Advancing Technology

How CASE Can Help Resolve the Friend or Foe Dichotomy

By Pedro Sifre, S.E.

Throughout history groups of people have created organizations to improve the lot of the members of the group and of society at large. Factors that triggered the formation of such organizations vary. The medieval guilds were a response to the need to maintain a competitive edge and quality standards in the face of competition facilitated by increasing mobility within Europe. Ethnic-centric charities in the United States were providing mutual aid to recently arriving immigrant groups. Some of these still exist and spread their good works well beyond ethnic boundaries. Engineering societies have provided a way of establishing and maintaining standards and for disseminating knowledge among their members. The Council of American Structural Engineers (CASE) is one example of professionals joining together to address challenges posed by exercising our profession in an environment made more complex by, among other things, increasing litigiousness, galloping technology, and generational changes.

The rise of NCSEA, CASE, SEI and other organizations driven by the hard work of individuals is the best way to amplify voices and channel our energies to help manage the evolution of the profession and educate our young people with resources and knowledge sharing. CASE Tools and other CASE publications provide valuable resources that help polish our business practices and navigate ever increasing risks in this complex world. This article provides a few examples of stimulus-and-response cycles that continue to motivate the work of CASE, and of how CASE can help us negotiate the evolution of our business practices.

Recently, the author was in a conference call concerning existing conditions at an old building where the concrete was deemed to be too weak for a new fall arrest anchor installation. On the line for the contracting side were the construction manager, the roofing contractor, the fall arrest subcontractor, and the subcontractor's supplier and engineer. On the Owner's side were the Owner, the Owner's project manager (OPM), the facilities manager, and the safety manager. On the design side, in addition to the author's firm, were the architect, envelope consultant, code consultant, and an OSHA rules consultant. From these conversations came word-by-word minutes to be edited by all parties and reviewed by who knows how many legal departments.

This is but one example of the complexity of relationships and communications that we navigate on a daily basis; a complexity that has been facilitated by the very technology that was supposed to make things easier. The phone call reference is a composite of real cases. But this type of conference call often has ten to twenty people on the line with more than 10 lines; something that would have been impossible 25 years ago. The callers saved the time and cost of travelling to a meeting, but somehow there was not a feeling of technology's blessing that day. And the same was probably true of the people within earshot of countless speaker phones. Blaring speaker phones in cube farms are yet another unintended consequence of virtual meeting technology: a shortage of meeting rooms.

BIM platforms have created the benefits of three-dimensional modeling and the ability to visualize and coordinate multiple disciplines. For structural engineers, the problem is that the modelling time is out of proportion with what is required for merely conveying design intent. With all their limitations, 2-D CAD drawings were such an efficient shorthand for conveying design information that most engineers still use BIM to create drawings that are facsimiles of CAD drawings. The problem comes with the increasing "clock speed" of revisions that architects can make. For structural engineers, we not only have to track the changes, but also redesign, alter section cuts and the calculations behind them, and then rearrange the annotations that accompany plans and sections.

As a benefit, BIM forces us into integrated thinking of the structure. For all but larger projects, it is now more difficult to establish assembly line work processes where one person is designing footings, another one is designing columns and developing the column schedule, etc. This is, of course, facilitated by design software. The down side is that a lot of entry level engineers used to gain valuable experience and insight from working on these assembly lines. And, the author argues, some of that feel is being lost by working with more automated platforms. Couple that loss of insight with the greater "clock speed" of changes, and consider how they strain our management of design, analysis, and drawing production software

Consider also challenges in training young engineers that have to enter a world in which the developments in the profession leave more work crammed into the same amount of time and the unrealistic expectations that technology creates.

Some of the unrealistic expectations are driven by technology. But another element is at play as well. The author calls it the increasing layering of project teams. Where there used to be a contractor and a few subs, now there is a construction manager and three times as many subs. Where there used to be an owner, there often is an Owner's Project Manager (with the OPM having increasingly more consultants, especially on public projects). On design teams, we now see countless consultants. The layers add inefficiencies to communication which are complicated by more minutes and more email correspondence. The multi-layered project network is more fragile too. Consider how many times we are in a position that we have to answer a question instantly because not doing so is going to put somebody at a dead stop, which can set off a chain reaction of disproportionate delays. Immediate effects include 24-7 connectivity and endless RFIs, which have evolved from their original purpose of clarifying contract documents into numbered correspondence. How many people remember that the "I" used to stand for interpretation?

Another factor adding complexity to our work is the proliferation of uninsurable

contract clauses requiring us to accept defense obligations not tied to negligence, performance beyond the standard of care, and warranty language. It seems that the more seminars we attend alerting us to these clauses, the more we see them. I can imagine Owners attending similar seminars telling them the flip side of the argument. It is as if the "seminarization" of the profession has fueled a contract language arms race between owners and designers.

An element of technology – Powerpoint – has facilitated the "seminarization" trend. Twenty years ago, developing a presentation with real slides was a monumental task limited to a few experts with access to production resources and time. The rest of us had to manage with overhead transparencies or "flimsies". This and less expensive media have benefitted us by facilitating communications among structural engineers.

These woes of technology did not exist twenty-five years ago. Neither did the benefits, including this medium and this forum. For dealing with issues discussed in this article, there are multiple tools provided by CASE.

For example, Tool 1-1 that helps manage risks and prevents claims; Tool 1-2 assists in developing a culture of quality; and Tool 3-4 for project work plans. The Tool 4-series provides communications tools that are useful for communicating within more complex teams. Tools 5-2 and 5-3 help manage the complexities of tasks and computation in the design office. The contract document tools in the Tool 9- series help ensure contract document quality and completeness. The CASE *National Practice Guidelines* offer a wealth of information that allows us to tackle assignments within the ever increasing complexity we have to navigate on a daily basis. CASE contracts and guidelines assist the engineer in developing scopes of work and agreements that protect the engineer and minimize risk.▪

*Pedro Sifre (**pjsifre@sgh.com**) is a Senior Principal at Simpson Gumpertz & Heger, Boston, MA. He serves as a member of the CASE Toolkit Committee.*

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