



Integrated Project Delivery: The Owner's Perspective

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Throughout this book¹ we have noted the owner's central role in IPD. The owner is often the party calling for change, the owner assembles the IPD team, defines the project goals, and, as you will read below, has a leadership role that is critical to project success. But how do owners view their role? How do they respond to skepticism within their organizations from above and below? How do they manage AEC partners that have limited experience with IPD? What do owners believe they are gaining through IPD? What has surprised them and what advice would they give to owners contemplating IPD?

We decided to ask them.

The section below summarizes conversations with owners who have embraced IPD and who are leading their teams and the industry. In groups of 2 to 3, they met telephonically to discuss the owner's role in IPD. Their conversations were recorded, transcribed and are summarized below.

Because we chose to draw from projects that were well underway or completed, the sampling is biased towards healthcare projects. But as this is being written, one of the authors who structures project across the United States and Canada is reporting a significant increase in institutional, academic, commercial, high tech and entertainment projects. To broaden the perspective, we provided a draft of this chapter to owners in these sectors and they have provided critical review and comment.

In alphabetical order, the interviewees were:

Michael Bade, Vice-Chancellor and Campus Architect, University of California, San Francisco. UCSF is a leading academic health care university with world-class research, teaching and clinical groups. UCSF has two primary campuses, Parnassians and the new Mission Bay campus.

Brenda Bullied, Director of Facilities Innovation and Planning, Lawrence & Memorial Hospital. Lawrence & Memorial (L&M) is a regional hospital system in New London, Connecticut that operates a 300 bed acute care hospital as well as related out-patient facilities. L&M is currently using IPD for a cancer center affiliated with Dana-Farber Cancer Institute, a medical office building, and an in-patient renovation. Brenda is the project manager responsible for these projects.

Digby Christian, Senior Project Manager, Sutter Health. Castro Valley Medical Center, \$320 million project, 130 bed, 230,000 square foot. Opened on December 1, 2012. This project was delivered under an 11 party integrated project delivery contract and won ENR California's Best Projects Award for 2012, as well as other awards.

Wendy Cohen, Regional Executive, Kitchell (Formerly Director of Facilities & Development, Palomar Health. Wendy was the primary owner representative for PMC West, a very successful, \$956 Million, 360 bed cutting edge acute care hospital in Escondido, California.

¹ The material in this article was prepared for a chapter in an upcoming textbook: *Integrated Project Delivery: Theory and Practice*, which should be available in 2014.

Crista Durand, Vice President Strategic Planning, Lawrence & Memorial Hospital. Crista provides senior leadership on the L & M projects. Crista is responsible for all L&M facilities and is the Senior Management Team representative on L&M's IPD projects.

Stewart Eckblad, Director of Design and Construction, University of California Medical Center, Mission Bay, San Francisco. The Mission Bay Medical Center complex is comprised of a new 289-bed children's, women's and cancer hospital; the Gateway Medical Building, which will contain ambulatory services for pediatric, women, and cancer patients; and an Energy Center to run the 878,000 gross square foot hospital complex. The project construction cost exceeds \$800 million and it will be completed in late Summer of 2014.

Sean Graystone, Superintendent, House of the Temple, Supreme Council 33° Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction. Sean is spearheading the functional renovation of a turn-of-the-century architectural and historical masterpiece. Completed in 1915, the House of the Temple was designed by John Russell Pope, constructed by Norcross Brothers, and has an innovative Rafael Gustavino dome. Modeled after the tomb of Mausolus at Halicarnassus, the House of the Temple is considered one of the most important examples of American Neo-Classical architecture.

Chuck Hays, President and CEO, MaineGeneral Health System. MaineGeneral is the third largest health care system in Maine, operating two hospitals, outpatient, long term care, home health and retirement facilities. By November of 2013, it will have completed a new, LEED Gold, 650,000 square foot regional hospital that provides state-of-the-art treatment and operational efficiency.

Roger Johnson, Senior Vice President, Enterprise Real Estate, TD Bank Financial Group. TD Bank is one of the largest financial institutions in North America. It has approximately 2,500 branches in Canada and the Eastern United States. It is currently upgrading its offices in Toronto, an approximately \$150,000,000 effort, and beginning the roll out of new branch banks across Canada.

Mark Linenberger, Vice President, Linbeck Group. Senior Management Team leader on Cook's Children Medical Center (CCMC) IPD projects. Linbeck Group is a construction manager with a long history of innovation, and is currently the construction manager for both of Cook Children's Medical Center's IPD projects. Linbeck introduced CCMC to IPD.

Robert Mitsch, Vice President Facility Planning and Development and Real Estate Services, Sutter Health. Sutter Health is one of the largest health systems in California, serving over 100 communities and operating 24 hospitals as well as other healthcare facilities. It is currently in the latter portion of an \$8 billion dollar construction program to upgrade the seismic capacity of existing facilities, replace facilities, and build new facilities to accommodate growth. At the time of the interviews, it had 4 major IPD projects in construction and was in the late design stages for several others, the most expensive of which has a construction cost exceeding \$1 billion USD.

George Montague, Vice President Real Estate, Cook Children's Medical Center (CCMC). CCMC is completing a 120,000 square foot medical office and administrative building with an adjacent parking garage that will open late Summer 2013. Based on its favorable experience with the current IPD project, CCMC is now undertaking a \$300 million dollar, 300,000 square foot South Tower hospital expansion and a new central utility plant.

William Seed, Vice President of Design and Construction, Universal Health Services. Universal Health Services has 240 campuses spread across 37 states. These include 26 surgical/medical hospitals and 200 behavioral health hospitals. Universal Health Services executes all projects over \$5 million using Lean IPD.

David Tam, M.D., FACHE, Chief Administrative Officer, Palomar Health. Palomar Health recently completed a very successful, \$956 million, 360 bed cutting edge acute care hospital in Escondido, California.

1. The Road to IPD

There is no one road to IPD, however certain patterns emerged from the interviews, and it became clear that regardless of the path taken, IPD is an owner driven process. "It seems to me that owners—smart owners—are driving the transition to Lean and IPD." — *Sean Graystone*

Frustration with existing project delivery systems was the most common reason for turning to IPD. Several owners mentioned prior projects that were disappointing and they knew their organizations had to develop better performing systems. They simply could not repeat their prior experiences. Sutter Health, for example, was embarking on a 8 billion dollar seismic retrofit and expansion program and needed a system that was predictable and reliable—which they were not gaining from Construction Manager at Risk, even with design assist services. Universal Health Services needed to turn around a program that was not efficiently delivering their facilities. "I was very frustrated with the entire delivery process of how projects get delivered. It was just a continuous battle." — *William Seed* In some instances, such as Lawrence & Memorial Health, dissatisfaction with existing project delivery was coupled with a belief that IPD fit their operational focus on process transformation. They needed a change and IPD made sense.

Others arrived at IPD through research. MaineGeneral's CEO, Chuck Hays, recognized that they were undertaking a project much larger than anything it had previously attempted (and would be the largest construction project in Maine) and decided to research the best method for delivering a complex hospital project. MaineGeneral engaged a consultant to research project delivery options and created a team to evaluate available options, which recommended IPD. Sutter Health sent teams across the country and even to Europe to evaluate project delivery options. TD Bank's Roger Johnson was also frustrated by the existing project delivery process. "I have been in real estate and construction my entire life and I was frustrated with the traditional process of design and build, or any variation on that, and the conflicts that are just built into the process." He learned about IPD by reading *The Commercial Real Estate Revolution* and immediately recognized that the dysfunctions chronicled by the authors were plaguing TD Bank's delivery process and that IPD provided a path for change. William Seed first discovered IPD in a seminar about Lean IPD on Sutter Health Projects and its potential for removing dysfunction and improving results.

Values were also important. Lawrence & Memorial was drawn to the values of IPD, which matched L&M's focus on process transformation. Sutter Health also believed it fit their organization. "We think it matched our value system as an organization in terms of transparency and holding each other accountable." — *Robert Mitsch*

The upshot is that, whether driven by frustration, research, process transformation, or a combination of these factors, these owners followed a deliberative path to IPD.

2. The Owner's Role

The group agreed that owners have a critical role in IPD. When asked what it took to be a good IPD owner, they identified five key characteristics: clarity, commitment, engagement, leadership and integrity.

Clarity. The owner must be able to define what it wants and what the IPD team must achieve. At a minimum, this requires clearly expressing programmatic needs at project inception and continuously throughout the project. "The owner must be very clear about their expectations for the project and what they want." — *Crista Durand*

But clarity should also exist at a strategic level. As Digby Christian stated: "You have to understand why you want to do the project." Michael Bade explained: "An IPD project demands an owner who can state the objective of a project strategically. When an owner isn't engaging strategically, the project is looked at in simplistic, programmatic terms. One of the most powerful aspects of IPD, in my mind, is that the IPD team helps the owner test its own assumptions." He went on to describe the Mission Hall project where the team recognized the owner's need for a transformative medical academic space and developed town halls within the building, without increasing the budget, and created linking, collaborative spaces that enhanced the research and academic mission of the building, but were not in the owner's original program. By understanding the owner's strategic needs, they were able to create a facility that effectively responded to those needs, not just to the numbers in the programming document.

Commitment. All of these owners expressed commitment to IPD and a willingness to support the process with training and resources. "The biggest thing that people who are just starting IPD don't understand is the commitment an owner must make to this delivery method." — *Robert Mitsch* The owner's commitment is critical for behavioral change. "The owner has to demonstrate full commitment to the project so there's no opportunity to do an end run around the process. Not everyone who shows up on the project is going to be comfortable doing IPD and not everyone believes it will be better, so the owner needs to be strongly committed to 'doing things this way' and have a vision for what 'doing things this way' means." — *Digby Christian* "I think it has been really helpful to have a higher level of involvement to do several things, one is just to demonstrate the owner's commitment to IPD and to change behavior." — *George Montague*. Several owners commented that if the owner's commitment is lacking, team behavior will not change.

Ideally, commitment runs from top to bottom. Robert Mitsch noted that Sutter Health's CEO, Pat Fry, was deeply committed to their Lean IPD process. "It really helps knowing that the guy at the top and who runs the whole system wanted this to happen. So we were rock solid from my level all the way up to seven levels above in management." — *Digby Christian* But commitment needs to be refreshed. Several owners built support but then as managers and executives changed, they had to re-educate the new leaders in order to maintain that support. Within large organizations, support needs to be continuously refreshed.

Engagement. None of these owners were passive. "The owner needs to be fully engaged and an equal partner at the table—which is different from traditional delivery methods." — *Wendy Cohen* Although the level of staffing varied among the owners, all maintained daily presence on the project. Their managers were empowered to lead teams and seek solutions, did not shirk from their leadership role and took responsibility for their projects. "What drives value into the program is owner engagement." — *William Seed* Michael Bade also saw the need for deep engagement and recognized that the owner's engagement needed to be balanced and

challenged by the team. "IPD is so much in the owner's self-interest, but a lot of owners manage by sitting back and you can't do that with a Lean IPD process. You have to be an engaged and knowledgeable participant and actively work to ensure that your teams are tracking and trying to achieve your objectives. But you are also placing yourself in the position of having them challenge you. It is a reciprocal relationship." — *Michael Bade*

All of the owners reported that they were intensely involved in the projects. "I had no idea how involved I would be as an owner—these projects are part of my life and I would say this is true for every person on the team—we live and breathe these projects differently than any other kind of construction project." — *Brenda Bullied* Roger Johnson agreed: "I think you actually take more of a role—at least we took more of a role in the project than we would in a typical design bid build." And Crista Durand found that these projects required more of her time than traditional projects—but it was worth it.

Staffing varied between owners. Robert Mitsch and Digby Christian plan an active leadership and administrative role on Sutter Health projects and they staff accordingly. In contrast, MaineGeneral thought they would have to hire 6 more people to manage their project—but they only hired one. "To me it just felt like it flowed much easier than having to beat on contractors who were behind or weren't putting enough manpower on the job." — *Chuck Hays* In their case, leadership effort was distributed among the team, which may have resulted in less owner effort. William Seed agreed with both. "I'm going to agree with Chuck [Hays] that it is easier because you have empowered the team and distributed the leadership, but I also agree with Bob [Mitsch] that you spend more energy at the proper time to empower people to make those decisions and that is why you are seeing the benefits you are seeing." — *William Seed*

Stuart Eckblad did not think that his team put in more effort than they did on conventional projects, but he agreed that the type of work differed. "Going back to the whole issue of owner involvement, it is a different kind of involvement. ... I use my 10 hours of the day differently." — *Stuart Eckblad* Digby Christian and Mark Linenberger agreed with this observation. Crista Durand stated that IPD required a much higher level of responsiveness and involvement at her level. William Seed echoed the deeper level of engagement, but also noted that it was easier, too. "My department and my staff appreciate that we don't go home with stomach aches and headaches anymore. We appreciate that our intellectual capital is now used to drive improvement and increase value as opposed to fighting battles over what is in and out of a contract or the value of a change order." — *William Seed*

The more an owner puts into IPD, the more it will achieve.

Leadership. All of the owners led their projects, but as described below, their leadership styles and interactions varied significantly. Although leadership is crucial, it manifests in many ways. Moreover, as Sean Graystone stated, "An owner has to know when to lead and when not to lead."

"The more leadership the owner takes, the better value and the more success is driven into the project. I would say the owner's leadership is absolutely critical at the beginning of the project to set what we call conditions of satisfaction that the team can actually measure and use to make decisions." — *William Seed* "What we really did not understand early on was how important our role was.... It is not something you can set forth on a piece of paper and expect everybody to follow the process. It was something we had to participate in fully and we actually had to lead in order for IPD to be successful." — *Robert Mitsch*

Leadership styles varied widely. Several of the leaders had project managers that administrated and managed the overall project. They took explicit control of running meetings and the project, overall. For others, leadership was distributed among team members. "I have been present, but in our meetings we have passed around the responsibility of leading and facilitating the meetings. I think one reason is that it has forced people to engage and be involved." — *George Montague* In MaineGeneral, the Project Management Team consisting of the owner, contractor and architect, jointly managed the project. Palomar Health's PMC West project was similar.

"The leadership was a joint effort on our project with a core group which included one person from the general contractor, one person from then architect and one from the owner's side. These were each people that had the day to day responsibility for executing the project. This team created a close relationship that built significant trust over time. Most decisions were made jointly or by one of the three on the team. The trust was a key factor here so that each person of this team could come together when needed or make decisions independently when needed. It was also important that we were seen as one unit and that it wasn't possible to divide and conquer us by different aspects of the project team." — *Wendy Cohen*

But regardless of structure, the owner was actively engaged, clear in its vision, and willing to step-up if team leadership faltered.

There was general agreement that IPD projects require champions who measure project processes and behaviors against IPD ideals. In part, these people are those within the team who are willing to call out when the process is not occurring properly. Deep change comes when a team can declare a break-down in process, reflect on the cause, and then implement solutions. For many teams, analysis, reflection and change are new skills and many of the owners used outside coaching to build these behaviors. Others have used a combination of outside training to assist staff or to "train the trainer." William Seed has used outside facilitators and coaches, but also provides coaching by his own staff. One of his project managers is assigned to coach on other project manager's projects. He believes it is important to have someone independent of the project manager. "It is a lot easier for somebody from outside of the job to come in and feel the culture or the pulse of the job and help guide it back into the place that it ought to be functioning." — *William Seed*

The owners focused on mentoring and teaching, as well as managing. In Sutter Health, successful project managers check in on other projects to see how they are working. They provide experience, expertise and assistance to the less experienced project managers. Universal Health's project managers also have mentoring and teaching roles. "Frankly, I think my project managers are more lean coaches than they are project managers. They don't manage the project's budgets—the team manages the budgets. They don't wrestle with quality—the team wrestles with quality." — *William Seed*

IPD leadership is not imposed from above nor is it forced consensus. Active questioning and debate are critical to the process. "It is those points of disagreement that are the genesis of creative solutions and people need to learn the skills of disagreeing with each other in a friendly way and inviting each other to define the problem first and to solve it second. In IPD leadership you stimulate people to think more deeply and you reward them with recognition and kudos and stuff like that when they actually push farther than they have done before." — *Michael Bade*

Traditional project delivery uses a "propose/dispose" model with the team proposing solutions to the owner's program and the owner accepting, rejecting or critiquing those proposals. IPD puts

the owner in an active role, engaging with the team at a strategic level and influencing or jointly developing the solutions to project challenges. IPD leaders empower their teams to take responsibility for the project, challenge the owner's assumptions, and deliver the project to the agreed goals. As the comments indicate, these owners understood the power provided to them by IPD and accepted the responsibility to use it effectively.

Integrity

The owner has a key role in setting the project tone. IPD is based on optimizing the entire project and that includes the interests of the participants as well as the owner. An owner that acts only in its immediate self-interest, or that doesn't act in accordance with its expressed principles, will find that the participants do not fully engage in the IPD process. "I think the owner is key in setting the tone and the owner needs to create the space and environment to develop trust based relationships." — *Wendy Cohen* "The owner can quickly create trust and thus creditability – by doing what we say we are going to do, every time – creating reliability." — *Mark Linenberger* As Mark also noted, "The owner models the way." The challenge, as Wendy Cohen noted, is to "identify the right person from the owner that will be the point person and to ensure that the people that they enlist on their team have the ability to work in an IPD environment."

3. Organizing the "Owner"

"IPD is simple in concept, but it becomes complex when applied to specific organizations. — *Wendy Cohen* The PMC West Project, a nearly billion dollar hospital for a public hospital district, was challenging because there were many stakeholders represented by a 40-50 person executive steering committee, the hospital management, and the publicly elected board of directors, each with its own interest in the project. It is an example of the difficulties in determining who is the "owner" in a large IPD project. Dr. David Tam was thrust into the project through his role as the district's Chief Administrative Officer and had to carefully orchestrate the interactions between the broader owner groups and the project team. This involved the delicate task of determining when to involve stakeholders, when not, and how deeply to involve the organization into the IPD process. As Dr. David Tam observed, "In an IPD project, it is important that the "owner" be carefully defined. The IPD owner is the person or persons that engenders trust with the members of the integrated project." He and Wendy Cohen served this intermediary role, providing a consistent face to the IPD. They did not try to "sell" the organization on IPD and first started explaining the process after the project became successful. In Wendy Cohen's words, she became a translator between the IPD project and a more traditional organization. By keeping IPD within the construction organization, but providing results that the traditional organization valued, they kept IPD moving forward without requiring buy in by the entire organization. It was a stealth IPD project.

But the success of PMC West changed the organization, itself. "It wasn't just stealth that we did IPD and the organization didn't know it, but it was also stealth in the sense that the organization absorbed the principles of IPD and started using it in a variety of other ways." — *Dr. David Tam* "The project was an actual pivotal transformational chapter in the organization. It actually caused the organization to change. The project was so significant from all aspects, that when it became clear that IPD was working for the construction process, it infiltrated the organization." — *Dr. David Tam* When the project moved from construction to activation, IPD principles and Lean tools, such as pull planning, continued to be used.

The success of PMC West demonstrates how organizing a major project can affect the organization itself. It echoes comments by Robert Mitsch and Crista Durand about the interaction between the construction processes and the operational processes used by a health organization. Process transformation in one can inform the other.

4. Resistance from Within

William Seed's approach to adopting IPD was the simplest. "I never asked for permission. I just sort of did it. Then I showed I was doing better than they claimed to have been doing and overcame challenges to IPD." George Montague felt that IPD was a natural extension of their working relationship with key partners, such as Linbeck. Moreover, one of the hospital trustees was an architect who favored IPD, which made the rest of the board comfortable with changing project delivery methods. (George Montague also stated that the success of their medical office building project made it easier to undertake the larger hospital renovation.)

But most of the owners faced resistance from senior management, or from operational staff. Moreover, the effort to overcome management resistance had to be periodically repeated because executives and board members would forget the lessons learned and the progress made. In a declining economy, these senior executives would argue for returning to low bid procurement. Moreover, several of the owners work within highly structured organizations that have strong compliance, internal audit, or legal protocols. For example, although Sutter Health had a track record of successful IPD projects, it still had to satisfy internal and external auditors and show that the projects were being properly managed and controlled, which required significant time and effort from project staff.

Roger Johnson recognized that building understanding was a first step in developing support in a large institution. He asked the firm auditors to read the first 100 pages of *The Commercial Real Estate Revolution* [which chronicles problems in design and construction coming from traditional project delivery]. He then engaged the support of the bank's sourcing director, who had prior experience with Project Alliances in petrochemical exploration [similar to IPD], and a knowledgeable supporter of IPD processes. Sean Graystone faced a similar problem with internal counsel who began as a skeptic, but as she participated in training, began understanding the theory, and saw the result – now she supports IPD.

Resistance has also come from middle management. "There are a lot of people who are invested in the old way of doing things. They know how to fight with each other really well and a process that demands that they step forward and become more of a positive participant is something that is outside their area of professional expertise." — *Michael Bade* "There are still some folks on the team who are not in leadership roles but probably one down from leadership roles who are much more comfortable in the traditional ways and are dragging heels on really adopting where we want to go." — *Roger Johnson*

Not everyone likes the level of personal accountability IPD imposes. "I think that where there has been resistance, it has been, quite candidly, with those departments that are not high performers. They have resisted it because there is more work and a high level of accountability." — *Crista Durand* Lawrence & Memorial had to pass over several project managers because they did not have the skill set to perform at the level required. Roger Johnson used innovative thinkers with flexible management styles who could see the benefit of the process and volunteered to undertake the IPD projects. And when the projects progressed and were successful, there was a change within the bank. "There was resistance throughout, but when people started seeing the results, started seeing the activity of the team coming

together and everybody looking to develop the best end product and not just line their own pockets, most of those people who were resisted in the beginning have become supporters. At this point in time and inside the bank today there are actually very few naysayers or resisters to this process whether it be in audit, sourcing or on the construction team." — *Roger Johnson*

5. Resistance from the AEC Community

These owners were more critical of their own organizations than they were of resistance within the AEC community. In general, they were very pleased with the willingness of their partners to step up and take responsibility for the entire project. But it wasn't always easy to find good IPD partners. Robert Mitsch noted that as a pioneer, Sutter Health had to look hard to find partners who were committed to change. Even now, there are pretenders. "There are many in our industry who raise their hand and want to do IPD, but who have not spent any time or effort to understand what IPD really is." — *Robert Mitsch* "It is interesting how many people say they do IPD and when you dig into their experience, it is not even close." — *Chuck Hays* Vendors that claimed to have "always been doing IPD" were seen as lacking understanding or being disingenuous.

Several owners reported that they had to dismiss one or more participants because those participants weren't engaging collaboratively. In two instances, the dismissed participants were entities that the team "assumed" would be good partners and, therefore, skipped the vetting process. As William Seed described the error, "Let's not bother to go through the CBA [Choosing by Advantages] on this particular selection because we all think this is the key guy and we need to make a decision fast so let's just pick this guy. Those are the ones that fail because you didn't do your diligence and you didn't vet them for the new processes or the new culture." — *William Seed* Chuck Hays noted that the one contractor they had a problem with was the one they didn't vet because they assumed it would be a good fit. Firm culture was viewed as critical to team success.

Despite difficulties in finding partners, resistance and backsliding, all of the owners felt that their contracting partners became project partners through the process. "I think that what has surprised me is our subs have been fully engaged in this process and have actually turned around to becoming partners in the process. I didn't expect that to happen at all." — *Brenda Bullied* MaineGeneral's experience of building a big IPD team in a small construction community is particularly inspiring. "After viewing two of the larger projects in Maine, everybody we talked to said you absolutely are going to have to pull labor from Boston and New York. You don't have a qualified work force [in Maine]. We ended up selecting a Maine architect and a Maine construction manager that we trusted, but who couldn't possibly do this size project. They partnered with national firms. We trusted them to pick good partners and they did pick good partners and we told them that the winning team would be the one that could tell us how to use Maine labor effectively." Giving back to their community is an important value for MaineGeneral. On the new regional hospital, 96% of the trade contracts have been awarded to Maine companies. The designers, construction managers and trades have all worked together to help local firms rise to the level required and the community has responded.

The upshot is that getting a good team can be challenging. An owner must carefully select its team and must place a high value on culture and collaboration. "Look for partners who are willing to innovate, bring the best ideas and continually look for ways to solve problems as opposed to their traditional manners. This requires a different interviewing process and technique than the traditional background screening and financial review." — *William Seed* "I would advise a new IPD owner to pick cultural fit over everything, pick partners that can be team

players and who will work well with a group. Pick partners that will take responsibility for the whole project, not just their piece." — *Chuck Hays*

6. Education and Training

"Educate, educate, educate. Educate every staff member, even V.P.s. Educate non-stop about the process and why we are doing IPD." — *Brenda Bullied*

Every owner invested heavily in educating their staffs and their teams. "We have found training to be critical to pretty much everything we are doing. ... There is going to be a learning curve and a training curve and if you embrace that up front and prepare for it, I think you can do a better job of getting a team up to speed fast." — *William Seed* Education was also used to reinforce IPD behaviors and processes. "How did we address the risk of reverting to traditional behavior? We educated." — *Sean Graystone*

But although every owner valued education, they used varied methods of educating their staffs and their teams ranging from structured project kick-off training, to independent coaching, to internal training based on training from others. The owners that gained the most from education and training made it part of the fabric of the project. They did not expect instant transformation. As Michael Bade noted, "Change takes time, but it is possible."

Many of the projects used formal kick-off meetings to begin building teamwork, start the process of organization into teams and developing goals and processes. "We did do some pretty extensive training about how to get firms to be integrated for the collective good. We had a program at that time that was about a week long where the principals of the firms and the lead detailers worked together trying to figure out the best ways to solve issues." — *Stuart Eckblad* They went on to use quarterly surveys and refreshers to reinforce learning.

Virtually everyone used consultants for training, at least initially. "The facilitator was initially involved in the creation of the team, namely the project board, development of mission and core values and the role out to the larger team. The facilitator was very active in the beginning, maybe a few days a week. Once the team was established, their role was reduced to one or two times a month." — *Wendy Cohen*. TD Bank engaged a project facilitator to provide IPD and Lean training. Sean Graystone required his team to participate in Lean and IPD training and strongly encouraged them to attend courses and conferences given by the Lean Construction Institute. They also engaged an attorney experienced in IPD projects to meet with the project team to explain how IPD operated. UCSF has engaged a civil engineering firm that has gone through a lean transition to assist UCSF in developing its processes. Universal Health has engaged lean coaches on their projects, but now expects its IPD partners to not only participate in training, but contribute to the cost. "I was very frustrated that it was always us that had to do the training for the contractors and the architects that were inexperienced and didn't really understand the process. So we had to bring coaches in. I now rely and insist on partners participating in the exercise, including paying for coaching. And I encourage them to bring coaches into their own organization outside of my projects, so they have their own learning track." — *William Seed*

Many of the owners are developing internal training capability. William Seed always uses coaches, but they may be from his staff. One of his project managers has been tasked to coach other project managers and he is developing another internal lean coach. Sutter Health uses their experienced IPD project managers to evaluate projects and train less experienced personnel. MaineGeneral used some external training, but also set up a team to focus on lean

processes. "We had an internal lean group of three people that we cleared of other responsibilities and had them focus on our design processes. We also had a lot of BIM training. It was actually exciting because we were able to increase the knowledge of the subcontractors and consultants and make them more competitive by training them on 3-D modeling." — *Chuck Hays*

Owners also used consultants to jump start their training process, but then continued on their own, with only intermittent assistance. "We did a host of educational series and when we hit key milestones with design or what not, we had special meetings to get outside assistance. ... Howard, you were our facilitator. I think we took expertise and advice you gave to us and parlayed that into several education and training seminars for staff, clinical folks, contractors, architects, etc. We didn't hire a facilitator, we leveraged your skill set to "train the trainer" and then took the show on the road. We think it worked effectively." — *Crista Durand*

George Montague raised an issue regarding on-boarding of new personnel that resonated with other owners. "One thing we have found that was frustrating—but probably unavoidable—is that through the course of the project people come and go and you have to bring the new comers up to speed." He felt that there was a real role for someone to do "1) What I call shepherding [running the project processes and meetings]; 2) training, teaching and installing tools; and 3) helping with the continuous process of on-boarding."

As Crista Durand summarized. "From a governance perspective and from a leadership perspective, I think it all comes down to education."

[Author note: These teams emphasized training and were successful. Where training has been overlooked or short-changed, the teams have struggled to overcome traditional behavior.]

7. The IPD Contract

The interviewees were not asked questions about the IPD contract, but there were some interesting comments. All of the participants, with the exception of Stuart Eckblad and Michael Bade, did projects using a multi-party (owner/architect/contractor) or poly-party (owner and the entire risk/reward team) contracts. Because UCSF is a governmental institution, it could only use the best value process permitted by statute, which did not allow a multi-party or poly-party contract. However, they used a system of design-build or interlocking contracts to attempt to create a risk/reward approach similar to a single IPD contract. The comments below reflect a few of the interviewees observations about the effect of the contract and differences in contract structure.

IPD is actually different from other collaborative approaches. For example, until Sutter Health solidified their approach to include contractually binding the parties to a common goal with shared risk and reward, they did not get the behavior they sought. "We didn't create a relationship [until they adopted full IPD] between the contractor and architect that had any substance so although we legislated that the contractor was going to assist in the design process and this was going to hopefully eliminate gaps in the drawings and with what was constructible, we found that all we did was legislate something and the old practices continued in design and the contractor would then just price it. — *Robert Mitsch* Sutter Health then evolved to full single IPD contract under the Integrated Form of Agreement (IFOA), which they found made a difference. "When we are all in this together and if the whole thing blows up we are all at risk, then you get different behavior and different results." — *Robert Mitsch*

Stuart Eckblad had the interesting experience of starting a project somewhat traditionally with only the designers under contract (because of procurement issues specific to the project), but then adding IPD elements when the construction manager and trades were procured, by using interlocking risk/reward provisions in the contracts. "And what was interesting is as a result of the traditional process for the first 18 months, we were way over budget and having to consider dropping scope. About three months after we were able to get everyone on board [with interlocking contracts], we actually had a huge reduction in costs and got all of our scope." — *Stuart Eckblad*

In discussing whether to use a poly-party (more than just owner, architect and contractor) or multi-party contract (owner, designer and contractor), Digby Christian observed: "I'm finding it easier and finding it a little more complicated going into projects where owner only contracts with the architect and construction manager. I am not one of those people who believes that increasing the number of signatories increases the complexity. It just creates a little more paperwork. In terms of running the project I find that it makes it easier and I am a big fan of making sure that you contract directly with all of the major risk drivers on the project and I will do it again on the next big complex project I get. I just find it much easier. You get direct relationships. You get to talk directly to the principals of each risk/reward participant and you get to ensure that communication goes directly to everyone who has a stake in the project."

The owners that discussed contracts did feel that contractual provisions, particularly shared risk/reward among the team based on project outcome, did affect behavior. And if the owner has the capacity to manage a poly-party contract, it may provide the owner with more information and control.

8. The Right Level of Challenge

Several of the owners noted that setting aggressive targets was a factor in project success. Mark Linenberger, who as a construction manager brought IPD to Cook Children's noted that, "We have to set the bar high and when everyone feels they can grab the bar, the old ways become apparent very quickly." Challenge encourages behavioral change. William Seed echoed the need to set tough targets. "We take a slightly different approach than others do in establishing our project target cost estimates so we set the target aggressively and once the contracts are signed, the team literally has to find new ways in order to earn their profit." William Seed

Teams are motivated not to miss targets. "The team at Castro Valley was extremely determined not to lose money and not as driven to make more money. Because they were always in danger of losing money through the entire length of the project, we got a lot of behavioral change." — *Digby Christian* This fits with current thinking about loss aversion. The Castro Valley project was significantly over-budget at inception, but was brought into budget through hard work by the team. As Digby explained, "We got the team to understand that cost is a design constraint. Design is a constraint, but the budget is also a constraint. They had to get 10% out of their number."

Dr. David Tam used the metaphor of a "burning platform" that would force people to change. "From my perspective, IPD probably works best if there is a burning platform—a sense of urgency that requires people to get rid of their preconceived notions, adopt new processes, and jump into trusting each other. The challenge for the owner is how to create this sense of urgency, this sense that you are standing on a burning platform." — *Dr. David Tam* Turning around the PMC West Project, facing immense challenges, required abandoning traditional

behaviors and jumping in. (PMC West was commenced fairly traditionally, and IPD was brought into the project by the new construction manager in order to put the project back on track)

Crista Durand also set high goals. On a project that already had a challenging budget, she observed "I challenged our cancer team to bring in another million dollars from the budget. They all kind of looked at me but we are three quarters of the way to achieving that goal."

Although there was strong support for setting tough goals, none of the owners felt that the goals they set were impossible. Thus, they kept the projects in the zone where teams were challenged, not discouraged. This is the sweet spot for project performance.

9. Frustrations

Although the projects discussed were all very successful, there were still difficulties and frustrations. Robert Mitsch noted the difficulty in finding experienced IPD partners. Even within firms that have IPD experience, the level of experience can vary significantly from team to team. "I think the most frustrating thing is that these ideas are new to the industry and even in companies that have demonstrated some facility and familiarity it's not uniform across all their people so there's a constant kind of need to focus, to train, to clarify, to support, to define, to envision how these processes should work, to explain them, and to relentlessly advocate for them." — *Michael Bade* Digby Christian had a similar observation. "The actual personnel count more than the companies. Because this way of working is so new, unless you can move the same people from project to project, you will probably have to train the new team." As companies expand their internal training and develop more experience throughout their personnel, this should become less necessary.

Change is difficult and virtually everyone cited instances where team members fell back on old behaviors. Mark Linenberger noted that developing trust is a real and continuous challenge. It is easy to become protective of your interests and forget that in IPD the team wins or loses together. Not everyone can make the change. "The most frustrating part of IPD is when other people on your team do not understand the concept. They tend to be fairly disruptive and it becomes very obvious to the rest of the team members who have embraced the process. I think spending a lot of up front time selecting the right people and building the team is the key here. I don't think you will ever have 100% buy in, but I think you can increase your chance of success with being very specific about the type of people that are on the team." *Wendy Cohen*.

It was not uncommon for owners to have to remove or replace members of their own team that couldn't adapt to a collaborative process. Similarly, participating companies and sometimes specific individuals had to be removed from the project. These decisions were often team decisions and one owner reported that the IPD team was strengthened by the process of realizing they had a team member that didn't fit and then jointly taking action to reconfigure the team.

Even when you have the right team, there will be continual personnel change that must be addressed through on-boarding. It is important that the entire team, from Project Executives to field crew, understand the IPD process and how their behavior needs to change. "IPD is most effective when it drives down to the people actually doing the work." — *Wendy Cohen* In the PMC West project, the team held regular dinners with the project foremen to create a connection between the field and project management.

Crista Durand and Brenda Bullied of Lawrence & Memorial were concerned about the loss of information between projects and have used almost the identical personnel to design and build two consecutive projects. They feel that any potential loss in competitiveness was far outweighed by having an experienced, effective and integrated team, and the initial results are quite good. Other owners are considering "batching" smaller IPD projects to spread the training cost over several projects and to keep effective teams together.

10. Target Value Design

Three of the participants discussed Target Value Design on their projects. Digby Christian noted that the process went extremely well and that they treated cost as a design constraint, just like any other constraint that had to be considered as the design developed. They then set up budgets for each team member and challenged each of them to reduce their cost by 10%. Stuart Eckblad briefly explained how they approached Target Value Design. "Once we got everyone onboard, we then went through each of those systems and developed sub-targets. We then identified cost drivers within each sub-target. Now the teams could really focus on those drivers to find, for example, how design changes affected the length of duct work—a major cost driver. We were able to get the subs to come up with a better sound insulating system that both shortened the ducts and was much quicker to install. In other cases we found different and less expensive ways to solve a problem. We couldn't get rid of the fire alarm system, but we did find a way to get rid of all the paging systems and use a more effective, quieter system that was also better for our patients."

UCSF used sub-targets around major interrelated systems, such as mechanical, electrical, plumbing. Cook Children's is using a comparable approach built around CSI or Uniforamt Division. "We are taking more of the approach that Stuart described as far as breaking it down to divisions and challenging each division initially with a certain reduction." — *Mark Linenberger*

Mark Linenberger also had an intriguing observation about a "hidden contingency." "One of the things from our first experience relative to reduction in costs is this hidden contingency. It is not the contingency we typically carry, but is the product of over-estimating costs because of the way we have performed work in the past. Our historical units are based on the wrong behaviors." Mark's observation is echoed in a comment by Digby Christian. "My feeling—though I never did precise metrics on it— was that we got about a third of the money [cost reduction] from actual innovation and two-thirds from people that started to reduce the buffer that they had in their numbers because when they saw how much certainty there was and how much coordination that they got more and more comfortable." The interviewees also cited many examples where team members in IPD exceeded their traditional production rates, had less rework than they traditionally expect, or didn't have to do duplicate work (for example, design drawings followed by submittals and fabrication drawings where design drawings and submittals could be replaced by the engineer directly working with the fabricator and using the reviewed fabrication drawings in lieu of the design drawings and submittals).

Mark Linenberger and Digby Christian's observations raise interesting questions whether historical production data needs to be adjusted when estimating potential IPD costs, and if it does, what affect this should have on initial project profit levels.

11. Reliability

"What has the organization gotten out of IPD? Reliability and predictability." — *Digby Christian*

Although the owners were focused on improving the value of their projects, they were also interested in being able to accurately predict outcomes. For many owners, being able to deliver the project without any significant problems, delays or budget upsets was critical to business planning. This was especially true for the owners that built repetitively. In addition to controlling spiraling construction costs, Sutter Health was looking for a methodology that delivered as promised. "For our high complexity projects, there is no more reliable way [than Lean IPD] to deliver." — *Robert Mitsch* Universal Health has seen significant improvements in value, but they, too, emphasize the importance of reliability. William Seed noted that Universal's experience (40 out of 45 projects delivered for less than budgeted) "...speaks volumes about reliability."

12. Value

We asked the owners to discuss metrics and they responded by providing specific examples of traditional value measures—cost and schedule, as described below.

The owners also discussed qualitative improvements. MaineGeneral, for example, is achieving LEED Gold although it was programmed to be LEED Silver. Sutter Health Castro Valley had very low percentages of rework (0.5% for trades that normally have 7% to 10%) which speaks eloquently about the quality of installation. Moreover, others stated that the finished systems were more rationally laid out and maintainable. Quality of design and creativity were discussed. Michael Bade cited the creativity of the team in developing the town hall concept to achieve a more useful building. Sean Graystone discussed the quality of the information developed by the team for the renovation of the historic and architecturally significant House of the Temple in Washington, D.C. "I don't have metrics but I can testify to the quality of the information that we derive. The quality of the information we are getting is amazing." And William Seed noted how the process affected the owner's decisions. "I think this methodology [IPD] offers us a far better ability to make value decisions—how to spend the money, where to spend the money. By understanding real time costs and real time impact of one system to another, we can make better decisions." Better decisions result in more project value.

But everyone also had examples of how IPD had a direct impact on cost and schedule. A few examples follow:

"We are about nine months ahead of schedule, \$3 million dollars under budget and still have a lot of our contingencies left. There have only been two change orders on the project, which is unbelievable to me." — *Chuck Hays* describing the \$320 million dollar MaineGeneral Regional Hospital. In addition, this hospital is achieving a higher LEED rating than planned and has had other scope additions within the target cost.

"We have seen a statistically significant reduction in our construction costs and an absolute reduction in construction time. Comparing the baseline information we have on similar projects we have done without IPD and the ones we have done with IPD there has been a greater than 15% reduction in cost and 20% reduction in time." — *Roger Johnson*

"Our first project we delivered was \$10 million dollars under budget on a \$130 million dollar project. We are clearly delivering projects 15% below all of our market competitors. Of the last 45 projects, 40 of them were delivered for less than 100% of the budget. I think that speaks volumes about reliability." — *William Seed*

"We had a very high level of collaboration between the steel erector and fabricator. We didn't apply any new structural design elements but because it was highly collaborative and very connected the iron workers spent 1,000 less man hours—it was almost a tenth of their planned man hours in the erection." — *Mark Linenberger* discussing the benefits of collaboration. "The project in Castro Valley was completed about four months ahead of schedule and under budget through the IPD lean delivery model. It was about a \$320 million dollar project." — *Robert Mitsch*

"During the course of this renovation, we discovered an unknown condition that had we been in a standard design-bid process would have added six months and close to one million dollars in construction costs. I think it was \$600,000 to \$700,000 and on a \$16-17 million dollar project it was a significant savings by having that team in place to lend their expertise to the issues at hand and wanting to work through them. Traditionally, we would have come to a complete stall on the project with time and money being wasted." — *Brenda Bullied*

"The cancer center project is moving so well. We are under budget, we are ahead of the construction schedule, and there are very few change orders. We have saved over six months of traditional design time and hundreds of thousands of dollars...Dana Farber has done five of these community hospital partnerships and from start to finish they have typically taken two to three years. Our project from start to finish will be eighteen months or less." — *Crista Durand* discussing the L&M/Dana Farber Cancer Center project.

"First of all, I firmly believe that it saved our bacon and that without the IPD process we would not have been able to achieve our schedule or our budget. Second, we accomplished a high quality product. I don't know whether it is a by-product of IPD or a planned outcome of IPD, but it really brings together pride of ownership by the entire team. ... For example, the majority of the trades did not see a certificate of occupancy being the end of their process. It became relatively easy to say that success of the project under IPD is when there was a patient in a bed and the hospital is licensed and operating. This has huge value to a hospital system." — *Dr. David Tam* "IPD created an environment where pride of ownership could happen." — *Wendy Cohen*

Wendy Cohen felt that the lack of legal disputes was also significant. She noted that projects the size of PMC West often have lingering legal issues, but that none of the issues that arose were every allowed to grow to where attorneys or company executives had to get involved. "The environment that the IPD process cultivated prevented us from going there [legal disputes]." — *Dr. David Tam* Similarly, none of the IPD projects undertaken by any of the other owners resulted in any claims or litigation.

The owners are also focused on value to their team members. "All of my project managers are deeply engaged in the process of bringing out improvements to the team because we want those teams to succeed for their own purposes, not just ours. About 50 of our projects have offered some level of enhanced profit for the team members." — *William Seed*

13. Would You Do it Again?

All of the owners would do it again, and most already are. "We have three IPD projects and have embraced IPD so much, I want to do everything IPD. I know this sounds ridiculous, but even with the small (3-5 million) projects I don't want to go back to design build. Once you taste great wine you don't want to go back to the cheap stuff." — *Crista Durand*

Universal Health has committed to using IPD on every project above \$5 million; Sutter Health has 4 major IPD projects in construction and 2 in design. Cook Children's is embarking on a second IPD project that is six times larger than their first. UCSF is also planning on using IPD for other projects. "Without a doubt we would do it again." — *Stuart Eckblad* In fact due to the success of the UCSF Mission Bay projects, the University of California system has had legislation² passed to allow the UCSF Mission Bay best value process to be used on any project larger than \$1 million.

Roger Johnson, Crista Durand and Sean Graystone all stated that the process has met and exceeded their expectations. "So has it met my expectations? Absolutely, the product has exceeded what we have put into it by far. ... IPD is a system of subtle changes that leads to really large scale results." — *Sean Graystone*

14. Advice to Other Owners

Several of the owners had specific advice for those first trying IPD.

"I think number one you really have to understand the value proposition. I think IPD is really interesting and it's not for all projects but if you really don't understand the value proposition you really can't manage it." — *Stewart Eckblad*

"Get your hands dirty. You shouldn't use our contracts without translating them into your own world, and by the way, how do you want your world to be? You have to answer that question before you can effectively translate." — *Michael Bade*

"Definitely consider using IPD, but make sure that you are fully prepared for actively engaging as a leader on the project and leading your team to support IPD principles." — *Wendy Cohen*

"For someone that is just learning about IPD get good advisors and people who have had some experience—it is really helpful. It has been a great experience for us and I think we will certainly share our enthusiasm for it if anyone were to ask about it." — *George Montague*

"1) There are not going to be a lot of vendors who understand it and change is difficult. They are going to be resistant and if left unattended will resort to old means and methods. 2) You need to focus on the owner's role and making sure you are participating in the right way to support IPD and don't just rely on the contract. 3) Invest your time in learning about IPD and getting experienced people who have done it and who can lead your projects into an efficient mode more quickly than if you tried to do it on your own." — *Robert Mitsch*

"Avoid pre-conceived notions. Ask questions at every step." — *Dr. David Tam*

"Look for partners who are willing to innovate and bring the best ideas and continually look for ways to solve problems." — *William Seed*

"I wish I had known about IPD a lot sooner in my career. I mean, quite frankly, I wish I would have learned about IPD and taken the risk of plugging in sooner than now." — *Crista Durand*

² California Pub. Cont. Code section 10506.4, *et seq.*

15. Humanity and Morale

Although it wasn't a specific focus of the interviews, many of the participants commented on the softer or behavioral side of IPD.

"The other thing that surprised me and that I didn't expect was that almost uniformly the people working on the job have said this is the best job they have ever worked on. It's really overwhelming with the number of people that have come up to me and told me — my husband or my son is working on this job and it's the best job they have ever worked on." — *Chuck Hays*

"There was clearly a huge enthusiasm about finding better ways to—I was going to say a better way to solve the same problem but—in fact a better way to do things because some of the old problems just weren't there anymore. It was just a new way of looking at things." — *George Montague*

William Seed and Sean Graystone talked about the value of returning control and craftsmanship to the craftsmen. "The subcontractors have to feel satisfied in their work, so do the crafts people and the engineering people, so do all the museum consultants and everyone else." — *Sean Graystone* "If people have fun and do work they can be proud of and feel that the situation they are put in and the structure is conducive to fun and results they can be proud of—that's what they want to have." — *Michael Bade* "What motivates people is doing a good job." — *Brenda Bullied*

Michael Bade summarized the effect of the human equation on project outcome. "If the project team is working really well together you are going to have a good outcome. First and foremost are people respectful, are they engaged with each other, do they listen well, do they seek out problems to solve together, do they automatically recognize all of the dimensions of a problem and marshal the people who are responsible for those dimensions from the outset to solve the problem? It is really the soft stuff that is important and projects where the people interact with each other that way will surprise you with the quality and the creativity of the results. It is projects where people are not engaged with each other in that way where the results remain pedestrian."

16. Conclusion

None of these owners would suggest that IPD is the right process for every owner or every project. "The more complex the project, the more appropriate this delivery model is. On a simple project you may not need a full blown IPD model, but we have found that for our high risk/high complexity projects, there is no more reliable way to deliver." — *Robert Mitsch*

But IPD needs a different kind of owner, an owner who is engaged, committed, can draw the team into its vision, and can provide leadership throughout the project. But if the owner undertakes its projects as these leaders have, then the results will be exceptional.