



CONSTRUCTION

The Ins and Outs of Integrated Project Delivery

Why this multi-party method should, in theory, lead to better communication, collaboration, and lower costs than traditional approaches

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Every few decades, the construction industry — in its “brute force” way — tries to come up with a better way of delivering to its customers. This is typically done through a new type of contracting method (e.g., design-build) or an

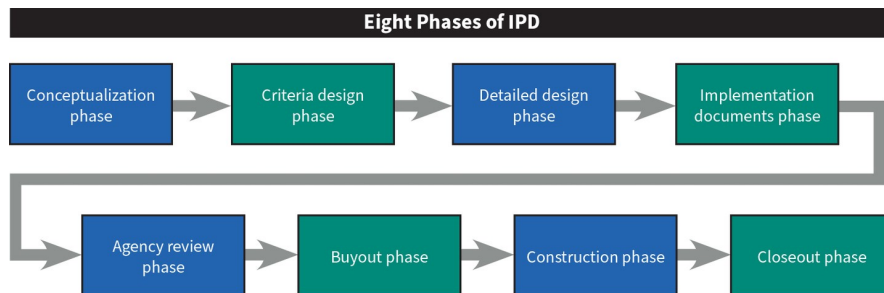
evolution of tools and technologies (e.g., BIM). Sometimes it's sold based on building quality for the consumers (e.g., "green/sustainable" construction). Although this moves our industry forward, these new approaches are sometimes muscled into place with a skewed or limited sight of view for all industry participants. This article explains one of these approaches — integrated project delivery (IPD).

IPD first appeared on the construction scene in the early 2000s as a new contracting method, coinciding with lean construction applications. It was developed to try and solve the decade-old problem of low productivity in construction as well as address constant time and budget overruns and escalating litigation costs that general contractors (GCs) and construction managers (CMs) deal with on a regular basis.

The key for IPD starts with a multi-party contract, which is signed by several parties. Participants can include: the owner, designer, architect, GC/CM, engineers, and subcontractors. The contract is written with a shared financial risk and reward structure, where all parties are involved from beginning to end of the project; theoretically, working for common solutions to get to lowest overall cost. Project savings are shared amongst the contracted parties. The goals of the IPD process are to:

- Optimize project results.
- Increase value to the owner.

- Reduce waste.
- Maximize efficiency through all phases of design, fabrication, and construction.
- Solve problems of low productivity and poor quality.



All parties involved in an IPD-type project work together to reduce the total cost of construction.

The **Figure** shows an 8-phase overview of the IPD process. Each IPD project may or may not follow these steps exactly, but you should be aware of how they may impact you — and the overall spirit of how they line up with the goals of the project. The key is that all parties (i.e., owner, architect, GC/CM, subs, engineers, etc.) are involved in all eight phases and work together to reduce the total cost of construction.

As an electrical contractor (EC), if you are part of an IPD project and were not at the table when the owner was conceptualizing their building, then the project is not truly IPD. For example, if you did not have input on the luminaire selection in a way to reduce your cost of submittals and procurement, then the project is not truly IPD.

An IPD project, in theory, should lead to better communication, collaboration, and lower costs than traditional design-bid-build or design-build approaches. However, the risks and cost models of trade contractors are different than those of CMs and GCs. IPD forces these differences to be visible. Thus, the IPD approach is typically still driven from the architect/engineer/GC perspective.

In the context of “lean construction,” the IPD model took a page out of the book, *The Machine that Changed the World*, (Womack, J. P., Jones, D. T., & Roos, D. (1991), New York: Simon & Schuster), which is a premature application in construction, since the work is still performed by skilled trades. A trade contractor can participate successfully in an IPD-type project by managing their sequence of work, even though the GC is fundamentally concerned about the sequence of time on a project.

What to Do if You are Part of an IPD Project

Realize that behaviors don’t change overnight. IPD is a name of a project delivery method, but use of the name only cannot erase the decades of history and fundamental differences in financial models between GCs/CMs and specialty trade contractors. Even though financial results are “shared” on a single IPD project, the history and antagonism between subcontractors and their GCs is still driven by the fact that subcontractors make or lose money

based on labor productivity where GCs/CMs make or lose money based on time and budget management.

There are three elements that need to be managed between a GC and its subcontractors for true “integrated” project delivery to be realized:

- *Work*: matters to subcontractor, not to GC.
- *Effort*: matters to subcontractor, not to GC.
- *Duration (time)*: matters to GC, not to subcontractor.

For an “integrated” project to be successful, all three elements need to be managed together by all parties.



Make sure the effort that's required to complete the task at hand is taken into account in the early stages of the project.

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Lean construction practices such as “pull planning” are driven by GC/CM interest in managing durations by trying

to “force” the effort. Subcontractor practices of “do whatever it takes” to get the work done are driven by an interest in quality trade installation, without regard to getting the job done on time and on budget.

Be prepared for what you will see. As a participant on an IPD project, you may see a few different “tools” being used. These include, but are not limited to:

- *Multi-party contracts.* Multiple parties will collectively sign an agreement to share risk and reward on the project. The documents are available from the American Institute of Architects (AIA) and ConsensusDocs.
- *Heavy BIM utilization.* The model is owned by the IPD core team, and is used as a shared space that contains necessary project information such as the 3D building model.
- *Project management information systems (PMIS) and attempts to integrate.* PMIS are often utilized by the project teams in IPD to define the project in terms of cost and time. The challenge here is that “project management” to a GC is schedule and time driven, where “project management” to a subcontractor is labor and resource management focused. So, the PMIS picked by the GC may end up getting used by all contractors, which can lead to duplicate and in some cases, not very useful, information for the trades to work productively.

- *“Open book” financial statements and review.* The contracted parties contribute to and share from a profit pool if the project is profitable. When a project is delivered under budget, they have shared savings. This requires all parties to report all their true project costs throughout the project.
- *Open and collaborative space with all subcontractor partners.* This includes extensive meetings, which may not have been incorporated in your budget.
- *Pull and takt planning.* Commonly used in IPD projects, pull planning brings the stakeholders of the project together to create a timeline and specific tasks that will fill it in. Pull planning estimates tasks duration, often based on crew size. This method, however, fails to consider the effort that each task will take. Without this critical information, schedules and timelines may be unrealistic and lack understanding of the work involved for each of the subcontractors.

Integrate your own processes. Once each subcontractor has defined their scopes of work and the effort required on the project, they can work collaboratively to translate their own work breakdown structures into an integrated project schedule. A subcontractor’s work structure is built on a “forward pass” of the work that will happen on site from the perspective of the skilled trade. The GC schedule provides a sequence of time for when certain activities need to happen. It can be viewed as a “backward pass.” Both schedules need to be

considered to ensure a schedule that allows for communicating potential conflicts and ensuring proper coordination.

Example of an Electrical Contractor's Experience on an IPD Project

A new hospital project currently under construction in the Midwest is practicing IPD, implementing the use of takt planning, co-location, and collaboration through BIM.

The project team (made up of engineers, designers, and contractors) all work in the same area. This is known as co-location, and is the practice of design and construction teams working together from a central operations hub with hopes of significant savings in time, effort, and financial resources, as well as higher quality throughout the construction process.

The project team participates in weekly meetings where they review the schedule and coordinate between the various trades. In addition, there are multiple meetings per day to do “takt” planning, which aims to balance the work between trades by designing work batches that take the same amount of time.

Learning point. The EC has found that takt planning fails to consider input from the field related to effort required, and instead is based on an estimated crew size.

Despite the efforts to be successful on IPD projects, here's a list of negative impacts to be aware of:

- Reduced installation time on the job due to frequent communication and increased time spent in meetings.
- Continuous updates and changes to the schedule, making it more difficult for subcontractors to be efficient.
- Drawings and designs are frequently updated throughout the project; if not monitored closely, subcontractors may make the mistake of using outdated versions of the drawings for planning and installation.

In Summary

While IPD projects may be overwhelming to subcontractors that have little exposure to the approach, it's important to understand this is a growing trend. If you're not familiar with this project management technique or aren't willing to participate in it on a potential project, then you'll miss out on future business opportunities.

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