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Special Report:

The May 5th, 2010 ENR article, "Integrated-Project-Delivery Boosters Ignore many Flashing Red Lights," reports the opinions of those for and against Integrated Project Delivery. The title and some of the language suggests that IPD™[1] is a dangerous approach to managing projects. Our response follows.

History Matters: IPD developed and is becoming increasingly popular because of widespread dissatisfaction with current practice. Traditional CPM-based project management and low-bid contracting rests on the unspoken assumption that the economic motivation to reduce cost of each trade's work will produce the lowest cost for the project and maximize total project performance. There should be no surprise that projects with the internal competition created by these practices often turn adversarial. Certainly, parties can work collaboratively under this traditional approach, but it becomes more difficult as uncertainty and complexity increases.

IPD co--evolved with development of Lean Construction (LC); both aim to optimize the project not the piece. The ENR article and people with long experience with traditional practice miss, indeed cannot see, this key theoretical and practical point. People who have this new perspective, those who "have drunk the Kool-aid," grasp this central distinction.

Looking back 30 years, there have been at least two other responses to the problems caused by traditional practice's focus on local optimization. Partnering was an organizational approach aimed at helping people work together more effectively for the benefit of all. Partnering improved communication and reduced misunderstanding, but neither changed the commercial terms nor the operating system. Partnering often worked until the going got rough; then people retreated to their contractual bunkers and began lobbing risk like hand grenades. There is little wonder that people became cynical about it and we hear this cynicism when people use "Kumbaya" to describe IPD.

Design/Build (DB) contracting, like partnering, aimed to shift the focus of optimization from the activity to the project level. DB reduces contractual complexity, but does not change the nature of the organization or operating system. This is particularly true when trade contractors are engaged after

[1] IPD™ is the Trademark of the Westbrook Air Conditioning, a corporation in Florida established by Owen Matthews.

design is complete with low-bid, lump-sum contracts. Owners often see DB as an opportunity to offload risk to one entity, but frequently complain that they lose a voice in the process, and still must deal with misaligned expectations. Architects bemoan the disintegration of their direct relationship with the Owner. Many staunch DB advocates have come to see the limitations of relying solely on a changed contractual relationship with the Owner as a panacea to improve project performance.

Undeniably, however, both partnering and DB contracting have improved performance and have found acceptance in the industry. IPD and LC move each of these ideas further along an evolutionary path. Building on partnering's focus on the organization and DB's focus on commercial relationships, IPD and LC add a focus on the "operating system" – a production management view into how the work of design and construction actually gets done. Moreover, IPD and LC require the team to openly engage in an explicit effort to align the operating system with a collaborative organizational structure and commercial terms that support project-wide optimization through the use of relational contracts. This creates a coherent approach aimed at optimizing the project not the piece, serving the owner's ultimate goal of creating optimal value for minimum cost and time. (Traditional practice also creates a coherent and aligned approach aimed at local optimization -- the CPM driven, activity-centered operating system meshes with transactional contracting and creates a command-and-control organization.)

Context Matters: Simple, slow and certain projects may not require or benefit from the IPD/LC approach. We had local contractors bid lump-sum to pave our driveway, but we chose a cost-plus fee when rebuilding this Old House. The driveway was easy to describe and did not interact with other work. By contrast, we had no idea what was behind every wall and so opted for a contract and process that did not require constant recordkeeping for what was in the drawings and what wasn't. The on-site owner, my wife, was always available when decisions were needed. Traditional contracting and project management work fine when cause-and-effect is well known and clear. It doesn't work as well when cause-and-effect is at best knowable. Complicated projects with complex interactions between subsystems in design and construction call for a more sophisticated approach. The ENR article does not discuss project context.

Competition Matters: Common sense and a growing body of research tells us that competition between people or organizations in complex and dynamic systems causes real problems. Consider a highway at rush hour: the consequences can be dire when one driver tries to optimize their performance with little regard for others. The ENR article focuses on competition between organizations within a project. Mr. Gensler says that it is not a plus to have "the architect and contractor in bed together." We wonder if he would make the same comment about an anesthesiologist and a heart surgeon?

This easy language mischaracterizes the relationship and misleads the reader. In many ways, our current dilemma traces back to the splitting of designing from making – architecture from construction. This has resulted in adversarial relationships where individuals spend way too much time and money building their "case," rather than building the project. Since we live in a society where you can't trust your enemies, its no wonder that individuals like Mr. Gensler believe that they need to "protect" the owner from unscrupulous contractors. The converse is also true, where contractors believe they need to protect the owner against the architect's "frivolous" focus on aesthetics and engineers' over design of systems.

Blaming one group or another feeds self-righteous posturing, as it tranquilizes us against our own complicity. Recognizing that these problems are symptoms of a broken system opens the door to real improvement. Our traditional approach has been to treat the symptoms by making the balkanization more explicit and digging deeper and clearer divides. Looking at the performance data over the past 50 years it is clear that this approach is not working.[2]

Competition between people or organizations in these complex circumstances makes it difficult to understand cause and effect in the work itself. This never helps and usually makes things worse. IPD and LC seek to get behind the symptoms and begin to explore the underlying problems. Working together, teams are exploring these problems from a new, collective perspective that provokes a competition among ideas, rather than between individuals or firms. This is the classic type of design-thinking employed by IDEO and other masters of innovation. Two lean design approaches that forward these goals are Target Value and Set Based Design. TVD and SBD create and manage competition between ideas, and Choosing by Advantages provides a basis for sound decision making among the alternatives. Early results have shown that competition among ideas creates value when it occurs within a collaborative organization shaped by a commercial framework where all parties can gain from making the best choice.

Risk Matters: The article says, "New risks replace old ones." This suggests that the risks in traditional and IPD projects are somehow equivalent. Risk is typically understood in current practice either as things that arise externally and endanger the project, or are the result of dishonesty, misbehavior or incompetence of one party or a conspiracy between many.

IPD and LC rest on a different understanding of the sources and nature of risk. We believe that much of the risk encountered on projects is inherent in the way the work is structured and the project is managed, rather than from external sources. We also believe that traditional approaches to project delivery have

[2] One set of data is summarized in the CMAA Whitepaper "Managing Integrated Project Delivery", available at www.cmaanet.org.

elected to address risk by contracting it away, focusing primarily on indemnity and insurance. To be blunt, traditional project management practices increase risk. As Pogo famously said, "We have met the enemy and he is us." It is hard to support the claim in the ENR article that IPD presents more risk for all parties. The CMAA reports “Between 40 and 50 percent of all construction projects are running behind schedule (same as previous years)” and “The biggest cost impacting construction today is that of inefficiencies built into the way projects are run and managed – not costs of raw material like steel and concrete, or the cost of labor.”[3]

IPD and LC seek to reverse this trend by addressing the causes of risk, rather than just the consequences. At the center of this approach is the belief that a well-managed, collaborative effort to identify the sources of risk and develop collective strategies to eliminate those causes will result in improved outcomes. A well-tested area that demonstrates the validity of this approach centers on the consequences of unpredictable workflow on project performance. We know that unpredictable workflow is the normal consequence of traditional project management and contracting practice. And we know that shifting from command-and-control, centralized scheduling to the Last Planner System® of production control reduces the risk caused by unpredictable workflow. A well-developed international body of research clearly demonstrates that managing projects to improve workflow reliability using the Last Planner System improves project outcomes for schedule, cost and safety. Anecdotally, it also results in project teams emerging from a project actually trusting each other and wanting to work together again. Similar improvements are also reported for other facets of IPD and LC.

Relationships Matter: We considered placing this section earlier in this essay and chose to place it here because we wanted it to focus on the connection between risk and relationship. We know communication problems occur even in long standing relationships and that these are reduced when all share a common understanding of that which is obvious. Building this common understanding and the trust it produces takes time and interaction. The opportunity for this is low in traditional practice.

We have never seen a curve representing the relationship between trust and contingency, but they are surely related – the higher the trust, the lower the contingency. Perhaps the greatest waste in projects is the hidden and unnecessary contingencies added by every participant beginning with the owner not revealing their real limits, designers over sizing components, and contractors adding time and cost to their estimates. All of these can and are being reduced in project organizations that are focused on collective risk management -- where the gains and risks of removing contingencies are open

[3] http://www.cmaanet.org/fellows

and shared.

Aligning the commercial terms, organization and operating system really matters! We noticed early on that specialty contractors brought larger assemblies and modules to projects when workflow predictability improved. Keeping people busy on-site is tough when workflow reliability is low. The best answers for trade contractors don't help the project: "Keep labor off of the site until a significant backlog is available or bring smaller pieces of work to the site so that people can stay busy." Both practices are aimed at optimizing that trade's performance as opposed to the project's.

Improving workflow predictability builds trust and is the first step toward designing and managing projects as production systems. Project stability is the essential first step to permit robust production system design. Production system design, the determination of who does what, when and where, can begin during the project's design phase, particularly when Building Information Modeling (BIM) or better yet "Virtual Building" is used. Moreover, where the project's commercial terms support the ability to move money across commercial boundaries, giving the team the entrepreneurial investment mentality of a "collective enterprise," the team can begin to design the production system with an unfettered goal of supporting overall project performance.

The design and construction of a chilled water plant for the city of Orlando Florida by Owen Matthews' company, IPD, provides a number of salient examples.[4] In one case, the mechanical contractor noted that the cost of their work would be reduced if the structural contractor welded clevises to the beams in its shop. The structural contractor said this would increase their cost by some amount. The mechanical contractor showed that it would save them many multiples of the cost in the shop and reduce the project duration. Traditional project practice would inhibit if not prevent the conversations necessary to make this sort of improvement possible and cost control would prevent the simple movement of money. Simplifying work in this way further reduces risk.

Contracts Matter: The Integrated Form of Agreement (IFOA), a relational contract, was developed by Will Lichtig to create and take advantage of the opportunities created by LC. Traditional projects are delivered under transactional contracts, the sort used for buying a defined product or service. Relational contracts[5] as defined by Ian MacNeil are appropriate when relations are of significant duration, objects of "value" are not all easily measurable, there are many individuals and collective poles of interest, future cooperation is

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[4] Aligning the Lean Organization: A Contractual Approach, Owen Matthews et al, http://iglc.net/conferences/2003/Papers/index_html/view?searchterm=matthews

[5] The New Social Contract (Yale UP: New Haven, Conn, 1980) & The Many Futures of Contracts' (1974) 47 Southern California Law Review 691

anticipated, benefits and burdens are shared, trouble is expected, and the nature of relations will vary as the unforeseeable future unfolds. As Jim Carroll said, “An owner must decide what they are buying – a product or the services of a team trying to solve a problem no one quite understands and keeps changing.” From this perspective, Partnering was an attempt to place a relational wrapper on transactional contracts. While a three-party agreement may not be essential to implementing IPD and LC, a relational contract that fully embraces the new organizational, commercial, and operating system paradigms is.

Responsibility Matters: Those working in IPD projects report a greater sense of responsibility for the project and its overall outcome. They explicitly realize that their success is directly tied to other team members and demonstrate an increased willingness to step in to suggest innovations or correct errors. When there is no contractual barrier or financial advantage to be gained by letting another fail, humans are inclined to do the right thing.

Reporting Matters: The ENR article does not explore the relationship among incentives, risk, project performance and the operating system. It does raise the concern many people have about new forms of contract, for sharing risk and profit, and the need for careful consideration of insurance. These are all issues that the IPD and LC community understand and are addressing. Rather than reporting how these issues are being addressed and what the industry needs to pursue in order to expand these solutions, ENR simply looked to uninitiated skeptics to sensationalize the traditionalists’ view of IPD. It is like asking an individual who has never skied, but has only snow shoed, to comment on the risks of skiing. What qualifications do these individuals have on IPD projects that would make their assessments valuable? ENR should investigate these and related issues with direct on-site investigation of how IPD/LC principles and practices work on projects. It should report on the success and failures of IPD and LC, and the gaps in ancillary industries, such as BIM and insurance, to enable the industry to learn and move forward.

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