Key Take-Aways:
1. Good teams follow operational norms (see Google study)
2. A team of all “A-players” does not mean you’ll automatically get a high performing team
3. Pendulum can swing by 40% between high performing and standard/below standard team

Follow up Links:
1. Bill Seed – New Project Manager: https://iglcstorage.blob.core.windows.net/papers/attachment-a5bdd89c-9588-4a46-82e6-d5308a7e34de.pdf
2. Google Study: https://rework.withgoogle.com/print/guides/5721312655835136/
3. 5 Traits of Successful Teams found through Google Study: https://www.inc.com/michael-schneider/google-thought-they-knew-how-to-create-the-perfect.html?cid=email
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<thead>
<tr>
<th>Date</th>
<th>Event Title</th>
<th>Event Type</th>
<th>Time (Note 1)</th>
<th>Location (Note 2)</th>
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<tr>
<td>1/18/2018</td>
<td>2018 Kick-off</td>
<td>Happy Hour</td>
<td>4:30 – 6:30 pm</td>
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<tr>
<td>2/13/2018</td>
<td>Coffee – Conditions of Satisfaction</td>
<td>Coffee</td>
<td>8:00 – 9:00 am</td>
<td>Torchy’s</td>
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<tr>
<td>2/22/2018</td>
<td>Lunch – Building High Performing Teams</td>
<td>Lunch</td>
<td>11:30 am – 1:00 pm</td>
<td>Fibercove</td>
</tr>
<tr>
<td>3/13/2018</td>
<td>Coffee – Teams &amp; Teamwork</td>
<td>Coffee</td>
<td>8:00 – 9:00 am</td>
<td>Torchy’s</td>
</tr>
<tr>
<td>3/21/2018</td>
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<td>Lunch</td>
<td>11:30 am – 1:00 pm</td>
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<tr>
<td>5/8/2018</td>
<td>Lunch – A3 Thinking</td>
<td>Lunch</td>
<td>11:30 am – 1:00 pm</td>
<td>Fibercove</td>
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<tr>
<td>5/17/2018</td>
<td>Multi-tasking Simulation</td>
<td>Lunch</td>
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<td>Fibercove</td>
</tr>
<tr>
<td>6/14/2018</td>
<td>Big Room</td>
<td>Full Day</td>
<td>8:00 am – 4:00 pm</td>
<td>THA</td>
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<tr>
<td>7/10/2018</td>
<td>Big Room</td>
<td>Coffee</td>
<td>8:00 am – 9:00 am</td>
<td>Torchy’s</td>
</tr>
<tr>
<td>7/19/2018</td>
<td>Big Room @ Jobsite</td>
<td>Gemba</td>
<td>11:00 am – 1:00 pm</td>
<td>22nd &amp; Nueces</td>
</tr>
<tr>
<td>8/14/2018</td>
<td>Eliminating Waste</td>
<td>Coffee</td>
<td>8:00 am – 9:00 am</td>
<td>Torchy’s</td>
</tr>
<tr>
<td>8/23/2018</td>
<td>Choosing By Advantages</td>
<td>Lunch</td>
<td>11:15 am – 1:00 pm</td>
<td>Fibercove</td>
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<tr>
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<td>Choosing By Advantages</td>
<td>Coffee</td>
<td>8:00 am – 9:00 am</td>
<td>Torchy’s</td>
</tr>
<tr>
<td>9/20/2018</td>
<td>Last Planner Workshop</td>
<td>Full Day</td>
<td>8:00 am – 4:00 pm</td>
<td>THA</td>
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<tr>
<td>10/9/2018</td>
<td>Last Planner</td>
<td>Coffee</td>
<td>8:00 am – 9:00 am</td>
<td>Torchy’s</td>
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<tr>
<td>10/18/2018</td>
<td>Target Value Delivery</td>
<td>Lunch</td>
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<td>Fibercove</td>
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<td>11/13/2018</td>
<td>Target Value Delivery</td>
<td>Lunch</td>
<td>8:00 am – 9:00 am</td>
<td>Torchy’s</td>
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<tr>
<td>11/22/2018</td>
<td>Turn-over / Close-out Using Lean Principles</td>
<td>Lunch</td>
<td>11:30 am – 1:00 pm</td>
<td>Fibercove</td>
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<tr>
<td>12/11/2018</td>
<td>2018 Recap</td>
<td>Coffee</td>
<td>8:00 am – 9:00 am</td>
<td>Torchy’s</td>
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<tr>
<td>12/20/2018</td>
<td>Continuous Improvement Using Metrics</td>
<td>Lunch</td>
<td>11:15 am – 1:00 pm</td>
<td>Fibercove</td>
</tr>
</tbody>
</table>

**Note 1** – Not all times and dates are final. Please refer to Austin LCI CoP website (https://www.leanconstruction.org/local-communities/austin/)

**Note 2** – Location addresses are included below:

<table>
<thead>
<tr>
<th>Venue</th>
<th>Address</th>
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<tbody>
<tr>
<td>Cover 3</td>
<td>2700 W Anderson Ln #202, Austin, TX 78757</td>
</tr>
<tr>
<td>Torchy’s</td>
<td>1822 S Congress Ave, Austin, TX 78704</td>
</tr>
<tr>
<td>Fibercove</td>
<td>1700 S Lamar Blvd #338, Austin, TX 78704</td>
</tr>
<tr>
<td>Texas Hospital Association (THA)</td>
<td>1108 Lavaca St # 700, Austin, TX 78701</td>
</tr>
</tbody>
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**Definitions:**

A3 – A one-page report prepared on a single 11 x 17 sheet of paper that adheres to the discipline of PDCA thinking as applied to collaborative problem solving, strategy development or reporting. The A3 includes the background, problem statement, analysis, proposed actions, and the expected results.

Big Room – An approach used to facilitate Lean principles in design and construction. It is a space that physically brings together designers, builders and facility operators to work collaboratively. An effective Big Rom also supports cross-functional team collaboration by advancing work and bringing teams involved on a project up to speed on the activities of other groups or individuals.
Choosing by Advantages (CBA) – CBA is a tested and effective sound decision-making system developed by Jim Suhr (1999) for determining the best decision by looking at the advantages of each option. CBA’s five phases of decision-making:

1. Stage-setting: establish the purpose and context for the decision;
2. Innovation: formulate an adequate set of alternatives;
3. Decision-making: choose the alternative with the greatest total importance of advantages;
4. Reconsideration: change the decision if it should be changed or improved on;
5. Implementation: make the decision happen, adjust as needed, and evaluate the process and results.

Gemba – The Japanese term for where value is added or where the work takes place. Lean experts encourage “going to the gemba” to see how things are really done and where there is opportunity to eliminate or reduce waste.

Integrated Project Delivery – A project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of the project, from early design through project handover.

Last Planner® – The person or group that makes assignments to direct workers. Project Architect and ‘discipline lead’ are common names for last planners in design processes. ‘Superintendent’ or ‘foremen’ are common names for last planners in construction processes.

Last Planner® System (LPS) – System for project production planning and control, aimed at creating a workflow that achieves reliable execution, developed by Glenn Ballard and Greg Howell, with documentation by Ballard in 2000. LPS is the collaborative, commitment-based planning system that integrates should-can-will-did planning: pull planning, make-ready look-ahead planning with constraint analysis, weekly work planning based upon reliable promises, and learning based upon analysis of PPC and Reasons for Variance.

Lean – Culture of respect and continuous improvement aimed at creating value for the customer by identifying and eliminating waste.

Target Value Delivery – A disciplined management practice to be used throughout the project to assure that the facility meets the operational needs and values of the users, is delivered within the allowable budget, and promotes innovation throughout the process to increase value and eliminate waste (time, money, human effort.)

Notes
SAVE THE DATE

MAY 30-31, 2018 • CHICAGO, IL

LEAN IN DESIGN FORUM

WYNDHAM GRAND CHICAGO RIVERFRONT
71 East Wacker Drive | Chicago, Illinois 60601

www.leanconstruction.org
20th LCI Congress
OCTOBER 15-19, 2018
Orlando, Florida
Last Planner® System immersive learning

Lean Construction Immersive Education Program coming in spring, 2018
New Last Planner® System e-learning will offer:

- **On-demand** learning you can do on a desktop, tablet or mobile device
- **Small batch** learning to increase retention
- **Personalized** learning that appeals to various learning styles
- **Knowledge checks** along the way to benchmark your learning

Questions?
Contract Kristin Hill, khill@leanconstruction.org

Photo by Skiles Group
Building High Performing Teams

Relevate
Lean Construction Consulting

www.relevatewith.us
Learning Objectives

At the end of the this course, participants will be able to:

1. Understand the importance of high performing teams on construction projects. Participants shall understand the construction industry and academic data that supports making an investment in high performing teams. Students will understand that implementing lean principles such as last planner and changing incentives within contracts are important but will not yield the benefits that are possible without an effort to build a high performing team.

2. Understand the benefits of a high performing team. Participants will learn the four major benefits of a high performing team (improved decision making, problem solving, collaboration, and commitment) and how they apply to construction projects.

3. How to build a high performing team. Participants will understand that building a high performing team takes an investment in time. They will also understand the key factors in building a high performing team based on academic and industry research and will learn some steps to take to achieve those factors.

4. Understand the basics of building a network of multiple teams. Participants will understand industry (outside of the construction industry) best practice for building a “Team of Teams” and some practical steps construction teams can take that align with the practice.
Agenda

• Why construction needs to focus on high performing teams
• The benefits of high performing teams
• What high performing teams do
• How to build high performing teams
• Leading high performing teams
• Team of Teams
UK Study of Construction Industry

“The Construction Industry is ineffective, adversarial, fragmented, and incapable of delivering value to its customers.”
Only 2.5% of projects are considered “successful” (scope, schedule, cost, business) – PricewaterhouseCoopers 2009

24% growth in Owner’s indirect construction costs since 1995 (net of inflation AND escalation) – CII Performance Assessment Committee 2015

Only 30% of projects finish within 10% of original cost and schedule – CII Performance Assessment Committee 2015
Proven Solution To Increase Odds of Success On ANY Project:

Hire Experts

(High Performing Individuals & Teams That Actually Know How To Create Value & Mitigate Risk)
Only One Small Problem...
(or three)
The SPEED Of TRUST
THE ONE THING THAT CHANGES EVERYTHING

STEPHEN M.R. COVEY
with REBECCA R. MERRILL

FOREWORD BY STEPHEN R. COVEY
AUTHOR OF The 7 HABITS of HIGHLY EFFECTIVE PEOPLE
A team IS NOT a group of people that work together.

A team IS a group of people that trust each other
“Although a single twig will break, a bunch of twigs is strong.”

-Tecumseh
Not Convinced? Try implementing BIM on a “team” that doesn’t trust each other.
Bottom Line

Construction does not invest in building trust and teams and the results reflect it
BENEFITS
Why do I need to go see a hospital in Temecula?
Sutter Health 5 Big Ideas

Collaborate, Really Collaborate

Improves:
1. Decision Making
2. Risk Taking
3. Commitment

Increase Relatedness

Network of Commitments

Optimize the Project, not the pieces

Tightly couple learning with action
The Palomares Incident

Group Think is Good
Psychological Safety Leads to Improved Risk Taking
Rosabeth Kanter
Harvard Business School

• Continuance Commitment: Survival of the Group is Important to My Survival

• Cohesion Commitment: I Agree With the Goals of the Organization and Relate to Them

• Control Commitment
YOU REAP
WHAT
YOU SOW
What High Performing Teams Do
Be On Time

Or meet my new friend...
Seamus Heaney
Everyone Gets to Talk
We learn **BEST**

when we learn **TOGETHER**.

- Seth Godin
TIME TO PLAN
Rotate Who Leads the Meeting
Building a High Performing Team
Step 1

Practice
Practice
Practice
Practice
Practice
Take the time to align on mission, **goals** (Conditions of Satisfaction) success indicators, decision making, escalation, communication, meeting times, lunch menu, safety performance, meeting frequency (more is better), leader responsibilities, etc.
Learn to Care for Each Other
Allow the Team to Self-Organize

It is a real life thing. I have seen it
Leading High Performing Teams
Leaders not Required
Facilitative Leadership
Basic Principles

- Share ALL valid and relevant information
- Explain Reasoning and Intent
- Empathy
- In general, talk less and listen more
Where is Bob?
TEAM OF TEAMS
Everyone Needs to Know the Score
Transparency produces self-correcting behavior
The New Model

Support PITs
- Offsite Fabrication PIT
- Logistics PIT
- Schedule PIT
- LPS PIT
- Safety PIT
- Productivity PIT
- TTT PIT

PIT Level:
- Schedule/Scope/Budget/Safety

FA PIT 1
FA PIT 2
FA PIT 3
FA PIT 4
FA PIT 5
PLS PIT

Support PIT Level:
- Strategic Direction from PMT
- Support the FA PITS

PMT

PMT Level:
- Schedule issue resolution
- Budget issue resolution
- Appropriating new work
- Shared Risk/Reward

SMT

SMT Level:
- Supporting Overall program health

TTT PIT

Support PITs
OFFICE HOURS
MENTORING

- Motivation
- Advice
- Success
- Direction
- Coaching
- Support
- Goal
- Training
Learning Objectives

At the end of the this course, participants will be able to:

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This concludes The American Institute of Architects
Continuing Education Systems Course

Connor Butler
Managing Principal
602-561-0963
Connor.m.butler@relevatewith.us
Create Positive Cultural Norms
INTEGRATED PROJECT DELIVERY REQUIRES A NEW PROJECT MANAGER

William R. Seed

ABSTRACT

Universal Health Services, Inc. (UHS) is a $8 Billion for profit health care company, with over 230 hospitals in 37 states across the USA. UHS has completed over 40 Integrated Lean Project Delivery® (ILPD®) projects and has over 60 more in development or construction. These projects range from $2 Million to $150 Million, with an aggregate value in excess of $1 Billion. UHS’ lean journey began in 2007.

While attempting to replicate ILPD project success from one project to another, UHS has found that the traditionally trained Project Manager is not equipped to deal with the relationship-based nature of the delivery model. The desire for early involvement from the constructors and specialty trades and strong multi-disciplinary collaboration demands a new kind of leadership.

Architectural and construction Project Managers are well trained in tactical problem solving, critical path task management and technical building knowledge. ILPD comingles the design process with the build strategy planning from the earliest concepts to drive customer value. The process, involving more stakeholders in planning meetings, more cost and quality value decisions and the ever present desire for better, faster and cheaper outcomes, demands transformational change. This transformational change requires project leaders who possess group facilitation skills, organizational management skills, people assessment and change management skills, along with the tactical skills of the past.

UHS has attempted significant self-learning on numerous projects through Study Action Teams. These projects have engaged numerous consultants for more formal teaching in personal assessment and team building. UHS has developed an internal kick off agenda outlining topical training needs and attempt to engage the team throughout development. UHS continues to rely on outside consultants for strategic training.

UHS projects are quite successful in terms of traditional measurements. Over 97% of the ILPD projects have been delivered at or better than prediction for cost and schedule. Moreover, the project cost targets have ranged between 10% and 30% below similar project development costs. While these projects have dramatically reduced project conflicts, they continue to struggle to capture and transfer learning from one project to another, at least in part because team members change from one project to the next. As a result, the pace of performance improvement is not keeping up with the potential that should exist if each project were able to fully leverage the learning from each of the prior projects.

1 Project Integration Executive, Walt Disney Imagineering; formerly Staff Vice President, Design and Construction, Universal Health Services
2 Study Action Teams and their use to promote transformational change in support of Lean Project Delivery is discussed in Hill, et. al., 2007.
At least for the time being it is critical that an owner interested in improving their portfolio of projects take a strong, active leadership role in transforming the relationships and roles on projects to deliver better value for all stakeholders.

**KEYWORDS**
Integrated Project Manager, Transformational Change management, Organizational Management, Facilitation

**INTRODUCTION**

Universal Health Services, Inc. (UHS) is a $8 Billion for profit health care company with over 230 hospitals in 37 states across the USA. UHS has completed over 40 Integrated Lean Project Delivery (ILPD) projects and has over 60 more in development or construction. These projects range from $2 Million to $150 Million with an aggregate value in excess of $1 Billion. UHS’ lean journey began in 2007.

While attempting to replicate ILPD project success from one project to another, UHS has found that the traditionally trained Project Manager is not equipped to deal with the relationship-based nature of ILPD. The early involvement of constructors and specialty trades, and strong multi-disciplinary collaboration with designers, demands a new kind of leadership.

The ILPD Project Manager of the future must possess a broader skill set than the Project Manager (PM) of the past. A traditional PM was required to be technically knowledgeable about many aspects of the project (e.g., financial management; risk and legal assessments; negotiations; task delegation). That is no longer sufficient. An ILPD PM needs to add a strong portfolio of diverse leadership skills and the ability to manage in dynamic and shifting organizational structures. This manager must be able to function in a hierarchy, a multi-divisional structure, a matrix organization, and various market and network organizations.

Historically, an architectural PM functions as the leader during project development (pre-permit phase) and then hands off the leadership position to the building team PM (post-permit phase). On an ILPD project, this type of rigid division is unworkable and short sighted. With the build team joining the design team at project concept stage, each of these individuals needs to participate as active leaders throughout the project. In addition, leadership responsibilities typically extend beyond the Architect and General Contractor (GC) as the number of firms signing the contract increases. Most Integrated Forms of Agreement (IFOA) speak to this leadership group as the “Core Group” or Management Team. This management team must be prepared to overcome the five dysfunctions defined in Five Dysfunctions of a Team, by Patrick Lencioni, as depicted below. If done correctly, a properly functioning Management Team creates a highly sustainable leadership model, far less susceptible to personnel turnover. In addition, it offers tremendous opportunities for personal growth, creates great friendships and leads to outstanding performance outcomes.

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3 The Integrated Form of Agreement or IFOA was originally developed by Sutter Health and became the foundation for the ConsensusDoc 300. UHS has used the CD 300 as the basis for its ILPD projects.
The individual PM that participates on this Management Team needs strong collaboration and facilitation skills, a strong strategic visionary capability and a clear understanding of how to affect transformational change. In UHS’ experience the most successful project will have a highly active, seasoned leader from the Owner’s side of the team as champion of this Management Team.

Figure 5 can help assess the Management Team and identify skills needed to improve team competency. This paper will use the label “Integrated Project Manager” (IPM) to define a role that most likely will be filled by multiple individuals on the project team, not one individual, as might be the traditional role. In the ILPD context the IPM is typically one of five to seven individuals, usually a primary leader from each of the signatory partners to the IFOA. Other individuals will take on a similar role from time to time, as their area of expertise becomes the hot topic. The characteristics defined for IPM are for both the individual IPM and the collective team IPM. This article describes the author’s perspective on the changing nature of the PM role based upon implementation of 100 + IFOA projects. These changes will be described under the three project delivery domains as depicted below. (Thomson 2009) Each of these domains will be subdivided into pre-permit phase and post permit phase as the nature of challenges change dramatically between these phases.

OPERATING SYSTEM

PRE-PERMIT PHASE

While the concept of operating system is most commonly thought of as the management process used to organize the building process, I believe it equally applies to the development or Target Value Design process (Ballard 2008). The (IPM) will be required to eliminate siloed development activities. This can be accomplished through the establishment of Cluster Groups usually developed around common building systems. These cluster groups are multi-disciplinary, including Architect, Engineer, Building Expert, Estimators, End Users and others. The IPM must encourage the collaborative solicitation of need, input and output from all members. They must build trust and respect amongst team members. They must drive constructive conflict so that all ideas/concepts are presented, discussed, openly considered and either implemented or discarded. At the same time, the IPM must

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4 This concept of rotating leadership depending on the expertise demanded by the situation is discussed in the setting of hospital trauma teams in Knowledge@Wharton 2004.
keep the team focused on the owner’s value proposition and appropriate topical matters, while not allowing them to let ego and human emotion promote destructive conflict.

After soliciting numerous options to consider, it is important to select a number of viable solutions and continue development through a process of Set Based Design. Since set based design requires time, effort, and cost, this IPM will need a keen instinct to limit the solution sets while not discarding viable options. This IPM will require the knowledge to use and facilitate advanced study and decision-making tools like Choosing by Advantages\(^5\) and A3 Thinking\(^6\).

A significant need of each Cluster Group is Conceptual Estimating. TVD requires that the team design to a detailed estimate, rather than estimate a detailed design. As a result, at the outset of the project, material and unit take off and pricing is unavailable and inappropriate. As the project develops, iterative estimating only to discover that the project is over budget is a time-wasting exercise. The team does not develop a detailed design for each set, but instead produces only enough information to support a conceptual estimate. While there are many qualified “plan and spec” estimators in the industry, the skill of conceptual estimating is far less common. The most impactful time to reduce waste and add value to a project is during design. The ability to conceptually estimate gives the project team power to make value-added decisions that benefit the customer. Additionally, this estimator becomes a significant contributor and usually acts as an IPM.

During design/development the IPM will need to employ some production like techniques to keep the team on track. As noted in the work describing the Last Planner™ System, its purpose is to create a “network of commitments.”\(^7\) The Last Planner System can be adapted and used advantageously during design. Milestone scheduling of design allows Pull Planning targets to be established. Design can be a messy, iterative process. Pull Planning establishes a pattern for iterations through Set Based Design and helps the team control the decision-making process during design. Pull Planning facilitates Reliable Promises amongst designers and regular check in calls and work registers help measure commitments and afford accountability to all.

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\(^5\) CBA is a sound system to make decisions using well-defined vocabulary to ensure clarity and transparency in the decision-making process (Parrish, K. and Tommelein, I.D., 2009). According to this system, it is important to identify which factors will reveal significant differences among alternatives.

\(^6\) A3 thinking is the embodiment of the scientific method, requiring the author to fully engage with PDCA thinking. A typical A3 states the background, the problem, the current state; the future desired state and the proposed counter-measures to get to the future state all on a single, 11” by 17” piece of paper. John Shook has explained the process as follows: “…an A3 document structures effective and efficient dialogue that fosters understanding followed by the opportunity for deep agreement. It’s a tool that engenders communication and dialogue in a manner that leads to good decisions, where the proposed countermeasures have a better chance of being effective because they are based on facts and data gathered at the place where the work is performed, from the people who perform it.” (Shook, J. 2008)

\(^7\) Managers acting in the LPS ‘articulate and activate’ a routine of conversations that lead to commitments connecting ‘horsepower work’ with the project’s promise to the client and coordinating the wherewithal for the fulfillment of that promise.” “People working in the LPS coordinate action by designing their unique network of commitments and activating it in routine planning cycles.” (Macomber 2003)
These concepts offer tremendous insight into the work and effort required of others. This allows for a more clear discussion of what is truly required from a request for work product from others. These discussions lead to smaller batch size development and significantly reduce redesign efforts. The commitment making and measurement allows visibility to the impact and ownership that one’s missed commitment has on other team members. This transparency promotes accountability and the resulting peer pressure helps drive self-improvement along with team improvement. This exercise makes it painfully obvious how bad we are collectively at making and keeping promises.

These processes need to be coupled with more rigorous financial management from the onset of development. UHS uses a **Burn Rate** tool that considers estimated hourly rates along with any specialty consultancy costs. All participants are required to estimate labor hours, labor rates, travel, equipment, and other related costs and distribute them over the development time line. Using this as a target development budget, the team measures actual performance against its plan regularly, identifying any variance as an opportunity for continuous improvement. This must lead to open, honest and frank discussions about staffing, meeting time and frequency, meeting participants, etc. When this rigor is coupled with set based design and scientific, not emotional decision making tools, tremendous program value decision making is created.

This IPM will need to have a better understanding of the value proposition for the use and life cycle cost of the building project. This can be defined through a thorough collaborative effort of assembling meaningful **Conditions of Satisfaction (CoS)**—an expression at the highest order of what is “value” to the customer. These CoS can create a benchmark for all decision makers to measure their decisions. The effective use of CoS can allow a distribution of decision-making without significant concern for misaligned decisions. Empowering those closest to the work to make decisions, speeds the process; allows more options to be considered; allows for broader innovation; and facilitates input from more stakeholders. The IPM will also need to know when and how to interject learning into the program. **Continuous Improvement** demands continuous learning. Most participants feel pressure to produce and feel focused learning takes away valuable “productive” time. Learning topics should be introduced into every **Big Room** environment. The learning topics and teaching should be the responsibility of all project leaders and not just one or two. Teaching a topic usually requires a higher mastery of that topic which benefits the team. Shared teaching distributes leadership across a broader group of people. This in turn provides a greater respect for the individuals and identifies expertise that might go unnoticed or unused.

The IPM needs to lead the team in frequent periods of **Reflection**. Perhaps the most common reflection technique is the **Plus/Delta**. This is most effectively used after each meeting or meeting segment to help improve the process of meeting. This reflection should be taken seriously and if done so will drive significantly improved outcomes. Specifically, meeting agendas can be more meaningful, proper attendance improves; topics can be more prepared, time management improves and learning topics are more meaningful. Simple things like meeting logistics and technology can dramatically improve the meeting experience. The IPM must learn to facilitate meaningful feedback to gain these benefits. Any Deltas identified during this
reflection need to result in direct action for the team to show immediate improvement and build trust among team members.

The IPM will also need to be conscious of the new team members being added as the development progresses. These new members will need to be educated in the new learning the team is attempting, as well as the new behavioral expectations. The IPM will create an **Onboarding Curriculum** and schedule regular training to keep the learning level as consistent as possible as the team grows with new members. This is critical to team success as new language has been introduced, and new relationships and expectations have been set, which often differ greatly from previous experiences.

Perhaps, one of the most difficult skills for the IPM is to decipher which variance requires a tactical solution (tool, software, specialist), a strategic solution (new approach, out of box thinking, further research), or transformational solution that requires people to change their perspectives, their view point, belief or approach, often giving up long held beliefs or practices. These variances can be very different and require quite a different approach. This can be very difficult for the experienced PM who was trained in almost exclusively tactical solutions. The below depicts some indication of variance by change type.

**Table 1: ILPD Typical Changes**

<table>
<thead>
<tr>
<th>Transformational Changes</th>
<th>Strategic Changes</th>
<th>Tactical Changes</th>
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</thead>
<tbody>
<tr>
<td>Hierarchical to Networked Organization</td>
<td>Early team involvement</td>
<td>Last Planner System</td>
</tr>
<tr>
<td>Individual Company Goals to Project Goals</td>
<td>Consensus decision making</td>
<td>A3 Thinking</td>
</tr>
<tr>
<td>Personal Goals to Project Goals</td>
<td>Seek and use craft, trade and multi-stakeholder input</td>
<td>Choosing by Advantages</td>
</tr>
<tr>
<td>Piece work optimization to project-wide</td>
<td>Continuous estimating</td>
<td>PDCA Cycles</td>
</tr>
<tr>
<td>Local Optimization to value stream optimization</td>
<td>Target Value Design</td>
<td>Swarming</td>
</tr>
<tr>
<td>Rigidly defined roles to no stripes in the room</td>
<td>PDCA in all phases of development and build</td>
<td>5 Why</td>
</tr>
<tr>
<td>“Just get it done” to PDCA Cycles</td>
<td>Burn-rate management</td>
<td>Big Room Rules</td>
</tr>
<tr>
<td>“Just get it done” to continuous reflection</td>
<td>Consolidated budget/cost management</td>
<td>Daily huddles</td>
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<td></td>
<td>Conditions of Satisfaction</td>
<td>Conditions of Satisfaction</td>
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</tbody>
</table>

**POST PERMIT PHASE**

As the project transitions from the office to the field, a similar set of challenges present themselves. As the size and diversity of the team increases, the IPM must develop a strategy to aligning a larger group of people with significantly varied skills and equally diverse viewpoints and goals.
The overriding implementation goal of ILPD is to empower the workers to more successfully plan and execute their work. Traditionally, craftworkers’ duties have been dictated to them by “managers.” As a result, when managers now ask them to contribute they often do not take the request as genuine. The IPM must begin by cultivating an environment where employee engagement can thrive. The IPM must build a foundation of trust with a large, diverse, ever changing group of individuals. To drive continuous improvement the craft and foremen must be empowered to design and improve how their work is performed. This IPM must encourage input and feedback, take it seriously, implement suggested improvements and communicate reasons when suggestions are not implemented and reward the willingness to speak up. The photo below shows a field communication requesting both good and bad input and offering communication to the team.

![Field Communication Boards at UHS Temecula Valley Hospital](image)

When trust is established, learning gains momentum. Generally speaking, the suggestions start with work condition improvements (toilets, water, a place for lunch and breaks). If taken seriously and accommodations made, this extension of trust will significantly improve communication and begin the innovation necessary for improvement.

The transformation from a critical path command and control operating system is far more than the learning and utilization of new tools. Rather than a supervisor dictating where and how much work will get done, input is solicited from the foreman on what can be accomplished. Once the weekly work plan is agreed upon and commitments are made, the team is expected to live up to those promises. This is a complete paradigm shift for most and requires a strategy to equip the foreman on how to perform in this new environment.

While a foreman may be an expert at his craft, he is often not trained with negotiating skills that require knowledge of others’ work, empathy, and compromise. These foremen must learn how to make a reliable promise. To do so, they must first be re-assured that not meeting a commitment is an opportunity for learning, not a reason to be scorned or punished. They then need to learn to employ a **PDCA Cycle** (Plan Do Check Adjust) internally. This helps them reflect on the reasons that a past promise may have been missed and to make more reliable promises as they learn and grow.
The premise of this learning requires a safe zone in which participants feel safe to fail. Trust is a critical component to this safe zone. An IPM needs to know how to create this trust and the more quickly they can do so the better the team benefits. The Speed of Trust, by Steven M.R. Covey, is a great resource for this learning. The IPM needs to be able to stimulate improvement through goal setting and measuring. This will require translating job cost estimates into meaningful production-based variables. Dashboards should be created around these goals and updated often. These variables then present baselines for experimentation. Experimentation should be encouraged, but in a disciplined manner. Predicted outcomes must be expressed and measured against, using a PDCA methodology. The IPM will need to be able to allow failure in a small controlled manner to encourage experimentation that will lead to innovation, but not catastrophic failure. The IPM will need to mentor the build teams’ Project Engineers (PE) and suppliers to regularly collaborate with their field counterparts.

The PE should be trained to treat the field staff as customers and better understand their material and equipment needs. These needs should be planned and well coordinated on a daily basis. The below A3 shows a simple way to get PE in the field to interact with foreman and crew.

![Field Produced A3, Temecula Valley Hospital](image)

**Figure 4: Field Produced A3, Temecula Valley Hospital**

**ORGANIZATION**

**DEVELOPMENT PHASE**

The IPM needs to be a strong organizational manager and developer. The Cluster Groups discussed above are a group who don’t spend much time together in traditional development. They are multi-disciplinary, each with the advocacy for their special interests (Structural Engineer, Electrical Contractor). The IPM must encourage release of territorial ownership, open dialog and learning. The IPM must dismantle the traditional command and control hierarchy, and promote distribution of roles and responsibilities, while encouraging open frank discussion and ideation. The IPM must encourage the team to focus on project goals, without being slaves to personal and company goals, while remaining cognoscente of the need for all to make a fair profit. The IPM needs to be able to facilitate discussion and definition of cost for service estimates from design professionals who do not traditionally share this information (and often do not internally manage their practices this way). The IPM needs to help all parties discuss compensation openly to reach fair agreements that allow the team to focus on the project not their own company concerns. The IPM
must also lead the team to review and revise this information regularly. The IPM needs to have a thorough understanding of cost risk assessment as it relates to the design process. This understanding needs to steer the team to determine where to spend development money in order to understand if the program is deliverable for a tolerable investment threshold. They must also be nimble enough to shift this focus as the risk profile changes significantly as they enter the build process.

**POST PERMIT PHASE**

During the build phase this IPM must be able to manage in multiple organizational structures. The management of an IFOA contract requires the understanding and leadership skills of several different types of organizational structure. A typical General Contractor PM might be used to a Functional Hierarchy whereby the general Contractor has contractual control over the subcontractors allowing him to demand performance based on the contract terms. However, an ILPD project using an IFOA creates a Functional Network between signatory partners. These partners become equal stakeholders and share equal risk/reward with the General Contractor and they are afforded equal say in all project management decisions. This requires far more consensus driven decision making, concern for each other, and willingness to help each other, but it also demands open sharing, frank discussion, conflict and resolution, to break down barriers and build trust.

While signatory firms may behave as a Network Organization, each of the partners has a hierarchical organization with their respective subcontractors. This creates a Multi-divisional Structure. This can create multiple reporting type relationships that demand consistency amongst the leaders to avoid chaos among the subcontractors. While maintaining the traditional contractual relationships, the IPM must find ways to incorporate these trades into the continuous improvement mentality and innovative efforts. They must be an encourager in ways other than financial incentive. If the IPM can create trusting relationships, this can often override the old school self-protection behavior even with trades that have traditional contracts. As a result, the IPM can incorporate the skills and knowledge of the trades not bound through relational contracts.

The IPM must also be able to function in a Matrix Type Organization. Each IPM has specialty responsibility from their traditional role (electrical contractor PM responsible for electrical trade work) and responsibility to the project organization as a whole. There exists a constant tension between doing what is best for his individual firm with what is best for the project team as a whole.

**COMMERCIAL TERMS**

Given the opportunity presented by the lean operating system and organizational structure, the IFOA’s commercial terms--premised on cost reimbursement, fixed profit and overhead, and the notion of shared risk and reward--present the catalyst for true transformational change. These commercial terms allow the project participants to focus on best of project outcomes, since that is what will drive each of their commercial outcomes on the project. When understood and implemented properly, the team can then apply all intellectual capital to problem solving, risk elimination, efficiency improvement and safety enhancement. This also re-focuses the attention, and demands new skills, of the IPM.
**PRE-PERMIT PHASE**

The IPM must diligently remind the team that nobody wins at the expense of another. The cost of one impacts the profit of all. The IPM must be able to create an ego-free environment and assure that the designers and builders work closely to create a shared understanding of value, design intent, available design alternatives, cost implications of each alternative and their potential impact on other systems and products.

The IPM must be able to assign **Target Cost** to clusters, manage interaction between the clusters, mediate compromise when necessary, and aggregate the outcomes and regularly present to the team the pre-permit financial forecast in a coherent program dashboard. Along with clear **CoS**, this empowers cluster groups to make value-driven decisions, rather than having all decisions funneling through a few individuals. This allows more decisions to be seriously contemplated, faster and with better outcomes. This IPM must be well versed in value decision making tools like **CBA** and **A3 thinking** and insist on the rigor to perform them when appropriate.

During the design phase, the IPM will need to constantly challenge where money is being allocated to development, research, and documentation. He must continuously remind all to ask “who is the customer of my work” and “what level of detail do they really need.” This reflection will significantly reduce design rework.

**POST PERMIT PHASE**

During the build phase, the commercial terms allow for easy transfer of scope to the team member best situated to perform the work and early team recognition of savings or cost overruns. The GC cannot pass scope to trades to create fee enhancement and the trades cannot refuse work to limit cost exposure. The team is responsible for all costs before any profit is earned by anyone. The IPM must find ways to collect, understand, aggregate and report on all cost data from all team members. This poses some challenges as each firm typically has a different cost and accounting systems. He must learn to facilitate team discussion of when and how to spend money, rather than allow silo-based decision-making.

The IFOA facilitates an open and honest sharing of cost estimates, overhead, material, rental, and other financial data. However, this opportunity first demands building trust in order to foster honesty. In turn, this level of openness can lead to new strategies for supply chain management and create significant opportunities for gain sharing and profit enhancement.

The IPM will need to create and sell a vision of opportunity that improvement can provide, encourage others to embrace that vision, resource the experimentation necessary, then report outcomes to the stakeholders. To seize these opportunities, the IPM will be required to translate estimates into measurable productivity units to allow benchmarking and test the effectiveness of field improvement concepts. Finally, the IPM will have to encourage the team to constantly revisit its targets. As improvements are implemented and progress is made, the IPM will have to help the team set new stretch goals to avoid becoming complacent.
CONCLUSIONS

UHS’ ILPD projects have been quite successful in terms of traditional measurements. Over 97% of our projects are delivered at or better than cost and schedule prediction. Similarly, the data gathered to date suggests that these projects are costing UHS between 10% and 30% below similar project development costs incurred by other owner. UHS ILPD projects have experienced dramatically reduced project conflicts. But the projects struggle to demonstrate a high level of consistency from one delivery team to the next. We attribute this success to our ILPD practice journey and the internal creation of eight UHS Integrated Project Managers. The IPM is a very rare commodity. The below Team assessment chart portrays skill categories in a matrix form. The left column shows tactical skills required to develop and deliver a project. The top row indicates relationship and organizational skills needed to be successful in the ILPD environment.

<table>
<thead>
<tr>
<th>Leadership Skills</th>
<th>Project Management Assessment/Use</th>
<th>Individual Skills</th>
<th>Team Dynamics Facilitation</th>
<th>Org Structure Management Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Matter Expertise</td>
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<tr>
<td>Design</td>
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<td>Cost</td>
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<td>Constructability</td>
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<tr>
<td>Mech/plumbing</td>
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<td>Electrical</td>
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<td>Technology</td>
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<tr>
<td>Owner Rep</td>
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Figure 5: ILPD IPM Assessment Matrix

Technical Subject Matter Expertise and Leadership Skills Team Assessment. The IPM assessment refers to the team as well as the individuals. But the team players must exude the characteristics of the individuals. The more Xs a team can populate in the chart is an indication of how well a team will perform. If a team is willing to spend time developing these skills, the proficiency can improve with time. The faster the team improves these skills the more value the team can produce.

Since the IPM capabilities do not exist widely within the industry, and since each project is typically a new and unique endeavor, a strategy should be developed to create these capabilities within a team. On a larger, long-term project the IPM, both team and individual, can be built during the early development stage. In a serial builder organization, a strategy to build internal capability and long-term partnerships is most likely a better solution.

UHS has invested significant time and energy both teaching and training internal Owner Project Managers (OPM) and creating long-term partnerships with vendors who have shown the willingness to learn. UHS has committed to long-term partnerships with various designers, builders, specialty trades, and suppliers. These partners are referred to as “Big L” partners to indicate a big commitment to Lean development. UHS’ Big L community has grown together through repetitive project
work, but also through collaboration between teams, by means of an internal Community of Practice (CoP). Vendors are expected to share with their competitors, what each is learning. They are also expected to share detailed cost estimates, best practices, A3 learning, lessons learned, etc. Big L partners routinely bring non-UHS project experience to this CoP as well.

UHS has learned that success demands a minimum of two experienced Big L partners along with our experienced OPM. This is needed to continuously focus on changing old habits, learning new skills, encouraging innovation, sharing leadership responsibility, and to catch each other when individuals revert to old school behavior. The IPMs from Big L partners are not all the traditional project leaders. They include Architect, Interior Designers, Equipment planners, Civil engineers, GC, MEP, and a few surprise leaders, including fire sprinkler PM, food service planner, and health care executives on their own projects.

A significant collateral benefit of creating a team of IPM is the shared knowledge and leadership. UHS had two separate instances on $100MM projects where the Senior Construction Project Manager and the Owner Project Manager both left the project in the same week. In both cases the balance of the team was capable of carrying the project successfully through the transition of personnel without any adverse outcomes. Not all individuals or firms are prepared for this transformation even after significant opportunity to change. While transformational change is not easy, if one cannot make the change after appropriate education, teaching, and training, it might become necessary to remove them from the project. ILPD is a team effort and one uncooperative partner can spoil the efforts of many.

REFERENCES