimes.com)

Lean manufacturing programs like "Achieving Excellence" are being implemented at an increasing rate now in North America. They promise to improve competitive positioning and increase profitability in the global economy. In their pursuit of excellence, more and more companies are also looking to Lean Project Management (LPM) as the next big thing to implement to better manage non-recurring activities.

Hence, the words lean project management are used all over the place by a lot of people nowadays. LPM is really not well understood, however. In this context, presenting the main rules of LPM, as I see them, might help us all better understand under what conditions project managers can really claim to use and live by lean principles.

Rule # 1: The Last Planners

Last thing comes first in LPM. So I'll start with the "Last Planner ®". The worst I heard about this is that it was a software package. So I guess some explaining is necessary. The Last Planner ® is a principle originally promoted by the Lean Construction Institute¹. The "Last Planner ® System", which explains the systematic use of this principle, was developed by Glenn Ballard for his PhD thesis². The Last Planner ® is defined as the person who will execute the planned work in a project. One of the most important last planners is ultimately the end-user of the product of a project, because he is the one who will materialise project benefits.

Simply put, the last planner approach states that "the one who will execute the planned activity is the one who must plan the planned activity." As simple as that! Why? Project success is achieved through a series of planned promises made by some people who work very hard to meet the promises *they* have made! As we all well know from our failure to make our spouses, best friends, children, etc., keep promises we have made for them, making promises for others does not work. And this becomes a certainty when we try to make promises for the almost pure strangers around us, like our employees, co-workers, collaborators and business partners, regarding how they use their time. .

This principle of the last planner first came from the realisation that centralised planning did not work for construction projects, among others. Project managers using centralised planning have to admit that, very often, a time comes when the project is in complete turmoil, with the building falling apart, water pipes bursting, the construction workers and very expensive machinery waiting (while being paid for) for conflict resolution. They finally realise that it would have been less costly to win the collaboration of their stakeholders while they were at the planning stage than, later, while witnessing destruction work.

¹ www.leanconstruction.org/

² www.leanconstruction.org/pdf/ballard2000-dissertation.pdf



So the last planner principle is about getting the right people making the right promises as early as possible. It is about negotiating a plan that people adhere to because part of it is their personal plan, their sacred promises for which they truly feel responsible. And more important, both the project and its last planners are bound to benefit from those promises, a sine qua non condition to meet for effectively building and mobilising project teams.

LPM rule # 1: The one who executes the work is the one who plans the work

Rule # 2: Tracking Percent Promises Complete (PPC)

This second rule is somewhat linked to the first one, the “Last Planner” rule.

What type of work should the Last Planner plan to execute in order to ensure the success of his/her part of the project? The Lean Construction Institute proposes a very simple answer to this question. Projects can be successfully managed by planning and executing reliable promises.

What are reliable promises? They are small deliverables that one agrees to complete in a very small timeframe, usually on a weekly basis. This is done for the ongoing project phase/stage and, if we really know what we are doing (according to rolling wave planning principles³), it is usually possible to cut the project into more manageable tiny bits. This approach, known as the Percent Plan/Promises Complete (PPC) is a mix of:

- The agile software development “timeboxing”⁴ approach, applied on an individual basis and
- Earned value management using deliverables realised as a measure of project performance achievement, the ultimate “seeing is believing” measure.

Cutting projects into very small promises that we can literally see at the end of each week is effective in at least three ways:

- First, you are in a position to see rapidly tangible progress on the project
- Second, you can also quickly see when the project is getting off track and correct the course while time and cost variances are still small enough to be correctable.
- Third, according to research by Goldratt, among others, productivity is greatly improved, since producing small deliverables reduces the “set-up time” a Last Planner has to go through to restart or complete work-in-progress after being interrupted. According to some time management studies, people spend in average close to 50% of their workweek on not-planned-for urgent work that comes in the form of frequent interruptions, frequent meaning on average every 30 minutes. Sound familiar?

Using weekly PPC as a measure of progress also has the advantage of giving early feedback about how and where to improve project delivery performance. Some empirical

³ <http://www.maxwideman.com/issacons/iac1077/tsld002.htm>

⁴ http://en.wikipedia.org/wiki/Time_boxing



data⁵ show instances where project teams managed to increase their PPC from 50 % at the start of a project to more than 80% within a 10 to 12 week timeframe, which is the equivalent of a 60% increase in speed of delivery.

Tracking small deliverables is very simple to do and does not require a complex reporting system (computing timesheets, project expenses, etc.) to accomplish. In all the things I propose, this is also the one approach that the vast majority of participants in my workshops like the most and want to put into place in their organization as soon as possible. And frankly, I believe that if you stick to delivering those small promises, and succeed most of the time, you will discover when you receive your “hours spent and/or incurred costs” reports (usually containing one-month old obsolete data), that you are on budget. You already know that you are on time, because you see the promises coming out every week.

LPM rule # 2: “Do not track time (effort) or cost; track small promises that you can see over time”

And if you want to put together your PPC system fast, there is help available. Just read Hal Macomber’s excellent article “Securing Reliable Promises on Projects”⁶ and you will be up and running fast-delivery projects successfully in no time at all.

Rule # 3: The Expanded Project Team

The 3rd rule of LPM is about the nature of the project team and its composition. It is an invitation to expand the boundaries of a project team to include all project stakeholders. It is of course linked to the proper execution of the two other rules already discussed:

Rule 1 – The Last Planner rule: The one who executes the work is the one who plans the work. Expanding the project team means more last planners, the ultimate ones being those who have to materialise the project benefits, once this project has delivered what it was intended to.

Rule 2 – The Track Promises rule: Do not track time (effort) or cost; track small promises that you can see over time. Expanding the project team means getting each promise made by the last planner who has a stake in it and can really make it happen.

The current edition of the PMBoK (4th edition) still makes a difference between:

- The “project team.” Those directly involved in the realisation of the project deliverables (the issues and management of this team being treated in Project HR management), and
- The “project stakeholders.” Those affected by or able to effect the realisation of these deliverables (the issues and management of these “separate” groups being treated in Project Communication Management).

⁵ <http://www.leanconstruction.org/pdf/LCICurt.pdf>

⁶ http://halmacomber.com/MSRP/reliable_promises.pdf



This way of discriminating among project players is one of the reasons for our low project success rates (29 %), as documented by the CHAOS Report. Merging those two groups into one, the expanded (or integrated) project team, is one of the main explanations for the high project success rates (85%) documented in the British Constructing Excellence program⁷.

I have a very fresh example in memory to illustrate the need to change the conventional view on who is and who is not on a project team. During a project management maturity diagnosis I was making with a customer (a highly innovative manufacturing enterprise), I met the manager responsible for after sale customer service. He told me of his last experience with the introduction of a new product. Since he had nothing to do directly with delivering the new product for production, the main objective of their new product development projects, he was not considered part of the project team. He came across some technical documentation on the new product just before it went into pre-production, only to realise then that the product included the very same component that was causing 90 % of his customer complaints about a similar product already in full scale production and on sale. These complaints were resulting in major on site service costs and loss of recurrent customers. He immediately went to the CEO and had the pre-production phase stopped right there. The “project team” had to go back to the drawing board, with an expensive prototype in the garbage bin and much rework to do in the very small time left to seize the window of opportunity for this new product. This mess would have been avoided very easily if this very important last planner had been integrated to the project team at the very start of its definition.

If you think that you must restrict the number of people in a project to those only involved in the direct realisation of deliverables, I hope that the little tale of disaster I just presented will have you refine your “need to know” criteria and your “project team” definition to include - as early as required - those who have to materialise the ROI on this project.

LPM rule # 3: “Expand the project team to include and integrate all significant stakeholders as part of the team as early as possible”.

Rule # 4: Humans, humans, humans

Lauri Koskela in his landmark article, *The underlying theory of project management is obsolete*⁸ says that the current theory of project management, as illustrated in the PMBoK, mostly defines project work as planning; not much is revealed with respect to work as executing. Projects are executed through people....and it just seems we do not know very well how to communicate this.

In the current theory, much emphasis is given to tools and “best practices”, what I call the “know how to do”. By the same token, when we talk about the so-called human skills (apparently these are soft), what I call the “know how to be”, we only pay lip service to them.

⁷ <http://www.constructingexcellence.org.uk/>

⁸ <http://www.leanconstruction.org/pdf/ObsoleteTheory.pdf>



This situation is confirmed and dramatized by the findings of Frederic Rodriguez, in his master degree thesis, *Are the required best behaviours integrated in project management maturity models?* (CESI, Aix-en-Provence, fall 2008 – my translation of the title into English). He found out that only 13 % of the points measured in OPM3 (76 out of the 589 best practices identified in the maturity model) had any link with managing or fostering proper human behaviours. So the answer to Frederic's question and the conclusion of his thesis is NO!

I know that, As I write this, OPM3 is being revised and that there is a big international effort to develop a universal standard on project management (PMI, AFITEP, IPMA and the like all working together on this); I sincerely hope that more consideration will be given to the main resources in projects - humans.

Meanwhile, lean project management principles can really help us in this ill-covered area, as it mainly concerns itself with executing work through humans. Just look at the three rules I laid out previously:

- Rule 1 – The Last Planner rule - HUMANS PLAN AND EXECUTE PROJECTS
- Rule 2 – The Track Promises rule - HUMANS ARE THE SOURCE OF PROMISES AND RESULTS
- Rule 3 – The Expanded Project team rule - HUMANS AROUND PROJECTS ARE MANY AND NEED TO BE ALIGNED TOGETHER THROUGH A SHARED VISION

Many people oppose PMBoK contents to lean project management approaches. I do not believe this is the proper way to look at this. Their focus is different, one promoting mainly *best practices*, the other calling for *best behaviours*. These are not opposed; they are two important parts of the same puzzle; they complement each other. However, until we merge them together to propose a better, more complete vision on managing projects successfully, I will continue to extensively promote lean project management and its fundamental proposition, spelt out here in this fourth paramount rule, a cry from the heart:

LPM rule # 4: Humans execute projects and projects' deliverables materialise through humans and for them. So be considerate to humans as, without them, no project can be a success.

Rule # 5: Rolling the Waves

My white paper on the Rules of Lean Project Management was supposed to end with Rule # 4 (Humans, Humans, Humans). However, I decided to expand my set of "rules" following Lean Project Management specialist Hal Macomber's enlightening comments on my ProjectTimes series in his blog⁹.

Hal observed that I left out three important principles underlying Lean PM, namely: make commitments at the last responsible moment, PDCA everything (Deming Wheel), and produce deliverables in small batch sizes of one or single-piece flow. I did not cover

⁹ <http://www.reformingprojectmanagement.com/2008/11/09/883/>



those, since I believed they were not unique to Lean Project Management. However Lean gives them a special slant, certainly worth presenting as additional rules or principles.

Rule # 5, I call “The Rolling the Waves” rule. Hal notices in his blog that, “(as last planners)¹⁰, you should make your choices and commitments at the last responsible moment”. I would somewhat equate this principle of making commitments, when we are more certain of possible outcomes, with the practice of Rolling Wave Planning, alluded to in the PMBoK and very well presented by Gregory D. Githens in his excellent white paper, “Rolling Wave Project Planning”¹¹.

Good project managers and their team understand that it is useless to plan in detail the whole of a project, when one does not have the results of the current project phase or stage necessary to elaborate clearly the next phase. For example, it is quite a waste of effort to detail the development phase of a new product, before we have a clear definition of its concept and design criteria. It is also presumptuous to commit oneself on the design of a building’s foundations, when the results of required geotechnical studies are not yet available.

On one of the projects I helped plan for an architecture firm, the project client asked me to be more specific on things that were planned to happen three years later; he wanted to discuss details about this period. I had to tell him then that this was useless to discuss these points further while nobody had made precise commitments about the feasibility study phase we were about to begin; these commitments were still impossible to make then, because we had yet to have his permission to enter the future project site to assess initial conditions.

The Rolling Wave Planning principles are very simple: take commitments and detail your plans for the work about to begin, for which you have all the information necessary to take proper action (very low uncertainty). These are “work packages” that you can commit to deliver with a high level of certainty, for a given budget and schedule. For the work to accomplish in a later phase, most often requiring as input the results of the work packages you are working on, you should stay away from too much detail, since you do not really know what will be needed then. Rather, you can present this latter part of the project as a set of “planning packages” that will be revisited and detailed only when appropriate - when we have a clearer understanding of what has to be done and what CAN be done.

LPM rule No. 5: Roll the waves. Make your choices and commitments (promises) at the last responsible moment. Make them in the form of work packages that will deliver the desired results anticipated with a high degree of certainty. Plan the work, execute the work, learn and adapt, plan the work, execute the work, learn and adapt, plan the work, execute the work...succeed

¹⁰ text between brackets added to the quote by Claude Emond

¹¹ <http://www.catalystpm.com/NP02.PDF>



Rule # 6: Opening, Adapting and Closing Often

Another important lean principle discussed by Hal Macomber is “the necessity to PDCA everything”¹² (the Deming Wheel¹³). Hal notices in his blog that “much has been made of the tools, techniques and methods of lean ways of working. But behind it all is Deming’s (Shewhart’s) Plan - Do - Check - Adjust cycle.” Hal has however revisited the PDCA acronym by replacing the original meaning of the “A” (Act) with “Adjust”. I will also revisit, because I believe the PDCA cycle, as stated, does not clearly illustrate what should be project work.

In the current edition of the PMBoK (4th ed., 2008), PMI also acknowledges the importance of the PDCA cycle in project management, but goes on promoting its own version of it, the IPECC cycle (Initiate, Plan, Execute, Control and Close). There are slight but significant differences between those two cycles, differences that mirror those between recurrent operations and projects:

- PMI “I” (Initiate) is inherent to projects (they start somewhere), hence not included in the more generic PDCA cycle
- PMI “P” (Plan) is similar to Deming’s “P” (Plan)
- PMI “E” (Execute) is similar to Deming’s “D” (Do)
- PMI first “C” (Control) is equivalent to some extent to Deming’s “CA” (Check-Act). Continuous improvement in project management requires, however, a special kind of “acting” to handle major project uncertainties and inherent changes. So for projects, “Adapt” would be a better word than “Act” and, I believe, more representative of high-uncertainty projects reality than the word “Adjust”
- PMI second “C” (Close) is also inherent to projects (they have to close, while we do not want to close operational business processes), hence also not included in the more generic PDCA cycle. Granted, one could argue that Acting in the case of a project includes closing it.

Hal Macomber also said that we had to “PDCA everything.” The word “everything” is, for me, the key to the Lean PM philosophy and is related to LPM # 2 (Track small concrete promises that you can see evolving over time). Everything, for me, means: each activity, each deliverable (daily and weekly promises/deliverables if you think Lean or Agile PM), each work package, each phase/stage of the project, as they evolve.

So I submit that, for projects, we have to **IPDCAAdC** continuously: Initiate, Plan, Do, Check, Adapt and Close everything. Open-Adapt-Close often. Open new work, adapt to change as you do it, and close it to the satisfaction of all stakeholders. And one must not forget that some projects need to be terminated before they are completed, if they cannot deliver what is required; so Close can also mean Stop!

¹² <http://www.reformingprojectmanagement.com/2008/11/09/883/>

¹³ http://en.wikipedia.org/wiki/Shewhart_cycle



LPM rule # 6: Open-Adapt-Close, Open-Adapt-Close, Open-Adapt-Close... all the time. The IPECC cycle is a recurring process; this recurrence is the true key to successful projects, lean-influenced or not. In order to close a project, you have to open-adapt-close formally at the phase level, to open-adapt-close formally at the work package level, to open-adapt-close for each required deliverable (small concrete promises), to open-adapt-close each required activity undertaken.

Rule # 7: Executing Your Small Promises on Single-tasking Mode

Another lean principle put forward by Hal Macomber “has to do with batch sizes of one or single-piece flow.”¹⁴ Hal, as do many Lean and Agile PM proponents, says that: “Large batch production, whether it's placing concrete, writing software code, doing design, or performing administrative work, misses the opportunity for learning, creates the circumstances for waste, and delays the completion of the project.”

I have already covered the part about very small deliverables (small batch size) through LPM rule # 2, without covering the need to deliver them, as much as possible, on single tasking mode. This is a very important principle to follow, on an individual level, to eliminate waste and accelerate the delivery of your own promises on any given project.

While discussing Rule # 2 above, I reported that, according to research by Goldratt and others, productivity is greatly improved when you deliver in small promises. Doing this reduces the set-up time required for the Last Planner to continue the work to be done after an interruption, thus increasing productivity dramatically. I want now to cover the single-tasking technique one can use to further accelerate individual promises delivery. Still, according to Goldratt, although you might work on many tasks in your multi-project environment, you will be more productive if you tackle those tasks one after the other, when possible (usually tasks on different projects that are independent of one another). So Goldratt proposes that you single-task those multi-tasks, that is “do one after the other”, to save further on task set-up time.

The productivity increases achieved through this single-tasking strategy can be quite impressive. Hal Macomber once wrote about a small experiment one can run in workshops that goes this way:

- Split the workshop participants in pairs, one person executing tasks and the other timing execution time
- Give the following tasks to perform: write three series of characters, namely 1 to 10, a to j, and I to X (roman numbers)
- These tasks must first be performed in parallel, i.e. write 1, a, I, then 2, b, II , etc...while you time the work
- The tasks must then be performed in series, i.e. write 1,2,3,4, etc., then a, b, c, d, etc.....while you time the work.

Try this. You will be amazed by the differences between the two ways of doing these tasks. I have tried that with more than 300 workshop participants up to now. The productivity increases come consistently between 20 to 50 %. If multitasking is this

¹⁴ <http://www.reformingprojectmanagement.com/2008/11/09/883/>



detrimental on such simple tasks as writing series of numbers or letters, imagine what is happening to your projects when you keep switching between more complex tasks, from one independent project task to another, in the hope of accomplishing more during your week.

LPM rule # 7: Execute your small promises on single-tasking mode. Once your deliverables are cut into smaller pieces, deliver them one after the other, as much as possible.

By cutting your project work in smaller pieces/promises, you will save on set-up time each time you are interrupted, thus accelerating delivery. This accelerating effect can be increased furthermore, if you also try to execute these promises, one after the other, this saving an additional amount of set-up time. In a multi-project/multi-tasking environment, the most productive strategy is to single-task, doing these multiple tasks in series, when possible.

Rule # 8: Using LPM Principles to Implement AND Adopt LPM

I conclude with this 8th rule of LPM, probably not the last word on this, but the essence of LPM as I see it...for now.

I want, finally, to address the issue of implementing LPM. I was unsure how to tackle this when I started to write about the rules of LPM. Once again, one of Hal Macomber's blog entries provided me with a good angle of attack¹⁵. I thank him for that and for many other influences (good and bad!) he has had and still has on my thinking and that of the people I coach in adopting LPM best practices and behaviours.

In his blog, Hal writes that implementing successful LPM is not possible by only going through the motions, i.e. use the Last Planner ® system, small promises, rolling wave planning, short recurrent IPECC cycles, extended/integrated project teams etc. It is only possible through "adopting" the collaborative behaviours that make these practises work. It has to do with taking seriously LPM rule # 4, which is to be considerate to humans and their individual interests to create the will to make a very important cultural change.

I believe that, in order to do that, some kind of chicken-and-egg approach is required. To develop the collaborative behaviours required by LPM (by all project management endeavours, actually), one has to use LPM principles to implement LPM. And this is exactly what I am doing with my clients when getting them to implement and adopt LPM. I have them go through the motions, but I also use these motions to promote the behaviours required. To do that, I use a technique I have called "changeboxing," in which I apply a mix of LPM principles and a variation of the "timeboxing" techniques used in SW development to make real change come through. And it does come through very fast.

Following a proper participative diagnosis and a workshop to promote a common vision of the change to be put in place, the definition of the new LPM process to be implemented is done coaching a team of five to 12 volunteers to develop and implement

¹⁵ <http://www.reformingprojectmanagement.com/2009/06/01/991/>



it themselves. This team represents the ultimate Last Planner ®, the end users of the LPM process (the project teams and main stakeholders). A changebox takes the form of a fixed duration meeting lasting three to seven hours, with the obligatory requirement to deliver the promise made at the start of the meeting by the end of the same meeting. The deliverable could be a collaborative project definition, planning or follow-up tool, specific parts of the process, some sets of roles and responsibilities, a corporate policy for LPM, mini-guides, etc. One changebox, one deliverable! This deliverable is tested as a prototype by the team members on their own projects for a couple of weeks. Then we initiate a new changebox. The first part of it is used to adjust the previous deliverable for organisation-wide adoption; the second part to produce a new deliverable (promise) by the end of the meeting. The development/prototype implementation/adoption cycle is repeated again and again until the team members decide they do not want any more changes...for now! These same people who develop-implement-adopt are the ones who decide how, when and how much they want to change, based on their individual will to change. We do it this way because, in matters of behaviours (which are intimately linked to individual value and belief systems), nobody else can decide for you, when, how and how much you will change.

Hal Macomber writes that, to adopt successful LPM, it “takes the determined unwavering examples of leaders”¹⁶. I agree: it is a question of leadership, of behavioural leadership in fact, and at two different levels:

1. upper management must demonstrate “trust” leadership in empowering the ultimate Last Planner ®, the LPM process users, to decide what will be implemented and how, based on the participative diagnosis mentioned above, and
2. these users must demonstrate “desire to take individual and team responsibility” leadership for adopting successful LPM. They must lead through their collaborative will and decisions to develop together and adopt these practices and behaviours. They become key change agents for the implementation of the new LPM process.

LPM rule # 8: Use Lean Project Management (LPM) principles to implement AND adopt LPM. Live and use what you preach to implement it; by «walking the talk», you will succeed in increasing the speed and extend of LPM adoption and ensure a lasting and fruitful change.

¹⁶ <http://www.reformingprojectmanagement.com/2009/06/01/991/>

