

INTEGRATED PROJECT DELIVERY REQUIRES A NEW PROJECT MANAGER

William R. Seed¹

ABSTRACT

Universal Health Services, Inc. (UHS), a US-based for-profit health care company, 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.

As a result of this experience, UHS has found that the traditionally trained Project Manager is not equipped to deal with the relationship-based nature of the ILPD model. The desire for early involvement from the constructors and specialty trades and strong multi-disciplinary collaboration demands a new kind of leadership.

The transformational change required by ILPD calls for project leaders who possess group facilitation skills, organizational management skills, people assessment and change management skills, along with the tactical skills of the past. This paper captures the challenges presented by the delivery model and proposes skills and abilities for the new “Integrated Project Manager.” It also offers a project leadership assessment tool to help align project needs with individual capabilities and identification of gaps and potential training needs.

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.

UHS has attempted significant self-learning on numerous projects through **Study Action Teams**². These projects have engaged lean consultants to provide formal training in personal assessment and team building. UHS has developed an internal kick off agenda outlining topical training needs and attempt to foster learning throughout the project.

UHS ILPD projects have been quite successful. 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

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.

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. While attempting to replicate ILPD project success from one project to another, UHS has found that the traditionally trained Project Manager is ill 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 skillset 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.

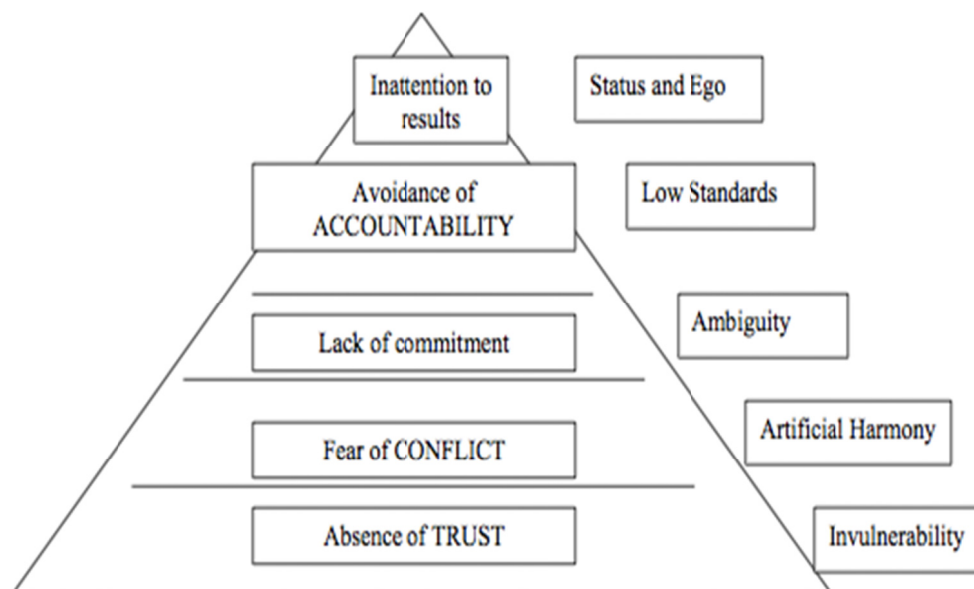


Figure 1: Five Dysfunctions of a Team in Lencioni 2002

Most Integrated Forms of Agreement (IFOA)¹ 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.

In the ILPD context, the “Integrated Project Manager”² (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.³ Each PM who 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.

This paper proposes that use the criteria outlined in Figure 5, a team can assess the **Management Team** and identify skills needed to improve team competency. 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.

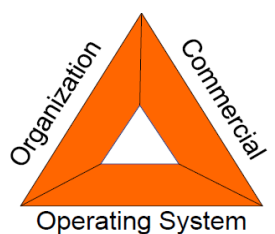


Figure 2: Project Delivery Domains

-
- 1 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.
 - 2 This paper will use the label “Integrated Project Manager” or 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.
 - 3 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.

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, it applies equally 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 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.

During this phase, after developing numerous options, 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**¹ and **A3 Thinking**².

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.

-
- 1 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.
 - 2 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)

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.”¹ 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.

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 to satisfy 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 consultant 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.

The 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

1 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)

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

Transformational Changes	Strategic Changes	Tactical Changes
Hierarchical to Networked Organization	Early team involvement	Last Planner System
Individual Company Goals to Project Goals	Consensus decision making	A3 Thinking
Personal Goals to Project Goals	Seek and use craft, trade and multi-stakeholder input	Choosing by Advantages
Piece work optimization to project-wide	Continuous estimating	PDCA Cycles
Local Optimization to value stream optimization	Target Value Design	Swarming

Rigidly defined roles to no stripes in the room	PDCA in all phases of development and build	5 Why
"Just get it done" to PDCA Cycles	Burn-rate management	Big Room Rules
"Just get it done" to continuous reflection	Consolidated budget/cost management	Daily huddles
	Conditions of Satisfaction	Conditions of Satisfaction

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 for 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 praise and corrective input and offering communication to the team.

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.



Figure 3: Field Communication Boards at UHS Temecula Valley Hospital

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. A simple hand drawn A3 might be a simple way to get PE in the field to interact with foreman and crew.

ORGANIZATION

DEVELOPMENT PHASE

The IPM needs to be a strong organizational manager and developer. The Cluster Groups discussed above do not exist in traditional development. They are multi-disciplinary, integrating individuals who are accustomed to advocating for their "special interests" (Structural Engineer, Electrical Contractor). The IPM must dissolve territorial ownership, and promote 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, the IPM must be able to manage in multiple organizational structures. The management of an IFOA contract requires an understanding and leadership skills of several different organizational structures. A typical General Contractor PM might be comfortable with 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. However, 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 often creates multiple reporting 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 traditionally contracted 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 stake holders. To seize these opportunities, the IPM will be required to translate estimates into measurable productivity units to allow benchmarking and to 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. UHS attributes this success to the ILPD practice journey and the internal creation of eight UHS Integrated Project Mangers. The IPM is a very rare commodity.

In order to promote assessment of the capabilities described in this paper, the following 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.

Leadership Skills	Project Management	Individual skill assessment/use	Team Dynamics Facilitation	Org Structure Management	Technical Skills
Subject Matter Expertise					
Design					
Cost					
Constructibility					
Mech/plumbing					
Electrical					
Technology					
Owner Rep					

Figure 5: ILPD IPM Assessment Matrix

This 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.¹

¹ -“Project management skills” refer to the traditional PM skills of financial management, risk and legal assessment, negotiating skills, task management, etc.
 -“Individual skill assessment/use” can be done with survey tools like Gallop Strength Finder or similar. The knowledge can be used to inform task assignment better aligned to individual strengths, optimizing performance.
 -“Team dynamic facilitation” is the ability to recognize and correct the 5 dysfunctions on a continuous basis as well as being sensitive to individual changes due to external life changes.
 -“Organizational structure management” is the ability to manage in varying business structures all at the same time. Networks require collaboration, while hierarchy requires firm decision making and follow through.

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

- Ballard, G.2008. “The Lean Project Delivery System: An Update,” *Lean Construction Journal* 2008 pp. 1-19.
- Covey, Steven M.R., & Merrill, Rebecca R. (2006). The speed of trust: the one thing that changes everything. New York: Free Press.
- Hill, K., Slivon, C., and Draper, J., (2007). “Another Approach to Transforming Project Delivery: Creating a Shared Mind”, *Proceedings IGLC-15*, July 2007, Michigan, USA.
- Knowledge@Wharton 2004. “Teamwork in a Shock Trauma Unit: New Lessons in Leadership,” accessed at <http://knowledge.wharton.upenn.edu/article/teamwork-in-a-shock-trauma-unit-new-lessons-in-leadership/>.

- Lencioni, Patrick (2002). Five dysfunctions of a team: a leadership fable. San Francisco: Jossey-Bass.
- Macomber, H. (2003) "Linguistic Action: Contributing to the Theory of Lean Construction Proceedings IGLC 11, Blacksburg, Virginia.
- Parrish, K. and Tommelein, I.D. (2009) "Making design decisions using Choosing By Advantages." Proc. 17th Annual Conference of the International Group for Lean Construction (IGLC 17), 15-17 July, Taipei, Taiwan, 501 - 510.
- Shook, J. (2008) Managing to Learn, The Lean Enterprise Institute, Inc, Cambridge MA, p. 107.
- Thomsen, C., Darrington, J., Dunne, D., and Lichtig, W. (2009) "Managing Integrated project Delivery", Construction Management Association of America