

Integrated Project Delivery Agreement—A Lawyer’s Perspective

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Editor’s Note

Howard W. Ashcraft, Jr. introduces the Integrated Project Delivery “IPD” approach as something that has been successfully used in the United States and the United Kingdom, and something to be considered by Canadian lawyers and their clients. This article provides a detailed and practical approach to IPD contract negotiation, based on experience drawn from over fifty IPD projects. Following his introduction, Ashcraft outlines the potential structure and process for successful IPD collaborative negotiations, and addresses the fundamental paradigm shift required for all parties to understand the key points and goals of IPD. Crucial differences between IPD concepts and those of the more traditional and familiar project approaches are noted.

Section 3 of the article provides details about the models and objectives of IPD contracts, and the micro-frameworks involved in executing a successful project. Collaboration is essential to IPD projects, and a good contract should ensure it through elements such as “Joint Project Control” and an attempt toward “Co-Location” for all key team members. Ashcraft further explains that collaboration and creativity should be partnered with a new business model that includes a risk/reward pool so that all parties have a vested interest in the final outcome of the project. Building Information Modelling (“BIM”) is also recommended as a means by which to increase team efficiency.

Section 4 addresses and analyzes, in detail, a host of important negotiation issues, and outlines best practice approaches to them. Ashcraft emphasizes the importance for IPD negotiators to develop a common understanding of what is being designed and constructed, given the fact that the agreement is executed before design is well advanced, such that it is impossible to predefine all aspects of the delivered outcome. We are informed that because the scope cannot be tightly defined at project execution, IPD agreements typically have a validation period for “go/no go decisions”. Managing decisions, compensation, target-setting and risk allocation are also discussed in this section.

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The final section of the article provides recommendations on how best to engage other project participants (namely, architects and sub-contractors) in the IPD model, noting that their involvement is crucial to a successful IPD system approach.

This article is an important read for both construction practitioners and construction industry members interested in a different approach to project delivery.

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1. INTRODUCTION

Integrated Project Delivery¹ (“IPD”) has been successfully used in the United States and the United Kingdom² (under different terminology), to deliver a broad range of construction projects. In many instances, these projects have significantly outperformed traditional market approaches and IPD is increasingly being used by major facility owners, especially those interested in high-performing projects.³ IPD projects are now beginning to appear in Canada with projects underway, or completed, in Ontario, Alberta, and Saskatchewan and projects being developed or considered in other Provinces. The Canadian Construction Documents Committee is currently working on IPD documents and conferences sponsored by Canadian trade and professional associations have explored IPD and its use in Canada.

Canadian lawyers are being asked by their clients to evaluate this new form of project delivery and advise their clients in the negotiation of IPD agreements. To provide good counsel, the attorney must understand that IPD approaches design and construction from a fundamentally different perspective. Successfully negotiating an IPD agreement requires a fresh perspective, unfettered by traditional contracting concepts. In many instances, the contract negotiator must “unlearn” rules that have served him or her well, but are not functional or relevant to an

¹ This article uses the term Integrated Project Delivery for projects where the key participants are involved from an early stage of design, the project is jointly managed by the project team, and risk and reward are shared based on project outcome. IPD is sometimes loosely used to describe projects that do not have these attributes, but use BIM or have pre-construction services. These are useful practices, but by themselves they are not IPD.

² Referred to in the UK as “partnering” (different from “partnering” in US and Canadian parlance) and delivered under the PPC 2000 form of contract issued by the Association of Consultant Architects.

³ The author’s projects have included healthcare, commercial, academic, software, semiconductor manufacturing, pharmaceutical, office and salesrooms. There has been recent interest in automobile manufacturing and natural resources.

integrated project. Moreover, negotiating an IPD agreement is not a separate act from the project itself. The negotiation process is the IPD team's first collaborative effort and will deeply influence its ability to smoothly collaborate as the project unfolds.

This article provides a practical approach to IPD contract negotiation that draws upon IPD principles to guide the negotiation process. It is based on experience from over fifty full IPD projects ranging from small \$1 million interior projects to \$1.5 billion regional facilities. It assumes that the parties are signing a single, multi-party agreement.⁴ Other approaches are possible, including individual but interlocking agreements and separate single purpose entities. But the multi-party agreement is simpler, less prone to inconsistency, and is the approach most frequently used. Moreover, the process of jointly negotiating a multi-party agreement deepens each party's understanding of the other's interests. And when executed, the multi-party agreement expresses each party's commitment to its jointly defined goals. For these reasons, the multi-party agreement is the preferred form for IPD projects. Although this preference is reflected in the discussions below, most of the information is relevant to negotiating any form of IPD agreement.

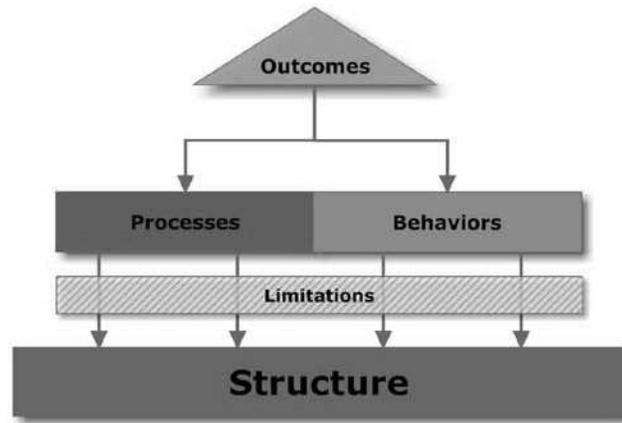
2. APPROACHING IPD NEGOTIATION

2.1 Collaborative Negotiation

Negotiation is not about contract language. It is about finding and defining the intersection of the parties' interests. Getting the deal right is the first step in negotiation. But in too many instances, contract language is exchanged before the key business issues are addressed, thus diverting attention away from the fundamental issues. Worse, the exchange of contract language may lock in terms that work against the parties' needs or preferences. The better practice is to follow the rule: *deal first, language second.*

⁴ There are two common variations on the multi-party agreement. The IPD agreement may include only core parties, such as owner, designer and builder with the key trade partners and key consultants who are within the risk reward group being retained through specialized sub-agreements. We refer to this as a multi-party IPD agreement. Alternatively, all the key parties may execute a single agreement, which we refer to as a poly-party agreement. The commercial and legal terms are similar under each approach, and the choice of multi or poly-party will depend upon the owner's ability to manage the many relationships in the poly-party method. Unless otherwise specified, the term multi-party agreement in the text applies to either approach. For simplicity, the terms "multi-party agreement" or "IPD agreement" in this article will apply to either approach.

Figure 1 – Structure Hierarchy



In fact, the best process begins with determining what outcomes the parties want to achieve and then determining the processes and behaviors needed to achieve those outcomes. Limitations (such as public procurement regulations) that may affect structure are then considered and structures are created to support the processes and behaviors (Figure 1). Processes include work flow design, Lean⁵ design and construction principles, and appropriate tools, such as Building Information Modeling. Behaviors include communication, collaboration, creativity, alignment, and effort. By starting with the desired outcomes, the contract structure is tightly aligned with the project objectives.

Unless mindsets are changed, negotiating an IPD contract may be difficult and frustrating because effort will be wasted on the wrong issues. One solution is to have an IPD workshop *before* any negotiation takes place. The workshop covers what IPD is, why it works, how it differs from traditional project delivery approaches, and discusses holdover thinking, such as the three issues highlighted above. The workshop creates a common level of understanding, allowing the parties (and their counsel) to focus on the issues that will make their IPD agreement successful. One approach we have used successfully is to have a two-part workshop where the first segment focuses on IPD education

⁵ For information on Lean, see articles and information published by the Lean Construction Institute, www.leanconstruction.org, and the International Group for Lean Construction, www.iglc.net.

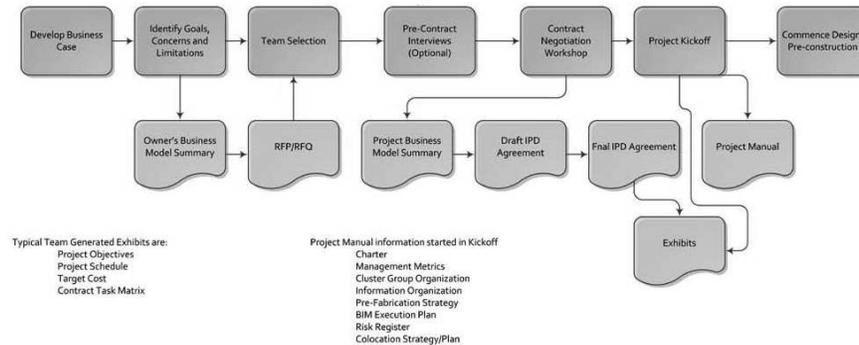
and alignment, followed by a second segment, with participation limited to principals and counsel that addresses the contract itself. If the owner does not have prior IPD experience, we also have found it helpful to meet with the owner's staff and key stakeholders, prior to the larger workshop, in order to create internal owner alignment and to explore the owner's goals and limitations that will be boundaries for any project.

The negotiations should begin with an open discussion of each party's legitimate interests and concerns, which should be documented to guide later negotiations. The goal of the IPD agreement is to create a project where all participants benefit by its success and are equally motivated to avoid its failure. This cannot be accomplished if the parties' interests are hidden or ignored.

The next step is to define the principle elements of the commercial terms and record them in a key terms summary. It should be compared to the guidance document developed previously to assure consistency with the parties' self-defined interests. Because it is short and spare, the key terms summary reveals the fundamental points in the parties' agreement with a clarity that may be lost in the detail of a completed contract.

The final step is to create a contract that fully expresses the agreement documented in the key terms summary. A contract created through this process should be aligned to the parties' interests and a tool that helps them manage the project, not just a weapon wielded in litigation.

Figure 2, below, graphically summarizes the negotiation workflow. Commencing with the development of the owner's business case, the process continues through developing an owner's business model, team selection, a contract negotiation workshop, and project kickoff. Once the key team members are onboard, they will jointly begin the process of validating the project objectives and developing the processes used to organize project information and workflow. Depending upon the project complexity, the project validation and process design agreements may be incorporated into the contract, added by amendment, or incorporated into an independent project manual.

Figure 2 - Negotiation Workflow

2.2 Changing Mindset

Experienced contract negotiators have mental “do” and “don’t” lists developed through hard experience. Similarly, contracts contain language that reflects scars of prior battles. Many of these provisions are designed to prevent a rare failure rather than designed to address fundamental issues that affect success. The accumulation of these provisions clogs the contract with terms that obscure the fundamental business transaction and do little to help the parties achieve success. Moreover, they may anticipate a problem that does not even exist in an IPD project. Drafting an IPD agreement requires forgetting as well as creating. The IPD craftsman should draw on experience, but not be bound to it, because IPD presents a different set of issues that require new responses.

If all of the parties and their principal representatives have prior IPD experience, you can begin by developing the intersection of interests—or if they are all highly experienced with IPD and with each other—may move directly into documenting the agreement. But in current practice, a significant number of the participants (including their counsel) will not understand what IPD is and why IPD works. Thus, they will raise concerns and propose solutions that are valid in other contexts, but are antithetical to IPD principles and undermine the IPD agreement. Once taken, these positions are not easily abandoned and can derail or complicate negotiations.

Three examples where prior contracting experience can actually impede IPD negotiation are set forth below.

(a) *Standard Construction Agreements*

Standard construction agreements seek to specify, in as much detail as possible, precisely what the parties must do and the procedural and notice requirements they must follow. This approach makes less sense in an IPD project for several reasons.

When the IPD agreement is executed, what will be designed and how it will be constructed is not yet known. In addition, because IPD assumes that work will be performed by the best person for the task, exactly who will do the work may also be unknown. Thus, one cannot specify everything in detail, although most IPD agreements will have a task matrix that identifies areas of both sole and shared responsibility.

In addition, most IPD agreements have some level of joint management by the principal parties. IPD expects the team to develop the most appropriate methods for meeting the owner's goals. This requires flexibility, not specificity.

Also, because the IPD agreement will waive or limit the parties' liability to each other, it makes little sense to have detailed provisions that are unenforceable because of the agreed waivers.

Finally, the IPD agreement should focus on the authority of the parties to act, rather than specifying how they should act in some future contingency. When in doubt, the contract drafter should delegate responsibility to the team to address issues, manage the project, and solve problems.⁶ In other words, the contract should empower the team, not limit it.

(b) *Target Cost and Target Cost Design*

The concepts of a target cost and target cost design can also create difficulty. For a variety of reasons, the target cost should be set relatively early in the project. But conventional wisdom (based on lump sum and GMP agreements), argues that setting the target cost should be deferred until the design is more fully developed and a more accurate estimate can be made. But this is a return to the design, estimate, and value engineer cycle that IPD seeks to eliminate. In IPD, the design is developed to the budget so it makes little sense to create the design first. Moreover, much of the fear is based on GMP thinking. If the contractor guarantees the price, it is very risky to use an early and possibly inaccurate target

⁶ If the business model correctly ties individual outcome to project outcome, then joint management must be focused on resolving issues in the overall project interest.

because the contractor must fund project overruns. But the owner pays all direct costs in an IPD project, the parties are only risking their profit. Thus, the consequence of an overly aggressive target is less severe than the consequence of an inadequate GMP. Despite this difference, GMP habits are hard to break.

(c) *Presumptions Regarding Contingencies*

Finally, preconceptions regarding the nature, amount, and use of contingency can be confusing. In a basic IPD agreement, the primary metric is whether the project is achieved within the targeted cost. Because the parties are using target value design, the traditional design contingency does not make sense. Moreover, because the target is set early, it already contains some quantification of uncertainty. Thus, arguably *no* contingencies should be in an IPD agreement (and some have none). The real issues are the timing of the target definition, what should the targets measure, what events cause an allowable change to the cost target or schedule, and whether the events also affect the parties' profit. Contingencies are still important, but the focus is on their use as management tools, not as pockets of protection.

3. KEY ELEMENTS OF INTEGRATED PROJECT DELIVERY AGREEMENTS

Negotiating IPD agreements requires understanding the key elements of an IPD agreement and why they support the behaviors needed to achieve the desired project outcomes. These elements are expressed in a new business model and a new contractual model as described below. In addition, the parties will need to develop a project operating system (micro-framework) that complements the contractual macro-framework and that reflects the organization of information and workflow. The micro-framework may be referenced in the contract, such as a BIM execution plan, but is developed by the team in parallel with the IPD agreement. Counsel may not be directly involved in crafting the micro-framework, but must give it space in the agreement to allow it to unfold.

3.1 IPD Contract Objectives

IPD is designed to encourage behaviors that lead to exceptional project performance and value. These goals are achieved through a properly crafted contract that should:

- remove impediments to and stimulate communication, collaboration, and creativity;
- align participants to well understood and agreed objectives; and
- encourage and reward behavior that increases project value.

These attributes must be built into the fabric of the IPD agreement. Some IPD agreements are filled with unenforceable aspirational language, such as exhorting the parties to act collaboratively. This may be harmless,⁷ but does not substitute for an effective contract structure. Aspirational language, alone, will not prevail against serious difficulties.

3.2 The New Business Model

Although the IPD business model is tuned to a specific project, we have found that a few principles are important to project success. These principles reflect a new balance between the parties and create a system where the structure and inherent incentives keep the project centered on the agreed goals.

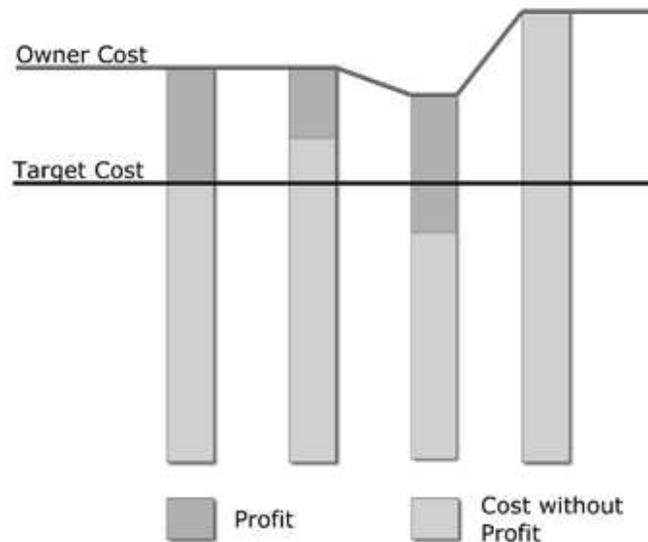
Fixed Profit. Profit in traditional projects is related to the amount of work done. Construction Fees are based on a multiplier applied to the cost of the work. For designers, profit is embedded in each hour billed. Profits grow as work increases, which incentivizes inefficiency. In an IPD project, the parties agree to a fixed prospective profit that is not linked to the actual labor, materials, or project cost.

A fixed profit creates an incentive to reduce the variable costs to increase each parties' margin. Because variable costs (labor, material, and equipment) account for most of a project's cost, reducing these costs directly benefits the owner. Moreover, because adjustments in scope do not affect the fixed profit, work may be easily transferred between parties. For example, if one party can efficiently install all the hangers needed for electrical, mechanical, plumbing, and fire protection, then the work can be shifted to that party. No one needs to fight for scope in order to maintain their profit. This allows the project team to look at what resources the project needs, remove duplications, and improve efficiency.

⁷ Purely aspirational language can be problematic. The aspirational text may obscure the enforceable provisions of the agreement creating a perception that an agreement is highly collaborative when it is not. Moreover, the lesson of partnering is that purely aspirational language does not guarantee collaborative behavior when problems are severe or the stakes are high. Similarly, unless the IPD contract embodies IPD terms, the aspirational language will not achieve collaborative behavior in hard situations—which is precisely when you need it to work.

Variable Costs Without a Cap. A lump sum, Guaranteed Maximum Price (GMP), or Not to Exceed (NTE) contract transfers—at least on paper—the risk of a project overrun to the contracting parties. If this really worked, then you would never see change orders or litigation on these types of projects, except for true owner’s elective changes. What actually occurs is that the contracting parties insert contingencies into their prices to protect against a cost overrun and they use change order and claims provisions to escape the constraints of the lump sum, NTE or GMP. Worse yet, this padding is inserted into each sub-tier contract because the fixed price cap is imposed on these parties, too. This results in multiple (and in the aggregate, excessive) contingencies and creates the possibility that the owner will pay for this risk twice—through initial pricing and then change orders and claims.

In the IPD business model, the owner agrees to pay for the variable costs (not the profit) without any cap. Thus, there is no need for the excessive contingencies carried in most projects. Moreover, because IPD projects generally use a design-to-cost-target approach, design contingencies are not required either. The result is that the owner only pays for what the project actually costs, not for the parties’ excessive perception of their risk. Although the absence of a contractual cost cap may seem bold, it is balanced by strict limitations on change orders and the ability to use party profit as a buffer against overruns. And as mentioned above, lump sum and GMP do not prevent cost overruns and claims.

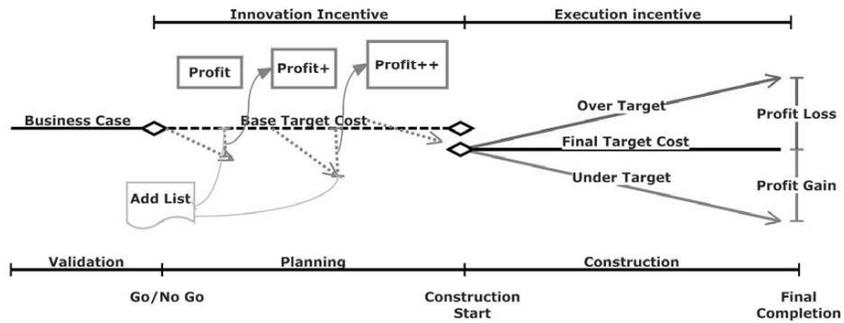
Figure 3 - Simple Compensation Model

Profit Based on Project Outcome. The fixed profit is contingent on project outcome. If the goals are not met, project profit is reduced or even eliminated. If the project performs better than the goals, the project profit is increased. Each party shares in the increase or decrease based on their percentage of the project profit. The profit should be 100% at risk. This increases the buffer against overruns and maintains the distinction between profit and variable costs. Alignment among the participants is strengthened because individual profit can only be preserved, or increased, by improving overall project performance with respect to the agreed goals.

The most common performance metric is project cost. In the simplest model, the parties agree to a target cost and a fixed at-risk profit (Figure 3). The parties are paid their actual costs (without profit) and if those costs are equal to the target cost, the parties receive the agreed profit. If they can deliver for less than the target cost, their profit is increased; if the costs are greater than the target cost, the profit is reduced—potentially to nothing. In that case the owner remains responsible for costs—without profit—until completion.

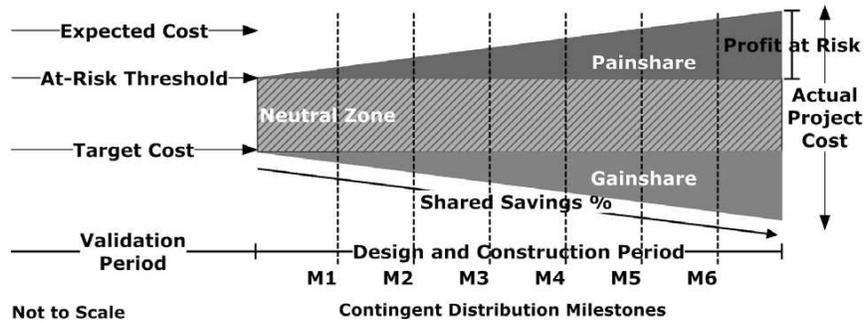
In many instances, an owner is more interested in maximizing the value achieved for a specific budget. In this instance, a model might be chosen, similar to Figure 4 that incentivizes increased value during the design/pre-construction phase and smooth execution during construction.

Figure 4 - Value/Cost Model



In order to set a target early to gain the maximum benefit from target value design, a model might be chosen, similar to Figure 5, that allows for a dead band between the at-risk target and the shared savings target.

Figure 5 - Compensation Model with Deadband



Models can also be chosen to focus on sustainability, perceived quality, performance, or combinations of all of these goals. The essential point is that the business model should be designed to align with the owner and team goals.

Limited Change Orders. Many IPD projects have a zero change order goal and most have far fewer change orders than conventional projects. The business model combined with joint project management leads to a rebalancing of budget in response to change rather than issuance of change orders. Moreover, properly crafted, the IPD agreement should limit change orders to a few specific reasons, such as an owner’s elective change or differing site conditions. Design errors and omissions, a fertile ground for claims in traditional projects, should not be a basis for a change order because design errors are a team risk to be managed and mitigated by the team. Similarly, contractor delay is not a reason for designers receiving augmented construction administration fees. The limits on change orders force the team to plan thoroughly, coordinate closely, and react swiftly when problems arise.

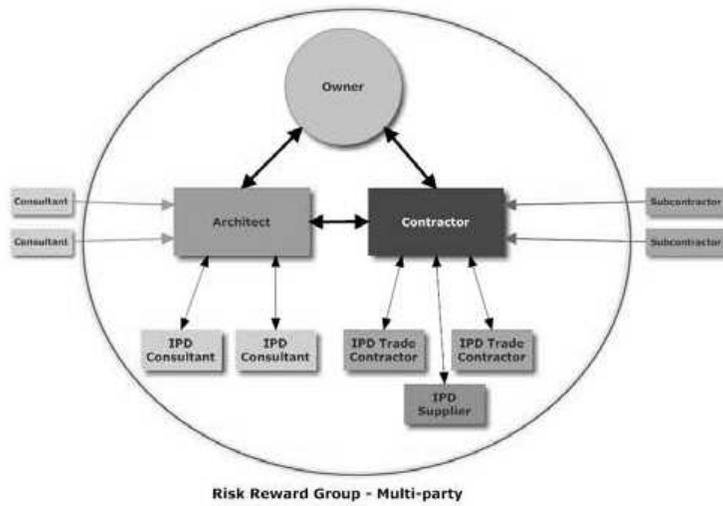
3.3 The New Contract Model

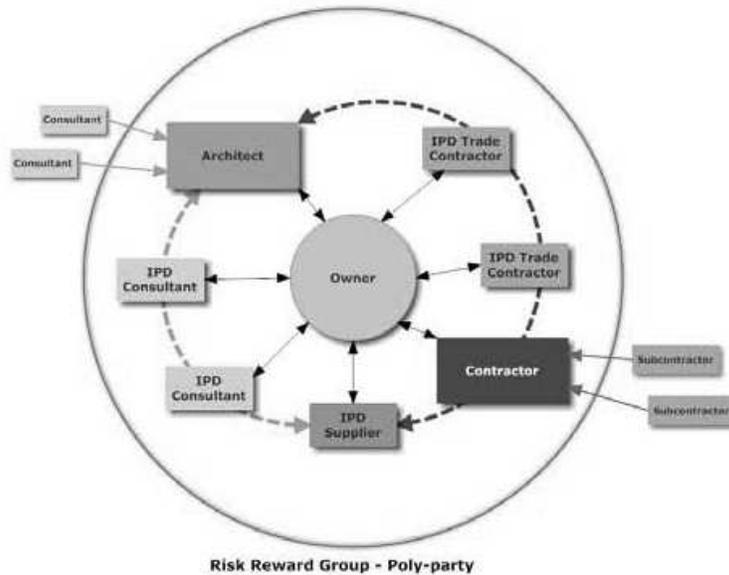
The IPD business model aligns the parties to the common goal and encourages the team to focus on optimizing project outcome. The IPD agreement extends this by creating the closed system that requires the parties to solve problems rather than deflect them.

Although you can theoretically create an IPD project from a series of interlocking contracts, it is much easier to accomplish in a single

agreement. This takes two general forms, a multi-party agreement between owner, prime contractor, and prime designer and a poly-party form that includes all risk/reward team members in a single agreement.

Figure 6 - Multi and Poly-Party Structures





In the multi-party form, the risk/reward team members are engaged through specialized subcontracts and consulting agreements with the prime contractor and prime designer. In the poly-party form, the risk/reward team members all sign the original IPD agreement. If risk/reward team members are added to the project after the IPD agreement is signed, they are included through joining agreements that bind them into the IPD agreement. The multi-party approach is more common, because it reduces the owner’s efforts in managing the many relationships in the poly-party form, but each has its advantages and the poly-party approach may be the better fit for a specific owner, project, and team.

In either a multi or poly-party form, a full⁸ IPD contract has five major structural elements:

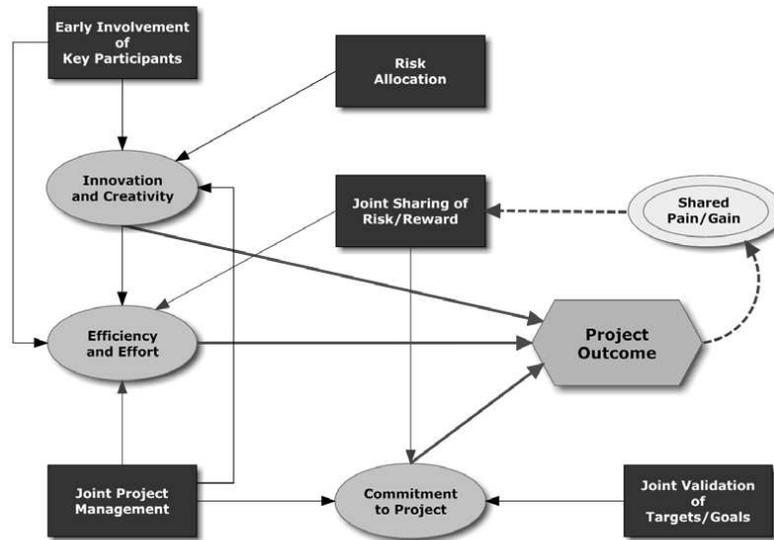
⁸ The AIA/AIACC IPD Case Studies (2010) used a similar description of a “pure IPD” project with the exception of a sixth element, Collaborative Decision Making. In the author’s view, Collaborative Decision Making is a key element of how the IPD project is executed, and is not usually discussed in the contract, itself, except in relationship to joint project management. The five elements are a structural distillation of the nine IPD characteristics described in the AIA/AIACC IPD Guide (2007). Those characteristics are:

- Mutual Respect and Trust
- Mutual Benefit and Reward
- Collaborative Innovation and Decision Making
- Early Involvement of Key Participants
- Early Goal Definition

- early involvement of key participants;
- shared risk and reward based on project outcome;
- joint project control;
- reduced liability exposure; and
- jointly developed and validated targets.

The sections below discuss the importance of each element and how it affects IPD behaviors. The influence diagram in Figure 7 summarizes the discussion by showing how these elements affect behaviors that affect outcome. If you have Innovation and Creativity, Efficiency and Effort and Commitment to the Project (represented in the ovals below), a successful outcome is virtually guaranteed. As described below, the structural elements in the blue rectangles are designed to foster the critical behaviors.

Figure 7 - Five Contractual Elements



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- Intensified Planning
 - Open Communication
 - Appropriate Technology
 - Organization and Leadership

(d) *Early Involvement of Key Participants*

Early involvement of key participants—defined as those who have the greatest influence on project success—is the most important IPD element. A project participant deeply influences project success if it can impart knowledge that improves the effectiveness or constructability of design or if its interactions with other organizations enhance project productivity. Identification of key participants is specific to a given project, but—in addition to the owner, designer, and builder—key participants generally include the mechanical, electrical, and plumbing designers and contractors because their knowledge strongly affects design and these parties must cooperate closely for the project to proceed smoothly. Depending upon the project, steel erectors, framers, curtain wall contractors, major equipment vendors, and others may similarly be key participants.

The key participants' diverse viewpoints improve project performance in many ways. Studies of creativity in commercial contexts note that teams with diverse backgrounds are more creative.

[O]ne common way managers kill creativity is by assembling homogeneous teams. The lure to do so is great. Homogeneous teams often reach “solutions” more quickly and with less friction along the way. These teams often report high morale, too. But homogeneous teams do little to enhance expertise and creative thinking. Everyone comes to the table with a similar mind-set. They leave with the same.⁹

The broad experience of the diverse team also benefits target value design. Designers provided with information concerning effectiveness and constructability of alternative concepts can more accurately choose systems and layouts that efficiently achieve the project goals. Moreover, the key specialty contractors can provide pricing information that is current and accurate, leading to better price control and fewer surprises. Finally, when parties are engaged in developing the project design, they develop a commitment to the overall project, not just to their individual component.

The timing of key participant involvement is also important. Key participants should become engaged at the appropriate time when their participation will benefit the project. This is almost always earlier than traditional design and construction practice, and the reference to “early”

⁹ T. Amabile, *How to Kill Creativity*, Harvard Business Review, Sept.-Oct. 1998.

is meant to highlight this change in practice. It does not imply that all key participants commence simultaneously, and in most projects, the core team will be augmented by additional key participants as the project progresses.

(e) *Shared Risk/Reward Based on Project Outcome*

IPD agreements tie compensation to achieving project objectives. Although formulations vary, preferably all of the participants' profit is placed into a risk pool that may be augmented if project performance is met or exceeded or which may be used to buffer cost over runs. Individual profit is not a function of the amount of work performed, or of individual productivity, but is proportionate to overall project success.

Tying shared risk/reward to project performance discourages selfish actions. Because of the compensation structure, selfishness is self-defeating. Shared risk/reward also increases project commitment. The parties perceive that they are rowing the same boat. Thus, a party benefits by providing suggestions or assistance to other parties. Parties become interested in how they can optimize the whole project, not just a single system or element.

Shared risk/reward also serves to align the parties to the project objective. If compensation is based on achieving that objective, it behooves each party to understand precisely what the objective is and how it is best achieved.

The structure of an incentive program requires careful design. In her study of creativity, Professor Teresa Amabile concluded that monetary incentives are not a principle driver for highly creative teams,¹⁰ although an absence of reward or recognition was often correlated with low creativity.¹¹ A recent study of six completed IPD projects uncovered pointed disagreement concerning the necessity of financial rewards programs.¹² Some participants believed they were absolutely essential, others thought that they were unnecessary.

This disagreement may reflect the difference between corporate and individual viewpoints. A firm considering IPD must assess the risk of engaging in the project. Expressed preference studies show that people are willing to accept a higher risk if they believe the activity is bene-

¹⁰ T. Amabile, *Managing for Creativity*, Harvard Business School 9-396-271, February 1996.

¹¹ *ibid.*

¹² *Integrated Project Delivery: Case Studies*, Joint Report of the American Institute of Architects California Council and the American Institute of Architects, 2010.

ficial.¹³ The possibility of superior profitability also lowers psychological barriers to entry.¹⁴ Managers considering whether to commit their organizations to IPD will consider its potential benefits to their organization. Shared reward not only makes risk more tolerable, it provides a basis for rationally preferring IPD projects. Thus, a workshop of design and construction managers concluded:

Shared Risk/Reward Pool

The Group felt that structuring participant's compensation to be raised or lowered according to performance against predetermined targets is the most important and effective driver—it provides a monetary reason to collaborate.¹⁵

In contrast, once an organization has committed to an IPD project, its employees are motivated by a combination of intrinsic as well as extrinsic rewards. Participants in IPD projects have commented that the positive, non-antagonistic focus of IPD is, itself, a significant reward. Thus, the supposed disagreement may simply reflect the viewpoint differences of persons considering IPD compared to those already engaged in a collaborative project.

Shared risk and reward should extend to all key IPD participants, not just the owner, contractor, and designer. Key participants are those who have a significant effect on project outcome, particularly if project outcome is tied to their successfully working with others. These sub-contractor and consultant key participants can be brought into the IPD agreement by flow-through provisions in their respective agreements with the contractor and designer, or can be included in the IPD agreement by “joining agreement” amendments.

(f) *Joint Project Control*

Joint project control requires real communication between the parties. To achieve consensus, the parties must clearly explain the issues from their perspectives and listen to the perspectives of others. The in-

¹³ P. Slovic, *Perception of Risk*, Science, Vol. 236 (1987).

¹⁴ A major barrier is the concept of *anticipated regret*. When a person recommends or undertakes a task that it could have avoided or ignored, the person runs the risk of embarrassment or otherwise regretting a decision he or she did not have to make. Anticipated regret amplifies risk perception. Nordgren, et al., Unpacking Perceived Control in Risk Perception: The Mediating Role of Anticipated Regret, *Journal of Behavioral Decision Making* 20:533-544 (2007). The opportunity for superior performance can help overcome this barrier to implementing IPD.

¹⁵ *Experiences in Collaboration: On the Path to IPD*, AIA National/AIA California Council, p. 9, 2009.

creased understanding provides a clearer and jointly held understanding of the issues. Miscommunication, although still possible, is less likely.

Joint project control also reinforces the communal nature of the undertaking. It is not “their project”, It is “our project”. In addition, joint project control balances the interests of the parties and provides a check against favoring the interests of one party over another. It also reflects a fundamental fairness. In IPD, parties are accepting risk based on project outcome and should certainly have a voice in decisions that affect those risks.

Joint project control also affects the perception of risk, as well as risk itself. Risk perception research indicates that perils a party cannot control are feared more than those they can.¹⁶ As noted below, fear chills creativity, and results in defensive behavior. It also results in excessive risk hedges through explicit or implicit contingencies. Thus, joint management serves to reduce defensive behavior and avoids unnecessary contingency expense.

In an IPD project, joint project control is affected through a project management team comprised of representatives from at least the owner, contractor, and designer. The project management team manages the project to achieve the jointly agreed objectives. Each member of the project management team must be able to bind its respective entity and each party must be able to rely on the agreements of the others. This direct decision making is foreign to some organizations that reserve final decision to senior levels. But senior management “second-guessing” of project level decisions is toxic, undermines trust, and reduces the parties’ willingness to place project objectives ahead of their short-term interests.

Joint project control is a significant paradigm shift for many owners. Traditionally, the owner’s project representative functioned as the owner’s “eyes and ears”, but did not actively participate in the development of design or construction solutions. Instead, the contractor or designer proposed options and solutions that were approved or disapproved by the owner’s senior management after being communicated by the project representative.

The IPD owner, in contrast, is actively involved in the development and analysis of options and solutions. This level of owner involvement and control is, in fact, one of the major advantages of IPD for appropriately sophisticated owners. In no other project delivery method does

¹⁶ P. Slovic, *Perception of Risk*, Science, V. 236 (1987).

the owner have such a strong role in fashioning the project to meet its needs. But this strength implies responsibility to commit capable personnel with decision authority. This change in practice can be particularly difficult for owners that have traditionally vested their project representatives with little authority.

Although all current IPD agreements have some level of joint project control, the detailed decision process and ultimate authority of the participants varies significantly. Variation is inevitable given the needs of specific projects and participants. But joint project control is designed to provide parties at risk with some control over the risks they have undertaken and to increase the parties' commitment to the project as a whole. Thus, skewing control in favor of one party or the other may undermine the behaviors IPD is designed to foster.

(g) *Reduced Liability Exposure*

The primary reasons for limiting liability are to increase communication,¹⁷ foster creativity, and reduce excessive contingencies.

Information sharing and collaboration support all three components of creativity. Take expertise. The more often people exchange ideas and data by working together, the more knowledge they will have. The same dynamic can be said for creative thinking. In fact, one way to enhance the creative thinking of employees is to expose them to various approaches to problem solving. With the exception of hardened misanthropes, information sharing and collaboration heighten peoples' enjoyment of work and thus their intrinsic motivation.¹⁸

Unfortunately, freely exchanging information can lead to greater liability.¹⁹ Fear of liability has led to bottling up information and a

¹⁷ The liability concern, and its potential harm, was neatly summarized in the commentary *Intelligent Building Models and Downstream Use*, Comments of the Technology in Architectural Practice Advisory Group submitted for the 2007 revisions to AIA Documents B141 and A201, AIA 2005.

"We fear there will be a tendency, driven by valid concerns about liability and insurability, to prevent such use of the architect's design data. We believe this is the wrong answer and would jeopardize the future of architectural practice as we know it . . . Obstacles to a free flow of data among the project participants should be overcome so that the architecture firm can deliver the full value of its work to the client and be rewarded commensurately."

¹⁸ T. Amabile, *How to Kill Creativity*, Harvard Business Review, Sep.-Oct. 1998.

¹⁹ *Edgeworth Construction Ltd. v. N.D. Lea & Associates Ltd.*, [1993] 3 S.C.R. 206 (S.C.C.); (1993), 107 D.L.R. (4th) 169.

reduction in creativity, performance, and efficiency. Liability waivers support communication and creativity by removing this concern.

In addition, liability waivers serve to generally reduce fear of failure. In a creative project, there must always be a safety net below people who make suggestions. A climate of fear is not conducive to creativity and undermines intrinsic motivation.²⁰

Liability exposure also directly raises project costs through increased contingency allocations. A rational negotiator assesses the risks his or her organization faces, attempts to quantify the risk, and includes an allowance in the project cost. This rational action is repeated by each participating organization with the result that the summed risk allowances exceed the actual contingency required for the project. Moreover, the division of project contingency into many smaller allocations impairs effective contingency management.

Liability concerns foster defensive design and reluctance to consider using new materials and techniques. Old practices may be costly and inefficient, but they are comfortable.

Liability waivers also reduce litigation costs, and can be justified on this ground alone, but as noted above, the primary reason for liability waivers is to increase communication, creativity, and to limit unnecessary contingencies.

(h) *Jointly Developed/Validated Targets*

Jointly developed targets bind the parties to common goals. They document the parties' agreement regarding objectives and confirm that they are achievable. In addition, the targets serve as metrics for compensation adjustment and as goals for target value design. Because they are jointly developed, each party owns the objectives and is committed to their achievement.

3.4 Five Micro-framework Elements (and why).

The contractual Macro-framework establishes the driving elements of the IPD project. The Micro-framework describes how the IPD elements will be executed. Unlike the Macro-framework which is embodied in the contract, the Micro-framework is generally documented in the project manual or exhibits that are created after contract execution.

²⁰ T. Amabile, *How to Kill Creativity*, Harvard Business Review, Sep.-Oct. 1998.

Macro-framework and Micro-framework are both required to fully portray the functioning IPD structure.

The discussion of Micro-framework is necessarily general because the actual structure is project specific. Moreover, the Micro-framework structure adapts to project evolution and continuously incorporates lessons learned during the project. The Micro-framework is a process, not a destination. Within this variability, however, are four elements that appear in virtually all IPD projects.

(i) *Team Structures*

Teams are the engine of IPD and greatly increase the potential for creativity, efficiency, and collaborative alignment. But creating groups of individuals does not guarantee project success. Poorly organized and managed teams may actually be less effective due to phenomena such as *social loafing*, *group think*, *diffusion of responsibility*, and the *bystander* or *Genovese* effect. Clearly, IPD teams need to be thoughtfully structured and managed.

IPD team structure should focus on two different issues. First, the teams should be created to logically marry scope and cost responsibility. In many projects, teams are created with systems responsibility (such as mechanical, electrical and plumbing) for the entire project or a physical section. These teams should also be responsible for scope and cost for their portion of the project. Although the teams are responsible for a portion of the project, they should be cross-functional, i.e., they should be comprised of the various groups and stakeholders that are affected by, or serve, that portion of the project. The various teams must then fit into an organized hierarch that comprises the entire project.

Second, the team should be comprised of the right personnel, organized to function efficiently and effectively. Teams require at least three types of people: those with critical technical expertise, those with decision making and problem solving skills and those with listening, feedback and interpersonal skills.²¹ Team size is also important. Teams that are too large are ineffective and those that are too small have insufficient experience, knowledge, and diversity. A good starting point is to use teams with 5 to 9 members,²² with work subdivided to fit that

²¹ Stephen Robbins and Timothy Judge, *Essentials of Organizational Behavior* (11th Ed., Prentice Hall 2011).

²² *ibid.*

team size. Finally, the teams must be supported and managed correctly and incentives, if used, must relate to team results.

(j) *Collaborative Decision Making*

Joint project management focuses on strategic direction and control. Collaborative decision making focuses on the actual design and construction of the project. The IPD project should be organized to capitalize on all team member insights while providing context. This often results in organizing around systems or functional units with system team members drawn from affected or interested organizations. The system teams should draw on and reflect the experience of all the team members. This includes information regarding first and life—cycle cost, constructability, and productivity. This collective knowledge should inform design and construction decisions.

The disparate viewpoints represented also stimulate creativity. As noted previously, creative teams are not homogenous.

Collaborative decisions lead to a deeper understanding of the problems and their solutions. When subcontractors are engaged in analyzing design issues, they can visualize, and help resolve, construction issues before they actually occur. This leads to a better understanding of design intent and fewer questions during execution. In addition, if parties participate in developing concepts and solutions they will be committed to the solution and will not question or argue as they might with a later imposed solution.

(k) *Co-location*

Physical proximity increases the quality and quantity of interactions and builds the relationships that create trust. Working together in real time creates a common understanding of the project and goals. Physical proximity also enhances joint management. In order for the management group to effectively manage and lead, its members need to know what everyone in the virtual organization is doing. If each participant is at its own location, this is very difficult to do. At some time during a project, it will be critical for all or portions of the team to be working together in the same location. On larger projects, co-location may be a semi-permanent state with all key team members at a single structure or location. On smaller projects, co-location may be used judiciously to accelerate progress at critical junctures. But even on the smallest pro-

jects, some co-location, or an extended charrette period, will be beneficial.

Virtual co-location is becoming increasingly possible, although even the best systems are still not equivalent to physical presence. Moreover, virtual co-location is more effective amongst parties that have already developed good working relationships. We recommend that teams meet physically to develop these relationships before they attempt virtual collaboration. Nonetheless, virtual techniques can be used to provide continuity when physical presence is not possible. Lesser collaboration systems, such as web-conferencing, video conferencing, and teleconferencing are also useful, but they should not be viewed as substitutes for co-location. If a project relies on collaboration technologies, it would be wise to map the type of meeting to the technical tool used. For example, web conferencing may be suitable for presenting and explaining information, but creative development is best done in the same physical location.

Co-location should be the default assumption with the parties needing to explain how they will achieve the benefits of co-location when working apart.

(l) *Building Information Modeling*

Collaborative projects can be executed without Building Information Modeling (BIM)—but why would you? Although interoperability issues persist, BIM provides a common platform to share and exchange detailed concepts of how a building will be designed, constructed, and operated. It allows optimization through iterative simulation that can reduce cost, and improve productivity and sustainability. Clash detection, alone, makes BIM invaluable on complex projects.

BIM also increases team efficiency by reducing data re-entry and error through repurposing of information. The BIM can act as the common library or reference for the project. This can lead to fewer mistakes caused by data discrepancies generated by unsynchronized systems.

Achieving these goals requires organizing the flow of information between various models that are included within the BIM and creating standards for how information is assembled, portrayed, and named. In addition, if data will be used for multiple purposes, these needs must be considered before information is entered into the models so that the correct information can be extracted. How these goals should be ac-

completed varies depending upon the participants, the software used, the extent to which BIM will be utilized, and the nature of the project itself. Organizing these details early in the project will increase the effective use of BIM and allow it to be the ultimate collaboration server.

(m) *Design and Construction Management Techniques*

Physical acts, such as cutting a dovetail, are more successful if the cabinet maker has a firm grasp of technique. Project processes, although less tangible, also benefit from good technique consistently practiced. During the last several decades, interest in principles and techniques for optimizing project performance has increased. Studies by the Construction Industry Institute, the Center for Integrated Facility Engineering, and others have examined design and construction processes and have proposed best practices. The principles and techniques recommended by the Lean Construction Institute²³ (LCI) have also been adopted by many construction firms and some designers. Broadly speaking, LCI has applied portions of the Toyota Production System to construction and design processes. These include techniques such as pull scheduling, reliable promising, value stream mapping, reliable commitments, A3 analysis, continuous improvement, and related techniques that have entered into construction parlance even if full Lean principles are not employed.

Forward thinking firms draw from all of these resources to improve their management practices. Some firms have also recognized that interpersonal skills are critical to collaborative project delivery and are emphasizing communication and facilitation skills. Sound management techniques are the tools for implementing IPD principles. They provide concrete guidance regarding how to effectively communicate and collaborate. At project conception, the project team should determine how the project will be managed and should implement clear and effective rules for communication and collaboration.

4. PRINCIPAL NEGOTIATION ISSUES

The discussion that follows focuses first on the principal negotiation issues that typically consume the most negotiation effort and then on several important but subsidiary issues.

²³ www.leanconstruction.org.

4.1 Project Dimensions

IPD agreements align the participants' interests to the project objective. To properly craft structures and incentives, the IPD negotiator must understand the specific characteristics of the project to accommodate them in the agreement. A portion of the negotiation period should be set aside to explore the project dimensions so that all parties understand the project from each participant's perspective.

(n) *The Deep Goal*

The blend of cost, scope, quality, sustainability, and schedule varies between owners and projects. If the owner intends to sell the project when it is completed, reducing the design and construction cost, and thus increasing the return on investment, may be the overriding concern. If the facility is key to bringing a product to market, schedule may be the dominant issue. Where the facility will produce a commodity, then the goal may be tied to cost of production and life cycle costs. And if the facility is for the owner's use, then the owner may be less interested in completing the project under budget than it is in maximizing the value received for the budgeted amount. If there is an underrun, the long-term owner may want to spend the difference to obtain more features or additional capabilities rather than save already budgeted funds. These differing deep goals affect how targets are defined and the structure of compensation and risk/reward provisions.

(o) *Funding*

An owner that self-funds a project has great freedom in how the project is structured. But an owner that uses borrowed funds may be significantly constrained by lender requirements. Lenders often want to have designs well developed before they decide whether to fund the project. Because the project might not be funded, owners may want to limit the amount of design work occurring before the funding decision. But IPD projects involve more parties in the design process and shift design work to earlier phases. The borrowing owner may, therefore, have to pay for more design work from its own funds, because the work must occur before borrowed funds are available. In addition, lenders may have little understanding of IPD and may demand "hard" pricing or may impose contract terms that preclude an integrated approach.²⁴

²⁴ In one of the author's IPD projects, the owner decided that it needed to pursue government

(p) *Duration*

The project duration can also affect the basic contract structure. If a project is relatively brief, the parties can afford to defer all profit until the project concludes. But in a longer project, the parties may not be willing or able to have all profit deferred. This leads to placing a smaller percentage of profit at risk or to using milestones, such as issuance of a building permit, to allow distribution of a portion of the withheld profit. In addition, if the project is quite long, without interim bonuses or distributions there may be insufficient connection between immediate selfless action and the eventual payoff from a successful project.

Project duration also affects the amount of organization, team building, and target validation effort that can be afforded. “Go slow” to “go fast” has greater benefit on longer projects. Shorter projects must necessarily reduce the time spent on organizational and administrative efforts. When developing shorter projects, established teams are preferred because they can draw on their understanding of the basic values of an IPD project and the details of an IPD transaction.

(q) *Uncertainty*

Project Alliancing²⁵ was initially developed for oil exploration in the North Sea and thereafter refined and applied to other project types outside of North America. At the time the projects were proposed, no one knew what the projects would cost, whether they were technically achievable, and what the price of crude oil would be when it was sold. To meet these uncertainties, the parties developed a highly flexible collaborative project delivery method. Integrated Project Delivery is a descendant of Project Alliancing and shares its flexible ability to respond to uncertainty.

Three aspects of IPD directly respond to uncertainty: joint project management, joint sharing of risk/reward, and liability waivers. Joint sharing of risk/reward makes project outcome paramount. Liability waivers remove fear that dampens creativity. Joint project management gives the team the ability to develop and implement solutions. How deeply one implements each concept is determined, in part, by the level of uncertainty.

guaranties of its bond financing. The government dictated contract terms that resulted in a reversion to a GMP structure and a significant increase in project costs.

²⁵ Project Alliancing has been extensively used in Australia and New Zealand to deliver public infrastructure. The *Project Alliancing Practitioner's Guide*, published by the Government of Victoria, is a very good primer to the Australian approach.

(r) *Participants*

IPD requires a sophisticated and capable client.²⁶ The character of the organization, its ability to make decisions, its tolerance for risk and its internal and external regulations all affect the parties' ability to fully engage in IPD. Although these factors affect all participants, in practice, the owner is limited more severely than the designers and builders. These limitations should not be overlooked. Although some owners like the benefits of IPD, they cannot perform in an IPD project because they do not have sufficient staff to actively participate, cannot make decisions swiftly, need "absolute" cost guarantees, or have other limitations.

IPD agreements often require staffing plans from the designer and contractor. Having the owner develop a staffing plan listing the personnel it will be dedicating to the project, how much time they will be dedicating, and who has real authority for decisions is useful, as well. At the very least, the development of a staffing plan stimulates discussion of the owner's IPD roles and whether the owner is capable of fulfilling them.

The experience of the other parties, and particularly their experience, or lack of experience with each other, must also be considered. Concepts such as target value design and BIM interoperability are easy to express, but difficult to accomplish. Less experienced teams will require more extensive coordination and integration efforts. In addition, it may be necessary to train the project participants in collaborative planning and workflow so that they can execute the project without reverting to traditional practices. If there are questions regarding the parties' experience with IPD or with each other, a Process Design phase should be inserted before the Conceptualization Phase²⁷ to develop the procedures, protocols, and trust that the project will require.

(s) *Other Limiters*

The ability to implement IPD can be limited by corporate compliance rules (that may require competitive bidding/estimates, for example), public procurement laws, public perceptions, or other limiters.

²⁶ Consultants can train, facilitate and manage clerical/administrative roles. But the owner still must actively participate in the daily decision making to fully reap the benefits of IPD and to assure that the project moves forward efficiently.

²⁷ The AIACC's *Integrated Project Delivery: A Working Definition* established phasing terminology that is used in the AIA/AIACC *IPD Guide*, the AIA's Integrated Project Delivery contract documents, and other contracts and forms. The standard IPD phases are Conceptualization, Detailed Design, Implementation Documents, Buyout, and Construction.

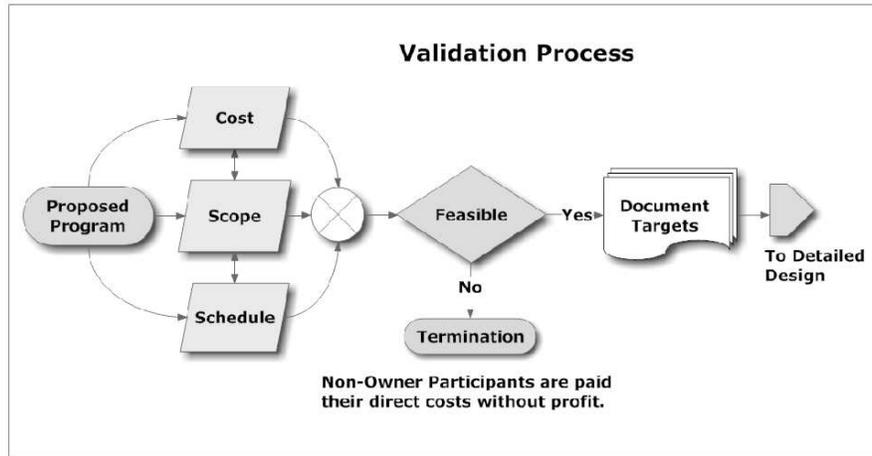
All limiters must be understood if they will significantly affect the project. Assuming the limiters are real, the parties must fold IPD concepts into their more limited project structure.

4.2 Project Scope

IPD is a flexible means to efficiently design and construct a project. Because the agreement is executed before design is well advanced, it is impossible to predefine all aspects of the delivered outcome. As the project progresses, the parties may have different opinions whether a specific item is within the initially contemplated scope, or is a justified change to the target cost. In some agreements, the project management team or the core group is the first arbiter of scope issues, but if disputes continue they are resolved by senior representatives, and in some instances, through the disputes process. It is better to avoid these disputes by developing a common understanding during negotiation of what is being designed and constructed.

Because the scope cannot be tightly defined at project execution, IPD agreements often have a validation period leading to a go/no go decision. During the first phase of design development, the parties jointly refine the owner's initial program and determine whether it can be achieved within the proposed target cost and schedule. Although this occurs after the contract is executed, it is still part of the negotiation process because the project will terminate if the parties cannot agree on scope, cost, and schedule. Validation is usually completed after the Conceptualization Phase and documented in a report or reports that detail scope, targets, performance metrics, and schedule. Validation requires effort, but is critical to establishing the common basis for understanding that avoids or minimizes later scope disputes.

Figure 8 - Validation Process



While the method used for defining project scope is also important, it must reflect the owner’s deep goals and the incentive plan (i.e. shared risk/reward) must be coordinated with both the scope and the owner’s deep goals.

For example, if the deep goal is designing and constructing the project as efficiently as possible, the project scope needs to be specified in detail. By setting efficiency as the primary goal, the team is incentivized *not* to include items unless they were reasonably inferred from the initial program. If the scope is vague, disputes are likely.

In contrast, if the deep goal is maximizing value for a defined budget, the incentives should reward the team for increasing the project value rather than reducing project cost. A minimal scope must still be defined, but the contract should focus more attention on how to reward exceeding the minimum scope.

If time to market is the most significant goal, then incentivization should first favor schedule reduction and then seek minimizing cost or maximizing value. In practice, most projects contain a blend of goals and the scope definition must reflect a similar balance.

The content of the validation documents will differ depending upon the method chosen to define scope. The documents may contain programming information and a prioritized list of goals. They may include schematic drawings and a matrix of included features. They may have a

list of elements categorized as required or desirable. Whatever method is chosen, they should be sufficient to guide the team in developing the project to meet the owner's goals.

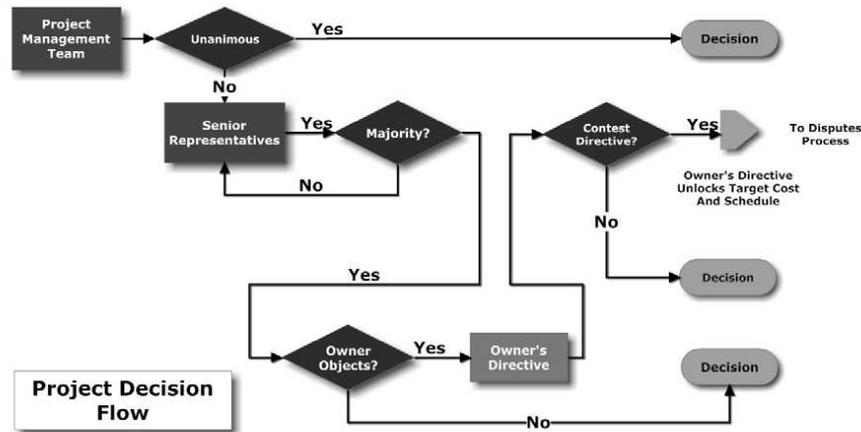
4.3 Management and Decision Making

In Project Alliancing agreements, every decision must be unanimous and there are no tie breaking or dispute resolution procedures. To move forward, all must agree.

In contrast, there are IPD agreements, such as the ConsensusDOCS 300 and the AIA IPD C195 agreements, that favor consensus, but allow the owner to ultimately decide. Although this approach avoids potential deadlock, in the hands of an uncommitted owner it undermines the principle of equitable joint management. And from a practical perspective, many owners do not have the staff or the decisiveness to assume this role.

One approach that attempts to balance project control is shown in Figure 9, below. In this approach, unanimous decisions at the project management team level are binding and unappealable. If the project management team is unable to reach a decision, a senior management team decides the issue by majority vote. This is also binding and unappealable, unless the owner decides to override the decision by issuing an owner's directive. If the designer or contractor challenges an owner's directive, it is resolved through the contract's dispute process and may result in an adjustment to project cost and schedule. Thus, all parties have a voice in decisions and authority is fairly evenly distributed with the owner having slightly more authority through the owner's directive. The owner's authority is balanced, however, by the ability to appeal unilateral owner's directives through the dispute process.

Figure 9 - Project Decision Flow



This is the project decision protocol used in the Hanson Bridgett IPD agreement and with a minor modification,²⁸ the approach used in the newer AIA C191-2009 Multi-party Integrated Project Delivery Agreement.

4.4 Compensation

(t) Overview

Compensation in an IPD agreement has three objectives. First, it should provide a fair return for a party’s efforts. Second, it should encourage the parties to act in the best interests of the project and should stimulate efficiency and creativity. These objectives are accomplished by tying a significant portion of compensation to project outcome, rather than individual performance. Third, it should buffer cost overruns. The buffer, which is funded by the “at risk” portion of compensation, must be large enough to keep anticipatable overruns within a range of acceptable results.

There are several principles used in IPD compensation design. The parties’ profit is unlinked from the direct costs that the party actually incurs although the initial profit may be calculated from an assumed

²⁸ The second level of decision making in the C191 requires unanimity, not a majority vote.

level of effort. Once the project has commenced, however, no party should be able to increase its profit by increasing the amount of work it does. Removing the incentive to “work to create profit” allows the team to move work between members without resistance. IPD compensation is cost plus fixed profit, not cost plus a percentage fee. Profit is based on group outcomes. The most common metric is overall project cost, but issues of safety, quality, schedule, or behavioral performance are commonly used in conjunction with cost performance. In some instances, the focus is on the value created, not the cost incurred. But all approaches are based on group performance. Cash flow can be another consideration. In a short term project, profit may be held until project completion. On longer projects, a portion of profit may be distributed before completion if milestones (and targets) are being met. Reducing the amount of profit at risk, can also reduce cash flow concerns by allowing payout of the profit not at risk on a percentage of completion basis. However, reducing profit at risk may unacceptably limit the buffering effect of the at risk profit and lessen the incentives for group performance.

This system requires careful definition of direct costs to ensure that profit is not duplicated in the hourly rates being charged by the team participants. Generally all rates are auditable and in larger projects, rate audits are performed at commencement and conclusion of the project. On smaller projects, rates may be audited at commencement, but once they are agreed to by all parties, can only be audited for misuse, rather than amount.²⁹ Using this approach, the key negotiation issues are: 1) the target cost; 2) the normal profit level; 3) the maximum contribution amount (“at risk profit”); 4) the percentage allocation between contractor and architect; and 5) the percentage allocation of cost savings between the owner and design team. The correct balance of these issues varies between specific projects and teams. In general, however, the owner wants to assure that the target cost is below similar projects delivered conventionally and that the maximum contribution amount is large enough to soften a moderate cost overrun.³⁰ The architect, contractor and any subconsultants or subcontractors within the shared risk/

²⁹ For example, an agreed rate of \$100 for a specific person or classification could not be audited, but whether the person worked on the project, or how many hours were incurred, would still be auditable.

³⁰ One approach to defining these numbers is to determine the appropriate maximum contribution amount and to back calculate the other numbers. For example, if the parties believe that change orders, other than true scope additions, on a typical project is approximately 3% and that the range of “reasonably anticipatable” cost outcomes is -5% to +7%, then a maximum contribution amount of 4% would result in a net 3% cost if the +7% outcome occurred. Thus the owner would have an acceptable (but not good) result if a significant overrun occurred, and would have a better than average outcome if the overrun was less. A 4% maximum contribution amount is achievable on many projects, especially if subcontractors and subconsultants are included in the cost sharing participants.

profit group want to assure that the target cost is high enough that, if they work collaboratively, there is a real chance they can better the target price. Moreover, they want a percentage of shared savings that is a real incentive and a reasonable limit to the amount of their risk. All parties have a shared interest in getting the numbers right because the correct balance encourages the collaboration that benefits all.

The basic compensation strategy can be varied to accommodate different goals and issues. For example, because the designer has completed most of its work before construction commences, it may not be reasonable, and perhaps not financially feasible, for the designer to wait until construction completes before obtaining any portion of the “at risk” profit. This leads to considering a partial distribution when the design milestone is completed, provided there is strong evidence that the design will be constructed within the target price. Table 1, below provides an example of milestone distributions with differing milestone percentages for architect and builder.

Table 1 - Milestone Distributions

Milestone Distributions		
Milestone	Architect Percentage	Builder Percentage
Building Permit Issuance	20%	10%
Subsurface Construction Complete	10%	15%
Superstructure Top Out	10%	15%
Building Envelope Complete	15%	20%
50% Finishes in Place	20%	10%
Substantial Completion	10%	15%
Total Milestone Distributions	85%	85%

Note: Milestone payment conditional on anticipated completion within targets. True-up if later recovery of slipped milestones.

A similar outcome can be achieved by splitting the incentive into design/pre-construction and construction portions. The first is an incentive for designing at or below the cost target and is measured by an updated cost estimate immediately before construction. The second is an incentive for constructing the project at or below the updated estimate. Incentive distributions should hold sufficient incentive to protect against overly optimistic estimates and “true-up” provisions should be included. If the shared savings rate differs during phases, it can create opportunities for gaming that undermine the effectiveness of the incentives.

Subcontractors can also have similar cash flow concerns and a more general approach is to use a matrix to distribute a portion of profit at specific milestones. The percentages applicable to each party can be adjusted to match their effort level in the measurement period. Profit distributions are not made unless the project is estimated to meet its goals, a portion of profit is withheld until final project completion, and there are provisions for adjusting missed milestones and overpayments. Table 2 displays a portion of a distribution matrix that uses each parties respective completion percentage to set the amount of their profit at risk that might be paid (if the preconditions are met) at a specific milestone.

Table 2 - Distribution Matrix (only 2 milestones shown)

 HansonBridgett	ICL %	Milestone 1 [event]		Milestone 2 [event]	
		Est. % Complete	% of ICL Distributable	Est. % Complete	% of ICL Distributable
Architect	15.0%	30.0%	4.5%	30.0%	4.5%
[Structural]	6.0%	30.0%	1.8%	30.0%	1.8%
[Mechanical]	6.0%	30.0%	1.8%	30.0%	1.8%
[Electrical]	6.0%	30.0%	1.8%	30.0%	1.8%
Contractor	23.0%	10.0%	2.3%	10.0%	2.3%
[Structural Steel]	6.0%	10.0%	0.6%	15.0%	0.9%
[Curtain Wall]	6.0%	5.0%	0.3%	10.0%	0.6%
[Mechanical]	9.0%	10.0%	0.9%	10.0%	0.9%
[Electrical]	8.0%	5.0%	0.4%	5.0%	0.4%
[Plumbing]	9.0%	5.0%	0.5%	10.0%	0.9%
[Fire Protection]	6.0%	5.0%	0.3%	10.0%	0.6%
	100.0%		15.2%		16.5%

IPD allows considerable variation within the concept of shared risk and reward based on project outcome. Compensation design is a key tool for obtaining collaborative alignment and efficiency. It is also critically important to all project participants and must fairly balance cost overrun buffering, profit opportunity, risk, and cash flow. An experienced IPD attorney and facilitator can help lead the team to a harmonious balance.

4.5 Target Setting

Targets in IPD perform two functions. First, the targets set the goal to which the parties design and construct the project.³¹ Second, the targets are the metric used to measure the team’s performance. Although

³¹ Target Cost Design or Target Value Design are key techniques in IPD. In a traditional project, the client’s programming needs are used to develop the design. As the design progresses, cost is addressed through an iterative design/estimate/redesign loop until the estimate meets the budget. This is a *feedback* process. Target Cost Design uses a continuous evaluation of alternatives and cost implications to influence developing a design *to the budget*. This is a feed-forward process and avoids the waste, delay, and lost opportunities that are associated with design/estimate/redesign.

the most common target is the project cost, targets can include performance, quality, schedule, or any other reasonably evaluated metric. Moreover, targets can be expressed in alternatives as well as quantitative spectra. For example, the level of profit enhancement can be tied to which “desirable” elements can be achieved for the target price, as well as those that are required by the program. In these projects, the question is how much value the owner can get for a set budget rather than how little can be spent to achieve a set program.

Setting targets correctly is of paramount importance and raises significant issues for the negotiation team. The key issues can be divided into three basic questions.

(u) *What are the targets?*

Integrated Project Delivery attempts to align behavior with the goals through the use of incentives and disincentives. Since these are meted out based on achievement of targets, the targets must align with the goals. If cost efficiency is the primary goal, then achievement of target cost should be the primary determinant of project success. But if issues such as schedule or sustainability are equally important, then they should be significant factors, as well. Moreover, if the owner wants to maximize value for a set budget, then a pure cost target actually works against the owner’s goals and different criteria should be used.

Target setting is further complicated because most projects have multiple goals and, if so, focusing on a single goal would not accurately model project values. In addition, some goals overlap, for example, lower maintenance or energy costs are financial *and* sustainability goals. Some goals are also more easily achieved and others are more easily measured. Influence diagrams can be helpful by exposing the relative value and interdependency of goals. In the end, the principal objective is to balance the targets such that they correctly reflect the project values and do not distort team performance. The targets must also be reasonably clear and administrable. Thus, the final targets will be a functional compromise between accuracy and practicality that is informed by the project’s true goals.

(v) *When are the targets set?*

Timing of target setting reflects a tension between creativity and precision. Because the targets can affect profitability, the team, especially those that are experienced with guaranteed maximum price pro-

jects, may feel uncomfortable with setting targets early. They will argue that design should be further advanced to allow a more accurate evaluation of cost. Moreover, if the targets are set too early, it will be difficult to adequately describe the project scope. The loose scope definition can lead to later disputes, especially when the cost of achieving scope undermines achieving a financial target.

Although setting the target too soon may create difficulties, delay in setting the target undermines key IPD objectives. A late target setting unbalances the contributions of designer and contractor, because the designers can do very little further to increase project efficiency after the design is fixed. At this point, project outcome is almost entirely in the contractor's hands. Moreover, there is little incentive to develop an efficient design because the target will be based on whatever design is developed. In fact, an "economically rational"³² designer will *not* want to create an efficient design because it lowers the target making the target more difficult to achieve. For the same reason, an "economically rational" contractor will not contribute its best ideas during pre-construction. Ideas shared during pre-construction lower the target and only benefit the owner, whereas ideas developed after the target may lead to savings that the contractor shares. Finally, IPD tries to use target value design to avoid the waste and lost opportunities inherent in design, estimate, and redesign cycles. Target value design is undermined if the target is set after the design is well developed. For these reasons, targets should be set before the design is well advanced.

Setting targets is also affected by the type of target used. If the target is purely financial, the related project scope must be clearly defined, which will require more time. If the target is the amount of value for a set budget, the target can be set earlier as the outcome is determined, to a great extent, on the amount of scope the team can achieve. Targets should be set when the team has had sufficient time to delineate the project program and determine that the target is an aggressive but achievable goal. This ties target setting into the process outlined in Figure 8 - Validation Process.

Although the correct time to set targets is specific to the project and target type, the practical range within which targets should be set begins

³² We recognize that parties do not always act in their short term economic interest because of inherent honesty and professionalism. But we believe it is better to align interests than to hope that parties will act altruistically. And besides, the parties should not be penalized for acting in the best interests of the project.

at the end of the Conceptualization Phase and into the middle of Detailed Design. This gives the team enough time to explore what is being designed and built without foreclosing opportunities for creativity and target value design.

(w) *How should the targets be set?*

Targets are best set by the team in a collaborative process that confirms scope, schedule, target cost, and any other relevant criteria. On complex projects, the team undertakes a validation study that evaluates the owner's business case, the program requirements, the schedule, and budget to confirm project feasibility and set appropriate targets. This process occurs during the Conceptualization Phase, and if agreement can be reached, the parties document the key project and target parameters and proceed to Detailed Design. If they cannot reach agreement, the project is terminated for convenience.

As noted previously, the targets should be aggressive. One purpose of IPD is to reduce inefficiency and achieve greater project value, which is expressed in lower cost targets. Target aggressiveness is sensitive to several factors. One factor that affects aggressiveness is the proposed profit levels for the participants. As the targets become more aggressive, proposed profitability should rise as well. Aggressiveness becomes counterproductive, however, if it creates fear of failure that leads to defensiveness and finger pointing. This is especially true if the owner retains unrestrained project control.

Financial targets can be expressed in current or escalated (de-escalated) amounts. If indices exist or can be created that accurately reflect true costs, then it is better to set the target in current dollars and adjust the target based on the change in the indices. This makes it easier to evaluate the design against the target and to make appropriate choices as the design develops. When the project (or a milestone) is completed, the incurred costs can be readjusted using the indices for comparison to the target number. But this is complicated because costs are incurred over a period of time and the adjustment will be different for each time period. Moreover, different indices may apply to different cost components. The parties may have to live with a short-cut approach, such as using a cost mid-point adjustment. The other option is to predict escalation (or de-escalation) and consider its effect in setting the target. This is simpler to administer, but increases target uncertainty.

Finally, whether and how contingencies are reflected in targets is a significant issue discussed in the next section.

4.6 Contingencies and Adjustments to Targets

Traditional projects have three different types of contingencies:

- Design Contingency (accommodates cost increases that are uncovered as the design is more fully developed);
- Construction Contingency (covers items that were overlooked during estimating, scope gaps, some design errors and omissions, rework and miscellaneous, but unanticipated construction phase events - can also include a risk buffer that becomes extra profit if the contingencies do not occur); and
- Owner's Contingencies (covers owner decisions to add out-of-scope items and truly unanticipated events, such as *force majeure*).

These contingencies are all necessary in traditional projects to buffer the contractor's risk when it signs a lump sum or GMP contract and to provide the owner with adequate funds to weather uncertainties. The construction contingencies are replicated within each lump sum subcontractor's bid. When summed, all of these contingencies create a risk pool that is larger than the project requires.

Contingencies in IPD projects function differently. The owner needs a contingency to cover elective scope changes and truly unforeseen events that are not the fault of the team, such as differing site conditions, *force majeure*, and some governmental actions. This contingency amount is in the owner's budget, but is usually not reflected in the contract. A design contingency is unnecessary because the project is designed to the target price, rather than priced based on an evolving design. There should be no need to dip into contingency as the design evolves. There is also little need for a construction contingency because the owner has guaranteed payment of direct costs. If a contingency event occurs, the construction cost may rise, but the effect on the designer and contractor is limited to reducing their profit. The same is true for subcontractors that are within the profit/risk sharing group as they are also compensated on an actual cost basis. In addition, if project events justify changes to targets and profit, the need for any construction contingency is further reduced. As a result, construction contingencies can be smaller in a well-drafted IPD agreement.³³

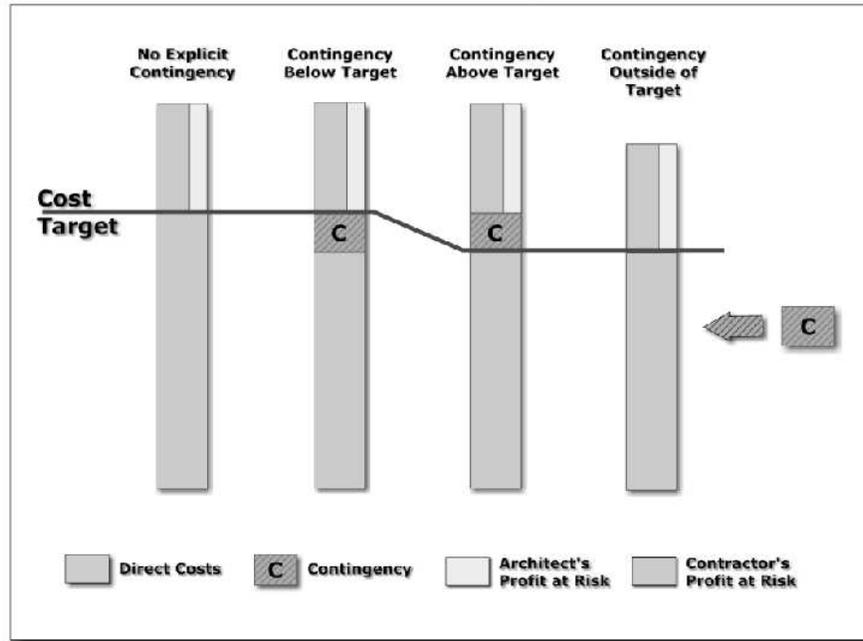
Because costs are guaranteed, contingency is an IPD issue only in relation to setting the target cost. As noted previously, setting the target costs early engages the entire team in developing a design that can be efficiently and economically realized. But early budgeting lacks the precision of later estimates and the non-owner parties will want to add a risk buffer to the target cost to ensure a reasonable chance of meeting or beating that target. Whether implicit or explicit, the target cost will thus contain some “uncertainty hedge”, which is essentially a contingency.

Unfortunately, there is often confusion regarding IPD contingencies. Part of the confusion stems from using a term, “contingency”, that has a well understood meaning in the traditional design and construction contracts, but operates differently in an IPD agreement. When the compensation metric is a target cost, “contingency” is just the amount of risk buffer that allows the parties to be comfortable with the target price given the level of project definition and design development. It is money that is intended to be spent if required to achieve the project goals whether or not any “contingency” event occurs.

There are at least four ways that contingency is treated in an IPD agreement.

³³ There is a tendency to put limits into contracts, such as GMPs, that transfer risk from one party to another. But the person accepting the risk must then build a risk buffer (contingency) into the contract and the owner then pays for the risk whether or not it occurs.

Figure 10 - Contingency Options



The first example recognizes that all project funds are equal and should be used to achieve the project goals. Thus, there is no explicit contingency and no reason to determine whether an allowable cost is covered by a contingency fund or is part of the normal project costs. A portion of the target cost undoubtedly reflects some risk assessment, especially if it is set early, but there is no separate fund. Under this approach, allowable costs are always payable by the owner and accrue towards the target cost, which is not amended unless the work is outside of the previously agreed scope. If the final cost is less than the target cost, the savings are shared among the architect, contractor and owner as agreed in the contract. This approach is preferred because it recognizes that all funds are dedicated to achieving the project goals and that non-owner profit is increased by improving performance in all areas, not by artificially hoarding a contingency fund.

The second and third examples are mathematically similar and have the same risk assessment as the first example, except that it is stated explicitly as a contingency rather than being implicitly included in the

target cost. The disadvantage of an explicit contingency is that it can lead to quarreling over when and how it should be used. Non-owner participants may view the contingency as a buffer protecting their profit that they do not want spent. The owner may view the contingency as funding overlooked items. The advantage of an explicit contingency is that it requires a conscious decision to transfer funds to cover an event and thus focuses the management team on underperforming parties or tasks.

The final example has a contingency that can be spent by the owner or Project Management Team if a defined contingency event occurs. Any unspent amount is returned to the owner. This approach has several difficulties. First, because the non-owner participants will not know whether the contingency will be spent, they will necessarily want a risk buffer when they set the target cost. This leads to multiple contingencies—a result IPD seeks to avoid. Second, the limited amount of the contingency fund raises the question of what occurs if the funds are insufficient for the contingency. Most non-owner participants will recoil from an approach that limits the owner's responsibility for truly unanticipated issues, such as pre-existing environmental hazards or governmental delays that are not caused by the design or construction team. This transfers risk to the non-owner parties that must be covered, somehow, and will likely end up being implicitly included in the fee. Third, this approach requires careful drafting to predict the events that justify using the contingency. Finally, there will be a tendency for the non-owner participants to argue that events require spending the contingency fund because, in this model, spent contingency funds are not considered in determining whether the target was met. This approach has the psychological disadvantage of the second and third options, is more difficult to administer, and if hidden in profit or overhead, tends to distort project accounting.

4.7 Allowable Costs and Profit

Designers and contractors account differently for allowable costs and profitability. Designers, for example, include profit in their normal hourly rates. Contractors, in contrast, consider profit a component of fee that is applied to the cost of the work. These accounting differences, and the differences in determining allowable costs, need to be reflected in the agreement. Moreover, because the IPD structure assumes payment of direct costs, care must be taken to specify what costs are properly chargeable to the project.

(x) *Designers*

As noted above, designers normally embed cost, overhead, and profit in their hourly rates. In an IPD agreement, the owner guarantees payment of direct costs (costs without profit, or with reduced profit) and reimbursable expenses. This is most easily done by agreeing on a multiplier on direct salary expense. For example, if a firm's normal hourly rates assume a 3.0 multiplier, the parties might agree to a lower multiplier, say 2.5, for all direct cost billings. The difference between multipliers would be the "at risk" profit. Reimbursable costs would be paid at cost, including subconsultant costs.³⁴ When using this approach, the parties should recognize what benefits are included within the multiplier. In some firms, the multiplier includes anticipated bonuses and profit sharing. These may be inappropriate if you are trying to define costs without profit.

Because many designers are salaried employees, hours incurred in excess of a normal work week may not have any significant cost and if charged to the project, could result in extra profit for the designer. This violates the concept of working at cost between distributions. But it is also not fair for the project to get worked hours at no cost. During negotiations, the team must decide if and how hours are incurred for salaried employees who are not paid for those hours should be charged to the project.

In an IPD project, you want to reward efficiency and discourage inefficiency. Thus, you do not want to have profit being a function of the number of hours worked. Instead, the profit should be a fixed amount based, perhaps, on the hours estimated, but not on the hours actually incurred.

(y) *Contractors*

Contractor's compensation is more complex. The fee charged by contractors covers firm overhead, profit, and risk. Cost of the work, to which the fee applies, includes labor, material, general conditions, and general requirements. There can be some overlap between these items, depending how the contractor normally manages its costs. For example, some contractors do not use actual costs for personnel, but charge a blended rate based on functional level (i.e., "senior estimator") that may or may not be directly tied to their cost for that specific person. If more

³⁴ Because the designer is being paid on a cost basis, including costs incurred in managing subconsultants, a mark-up is not justified.

junior employees are used on the project, the contractor has, in effect, put profit into its direct costs. In addition, contractors vary regarding the level of benefits included in their hourly rates. What is billed as an employee's direct cost may actually include profit sharing based on historic performance. In addition, where persons are not fully dedicated to the project, or where they arguably should be part of general overhead, the owner may be paying twice for the same service. In addition, the issue regarding salaried employees that are not paid for overtime hours, is equally relevant to the contractor's professional staff.

Another difference between designers and contractors is the level of detail required for allowable costs. This is true whether general conditions are paid on a lump sum monthly basis (or pursuant to a schedule) or are paid as an incurred allowable cost. The contract must list the items that are properly charged to the project and those that are excluded. This exercise results in extensive exhibits that define which costs are within general conditions or general requirements, and which are allowable costs under the agreement.

Compensation of contractors should also consider the level of fixed price subcontracting contained in the contractor's costs. Because these fixed price subcontracts contain profit and contingency (for the subcontractor), they can distort the cost accounting of an IPD project. In theory, all subcontracts should be cost reimbursable with shared risk/reward, but in practice this cannot be achieved. You should try to include the key subcontractors (usually firms that may be brought on board during the design process or that provide design as part of their contract such as MEP, and often drywall, structural steel, or curtainwall) within the shared risk/reward group and settle for as many others as can be reasonably administered and achieved.

Assuming you can adequately define allowable costs, you need to determine how profit will be defined. A fixed profit is preferable to avoid encouraging the contractor to increase hours to increase profit. This profit amount can then be entirely at risk, partially at risk, and can be distributed at project completion, or can be distributed at milestones. How this is accomplished will depend upon the participants and some of the project dimensions discussed previously in paragraph 4.1.

4.8 Measuring Performance

Cost and schedule are relatively easy to measure. If there are early profit distributions, however, there must be a method for comparing

progress achieved to the progress required at that milestone. This will invariably involve some level of estimating using a modified earned value calculation with claw-back and true-up provisions.

Assessing quality can be more subjective. There are at least three approaches that have been used. First, the completed project can be compared to previously identified similar projects using a matrix of characteristics. Second, an independent assessor or assessors can evaluate the project based on the initial program and a characteristics matrix. These approaches generate a score that is used to adjust distributions. The third approach lists project elements as required or desirable. If required elements are present, but do not meet a quality standard, they reduce the quality index. If they are done exceptionally well, they can raise the quality index. Desirable elements raise the quality index if they are achieved and raise the index higher if they are done exceptionally well.

A quality index reduces the incentive to “skimp” to achieve target cost. But because it is subjective, it raises concerns regarding the fairness of its application. The subjectivity of the quality index may affect its weight relative to other more objective criteria, such as cost and schedule.

4.9 Risk Allocation

The Project Alliancing approach used in Australia forbids any claims between the Alliance participants unless there is willful default. Although this approach is blissfully simple, it does not recognize the complexities of modern IPD projects. Some IPD agreements prefer to follow traditional risk management approaches, with each party fully responsible for its own failings. But this introduces counter-productive finger pointing and fear. Another approach is to waive claims for “joint decisions,” but this does not fully eliminate an adversarial environment because many important decisions will not have a “joint decision” pedigree, although taken in the interest of the project.

There are three intermediary risk management frameworks that the parties should consider.

The least complicated is a simple waiver of consequential damages. This prevents the owner, contractor, or architect from seeking damages for delay. The mutual consequential damage waiver should apply to all consultants and subcontractors that are within the risk/reward sharing pool. Responsibility for delays is adjusted, at least to some extent, by the

level of profit available for distribution. However, a simple consequential damage waiver does not solve all risk management issues. It does not address how direct damages should be handled or how a delay claim asserted by a person outside the risk/reward pool should be defended or paid.

A more comprehensive approach categorizes types of damages into project outcome, project performance, builder's risk, and third party claims. Project outcome risks are those related to cost and schedule and are mutually waived between the parties. Project performance (e.g., whether the roof leaks) are either warranty or professional liability claims. Builder's risk claims are waived between the parties, at least to the extent of builder's risk coverage. Third party claims, most often injured workers, are transferred by indemnification to the contractor, which is covered under their comprehensive general liability policy or an owner or contractor controlled insurance program (OCIP or CCIP).

Another approach divides claims by time. Thus, those claims between the parties that occur before completion are waived (generally cost and schedule), whereas those that occur after (generally non-conforming or defective work) are not. This still leaves issues regarding injured workers and third parties that must be addressed and raises tricky problems with regard to builder's risk claims.

Many of the difficulties with risk management can be alleviated by a comprehensive insurance program. As this article is being written, several larger IPD projects have or are obtaining comprehensive IPD OCIP products. In the future, integrated OCIPs will be commonly used on larger IPD projects as they simplify liability waiver and allocation.

One unsettled issue is how to handle claims brought by or against third parties with one or more of the IPD participants. Ideally, these would be jointly defended and prosecuted by the Project Management Team, but this is not easily done if the team members are liable to each other (or have indemnity obligations) related to the claim. If the claim is covered by an OCIP, it becomes easier to accomplish joint prosecution and defense of many third party claims.

5. SUBSIDIARY NEGOTIATION ISSUES

5.1 Subcontractors, Consultants, and Joining Agreements.

Contractors and Architects rarely perform their full contractual scope of work, delegating much of their scope to subcontractors and consultants. Architects may retain less than half of the total design fee and some contractors retain no self-performed work, at all. If IPD seeks to energize the people actually doing the work, it must clearly engage subcontractors and consultants. Moreover, if IPD is to provide the owner with a sufficient buffer against cost overruns, the subcontractors and consultants—or at least the key participants—must also share in the risk/reward structure.³⁵

Because IPD is a collaborative, trust—based delivery method, the consultants and subcontractors chosen must embrace IPD and must be able to work co-operatively with the other parties. Thus, in most IPD structures, the subcontractors and consultants are jointly chosen by the owner, designer, contractor team, or the team has interview and veto rights over the designer’s and contractor’s preferred consultant and subcontractor choices.³⁶

There are two primary methods for incorporating the key consultants and subcontractors: subagreements and joining agreements.

In the subagreement approach, the key IPD elements flow through the prime agreement (designer or contractor) into the subagreement (consultant or subcontractor). This includes key risk and reward terms as well as any liability limitations and waivers. The at—risk compensation of the subcontractor or consultant is a portion of the at—risk compensation of its respective prime. In almost all instances, the business structure of the subagreements mirrors the business structure of the IPD agreement, except that the subcontractors and consultants are less involved and have no or limited voting rights at the project management level.

In a joining agreement approach, the key subcontractors and consultants execute an agreement that amends the IPD agreement to add them as a party. The risk/reward provisions are amended with each

³⁵ As a general rule, at least half of the anticipated construction cost should be within the risk/reward structure, and preferably more.

³⁶ Another option is to have each new project participant interviewed by the entire team that precedes it. Although this may work on smaller projects, it becomes increasingly cumbersome as the number of project participants increases.

added key subcontractor or consultant to reflect the amount of compensation the added party has placed at risk. If all parties are added to a single agreement, the IPD agreement must distinguish between types of parties when determining issues, such as joint project control.

In theory, every project participant should be bound by the same risk sharing and liability limitation provisions as the principal parties. In practice, however, only key subcontractors and consultants are included in the cost guaranteed/shared risk model because the advantage of including less significant parties does not justify the administrative expense. Generally, the parties that must closely interact with others should be incentivized on communal rather than individual performance and should be within the cost guaranteed/shared risk pool. This group will vary between projects, but on most vertical projects will include the mechanical, electrical, and plumbing participants, and could include structural steel, framing, and exterior cladding systems.

The level of subcontractor and consultant involvement will affect the amount of profit at risk. Ideally, all subcontractors and consultants would be within the risk/reward group, but this level of participation is neither practical nor necessary. But at least fifty percent of construction cost should be compensated under a cost reimbursable/shared risk-reward basis and preferably two-thirds or more.

Subcontractors and consultants can be bound to the IPD contract through IPD riders that modify their subcontracts and consultant agreements to incorporate the IPD provisions. But many existing subcontracts and consulting agreements are not compatible with the provisions and tone of the IPD agreement. The better practice is to create subcontracts and consulting agreements that match the primary IPD agreement.

5.2 Document Ownership

If parties jointly contribute to a work, they obtain joint ownership to the entire product. This requires more than commenting and editing, but can conceivably arise where parties to an IPD agreement collaborate in the design, especially in projects using Building Information Modeling (“BIM”). The solution, however, is quite simple. The agreement should identify who owns what part of the joint work. Others using the joint work for the project should be licensed to do so and there should be licensing for reasonable use thereafter, such as warranty work, promotional and educational uses.

5.3 Building Information Modeling

Although IPD does not require BIM, few if any IPD projects will be done without it. Who, then, owns the BIM? Because the BIM has long term facility management value, institutional owners will view the BIM as a project deliverable they should own. This is a change from standard AIA practice with regard to instruments of service and thus requires discussion with the team. This discussion will raise issues regarding reuse of information and responsibility for designs that are not completed if the project or design team is terminated before completion. But these issues are no different in IPD than in conventional projects.

There are significant issues regarding how BIM is specified, what the process should be for developing BIM communication standards, and how the BIM should be managed and administered. Luckily, the Institute for BIM in Canada, AIA, ConsensusDOCS and vendors, such as Autodesk, have published documents that deal with many of these issues and there are various templates for the more comprehensive BIM Execution Plan that is coming into more frequent use.³⁷

5.4 Dispute Resolution

Although many claims among the IPD participants are waived, there will still be issues that need to be resolved. Moreover, specific obligations, such as the obligation to make payment or a duty to indemnify, must be enforceable despite the waivers. The parties should carefully consider what issues must be resolved at the project level and which can be elevated to senior representatives or an independent decision making process. In general, informal resolution processes should precede formal measures and the parties should have primary responsibility for resolving disputes.

6. CURRENT IPD CONTRACTS

A companion article available on the Hanson Bridgett website³⁸ compares key features in the currently available form contract docu-

³⁷ <http://www.ibe-bim.ca/resources.asp>, AIA C106 *Digital Data Licensing Agreement*; AIA E201 *Digital Data Protocol Exhibit*; AIA E202 *Building Information Modeling Protocol Exhibit*; ConsensusDOCS 200.2 *Electronic Communications Addendum*; ConsensusDOCS 301 *Building Information Modeling Addendum*; Autodesk *BIM Communications Specification*, Penn State *BIM Project Execution Planning Guide*.

³⁸ Lisa Dal Gallo et al, *Comparison of Integrated Project Delivery Agreements*, online: HansonBridgett <http://hansonbridgett.com/Practices-Industries/construction/~media/Files/Publications/IPD_-Contract_Comparison.pdf> .

ments. In addition, the article discusses two manuscript agreements that have been widely used or have served as the basis for custom agreements—the IPD Agreement prepared by Hanson Bridgett LLP and the Integrated Form of Agreement used by Sutter Health and initially created by the construction group of McDonough Holland and Allen (now a part of Hanson Bridgett LLP).

These agreements have common elements, but also have significant differences. Before using any of the existing forms, you should compare its structure to the previously prepared key point summary to assure that the form reasonably expresses the parties' agreement. If an existing form is a good match to your business agreement, it is a reasonable starting point. But some standard agreements may require extensive modification to match the business and risk structure of a specific project, in which case a custom agreement is preferable. In almost all instances, some modification of the contract form will be required.

7. CONCLUSION

IPD raises many new issues and raises old issues in new ways. Negotiating an IPD agreement requires that the team members understand IPD at a theoretical and practical level. They must know when past experience and practices are useful guides and when they should be abandoned. Understanding why and how IPD works allows them to craft an agreement that enforces IPD principles and strengthens the IPD project.