PART 1

COLLABORATION IN CONTEXT

Part 1, "Collaboration in Context," presents the historical and contemporary factors that affect architectural practice, collaborative versions of the most common project delivery types, the value of collaboration (as well as addressing times when it is not appropriate), and outlines the factors needed to create a culture of collaboration in teams and organizations.

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CHAPTER 1

Collaboration in Practice

The Changing Landscape of Architectural Practice

Over time, the process of designing and constructing buildings has transformed from a holistic master builder model in which all aspects of the design and construction process are orchestrated by one individual, to the fractured landscape of the early twenty-first century, in which industry professionals are hampered by archaic procurement models and disincentivized from working together for fear of litigation. The causes of this devolution are varied, but the resulting state of practice is one of inefficiency, with architects facing constant value engineering to meet project budgets, poor coordination, and disintegration between parties in the construction document phase (Figure 1-1). The result is most often excessive change orders and requests for information, which breed constant anxiety on the part of the client over exceeding the project budget and schedule. All of these contribute to delays, compromises, and the failure of most projects to fulfill their full potential (AIA/AIA CC, 2009). In the midst of this chaos, architects are losing revenue and relevance at an alarming rate.

Welcome alternatives to these siloed, contentious, and risk-adverse practices have emerged with the rise of Building Information Modeling (BIM) and the development of collaborative contract structures in the early 2000s. These structures showed how the creation of joint partnerships between key stakeholders—owners, architects, and contractors at a minimum—who share both the risk and reward for a project's success could incentivize an integrated delivery approach. Analysts projected that the industry-wide adoption of such collaborative tools—as with any paradigm-shifting change—would be slow and gradual.

However, economic, societal, and technological agents of disruption brought about by the Great Recession of 2008 accelerated this timeline. The future of practice (and to some extent the current state) is now one in which collaborative teams work together for the success of the project as a whole rather than prioritizing their own interests. This significant and necessary cultural shift requires that training and best practices be developed not only to help architects through the transition but also to foster ongoing collaboration and innovation.

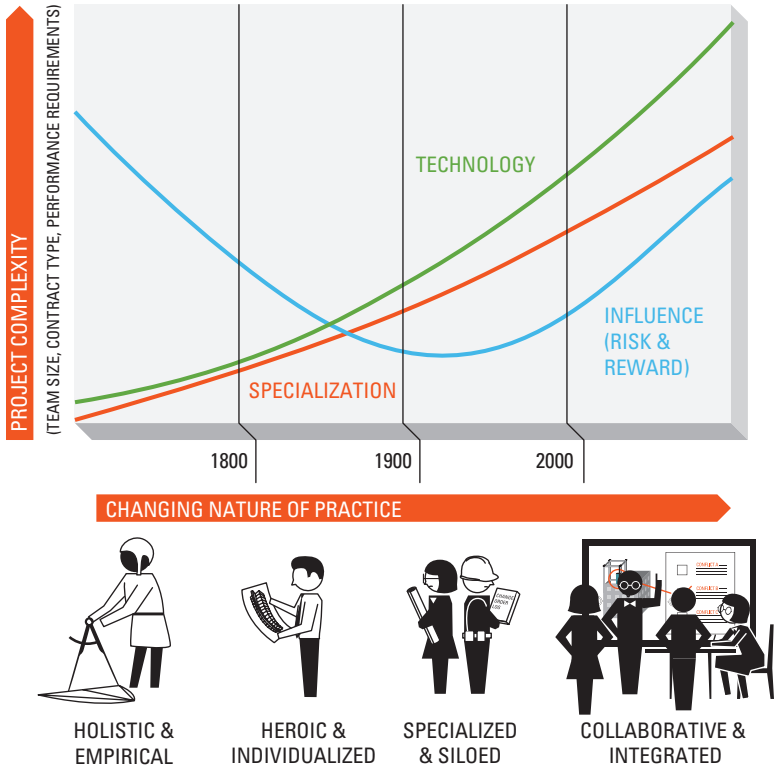

Figure 1-1 Culture of practice over time

The American Institute of Architects has been a leading voice in the national conversation regarding integrated and collaborative project delivery, calling for an industry-wide change. It developed *Integrated Project Delivery* (IPD) as one possible project delivery model that promotes a collaborative approach. The AIA also published a series of robust resources addressing the technical and procedural nature of IPD that have been widely utilized: *Integrated Project Delivery: A Working Definition* (AIA CC/McGraw-Hill, 2007); *Integrated Project Delivery: A Guide* (AIA/AIA CC, 2007); *Experiences in Collaboration: On the Path to IPD* (AIA CC/AIA, 2009); *IPD: Case Studies* (AIA/AIA MN, 2010); and *IPD: Updated Working Definition* (AIA/AIA CC, 2014).

In 2008 the AIA published a series of contract documents to provide three approaches to integrated delivery:

1. Transitional forms that are modeled after existing construction manager agreements (including owner–contractor, owner–architect, and general conditions contracts);
2. Multi-party agreements that create a single agreement that parties can use for IPD projects; and
3. The single purpose entity (SPE) contract that creates an LLC comprised of key stakeholders for the purposes of the project, which demonstrates the most robust engagement with this project delivery model.

Despite its promise, most practitioners have been slow to adopt IPD in the fullest sense, struggling to justify its value over traditional practice, to understand how to integrate the approach into existing practice structures, and to anticipate what the ramifications might be to changing the status quo (AIA CC/AIA, 2009). In 2008, a group of early adopters, made up of owners, architects, and contractors, gathered at a symposium conducted by the AIA California Chapter to share their practical experience. Although very few had participated in a "full" IPD project, all were engaged in integrated forms of project delivery and identified the following characteristics and structures that define Integrated Project Delivery:

Characteristics

- Results in efficiency and reduces redundancy
- Gets the right information to the right people at the right time
- Results in more accurate cost estimating earlier in the design process
- Decreases the risk of construction delays and additional costs
- Values people over technology
- Is unique to each project and team
- Is not appropriate in all situations

Structures

- Requires the right people
- Requires that all parties buy into the process
- Relies on trust
- Requires the owner's direct involvement throughout the entire process
- Requires a clear understanding of the process by all parties
- Requires clearly defined goals for the project and for all parties
- Requires leadership and structure
- Requires technical excellence
- Requires clear roles and responsibilities for each team member
- Requires a clear definition of risks and rewards
- Requires investment in team building, not just team assembling
- Often requires training to shift team members into a collaborative mindset
- Requires continuous education as new members join the team
- Requires transparency
- Results in personal rewards such as ownership and enjoyment of the process in addition to financial rewards
- Requires starting with "who" before "how"
- Requires a plan of action be developed at the beginning of the process by the key stakeholders collectively
- Requires clear decision-making processes and rules of engagement
- Requires regular, frequent meetings by the key stakeholders
- Requires personal, face-to-face communication
- Requires careful listening and asking questions
- Requires addressing issues and concerns in real time (AIA CC/AIA, 2009)

With such a list of clearly beneficial qualities and requirements, the question remains, why have there been so few projects that implement IPD holistically? The answer is that collaboration is simple in theory but difficult in practice. It is not easy for any industry to make the shift to a collaborative

approach and maintain the energy required to collaborate well over time, especially in one with as long a history of contention as that of the design and construction industry.

Collaboration has long been seen as either requiring the magical convergence of an ideal group of people or as hindering the "lone genius" model of traditional architectural mythology. It is, however, a skill set that can be taught and developed. Such skills, including leadership, collaboration, trust, and communication, need to be understood by architects in a way that provides both a conceptual grounding as well as the practical tools necessary for implementation. Although collaboration is rewarding when done well, it is not easy.

The Rise of Integrated and Collaborative Project Delivery

Effectively structured, trust-based collaboration encourages parties to focus on project outcomes rather than their individual goals. Without trust-based collaboration, IPD will falter and participants will remain in the adverse and antagonistic relationships that plague the construction industry today. IPD promises better outcomes, but outcomes will not change unless the people responsible for delivering those outcomes change.

(AIA CC, 2007)

A collaborative practice is distinguished from that of a typical, multiperson office by the intentional integration of diverse voices and expertise in all stages of the design process. Although architecture is by nature almost never a solitary act due to the size and complexity of its products, traditional models of practice and education have conditioned architects to develop a singular voice. The real fear in collaborating is that we and our work will be mediocre; a race toward the lowest common denominator, and with it, irrelevance; we will be seen as just one more designer among designers. The truth, of course, is by not collaborating architects become marginalized. Not knowing how to effectively collaborate will lead to their irrelevance" (Deutsch, 2014).

A defensive posture led to architecture being surpassed in significance by numerous allied fields such as engineering and manufacturing, which had long since streamlined their development and fabrication processes with great success. In 2004, Stephen Kieran and James Timberlake published *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction* (Kieran and Timberlake, 2004). The book challenged architects to recognize the current state of affairs and called for a radical rethinking of the ways in which buildings were made, through the adoption of advanced technology such as mass customization and information management tools. It called for integration, not segregation, in the process of making buildings: "The first act of design in this world beyond the old equilibrium is the redesign of the relations among those responsible for the making of things." They posit that in an integrated model of practice, the "intelligence of all relevant disciplines is used as a collective source of inspiration and constraint" (Kieran and Timberlake, 2004, 13). The central tool that allows for such a model to work is what they called the "IT/software enabler."

Although the authors do not mention BIM specifically in their book, the idea of a digital tool that supports the shared flow of information, instantaneous communication, and the interconnection of all disciplines is clearly outlined. Later that year, Phil Bernstein and Jon Pittman, in a white paper

written for Autodesk Building Solutions, echoed Kieran and Timberlake's call for the profession to cease operating in a model of discrete resource-intensive and inherently inefficient phases of design and construction. They proposed BIM as the tool to enable such collaboration (Bernstein and Pittman, 2004).

Bernstein and Pittman cite the sixfold greater investment in technology by the manufacturing industry as compared to that made by architecture and construction during the same time frame, as well as the increasingly competitive global market as indicators of the industry's lack of advancement. They argue that allied fields had "turned long ago to model-based digital design processes based on data that supported engineering analysis, bill-of-material generation, cost modeling, production planning, supply-chain integration, and eventually computer-driven fabrication on the factory floor," and were exerting a competitive pressure that the *AEC* industry could no longer ignore (Bernstein and Pittman, 2004). While these lessons were not lost on AEC stakeholders, the nature of the building industry—where project teams focus their efforts on the realization of a single, unique product and rarely work together more than once—made any effort to create more continuity difficult (Bernstein and Pittman, 2004).

Sharing of digital information prior to BIM was rare due to the lack of trust between architects, engineers, and contractors; the intermittent nature of technological implementation in practice; the lack of confidence in the accuracy of digital information transferred from one platform and discipline to another; and the lack of incentive (or more accurately the disincentive) for any party to take on more than their contractually obligated role in the process for fear of increased risk. Such an environment was ripe for disruption.

The introduction of BIM represented even more of a technological paradigm shift than the earlier transition from paper to CAD, because it also affected the social nature of practice, requiring new standards, workflows, and means of communication (Bernstein and Pittman, 2004). Even after BIM began to become more commonly known, design professionals struggled to understand how to harness its full potential. "[I]t is clear that there are many views as to what BIM is. Incorrectly seen as a technological solution to CAD integration, BIM places the effective use and exchange of 'information' at its heart. As a result, BIM will have an impact on most areas of business management and operation. It will revolutionise methods of working and fundamentally redefine the relationships between construction professionals. It will challenge current thinking on contracts and insurance and most importantly, it will support the integration of the design and construction teams" (NBS, 2011).

Bernstein and Pittman predicted that industry-wide adoption of BIM would be a slow process, prodded along by outside influence from clients and incentive-based contracts (2004). A year-long examination by the AIA in 2006 resulted in the *Report on Integrated Practice*, which foregrounded the need for the profession to address the changing needs of clients and society through alternative modes of project delivery, not just through technology. The report overview begins with a statement by 2002–2007 AIA vice-president and Miller/Hull partner Norman Strong: "Technological evolution coupled with owner demand for better, faster, less costly construction projects and more effective processes are driving change in the construction industry. These changes are revolutionary in nature. They will transform practice as we know it today." He concludes with the statement: "Together we have a very small window to change the trajectory

of the profession, and to best ensure its continued relevance" (Broshar et al., 2006).

The model of integrated practice was put forward as a "future perfect vision" where

> [A]ll communications throughout the process are clear, concise, open, transparent, and trusting; where designers have full understanding of the ramifications of their decisions at the time the decisions are made; where facilities managers, end users, contractors and suppliers are all involved at the start of the design process; where processes are outcome driven and decisions are not made solely on first cost basis; where risk and reward are value-based, appropriately balanced among all team members over the life of a project; and where the profession delivers higher quality design that is sustainable and responsive (Broshar et al., 2006).

Through technology, the communication barriers between silos would be demolished, allowing practices and projects to achieve their full potential. This revolutionary change promised to free architects from the burden of documentation and allow for greater focus on design (Broshar et al., 2006).

Presenting arguments for the benefits of BIM, architect and educator Daniel Friedman wrote that "the true potential of this technology in practice (for architects) presupposes deeper collaboration among all parties to the contract. That means dynamic hierarchies, joint authorship, and shared risks, responsibilities, and rewards—and we expect subsequent changes in the contract language to reflect these new relationships" (Broshar et al., 2006). Thom Mayne, in his report essay "Change or Perish," warned architects: "You need to prepare yourself for a profession you're not going to recognize a decade from now, that the next generation is going to occupy" (Mayne, 2006). Asked to revisit his statement in 2009, Mayne stated that the changes to practice were proving even more extreme than he had predicted.

> Today I would think that you couldn't even run a practice without having advanced performance techniques for understanding the way your projects operate within functional terms, within environmental terms, within technological terms, and for looking at the development of a project in the early stages, the cost models that are connected to extremely precise performance objectives. It's not evolutionary . . . our clients expect this. And, given current economic conditions and the way the relationship with subcontractors and our engineers has evolved, a huge amount of these people already are advanced in these areas and also have expectations of receiving 3D drawings and not normative drawings (Smith, 2009).

In 2007, the AIA National and AIA California Council published *Integrated Project Delivery: A Guide*, which outlined the ways IPD could be utilized in practice. It cited inefficiencies in the construction industry resulting in up to 30 percent waste, the lack of interoperability among AEC stakeholders costing the industry almost $16 billion annually, and the worst performance of any nonagricultural industry since 1964—construction productivity having decreased while all other industries increased over 200 percent during the same time frame—as clear proof that the old ways would no longer suffice (AIA/AIA CC, 2007).

This *IPD Guide* provided the first definition of IPD as a "project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction"

(AIA/AIA CC, 2007). It offered the notion that principles of IPD could be applied in multiple contract structures but that all projects claiming to be integrated included *highly effective collaboration* among the key stakeholders—owner, architect, and contractor—over the entirety of a project.

> IPD leverages early contributions of knowledge and expertise through utilization of new technologies, allowing all team members to better realize their highest potentials while expanding the value they provide throughout the project lifecycle. At the core of an integrated project are collaborative, integrated and productive teams composed of key project participants. Building upon early contributions of individual expertise, these teams are guided by principles of trust, transparent processes, effective collaboration, open information sharing, team success tied to project success, shared risk and reward, value-based decision making, and utilization of full technological capabilities and support (AIA/AIA CC, 2007).

The Great Recession had a marked impact on the accelerated adoption of BIM. A 2008 report titled *Building Information Modeling (BIM): Transforming Design and Construction to Achieve Greater Industry Productivity* found that in the face of the economic downturn, BIM adoption was expected to rise significantly as experienced users were able to differentiate themselves within the extremely competitive market by bringing added value and efficiency to their clients (McGraw-Hill Construction, 2008).

Between 2007 and 2012, the adoption of BIM increased by 75 percent, with approximately 90 percent of medium and large firms reporting the use of such tools (McGraw-Hill, 2014). In 2014, Patrick MacLeamy, CEO of HOK and chairman of buildingSMART International, referenced the undeniable force that BIM had become by stating that "those who practice in the old way are soon going to find themselves without work. Either change, get with the program, or go out of business." He goes on to state that the next great evolution in the industry will be aligning collaborative relationships between key stakeholders with the transfer and flow of information between these parties (McGraw-Hill, 2014).

MacLeamy had been an early advocate for IPD, particularly with regard to its ability to address the increasing cost and complexity of making design changes in a project over time by shifting the bulk of coordination efforts to earlier in a project's timeline. Consciously or unconsciously referencing a 1976 diagram drawn by Boyd Paulson in the *Journal of the Construction Division*,[1] MacLeamy sketched a set of relationships between time, complexity, influence, and cost in a construction project during a 2004 meeting that have become known as the MacLeamy curve (Figure 1-2).

In 2014, the AIA and AIA California Council released an updated report on IPD in order to distinguish it from other forms of project delivery,

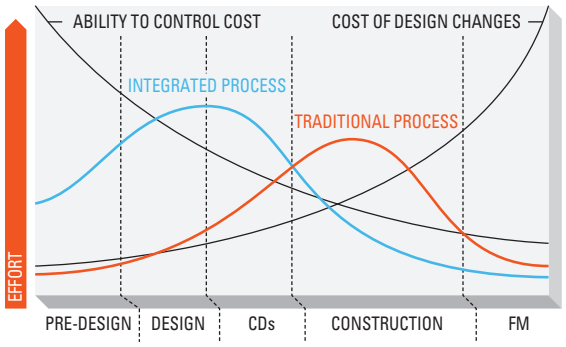

Figure 1-2 MacLeamy curve

[1] See www.danieldavis.com/papers/boyd.pdf.

sometimes referred to as "IPD lite" or "IPD-ish," that had begun to become popular alternatives to a "true IPD" project. The refined definition states:

> Integrated Project Delivery (IPD) is a project delivery method that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, fabrication and construction. The Integrated Project Delivery method contains, at a minimum, all of the following elements:
>
> - Continuous involvement of owner and key designers and builders from early design through project completion.
> - Business interests aligned through shared risk/reward, including financial gain at risk that is dependent upon project outcomes.
> - Joint project control by owner and key designers and builders.
> - A multiparty agreement or equal interlocking agreements.
> - Limited liability among owner and key designers and builders (AIA/AIA CC, 2014).

At the core of this model (Figure 1-3) is the creation of a project team that shares financial risk and reward through the creation of a multiparty contract and a commitment by all parties to create a shared culture of joint decision making that foregrounds what is best for the project rather

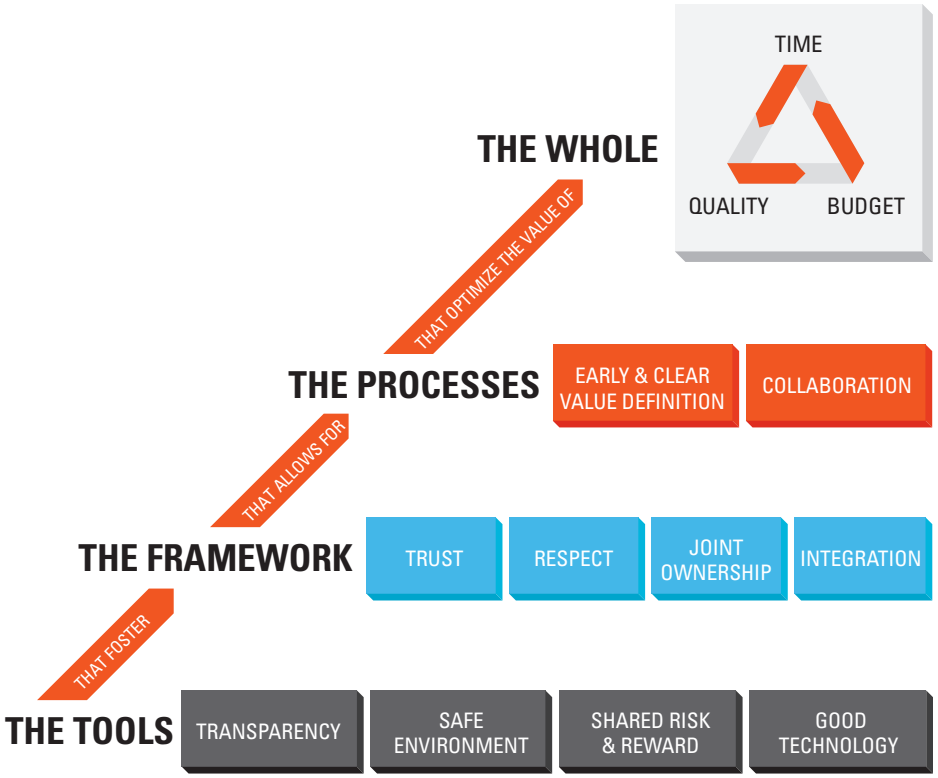

Figure 1-3 IPD fundamentals

than for one particular entity. Early integration of the key consultants and constructors leads to more accurate information and more effective decision making. Effective teams demonstrate respect, trust, and transparency, which are outlined in joint contracts but established by team leaders and sustained by members throughout the process (AIA/AIA CC, 2014). Interpersonal as well as infrastructural components were highlighted as critical to an integrated approach, each requiring equal investment.

Mutually Beneficial Collaboration

The most exciting groups—the ones. . .that shook the world—resulted from a mutually respectful marriage between an able leader and an assemblage of extraordinary people. Groups become great only when everyone in them, leaders and members alike, is free to be his or her absolute best.

(Bennis and Biederman, 1997)

The relationship between leadership and collaboration is interdependent rather than conflicting as one might first imagine, especially in creative fields and complex contexts. With relatively simple technical problems that have known variables leading to a right or wrong answer, traditional top-down models of leadership can be effective. With adaptive or "wicked" problems, however, complex partnerships among diverse experts are often required (Bennis, 1999). Such collaborative teams require that the experts be brought together efficiently when and where their efforts are most needed. Each must understand their specific role as well as the overall project vision, a dance that is choreographed by the team's leaders.

Leadership is grounded in a relationship between leaders, followers, and the common goal they want to achieve (Bennis, 2007) (Figure 1-4). Leaders do not operate alone or exist in a vacuum. "Any person can aspire to lead. But leadership exists only with the consensus of followers," said Warren Bennis, who is widely regarded as the father of modern leadership studies. Bennis contends that the opposite is also true—great teams always have a powerful leader. This person is not always the most technically or creatively skilled member of the team but the one who has the ability to assemble a team with the right skill sets, build consensus around a shared vision, and enable each team member to do their individual best. This more often than not means getting out of the team's way rather than micromanaging their process. In architectural practice, the leader/team dynamic exists within the office as well as among interdisciplinary project teams.

In today's increasingly complex society, where seemingly the only certainty is change, architects are tasked with challenging traditional disciplinary silos and hierarchical management structures. They must find new ways to critically address the complex issues of our time through coordinated collaboration with an increasingly vast array of specializations. Collaborative teams must work across disciplines and value the collective mind over the individual genius without losing their specific disciplinary expertise in the process. "Whether the task is building a global business or discovering the mysteries of the human brain, one person can't hope to accomplish it, however gifted or energetic he or she may be. There are simply too many problems to be identified and solved, too many connections to be made" (Bennis and Biederman, 1997). Despite such calls to collaboration, society in general—and architectural practice in particular—still champions the myth of the creative genius whose singular vision drives all great work. To achieve effective collaboration, the dynamics of teams must be understood as a whole comprised of discrete parts: leader, follower,

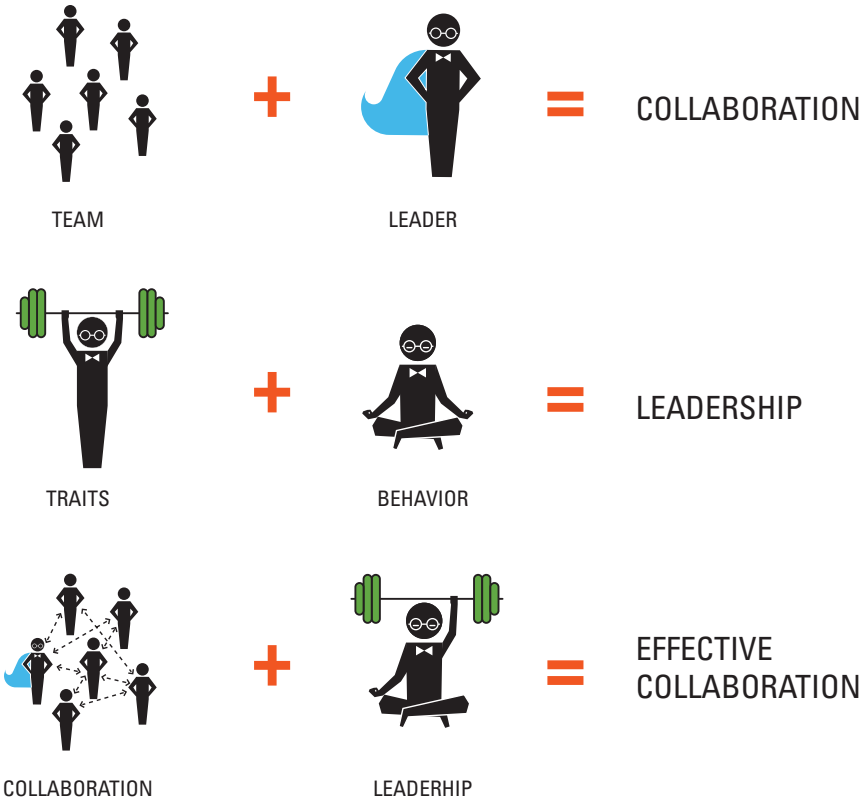

Figure 1-4 Effective collaboration

followers working together (i.e., team), and team orchestrated by leader (i.e., collaborative team).

Kieran and Timberlake put the exponential increase of complexity seen in today's practice that demands such specialization in context:

> Hundreds of years ago, all of architecture could be held in the intelligence of a single maker, the master builder. Part architect, part builder, part product and building engineer, and part materials scientist, the master builder integrated all the elements of architecture in a single mind, heart, and hand. The most significant, yet troubling, legacy of modernism has been the specialization of the various elements of building once directed and harmonized by the master builder. The multiple foci at the core of specialization have given rise to a world that is advancing while fragmenting. We applaud the advancement, but deplore a fragmentation that is no longer unavoidable and so needlessly diminishes architecture. Today, through the agency of information management tools, the architect can once again become the master builder by integrating the skills and intelligences at the core of architecture. The new master builder transforms the singular mind glorified in schools and media to a new genius of collective intelligence. Today's master architect is an amalgam of material scientist, product engineer, process engineer, user, and client who creates architecture informed by commodity and art. By recognizing commodity as

> an equal partner to art, architecture is made as accessible, affordable, and sustainable as the most technically sophisticated consumer products available today (Kieran and Timberlake, 2004).

Collaboration must be built, sustained, and grown culture-wide within firms and project teams. The leaders of such teams are tasked with nurturing individual members' abilities in integrative, synthetic thinking, empathetic understanding, and constructive communication to support success rather than employing top-down autocratic managerial styles or micromanagement (Figure 1-5). "The atmosphere most conducive to creativity is one in which individuals have a sense of autonomy and yet are focused on the collective goal. Constraint (perceived as well as real) is a major killer of creativity" (Bennis and Biederman, 1997). Essentially, people want to be led, not managed.

The urgency behind the change to more integrated and collaborative approaches has been driven by forces outside the discipline. The scope creep seen in contractors' services required the discipline to sprint to catch up or risk losing relevance and revenue. The technological shift to BIM as a powerful information sharing tool spurred a rapid rise in specialization in allied fields, with practitioners scrambling to differentiate themselves in a more and more competitive market. Architects, the last great generalists, must either similarly specialize and risk becoming obsolete with the next market shift or make the case for the value of their integrative expertise and lead the formation of collaborative teams with allied professionals to address the complex nature of most of today's boundary-pushing projects (Olsen and MacNamara, 2014).

All of this leaves generations of practitioners and leaders faced with examining the very means and methods of their work. Architects have a long disciplinary history of creative problem solving dealing with multiple streams of information. Their ability to synthesize these variables into a cohesive end result is the very skill set needed to address the barriers to a more collaborative practice culture (Figure 1-6).

The types of practitioners and leaders that will thrive in the increasingly global, digital, value-based, and market-driven world are those who are able to not just problem solve but challenge the very nature of the problems themselves. "The new economies demand a deeper conception of talent and the organic nature of our lives demands it, too. What we become in future is deeply influenced by our experiences here and now," says education reformer

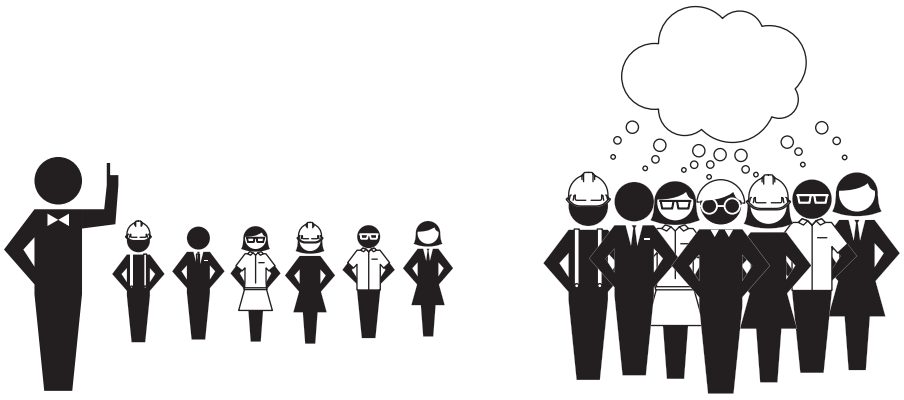

Figure 1-5 Autocratic versus collaborative leaders

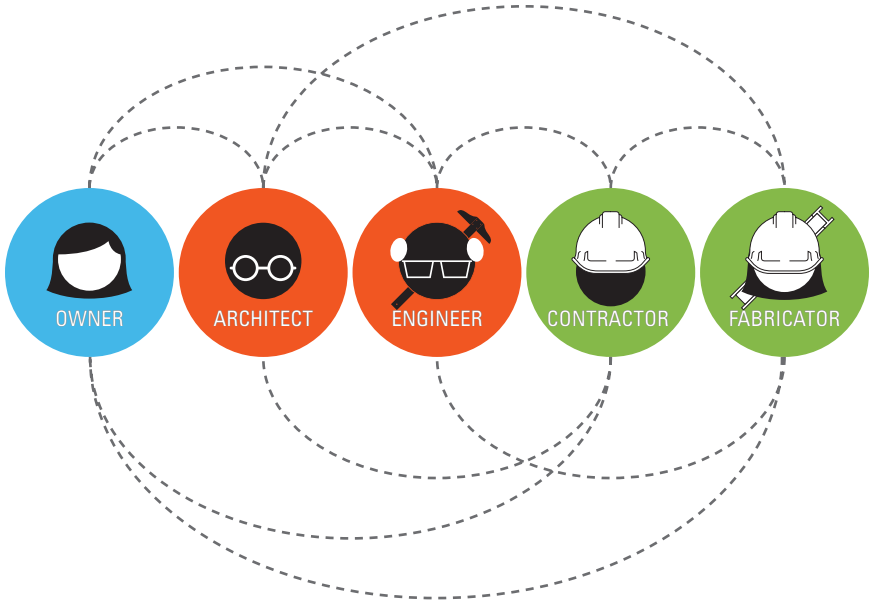

Figure 1-6 The collaborative team

Ken Robinson, who champions creativity as a critical skill for all contemporary students. "Education is not a linear process of preparation for the future: it is about cultivating the talents and sensibilities through which we can live our best lives in the present and create the best futures for us all" (Robinson, 2011).

In a 2015 global survey of more than 7,500 senior executives and business leaders, leadership development and strategic change were identified as critical to a business's success. However, the majority of these same individuals felt that their organizations fell short in the execution of these priorities:

> Leading for change requires a different set of skills than those required for traditional business management. Change leaders must be agile, flexible, resourceful, and have the ability to navigate unknown situations. They must be good listeners and open to new ideas from all corners of the organization. And, most importantly, change leaders must be able to articulate a vision and inspire others to higher levels of performance.[2]

The lack of follow-through in the architecture industry relative to the aspiration for a more collaborative approach is in part the result of a lack of academic and professional training on the subject. Architects are trained how to design buildings, not how to lead or participate in teams of multidisciplinary professionals with different personalities, cultural backgrounds, and communication styles. The archetype of the "natural" leader is a false one: the skills and abilities that define a successful leader who can foster collaboration in teams are in fact teachable and learnable.

[2] Korn Ferry Institute, "Real World Leadership: Part One: Develop Leaders Who Can Drive Real Change." Available at http://static.kornferry.com/media/sidebar_downloads/Korn-Ferry-Institute_RealWorldLeadership_Report-1.pdf.

Leadership and Followership

What distinguishes an effective from an ineffective follower is enthusiastic, intelligent, and self-reliant participation—without star billing—in the pursuit of an organizational goal. Effective followers differ in their motivations for following and in their perceptions of the role. Some choose followership as their primary role at work and serve as team players who take satisfaction in helping to further a cause, an idea, a product, a service, or, more rarely, a person. Others are leaders in some situations but choose the follower role in a particular context. Both view the role of a follower as legitimate, inherently valuable, even virtuous.

(Kelley, 1988)

In a global culture of participatory democracy, hierarchical management structures are more outdated than ever. As a result, the stereotypical roles of leader and follower must be reexamined. The time when leaders directed and followers did what they were told is long past. "Leadership has changed and so has followership. The assumptions on which the [social] contract is based are being challenged on a regular basis, not by the few but by the many, and generally in ways that are technologically revolutionary"(Kellerman, 2012). Power, authority, and influence—which were the leader's right in the past—no longer motivate an empowered workforce to do its best work. Leaders are required to prove their worth or be removed. "For a century or more, democratic leadership has been, or was presumed by the majority to be, a meritocracy, which is why we came to include that anyone can be a leader—so long as he or she has the right stuff." The "right stuff" boils down to ethics and effectiveness (Kellerman, 2012). As the idiom says, Caesar's wife must be above suspicion. So too must leaders.

Leaders' influence is quickly eroded if they are seen as breaking the unwritten social contract of trust with their team by appearing unethical or ineffective. Followers go along with leaders for any number of reasons, but the ideal one is that they believe in the leader's integrity and competence. Should a leader fail to deliver on these expectations, followers quickly become disillusioned (Kellerman, 2012). Leaders value followers as well; a survey of more than 300 business executives revealed that effective followership is a critical skill set, particularly in determining career success, and accounts for 99 percent of team performance and quality of work. It is based on emotional intelligence and interdependent on effective leadership. Nevertheless, 96 percent of respondents also said that people don't know how to follow (Hurwitz and Hurwitz, 2015). How then does one learn how to effectively lead and effectively follow?

Leadership has long been the most sought-after skill set that ambitious students sought to acquire from high-powered academic business and management programs. Such programs do not, however, teach followership skills, despite the fact that most members of the workforce—including leaders themselves—spend most of their time following. One could argue that there is a direct correlation between this top-heavy approach and architecture education, which to a large extent still focuses almost exclusively on the development of the individual design mind rather than the creative team. Despite the fact that organizations live or die based not only on how well their leaders lead but also on how well their followers follow, education continues to be biased toward the small percentage of the workforce that will become traditionally defined leaders. This leaves the majority to their own devices to figure out how to most effectively follow (Kelley, 1988). In the movement to more horizontal administration structures and leaner organizations, followers are taking on more autonomy (Lipman-Blumen et al., 2008), and in some cases rejecting traditional leadership structures entirely.

As with leadership and collaboration, leadership and followership have a mutually beneficial rather than a mutually exclusive relationship. Guiding principles for leaders and followers that lead to effective collaboration include:

- A mutual respect for leadership and followership, including respect for the equal, dynamic, and different qualities of each;
- The understanding that leaders help clearly frame the problem, allowing followers to work creatively within a given set of parameters;
- The need for all parties to constructively challenge each other and critically examine their own actions to ensure the process remains effective and lines of communication stay open;
- The use of a "Yes. And. . ." model of situational development, where existing positive attributes are valued and built on, rather than a "No. But. . ." model that begins with resistance when the proposal is not in keeping with past models; and
- The need for the entire team to agree to a set of mutually beneficial objectives (Hurwitz and Hurwitz, 2015).

Effective leaders of collaborative, creative teams know that the real capital in creative organizations is its people. Robert Kelley's 1988 article, "In Praise of Followers," outlines two dimensions that are important to understand in evaluating effective followership—to what degree followers exercise independent, critical thinking and where followers fall on a scale from passive to active. Effectiveness, he proposes, occurs when followers think for themselves and work with energy and assertiveness. Effective followers are distinguished from ineffective followers by their ability to self-manage, their commitment to the organization, their competence and focus, and their independent, critical thinking (Kelley, 1988). To build followership, three principles are key:

1. Followers must feel ownership, which is achieved through the development of a sense of place, self, and impact.
2. They must be trusted by and trust their leaders. Trust is built over time, and requires vulnerability on the part of followers; and
3. They must operate in a context of transparency, which allows for direct communication of ideas and concerns to the team (Lipman-Blumen et al., 2008).

Contemporary leadership theory holds that the qualities that define effective leaders and effective followers are largely the same and are not tied to a person's intelligence or character. The roles of leader and follower are often situational and change depending on the context. For example, a project manager may be a leader to the design team working under her while also being a follower to the partners of the firm. The ways in which a person's roles are defined within a given context influence the results, meaning that firms need to cultivate a culture where leaders and followers take on clearly defined "different but equal" responsibilities. According to Kelley:

> People who are effective in the leader role have the vision to set corporate goals and strategies, the interpersonal skills to achieve consensus, the verbal capacity to communicate enthusiasm to large and diverse groups of individuals, the organizational talent to coordinate disparate efforts, and, above all, the desire to lead. People who are effective in the follower role have the vision to see both the forest and the trees, the social capacity to work well with others, the strength of character to flourish without heroic status, the moral and psychological balance to pursue personal and corporate goals at no cost to either, and, above all, the desire to participate in a team effort for the accomplishment of some greater common purpose (Kelley, 1988).

With a more critical and contextual perspective on the traditional roles of leaders and followers, it is easy to see that all people take on some aspects of each on a regular basis. With the knowledge that culture shapes outcomes, practitioners can become even more collaborative members of organizations and build and take part in more effective teams. Kieran and Timberlake outline the reasons why these situational relationships are the result of the complex nature of contemporary practice. "The making of architecture is an act of organizing chaos," they state. This is especially true in an ever more complex world of products, engineers, specialists, and regulatory bodies. They propose that architecture should "accept chaos as inevitable and working to understand, appreciate, and organize complexity" (Kieran and Timberlake, 2004). Good collaboration can address such multifaceted problems through the collective intelligence of multiple disciplines and manage the "organized chaos" of practice through clear communication, defined roles and responsibilities, mutual respect, and trust.

THE PROMISE VERSUS REALITY OF INTEGRATED PROJECT DELIVERY—INTERVIEW WITH RENÉE CHENG

An award-winning educator, Renée Cheng is a professor and the Associate Dean of Research at the University of Minnesota's College of Design, where she directs the Master of Science in Architecture program with a concentration on research practices. A registered architect, Cheng's professional experience includes work for Pei, Cobb, Freed and Partners and Richard Meier and Partners before founding Cheng-Olson Design.

Nationally recognized as an expert on emerging practices and technology, her research involves documenting case studies of buildings that integrate design with emerging technologies, most recently focusing on IPD. She has written and lectured extensively on the topic, having completed three seminal case study publications on the topic—IPD Case Studies (AIA/AIA MN, 2012), Integration at Its Finest (Cheng, 2015), and Teams Matter (Cheng, 2016)—with another in development studying Lean and IPD.

In addition to sharing a case study from her 2015 GSA report, Professor Cheng spoke with us about the promise of IPD and whether the reality is living up to the hype.

Erin Carraher: You were involved as an author of the AIA's 2006 "Report on Integrated Practice" and have been developing case studies on IPD projects for a number of years. From your perspective, how do you see the changes toward more collaborative contract structures and the introduction of technologies like BIM impacting practice?

Renée Cheng: We've been witnessing a fundamental change in practice starting with the economic downturn, moving to more collaborative models. Technologies like BIM and Lean tools and processes are well-aligned to support collaboration; in fact, I would say they are essential.

To succeed, IPD needs tools like BIM that enable an integrated flow of information. It also needs the attention to process that Lean brings to the team. BIM on its own can be effective for solid documentation and communication, Lean on its own can increase team effectiveness, but it's really when you see all three being used together where the payoff of integration really occurs.

I'm hopeful that more collaboration is producing better outcomes for our industry, but concerned that there is a misperception that what we are doing is streamlining by reducing time on design. Streamlining in my mind is reducing what you might call low-quality time—hours spent on documenting disputes or mediating problems caused by errors that could have been foreseen.

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High-quality time is time spent on the design and planning; every hour spent on design is more than regained later in the process and improves the outcome for the user.

I'm seeing that Lean is incredibly effective in the construction phase but someone needs to understand what Lean principles mean to the design process. It's not all about reduction of time, it's about improving quality, which might actually mean more time or more iterations. Architects need to be the leaders in how design benefits from collaborative, Lean principles.

Carraher: Despite the development of contracts by the AIA and other organizations that specifically address integrated forms of project delivery, there have been surprisingly few projects that have reported using these documents. Have you seen any reasons for this in your research?

Cheng: It's true that the majority of IPD projects I've studied are using customized contracts. Sometimes they are built upon those industry templates, but really contracts aren't the place to start. There has been a lot of debate about the effectiveness of "soft" language—trust, respect, transparency—in a contract. I would say the process of *developing* the contract is key to establishing a culture of collaboration, trust, and transparency.

For example, in one of the projects we are studying now, there is one owner who did two projects under very different contracts. The first was classic, full-on IPD and the second had some IPD conditions but also more conventional language that didn't release liability. The project teams understood the differences in the contract, yet behaved quite similarly. So you can say the contract didn't make a difference. Personally, I believe that the level of trust created by developing and working under the first contract allowed them to continue the IPD behavior even under a more conventional contract.

Carraher: Many projects report using IPD principles within a more traditional contract structure. What are some of the challenges to fully adopting IPD?

Cheng: Full adoption isn't the goal. I don't think it is realistic to say all projects should use IPD contracts in the future. The issue is changing the culture of the building industry regardless of project size and location. The real driver of change needs to be creating buy-in regarding the value of collaboration—how much more successful, less litigious, and more fun the process is and how much more innovative the results are when everyone is engaged in the conversation.

The questions are how you drive these full benefits of everyone working together on a project to enable having the discussions needed to figure out how to work together. Early planning is key, though it's painful when you want to get started. All of the project teams that took the time to plan said there was a huge payoff in the end. Those who didn't had repeated issues that cost them a lot of time and ill will later in the process. Spending time developing the contract is one way to do this. Others focus more on the pressure points of a project, the drivers of complexity. Lean processes can be really effective to expose those drivers, especially the ones that are not immediately apparent.

There are a lot of people saying they are doing integrated or collaborative project delivery, but the extent to which they are doing so varies. Those who are doing it well have a high level of support—even to the extent that it is a part of the firm's business plan. It also takes investment on the ground level—people who know how to do it and who can train others on a new project. You can train up people on a new project and pretty quickly bring inexperienced people up to speed. It requires coaching, though. The type of expertise required is sometimes coming from outside facilitators who have backgrounds in any number of fields—personally, I'd like to see more architects in this space so that design issues are more highlighted.