Reforming Project Management
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Prelude:

The risks of finding and living in a new world are real. Columbus' choice was to take the Southern route where return was impossible but increased the chance of landing in a new world – a place with a new operating system. There is little doubt that construction is moving to a new world, but at least we can create the operating system.

Introduction:

In 1790, a speaker before Parliament predicted a 100-fold increase in the output per worker was possible. Following his declaration, The debate focussed on whether he was crazy or possessed – or both. He was of course wrong. The real increase in 70 years was closer to 200. We now call that the "Industrial Revolution" because it changed the way things were designed and made.

Today, we are in the midst of a second revolution in the way things are designed and made. Coupled with advances in computers and the web, this one will also result in tremendous change particularly in the way work is managed in design and construction.

LCI and results to date:

I am a co-founder of the Lean Construction Institute, an organization dedicated to Reforming Project management by adapting the production management principles, concepts & techniques drawn from Lean manufacturing to construction projects. Results so far -

Organizations working with LCI:

> Reduction of project cost and duration of 30%. And then by 20%
>
> Reduction in the cost of foundations from 10% to 80%
>
> Reduced duration 30%, Accidents 50% and increased predictability against budget to 95%

Some of this change will b driven by leading companies, others

> Owners applying lean in their operations and demanding similar performance in facilities– Ford.
>
> Suppliers – Cold springs granite
>
> Even the US Government – The DOD on the renovation of the Pentagon.

So while we are beginning to see results, I share the same risk as that speaker 210 years back. But I think I can avoid either label, or at least crazy, by explaining the mechanisms that will cause this next transformation. Then you can take the steps to apply them and support our efforts to avoid the stake or asylum. Some of what I say will be on the strange side, certainly counter-intuitive, while other parts will appear obvious – in essence I am going to argue we need a new operating system for managing projects.

(I understand calls for new operating systems aren't best thing to do around here but I mean this to be metaphor for how projects are managed.)

Defining the situation:

But first I want to make certain we all understand the nature of the project management problem, the context. (use flip chart with scales for each.)

Complexity

Uncertainty

Speed

Customer satisfaction – which one – the initial one or the one at the end of the project?

A claim

I believe the way we manage projects today – kills too many people, costs too much, takes too long, and leaves dissatisfied customers. This system even web enabled – design/build & partnered, is inadequate to assure success on these projects because the it,

> Rests on an incomplete understanding of work and its improvement

> Deficient concept of control that itself causes

>> Uncertainty and risk

>> Sub-optimal performance.

How do we manage projects today?

> Break them in pieces, estimate, sequence, NTP

> Control by tracking

> Optimize by improving each activity

> Shorten duration by increasing speed or changing logic

> Reduce cost by increasing productivity.

All this in the apparent belief that you get the lowest cost and greatest speed for each piece and you get the lowest cost fastest project – right?

Of course not – we all know that the dependence between the pieces is not simple and sequential. Modeling projects as a sequential related series of otherwise independent activities hides real and large opportunities for improvement – particularly on CUQ projects. And we can have real trouble when we apply techniques fit simple slow and certain projects.

I understand we do build these CUQ projects and many are successful – half would be better than average. I believe the average performance is too low and the range of outcomes to great because projects aren't really under control. Let me explain more of what I mean and how we got here with a brief history.

The history of project management

CPM introduced in late 50s. (It came with cautions about application in limited resource environments.) Call it Version 1.0

Over the years we have had upgrades – resource loading, cost schedule integration, cost loaded schedules, Version 1.1, 1.2, 1.3. Constructability, value engineering 1.4, 1.5 etc

Each has apparently strengthened the central control of projects by giving us greater ability to manage, indeed pressurize the people managing each activity.

By 1985 maybe version 1.12 or so, it became apparent that the system was in trouble. I contend the increasing ability to track and manage each piece inevitably lead to adversarial battles as each manager tried to optimize their activity.

The problems, the results were not blamed on the operating system but on whoever wasn't in the room and/or lawyers even if they were. A patch was required.

Partnering was one logical answer – it proposed that everyone could gain more by cooperating than fighting. And to a great extent this was true. At its heart, partnering asked participants to work for success at the project level and promises more in return at the activity level. Partnering tried to shift our attention to the larger system and the delivery to the client. Communications and Trust were key words. Unfortunately, it didn't change the underlying operating system, the way work is done. It was a patch.

Design-Build recognizes the same imperative – "Don't sub-optimize the project by optimizing any one function." And it offers contracting approaches that support this objective by giving one person total system responsibility. Equally important it reduced the distance between those who knew "how" and those defining "what." But again, it hasn't changed the underlying system.

Partnering tried to solve the problem by building relationships and trust - Because people believe bad relationships causes bad projects.

DB worked to redefine organizations and contracts – because people believe bad allocation of risk, responsibility and reward causes bad projects.

Who can argue with any of these approaches and their underlying cause and effect models? We don't. These movements aren't wrong – in fact they are trying to send us important messages about the management of projects. The problem is they don't change the underlying operating system, under their cause & effect models, we don't recognize the key weaknesses in project management itself –

>The failure to manage production in ways that optimize at the largest level.

>The impact of controls on variation in workflow, and

>The way these factors combine to cause sub-optimal performance at the project level.

We think it is time for a new operating system. Version 2.0. This system includes explicit consideration of production management. And the best thinking in this area can be described as "Lean".

What is lean?

History of term – not craft or mass

Ideal for the design of the delivery system – Custom product, delivered instantly with no waste.

Focus on what matters – creating and delivering value to clients and reducing the waste in making.

Describe and discuss a key form of waste not recognized by current project mangement.

First key difference is lean attacks variation in workflow.

> Ohno stopping the line
>
> Traffic metaphor.
>
> Variation and system throughput
>
> Current practices focus on speed with no concern for variation

Reducing variation

Lean attacks variation in workflow by first improving planning at the assignment level.

Experience on projects 50% PPC

Redefine control as making things happen. You are under control when you can do what you say you are going to do. (I won't trust you long, no matter what I say in the meetings unless you are reliable.)

Under lean we can drive that above 75% with

> resulting improvements in immediate productivity,
>
> downstream activities can be moved closer, managed more easily.
>
> JIT becomes possible if the flow of work at the task level is predictable.

If you missed the strange idea here, it is that we can increase reliability by how we manage the planning system – even on the most CUQ projects. We do this by making certain our planning system doesn't let a defective task assignment into the flow of work. Just as Ohno stopped the line.

Lots of people claim to do this now, but the real test question is, "How do you measure the performance of your planning system? Is it under control, that is does it do what it pretends?

Turn it on its head. How can you be certain your project is in control if your planning and control systems themselves are not?

Difference between us an current practice is the sequence –

> "speedy and reliable"

"reliable and then speedy" (if you have ever taught a child to drive you understand this sequence of development.)

Reliability and beyond

Once you understand the central importance of reliability in the larger system, the nature of design and supply change.

Learn to design projects to support reliable flow – simultaneous design of product and process.

Develop supply chains so they can respond within the window of reliability of the lookahead process – typically 6 weeks. Moves items off CPM, leads to JIT – but you have to know what time it is.

Apply pull – this means not doing things until it is needed to release work needed to meet project objectives. This allows deferred commitment in design. (I hear the contractors looking for a stake and gathering sticks) but we have strong evidence that the current point based design approach causes rework and waste because of its rush to get construction started.

Lci is working to better understand when and how to apply a set based approach that keeps alternatives open.

What is the role of the web in all this?

Transparency is a principle of lean. The idea is to give everyone involved information about the state of the delivery system so they can align their decisions with global success. Imagine being able to check on the available capacity and response time of specific building components during design. But transparency carries means distributed decision making.

Essential features of lean construction -
- ◆ Production system designed to an ideal that creates and delivers value to customers with CUQ projects,
- ◆ Uses a forward looking control systems to reduce variation and avoid sub-optimization
- ◆ Simultaneously designs product and process
- ◆ A delivery system that understands value, flow, pull and transparency.

The Situation Today

There is a revolution happening. It will happen in construction because

owners using lean in their operations will require new levels of performance from their facilities groups, and

subcontractors & suppliers who serve construction will give better service and prices to those organizations that allow them to better use their capacity.

It is going to happen and it will require and cause real change - innovations in the management of production in the project setting.

Partnering builds better relationships but doesn't change the way work is done.

DB changes contracts but doesn't change the way work is done

The web offers great communication but its impact will be limited if it simply automates the existing processes.

The innovations we need will build on these movements and what they tell us. And as in manufacturing these innovations will cause real dislocations. Early adopters and rapid learners will hold the edge as projects creep ever more to the right.

What can you do?

Learn more about Lean and its application in construction. Reader on the web page, Read books & articles, Attend a seminar.

Talk to successful practitioners – they can put you on to owners.

♦ Neenan

♦ Linbeck

♦ Southland Mechanical

♦ Emcor companies - Gowan Mechanical and Trautmann & Shreve

♦ N.L Barnes construction

♦ Oscar J. Boldt
Some new guys
♦ FD infrastructure

♦ DPR

♦ Walbridge Aldinger

Join LCI and support and participate in action research to complete a lean based project delivery system.

♦ We know we have the planning and control system in hand.

♦ Trying to learn more about how to structure work to support the lean ideal

♦ Deep into rethinking the design process.

Thank you

GAH