Extracting Disputes by their Roots: A Context for Discussing the Root Causes of Disputes in the Construction Industry

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The construction industry is experiencing increasing numbers of disputes requiring intervention. This paper puts forth a context for discussion, classifying disputes into the categories of contract, intellectual property, management, and organization. The ensuing discussion leads to conclusions and recommendations that are particularly relevant to integrated project delivery (IPD), building information modeling (BIM), and higher education.

Key Words: Integrated Project Delivery (IPD), Building Information Modeling (BIM), Relational Contract, Intellectual Property, Curricula.

Introduction

There was a time in the past when construction was a local business. Communities were built by businesspeople that lived within the communities that they built. Flowing from their efforts was a sense of place that embodied not just the built environment but the relationships that built it. Construction was an undertaking of familiar personal, social, and cultural relations. Between builders, construction disputes were resolved in ways that naturally flowed from their relationships. It rarely required the intervention of outsiders. By and large, builders solved their own problems.

Those sovereign communities of the past have given way to the extensive interrelated world of the present. This new order, a world of dynamic, interdependent, multi-disciplinary organizations, is largely enabled by modern mobility and technologies. Yet mobility and technology comes at a price. "The web of personal relationships—familial, social, political, and commercial—which worked in favor of settling disputes has been largely displaced" (Stipanowich, 1996). In the wake of technological change we have witnessed an erosion of the relational fabric that used to enable builders to solve their own problems. What fills the void left by personal solutions is public litigation.

Acknowledging change but with a determined effort to minimize the intervention of the courts, the construction industry has embraced a wide range of improved means of resolving their disputes. "No sector of American industry is more directly affected by current trends, and no sector has demonstrated more creative zeal in developing and utilizing alternatives to court" (Stipanowich, 1996). The resulting widespread use of alternative dispute resolution (ADR) methods has succeeded in effectively resolving disputes between contracting parties in the present world.

Yet the very fact that ADR has become so widespread infers increasing numbers of disputes requiring intervention. It is difficult to claim success in resolving disputes if what is driving that claim is an increasingly antagonistic construction environment. It is more apt to classify the widespread use of ADR methods not as a sustainable solution but as a remedial solution. On remedies it is said that the only sure remedy to a common cold is to allow it to worsen into very curable pneumonia. Likewise, the widespread availability of the ADR remedy in the absence of relationship-based solutions tends to encourage every problem to worsen to the point where only ADR can resolve it. Therein lays a moral hazard. So rather than a remedial solution, it behooves us to seek a sustainable solution. A sustainable solution endeavors to eliminate disputes by mitigating the dysfunctions that create the antagonistic construction environment in the first place. This paper will employ a cause-effect tool to contextualize disputes and then discuss each context pursuant to its underlying cause-effect streams.

Root Cause Analysis

To mitigate dysfunction is not to suggest that all conflict must be eliminated. While some forms of conflict lead to dysfunction, other forms lead to function. Conflict founded upon problems as opposed to people, what is called issue-based conflict, is beneficial because it contributes to a critical review of alternatives and increases the accountability of the parties (McCuen, 2009). In contrast, conflict founded upon people as opposed to problems, what is called interpersonal-based conflict, is detrimental because it energizes mutual dislikes and personality clashes (Atreyi, Bernard et al. 2007). Issue-based conflict can be constructive whenever it helps to prevent domination and stagnation, seeks solutions for questions and underlies creative thinking (Carte & Chidambaram, 2004). Interpersonal-based conflict is destructive (Carte & Chidambaram, 2004). Our focus must be upon eliminating interpersonal-based conflict.

Within the 2008 and 2009 proceedings of the annual conference of the Associated Schools of Construction there are seven papers that touch upon issues of interpersonal-based conflict. Measuring relevancy as a reasonable probability of interpersonal-based conflict flowing from an issue, 17 relevant issues were found and summarized in Table 1.

Table 1
Interpersonal-based conflict issues

Citation	Issue	Context
Ohrn & Rogers, 2008	Document interpretation	Contract
Azhar et al, 2008	Protecting BIM data through I.P. law	I.P.
	Licensing	I.P.
	Indemnification	Contract
	Control & accountability for data entry	Organization
	Allocation of liability	Contract
	Accuracy & coordination of cost & schedule data	Organization
Glick & Guggemos, 2009	Parochial interests & turf protection	Management
	Stakeholder relationships	Organization
	Independent design solutions & fragmentation	Management
	Inadequate prioritization	Management
	Adversarial relations	Organization
	Relations with agencies	Organization
McCuen, 2009	Team conflict within BIM	Management
Celik, 2009	People management challenges	Management
Jambro & Siddiqi, 2008	Conflict resolution & negotiating skills	Management
Bonanno et al, 2008	Leadership training & recruiting	Management

Those issues are mapped to Figure 1, a cause-effect diagram. A cause-effect diagram is a graphical display of the qualitative relationships between causes and their observed effects. The arrows on the cause-and-effect diagram overlay a directional attribute, with the head of an arrow inferring an effect and the tail of an arrow inferring a probable cause (Anupindi et al., 1999).

Because some of these issues speak to effects, others speak to cause, while still others speak to both cause and effect, it was necessary to first burst each issue into its elemental parts. Upon bursting them into elemental parts and employing a heuristic, they were easily organized into nine distinct clusters: document interpretation, liability, leadership, teamwork, relationships, stakeholders-agencies, enterprise data, licensing, and building information modeling (BIM) data. Those clusters were then formed into contextual groups, as follows: contract, intellectual property, management, and organization.

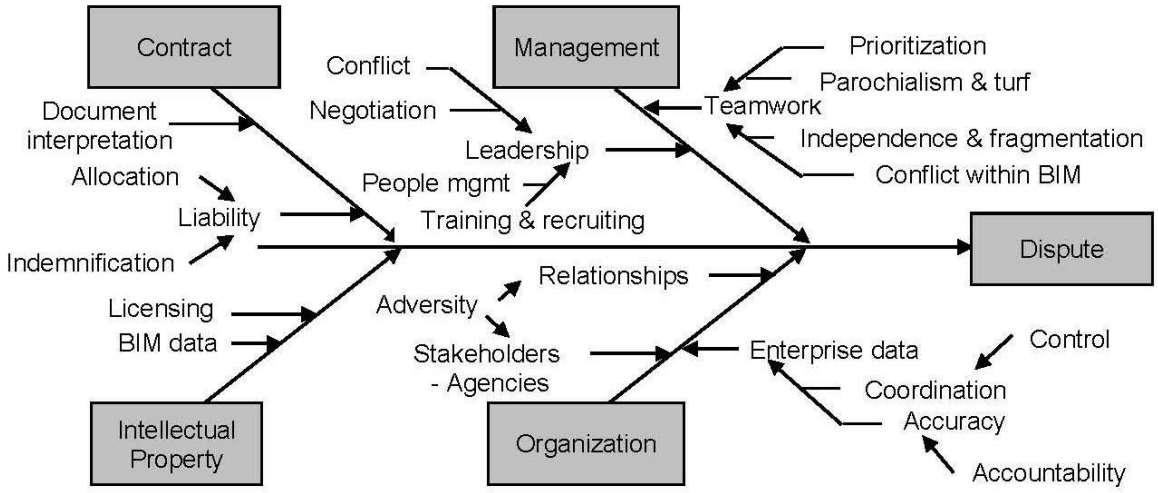

Figure 1: Cause-and-effect diagram

To read Figure 1 requires transforming each cause into its detrimental form. For example: upon transforming "document interpretation" into document "misinterpretation," the resulting effect is a contract dispute. As for another example: upon transforming "accountability" into "lack of accountability," the resulting effect is "inaccuracy" which leads to "gaps or conflicting enterprise data" which leads to an organizational dispute.

Contract

Document Interpretation

"A/E plans and specifications are rarely if ever perfect and the contractor's interpretation of the plans and specs rarely if ever match the intentions of the designer" (Ohrn & Rogers, 2008). Yet case law displays a strong presumption of harmony between parties to a contract; a presumption that is necessary for a public policy that supports contract. Thus, the AIA still does not have an order of precedence clause in its A201 General Conditions document, citing as their reasons that such a clause, if applied woodenly, would achieve wrong [legal] outcomes (Sweet, 1997). A doctrine of harmony, if it can be called by that name, emerges from relational contracts. Yet while the relational contract is ubiquitous in the construction industry, the relational contract is not well understood within the construction industry itself, or even within the legal profession.

Liability

In a traditional design-bid-build project the Spearin doctrine enables a contractor to recover damages from the owner due to defective plans and specifications produced by the design professional. ("Spearin" refers to *U.S. v. Spearin, 248 U.S. 132 (1918*), a case establishing that the owner warrants the sufficiency of the plans and specifications produced by the A/E.) In design-build, however, the owner ordinarily avoids the warranty implied by the Spearin doctrine: the design professional and contractor have only each other to find for damages.

"The integrated concept of BIM blurs the level of responsibility so much that risk and liability will likely be enhanced" (Azhar et al. 2008). When an owner, in participating in BIM, makes significant changes to the design, that owner may become vulnerable again to Spearin liability. The liability waters are even more treacherous for subcontractors and vendors participating in BIM. Performance-based specifications will ordinarily attach design liability directly upon the subcontractor or vendor. But even in the absence of performance-based specifications

liability may still attach whenever subcontractors or vendors contractually participate while the design is still preliminary. At least one court has held that change orders are inevitable when a subcontractor bids on plans and specifications that are still preliminary; therefore, because extra costs should be anticipated, claims for economic damages will be denied (Construction Claims Monthly, 2003). This exposure to economic damages is consistent with the relational contract model but it will likely surprise many subcontractors.

Curriculum

The typical first-year curriculum in all accredited law schools includes a contracts course. However, the contracts course is about classical contract theory that presumes a transactional model of contract. That transactional model, however, bears little resemblance to the relational contracts of the typical construction project. In response to a survey of all of the law schools accredited by the American Association of Law Schools, only twenty institutions identified current offerings focusing on construction law and these were perceived "specialty" courses situated at the upper end of the curriculum (Stipanowich, 1998). The consequence of sparse coverage is that the relational construction contract is poorly understood by the legal profession in general. The construction industry has for some time been the largest single production activity in the United States. Given that fact, much more needs to be done to influence the education of legal professionals insofar as relational contracts.

It is likely that many a constructor has walked away from a binding arbitration or litigation surprised by the outcome. Their surprise, however, may be founded upon misconceptions: a lack of understanding of the meanings behind the provisions in the relational contract. The teaching of the relational contract model at the university level could attack misconceptions directly, create a more relevant learning experience, providing students with better decision-making tools, and fostering more successful careers. Developing such a curriculum must be a collaborative effort, employing the skills and experience of regular faculty, experienced construction professionals, and attorneys with construction law education or grounding in relevant construction law practice.

Intellectual Property

It is reasonable for an owner to be entitled to the design in a traditional project because the owner accepts Spearin liability for that design: risk equals reward. That reason, however, fades with integrated project delivery (IPD), especially with a BIM, because the owner becomes unburdened of liability. Nevertheless, even owners with IPD contracts feel entitled to own the design because their money paid for it (Azhar, et al. 2008). Yet standing in opposition to an owner's claim of entitlement are the intellectual property rights of the project participants.

Both U.S. and international law endeavors to advance the general welfare by encouraging the public dissemination and sharing of ideas while protecting private economic interests. Emerging from the balancing of public versus private interests is a body of law covering patents, copyrights, trademarks, and trade secrets, collectively known as intellectual property law. Patents provide limited monopolies for inventions, copyrights provide protection of particular forms of the expressions of ideas, and trademarks protect branding, logos and the like. Among other things, wrongful disclosures of means, methods and know how are protected as trade secrets. It is this form of intellectual property that has the most meaning to project participants because means, methods, and know-how are competitive advantages. Unlike other forms of intellectual property, however, trade secrets do not receive monopoly-like protection. They are protected only from wrongful disclosure.

The usual means of preventing disclosure is a license, generally accompanied by a nondisclosure agreement (NDA). Yet NDAs are not entirely successful in preventing wrongful disclosure. Disclosure frequently occurs through agents, part-time employees, suppliers, or other third-parties whom come into contact with privileged information but are unaware of its secrecy. Regrettably, once information is disclosed through any means it is no longer protectable. Thus, the very nature of a BIM tends to negate attempts at keeping trade secrets. Great mistrust arises from this reality. Licensing issues arise when subcontractors and suppliers contribute information into the BIM (Azhar et al. 2008). The participation of regulatory agencies in BIM presents an especially daunting problem: where by statute agency information must be accessible to the public, it is impossible to prevent disclosure of trade secrets. Many contractors prefer to rely not on intellectual property law but on having trustworthy business partners. Thus,

IPD involving repeated partnering between the same groups of contractors has merit because it tends to develop trust. Whenever long term viability is a mutual goal, trade secrets can be profitably engaged.

Management

While there is much to be discovered about BIM the technology, it is important that equal emphasis be placed on understanding how diverse teams interact and work toward more productive solutions in BIM (McCuen, 2009). Construction industry professionals inform us that conflict resolution and negotiation skills are not apparent in younger project managers (Jambro & Sidiqui, 2008). Moreover, whatever shortcomings there may be in construction management curricula, construction industry practice is compounding the problem. "There is a perennial problem in the construction industry: the technical skills that engineers are trained in and hired for alone do not make them effective team members or able to learn on the job" (Goleman, 1999).

The usual indicators of high intellect in students, IQ and GPA, are not very good predictors of future success in the industry, success that largely emerges from teamwork and leadership skills. More telling predictors can be founded upon the emotional competencies of students: self-awareness (insight and certainty in decision-making), managing emotions (avoidance of anxiety and irritability, combating distress, and recovering from adversity), self-motivation (delayed gratification and creative problem solving), empathy (persuasive skills drawing on the ability to recognize subtle social signals), and handling relationships (social competence, popularity, leadership, and interpersonal effectiveness) (Goleman, 1995). Underscoring the positive consequences of emotional intelligence (EQ), a servant leadership index has been developed that positively correlates profits with incremental increases in an EQ-based index for surveyed Arizona construction companies (Bonanno et al. 2008).

Curriculum

U.S. four-year undergraduate construction management programs have minimal course content in conflict resolution and negotiation. That circumstance may be driven by the American Council for Construction Education's (ACCE) lack of conflict resolution and negotiation standards in their requirements for baccalaureate programs (Jambro & Sidiqui, 2008). "[It] is crucial to teach students of construction management programs different principles and phases of construction projects, as well as the personal, social and technical tools to effectively communicate and make decisions…" (Celik, 2009). Relevant curricula can serve to advance the emotional and social competencies of construction management students. University level construction management curricula need to address the challenges of managing people, teambuilding, leadership, communication, conflict-resolution skills, pro-social strategies for interpersonal problem-solving, self-control, social awareness, and social decision-making.

Organization

As the number and diversity of data inflows into a BIM increases there is a corresponding dilution in the accuracy of and accountability for its information (Azhar.et al, 2008).
Commercial data warehouses typically employ various data scrubbing techniques to address the accuracy problem. Data scrubbing will no doubt become necessary to the process of building a BIM. However, effective data scrubbing does not come cheap and it is not at all clear how that cost will be either absorbed or allocated amongst the BIM participants.

Fixing accountability is a more difficult problem. The more people that are entering information the less likely it is to find one accountable. Indeed, savvy managers in dysfunctional organizations know that spreading responsibility around is a good way to avoid accountability. In a healthy organization, however, performance is tied to accountability; thereto, the organization purges itself of the non-performers. So it would seem that the answer to BIM-data accountability lies in the organization that employs BIM, not in the tool itself. "Increasingly, sophisticated construction owners, contractors, and others are turning to management systems aimed at avoiding dysfunctional conflict by formalizing mutual commitment to common goals in an atmosphere of trust and cooperation, laying down principles of decision-making, and establishing channels of communications" (Stipanowich, 1998).

The IPD environment has a natural affinity for BIM, particularly as regards the flow of information from the lower tiers of the project organization, including outside suppliers, to the design tier. Facilitating that flow of information is the natural strength of BIM. However, tenacious obstacles to information flow are present within the BIM environment: the emotional intelligences of the participants; misunderstanding relative to the relational contract model; and fear of disclosure founded on lack of trust. The cost of failing to overcome those obstacles is for BIM to fall short of reaching its full potential. The benefits of overcoming these obstacles are high performance, lean organizations, competitive cost advantages, and business model sustainability.

Conclusions and Recommendations

Interpersonal-based conflicts are destructive. Utility is found in discussing interpersonal-based conflicts within the contexts of contract; intellectual property; management and organization. The ensuing discussion leads to the following observations and recommendations:

- Construction contracts are misunderstood by both builders and lawyers,
- More needs to be done to influence the education of lawyers,
- IPD and BIM expose participants to design liabilities and economic damages,
- BIM tends to expose trade secrets, thereby creating mistrust,
- Curricula can be devised to advance the EQ of construction management students,
- Accountability for BIM-data is an organizational issue,
- Tenacious obstacles to information flow are present with the BIM environment,
- BIM can reach its full potential only when information flow obstacles are overcome.

"[The] construction industry represents not only the cutting edge of experience with dispute resolution processes, but also the spearhead of experimentation with mechanisms aimed at avoiding disputes by addressing the roots of controversy" (Stipanowich, 1996). Construction educators, especially those in higher education, are uniquely positioned to extract disputes by their roots.

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