Responsibility-based Project Delivery

Managing design on a lean basis results in more value for your client and less rework and more satisfaction for the design team

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LEAN JUST WORKS

Lean thinking has shown great results for the construction industry. Projects are much better coordinated. They routinely come in on time or early and at or below budget. And, the safest projects turn out to be lean projects.

There is a similar opportunity for the design professions. With all the specialized expertise required to do anything but the simplest of projects, design work has become very tough to coordinate, complete on time, satisfy the client and make a profit in the process. On top of that, design team members express frustration and dissatisfaction with their work.

Lean thinking works for all aspects of project work. Responsibility-based Project Delivery™ is the path to lean design delivery.

Lean Project Consulting

Transforming the experience
of project work
from frustration and conflict
to trust and mutual respect.

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A Call to Action

Lean thinking has permeated the design and construction industry. Integrated Project Delivery (IPD) sprung to provide a framework for carrying out the big ideas that have been embraced by leading owners, designers and builders which are now requirements in IPD agreements. The Five Big Ideas are:

- Collaborate, <u>really</u> collaborate

- Optimize the whole, not the parts

- Tightly couple learning with action

- Conduct the project as a network of commitments

- Increase the relatedness of the project participants

The old ways of managing design work just doesn't support the above ideas. Builders need to participate in the design process as collaborators and co-designers. Optimizing the whole is as much about exploring alternatives – historically called "studies" by architects – as it is about understanding construction requirements and costs. The tight coupling of learning with everyday actions looks impractical in the overworked and overwhelmed situation on many projects. Managing the project in conversations is counter to the conventional wisdom that people must follow "baseline" schedules. And, building relationships intentionally looks like the nice to do airy-fairy stuff...don't we have real work to do?

Bringing these ideas to everyday behaviors and routines is the challenge and the opportunity. This paper focuses on how the ideas are can be carried out in the planning and managing of the everyday work of design.

We've come to expect changes throughout design. Owners change their minds. Designers come up with better ideas. Detailers don't get the designers' ideas quite right. Oh, did I mention owners change their minds?

Positive iterations are good for the project. Negative iterations take time, cost money and produce rework. Some of that rework may not be identified until the building is underway.

One of the lessons of RbPD and Target Value Design is that we want to do work in small batches with a clear intent to **finish** what is started. When design team members work on many fronts, they can get out of sequence with each other. This causes rework when the ductwork trunk line is laid out before cross bracing. Sure, BIM allows us to find those clashes. It's better that we don't have them in the first place.

Limiting WIP and delivering in short cycles minimizes design waste.

Design Project Work Is Unlike All other Project Work

Design of the built environment is iterative, incremental and emergent. Positive iterations – where designers learn with their clients – lead to more experienced value in the project. Negative iterations – where errors lead to rework, delay and additional costs – result in less value for the client and often costs for the designers. Working to firm schedules – where we try to have project reality conform to some predetermined view of the future – ignores the learning and innovation of the project team.

Design work is also abstract. By that we mean that the physical work product is merely an artifact of the actions of design. Bubble diagrams and rough sketches are instrumental in advancing the understanding of what the client's needs and concerns are. These documents are mere tools. The magic happens in the conversations. Even the work of engineering is more abstract than it is concrete. Whether they are developing specifications, doing code reviews or evaluating the advantages among a set of alternatives, the recording of that work in a document is incidental to the effort in the whole process.

We've Tried This Before

A number of design firms were familiar with the lean construction approach to planning and managing projects. It's known as the Last Planner® System (LPS). It is a planning approach for conducting planning as five linked conversations. These are conversations with the people who are ultimately responsible for managing the assignment of or performing the project work tasks. Those people are called "last planners" in construction. They get their name from having the last chance to plan the work at the moment that they assign the work to a person or a crew. The consideration last planners give while making the assignment we call planning.

Unlike common industry practice, the detail in LPS plans are developed while the project is underway. Early planning is at the level of milestones and phases. As the last planners are brought on the project, more detail is added in collaborative planning sessions that continue throughout the project.

Design project managers can't create the project plans and schedules that will support the pursuit of lean design. Asking those project managers to do more of what we've been doing doesn't work. Design teams are collectively smarter than their leaders; as design specialists they know their work and their requirements better than their leaders do; and design team members are in the best position to plan the project. It's time to embrace a collaborative commitment-based approach to design projects. Responsibility-based Project Delivery™ (RbPD) is that approach.

RbPD Explained

In 2007, Lean Project Consulting worked with a large design firm to come up with a lean approach to managing their work. The firm had been successful using the Last Planner System in their construction management assignments so they tried LPS in the design work. In spite of very good efforts on their part and some outside help, their teams rejected LPS.

The following questions and answers sheds light on where RbPD came from and how it works.

Why a new approach for design work?

We recognized that design teams were not succeeding with the LPS. For quite some time we saw the difference between design and construction, particularly the difference in the nature of the work. Design brings something from nothing, where construction puts something in place. RbPD was created based on the nature of design work.

"It's hard not to reach out, (RbPD) is such an unusual and human process....it promotes connectiveness."

- structural engineer at top-10 firm

What do we mean by an agile adaptation of the Last Planner System?

We went back to the some of the starting documents of the agile software development movement to reconsider the nature of doing design work. We decided to get first-hand experience with agile approaches by doing the project of creating RbPD using Scrum, an agile approach. We hired a certified scrum master to lead us in our project to develop RbPD and we had an architect on our staff become a certified scrum master.

Why did we look at software development?

Developing software is abstract work just like architecture and engineering. Like A&E, it is also multidisciplinary work. Good software programs involve user interface designers, database designers, communications engineers, system level architects and people who write the software code. Their challenges in keeping their work in synchronization with each other and avoiding rework are as challenging as coordinating design in the building design and construction industry. Curiously, in the last four years, the agile software community has been embracing lean ideas. They particularly like single-piece flow, limited work-in-process and short planning intervals.

What principles is RbPD based on?

PDSA Everything
There is no better starting point to create any lean practice than the heart of the Toyota Production System as taught to Toyota by Dr. W. Edwards Deming. Plan-Do-Study-Act (also known as Plan-Do-Check-Act) is the virtuous cycle that brings the scientific method to life in day-to-day work.

Let Learning Lead
Lean has been characterized as an approach for driving out waste. We think that falls short of what is really going on at Toyota. When you examine the practices of the best companies across all

PROJECT CONTROL THAT WORKS!

I used to understand project controls back before I really got into Lean Project Delivery (15 years ago). The idea of through-the-rear-view-mirror schedule and cost reviews seemed to help managers keep projects on track . Given the complexity of design and construction projects, the old approach is too little & too late.

We need an approach that provides "steering" to a project incorporating the best knowledge we have at every point. While people have tried that with real-time reporting systems, the costs are prohibitive and the tools are only as good as the team is at keeping the data current.

Lean projects take a different approach. By including all the performers in the planning conversations, the project now has 10x, 20x or 30x the number of eyes on how things are going in the moment. Planner-doers are in position to make small corrections as they see differences in their planning assumptions resulting in a project that stays closer to plan.

- Hal Macomber

industries, the majority point to a key intention to learn while doing work.

Respect for People
Called a pillar of The Toyota Way, respecting people, particularly the distinctiveness of their experience, perspective, expertise and autonomy brings out the best in the work we do.

Embrace Uncertainty
Not only is the future uncertain, but it is unknowable. Take an approach that recognizes that rather than one that is based on determining a fixed future.

Make Collaboration the Rule
Great work is produced by groups of people. It is cliché to say that two minds are better than one, but true. Yet, collaboration in most environments is the exception, not the rule.

Engage for Autonomic Actions
Project control, as in thermostatic control, has proven itself inadequate for projects of all types. Projects are said to be in control when the desired outcomes are realized. Rather than separate control from other project work, take a lesson from biology (and from Toyota), tap every member of the project team to help steer the project towards the desired outcomes. This is done through engaging the whole team in planning the project and their work on the project.

Self-Organize
The fundamental nature of a project is as a temporary organization. People come together from a variety of organizations, companies and cultures to assemble as a team. That team is disbanded at the end of the project. Let those who know the work and the people best determine how the project is to be organized and, perhaps, reorganized as the project unfolds.

One of the most effective practices we introduce to teams is the daily stand-up meeting for managing commitments. We often get tremendous push-back. "Death by meeting," people shout. Invariably, someone tries negotiating with us wanting to have a twice-weekly session rather than daily. We hold our ground. The team is always glad we do.

Follow these guidelines and you'll make huddles part of your standard project practices.

1. Always start on time.

2. Stand. No food.

3. Time the meeting and announce the time at the end.

4. Ask, "What promise are working on? Will you complete on time? Do you need help? What is your next promise?"

5. Block 30 minutes using the last 15 minutes for ad hoc coordination among team members.

6. Finish with a +Δ .

What is retained from the Last Planner System?

RbPD uses pull planning at the project level and the milestone level. It also uses daily stand-up meetings – check-in sessions – for making and managing commitments. And, it maintains the structure of *should – can – will – did* planning.

What are the RbPD practices?

Pull Planning
This is conducted in the same way as the LPS. Teams plan the whole project as well as the design cycle details of the project.

Design Cycle Planning
Conducted as workstreams and for completing something recognizable...a whole system or subsystem, rather than a design discipline-driven batch of work.

Daily Commitment Management
The daily check-in where the team spends less than 15 minutes announcing the work that was completed, the work that will be completed, any constraints that need to be relieved, and other help needed.

Retrospectives
These take various forms from the casual +Δ at the end of a meeting to the well-facilitated after-action review at the end of a design cycle or milestone. Teams are encouraged to call for a retrospective at any moment they think there is something to learn that the team can benefit from.

Why the new names "steward" and "chief designer"?

The agile approach uses the term "scrum master" and "product owner" as roles for taking care of the project team and leading design. In practice those people have a servant leadership role. We adopted more descriptive terms – *steward* – to convey explicitly the key promise that person makes to others...that of taking care of their well-being and *chief designer* for managing the process that

WHAT TO DO WITH PROJECT MANAGERS

Both the design community and the Agile Software community have struggled with the role of project managers in this new way of working. Some people took the radical action of cutting PMs out altogether. Others redefined their responsibilities to coaching the team. The fact remains that complicated projects require management beyond which a steward and chief designer can provide.

Some companies have the PM play the role of chief designer. It works when the PM is really competent as the head of design. It doesn't work when design responsibilities crowd out other work.

What do we need from a PM?

- A working time, cost and task collection system

- Clear authorization for people to work on the project

- Coupling of team goals with the strategy of the firm

- On-going assessments of project performance

results in an integral whole. It is important that these roles are filled by two different people. When one person attempts to take on both roles, it significantly dilutes the effectiveness of the entire process.

One aspect of taking care has to do with commitment-making and fulfilling. As is with the LPS, RbPD is an approach that creates the reliable completion of work assignments to the satisfaction of the customers. The steward tends to the ongoing practices to help that along.

The *chief designer* inherits its name from the Toyota role *shusa*. This most-respected leader is responsible for the overall integrity of the design goals and the congruence of the design solution. The individual acts as both designer and customer of the design team. This contrasts with the "star architect" role found in many high-profile architecture firms.

What happened to the project manager in RbPD?

Project managers in design organizations are a recent phenomenon. Previously, design firms had lead engineers, project architects and job captains. People who studied engineering and architecture didn't have a project management background. The project architect was responsible for the coordination with the owner and sub-consultants. The job captain coordinated the work of the design professionals.

There are responsibilities that must be addressed that project managers have been performing, specifically budgeting and reporting. These responsibilities can be taken up by a team member. In practice, design project managers usually take on the role of the chief designer.

How do we track work?

RbPD uses a work register. It is a listing of the work products the team has agreed to produce to satisfy an up-coming milestone. The

PROMISE-BASED MANAGEMENT

In 1986, Fernando Flores introduced the business community to the work of two unknown philosophers, John Austin and John Searle. In the early '50s Austin was a guest lecturer at Harvard. His lectures were eventually published as a book titled *How to Do Things with Words.* That work later became known as the language-action perspective. At the center of Flores work is the request-promise cycle that he called "workflow".

Eventually, LAP made it to the main stream via the work of Donald Sull in his many papers published by Harvard Business Review and Sloan Management Sull renamed "workflow" promise-based management.

In parallel, LPC was developing a new understanding of projects as commitment-based endeavors presenting 5 papers at the International Group for Lean Construction. In 2002 we introduced "reliable promising" as one of the key capabilities of all successful projects.

work register is organized by design cycles lasting from 1 to 3 weeks, although a 2-week window has become common. The work register represents the backlog of work that the team has promised to be complete by the end of the cycle.

The work register incorporates the practice of identifying and resolving constraints to the work products. The work register is updated at the daily check-in. Progress is depicted on a cumulative flow diagram (CFD).

What is the benefit to the team of cumulative flow diagrams? Do we really need a new graphical approach?

CFDs were popularized by David Anderson in his book *Agile Management*. The chart starts by depicting the backlog of work products that the team has committed to accomplish in the design cycle. As a work product is started its state is depicted as "in-process." When it completes the state changes to "complete." New items arising during the cycle are added along with items that have constraints. The chart quickly shows the status of the project.

Is RbPD a promise-based approach? Why not call it that? What is intended by a responsibility-based approach?

It certainly is a commitment-based approach. In fact, it goes a step further embracing the autonomy of the professional staff.

RbPD diverges from LPS by leaving behind the practice of making assignments. Instead, individual performers are included in planning sessions and are asked to make commitments for the work they will perform.

We call it a responsibility-based approach in recognition of the opportunity that each person has in shaping the outcome of others' work in addition to their own work. While individuals independently and with full autonomy make accept the

RELIABLE PROMISING

Increasing reliability is the first action needed to stabilize projects. Promising reliably has become the foundation of lean in the project setting.

Reliable promises have 5 elements and another 5 characteristics.

Elements:

1. Customer

2. Performer

3. Conditions of Satisfaction

4. Completion time

5. Future action

Characteristics:

1. Mutually understood Conditions of Satisfaction

2. Estimate of the effort to complete

3. Allocation of time to perform

4. Sincerity to fulfill

5. Responsibility to the customer that you'll make good should anything go awry

responsibility for the work and make commitments, they are in a position to support the commitment fulfilling of the whole team.

Does RbPD rely on last planners? How?

Every designer and team member is a last planner in the sense used by LPS. They are included in the planning of the project and the design cycle. Individual performers identify constraints, make commitments and offer help to other members of the team.

RbPD Outcomes

Responsibility-based Project Delivery has been used in a variety of design projects ranging from a small hospital addition to a multi-phase electronics factory. Somewhere in between, projects have been completed for a university science building, a medical office building, solar manufacturing plants for two clients and a green field $100 million hospital.

Results have all been in the same direction. Overall, projects have been far more reliable in the completion of the design work. Milestones are met; budgets are met; clients are satisfied; and the teams report more satisfaction in participating on the projects.

When RbPD is coupled with other lean design practices the results are amplified. One hospital project showed a greater than 90% reduction in the usual number of RFIs. One solar manufacturing project sailed through schematic design with a solution that was less than the client's budget. In general, when RbPD is coupled with the balance of the Target Value Design practices and Integrated Project Delivery, projects are much less risky for everyone involved. As one large hospital executive put it, "We won't do projects any other way."

Getting Started

The best way to start is by getting the help of someone who has done it before. Both roles of steward and chief of design are different enough from common practice that you will need help to play them effectively. There is a lot to learn for you and the team. Pull planning the work in design cycles – working from back to front – is counter intuitive for many people. Having a daily coordination meeting for 15 minutes or less is a habit that takes time to produce and to appreciate. Retrospectives, both the very short +Δ, and the more involved facilitated frequent lessons learned, take some time for people to participate fully.

While we intend to produce a RbPD handbook, there isn't one today. Instead, we offer a two-day workshop for stewards and chiefs of design. Contact us to schedule one for your organization or project team.

"Schematic design finished 3 days early and at a higher level of completeness than the client had ever seen before."

- Project Executive for top-10 firm

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