

Innovative Technology Sparks Evolution for Courtroom Demonstratives

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Technological advances over the last decade, and particularly during the last few years, have been dramatic. Previously out-of-reach technology is commonly used in business and socially by anyone holding a smartphone. While many lawyers have personally picked up the technology, they have not changed as rapidly in their use of technology for trial, nor have they changed as quickly as those that the evidence is presented to in the courtroom. Exactly what “audience” is a lawyer facing when she or he steps into a courtroom? In many instances, the lawyer is facing a virtual time warp of communication methodology and style, but also a courtroom that may not be equipped for current technological presentations of evidence, yet with a jury of many individuals who are used to having an immediate ability to “grab the phone” and find the answer through “Google,” “Siri,” or “Alexa” – and literally *see* “the answer,” or have it read to them by their electronic device. Complex ideas are available on his or her mobile device in short, concise, even if not precise, presentations and animations.

Into this environment the lawyer must navigate the presentation of the case for the client. Lawyers now find themselves searching for ways to meet their foundational and evidentiary burden, but also “compete” (so to speak) and comprehensively and effectively present detailed and complex, often dry or archaic, information to a group that is no longer used to receiving the information in that same traditional, and primarily verbal, fashion. Moreover, the lawyer is looking at presenting that evidence, often day after day and for a period of weeks (if not months), primarily through verbal communication in a virtually technology-free room, where the juror is prohibited from individually using the now-routine source: “ask Google.” How is the trial lawyer to compete for the jury’s focus and ensure comprehension to convey his or her case for the client’s benefit with the notably short attention span of today’s jurors, who have the “world in their hands”? By using a similar approach and technology, including innovative technology, in the presentation of the evidence in the case.

The lawyer must consider the “audience” and the venue. For instance, what is the composition of the jury? Is it an urban or a rural venue? Is the courtroom technologically sophisticated or is it a historic courtroom? Most judges and arbitrators are still our most senior lawyers, who are very sophisticated in the law, but much less sophisticated – as a general proposition – in the use of any substantive, let alone innovative, technology. Again, even in our technology-soaked world, it is not uncommon to find many lawyers regularly using only foam boards and some PowerPoint slides. “ELMO” and the overhead projector seem to have retired, but they were a common staple for many. Unfortunately, many courtrooms still do not have the necessary – or even basic – technological equipment installed or even available to “roll in” to the courtroom or venue to allow the lawyer to effectively utilize a laptop/iPad and large screen or video display for the presentation of evidence or to display demonstratives. Furthermore, juries are still likely composed of a wide-mix of Boomers, Gen X, Millennials, and the current Gen Z, with vastly different expectations and assumptions as to the presentation of information as either evidence or as a demonstrative by technology. When it is considered that the last two groups have never known an *absence* of technology, the lawyer must evaluate whether he or she will be able to capture the jury’s attention long enough to convey the case details in a manner that will clear the legal and evidentiary hurdles, but not lose the “audience” at the same time.

According to recent research, “in the U.S. alone, there are 70 million Gen Z’s – about 25% of the population entering the workforce over the next 15 years.” *Millennials are tech savvy. Gen Z’s are tech native*, <https://www.top-employers.com/en-US/insights/talent->

[strategy/millennials-are-tech-savvy.-gen-zs-are-tech-native/](#). And, Gen Z and younger Millennials “were born in the era of smart phones and they are used to multiple devices. The result is that they have a much shorter attention span, they are extremely comfortable multitasking (and think they’re inefficient if they’re not), and Goldman Sachs reports that nearly half of them spend ten hours online every day.” *Gen-Z Matters More Than Millennials* [3:21], <https://www.goldmansachs.com/insights/pages/what-if-i-told-you-full/?videoId=141042&playlist=0&video=2>. “This is the first generation to be born in a post-Internet world, truly device-in-hand.” *Id.* (citing Christopher Wolf, an analyst in Goldman Sachs Research).

It is into these dynamics that the trial lawyer walks, seeking to portray the evidence in a legally persuasive and appealing manner to capture the attention of the jury through the verdict in the client’s favor. And, while this paper is not intended to analyze the challenges with changing demographics and expectations of judges or juries specifically, considering the trier of fact is the necessary starting point from which we begin to outline the importance of the technological presentation of evidence in the case, and why incorporating innovative technology is very valuable, if not yet necessary for almost all cases.

In every case, the trial lawyer will evaluate the venue and trier of fact when determining the presentation of evidence with innovative technology. Evaluating the lay of the land, and how to deliver the “right” level of technology in varying situations must be considered early to evaluate what complexity and to what scale of the presentation will be shaped, and what method will best serve the client to convey the evidence and the client’s position. Gone are the days when only “wealthy defendants” or “big corporations” used technology, or innovative technology. In the smartphone era, it is expected that something more than foam boards and even PowerPoint slides will be used to present evidence in a compelling fashion to the jury. A PowerPoint with embedded video, or Trial Director smoothly presenting the evidence, with “on-the-fly” emphasis of certain material, will almost always be expected of all parties in the dispute. But giving the jury a “fly-through” or “walk-through” of a scene or complex mechanism, using drones or other innovative technology integrated into the testimony, will allow the jury to conceptualize the scale of a site better or the details of the complex mechanism in a much more robust and compelling manner. Remember, most people under 50 today are “technologically proficient,” consulting the internet for much of their information. And, they are not listening; they are reading or watching that information. The problem is whether, learning as they now do in this way, they can actively listen for prolonged periods while taking in detailed and often complex information. To avoid the “what if,” the use of engaging and often innovative technology is strongly recommended.

1. Overview of Various Types of Technology

A – “Old School” Traditional Presentations (Board, Pictures, Videos)

Most lawyers likely started their first trials with foam boards, flip charts, overlays, and maybe an overhead, real “slides,” or even an ELMO if it could be afforded and the courtroom had the capability. They presented a complicated case through the step-by-step use of photographs, diagrams, and other images of the subject in an enlarged format for the judge and jury to view during witness examination, to illustrate key parts of a machine, building, or scene,

using a pointer or laser for emphasis with the witnesses. As computers and software progressed through the 1990s and early 2000s, PowerPoint presentations were routinely used to organize and quickly present the evidence and show pictures on a larger screen or perhaps even a TV in the courtroom if it was available. Even then, the screen was small and distant from the trier of fact many times, and the lighting was not optimal.

If the lawyer was ambitious, she or he considered bringing an exemplar of the evidence to the courthouse for emphasis, or even a live demonstration, but had to consider the physical logistics of such a presentation and worry that something might go wrong during that presentation. If the scene was close enough to the courtroom, a lawyer could request a “jury walk” or “jury visit” and incur the cost, expense, and unique evidentiary value of that method of evidence. If the case warranted the expense, the lawyer might hire a graphics consultant to create a series of computer-based animations depicting various aspects of the evidence, including the scene or recreation of the accident, the injury, or damages. This “animation” effort bore the risk, despite the expense, that the judge would not even allow it to be used as a demonstrative as it may not be perfectly “to scale” or did not “precisely replicate” the functionality of the matter in dispute. Many motions and legal arguments and time were spent on attempting to move these proposed pieces of evidence in or keeping them out.

More commonly used are video clips of trial testimony, but also site locations, impacts of defective construction, and resulting damages. Clipped embedded videos in presentations, including PowerPoint presentations, emphasize the text and pictures already provided to the trier of fact, or in contrast to what the trier of fact has just testified about. Creating clear and memorable evidence of a scene or vantage point, or even testing results, that would otherwise not convey the same information in a picture, and due to the nature of the evidence, cannot be produced with the same impact through animation or other methods. Capture of “real time” evidence has the advantage of reality emphasized, from the location of the courtroom, but also such evidence can be replayed with multiple witnesses (working to avoid a “cumulative” objection), as well as at closing to keep the impact of the evidence fresh for the jury.

Each of these methods of presenting evidence, except perhaps the overhead and ELMO, does still have its place, depending on the venue, the “sophistication” and expense the client wants to convey and incur, as well as the capabilities or restrictions of the physical setting. And, serious consideration should still be given to mixing the evidence presentation to keep the trier of fact’s attention, as well as considering having the evidence “always up” in the hearing room for the trier of fact to dwell on, if possible.

B – Innovative Technology (3D Scanning, 3D Models)

Considering the options of the case and the complexity of the dispute, more sophisticated technology should be used, with a few “old school” pieces of evidence mixed into the case presentation. A current valuable innovation is 3D laser scanning, which refers to the capture and digital replication of real-world geometries or shapes in 3D space using a variety of available technologies. Commonly used as a tool for surveying buildings, terrain, and other architectural features, 3D scanning is now being used to create incredibly accurate and highly compelling trial

presentations. The most common types of 3D scanning that lawyers and their experts use are terrestrial scanning and hand-held scanning.

In terrestrial scanning, a computerized scanner is mounted on a tripod and uses a laser to scan a specified area thousands of times per second as it pans across the scene. As each laser pulse is emitted, the scanner measures the time that it takes for the laser to return, and with the known speed of light, the scanner can determine the distance to the surface measured. Terrestrial scanning is performed from a fixed position, with multiple scans of the subject area taken from various positions using designated reference points to fill in the blind spots, or “shadows.” The “point cloud” data generated by the various scans are then combined with photography to create highly accurate, photorealistic 3D models of the scene – typically accurate to within millimeters. Hand-held scanning generates similar data to terrestrial scanning data, but instead of the scanner being mounted on a tripod, the operator holds the scanner in his or her hand and scans an object while moving around it. The most common hand-held scanning technology uses a combination of depth sensors and cameras to triangulate distance, track the scanner’s position in real time, and likewise achieve accuracy to within a millimeter. One of the most dramatic uses of 3D-scanned data is the ability to do fly-throughs of what would normally be solid objects. This capability allows the viewer to see key components inside a building or mechanical device. And, both methods’ sophistication permits reliable evidence, thereby defeating the most common objection to technology: that it is not to scale or is not an accurate representation of the matter represented.

A key attribute of 3D-scanned images is their ability to always remain in proportion no matter how the images are manipulated. With traditional site investigations, forensic engineers might take hundreds of photographs and then attempt to piece them together to recreate the conditions in the field. With 3D scanning, however, all of the spatial relationships are preserved exactly as they appear in real life. This makes it possible to zoom in or out on a particular object without ever losing “scale.” Once you have collected the 3D-scanned data, you can then use them in a variety of ways to demonstrate key points effectively at trial. 3D images allow you to view, pan, zoom, measure, and mark up point cloud data right before a jury as if you were “inside” a 3D photograph. Working with a graphics professional, you can create 3D models of objects and place them on virtual “turntables” so that they can be viewed from any angle.

Also of potential use is a reduced duplicate scale 3D print of evidence, such as a very large piece of equipment that is too large or cumbersome for the courtroom, but which may provide a more “hands on” representation of the subject than a mere photograph alone. What is 3D printing? It is actually an umbrella term that encompasses a group of 3D printing processes, by which material is joined or solidified under computer control to create a 3D object within a precision scale. The material is being added together, typically layer by layer, from a like and detailed scale of the original. For instance, if you were trying to depict one of the world’s largest tunnel boring machines, you could use pictures, videos, or animation, but you could also combine that with a 3D replica to emphasize aspects to the trier of fact.

2. Why Is It Important to Consider Updating Your Demonstratives with Technology?

A – Jury Expectations

There is no doubt about the vast range of technological expectations from juries in the current environment as described earlier in this article. The jury demographics swing from those in their 60s to early 20s, which necessarily includes a vast range of expectations about technology and the presentation of data and evidence. A 2014 article in Claims and Litigation Management (CLM) succinctly states the competing expectations and understanding of technology:

As Millennials have grown up in a world of instant access to anything they want to know. Millennials have the Internet at their fingertips and expect information, products and anything they desire to be immediately accessible. As a result of these experiences, Millennials have certain expectations of a defendant in a case.

....

Millennials also have short attention spans due to the quickness that they normally receive information, so long-winded scripts won't cut it with this crowd. They desire to be entertained while learning about the evidence.

They believe there is an App for everything and any reasonable person should know that. If you cannot find the answer you can Google it. Millennials believe this and think everyone should work and live this way.

....

As a result, defense counsel must include technology in their trial presentation. They also must be aware of what is out there about the subject matter of their case on the Internet. It is very likely a Millennial juror will Google the product/injury/information that is central in the case to determine what "really happened." However, counsel also has to be cognizant of the other generations on the jury that could be put off by too much technology. An example of this is that Baby Boomers want straightforward numbers, not fancy, slick graphs and charts.

<http://clmmag.theclm.org/home/article/Your-Jury-Box-In-The-21st-Century>.

B – With Technology There Can Be Clarity of Point, and Complex Items Can Be Simplified, Perspective Can Be Given

Using 3D scanning, for example, you could start a demonstrative of a facility or building with a "birds-eye" view outside the building, and then "fly" inside to show the jury precisely where the defective construction is located and capture the resulting damages. Next, you could isolate and place the defective equipment on a virtual turntable to highlight each of its key

components. 3D-scanned data can also effectively place a jury into the “driver’s seat” by providing the jurors with the same point of view as the involved parties. Thus, in a construction accident case, a jury would be able to understand almost exactly what various witnesses and the plaintiff were able to see (and for how long) before the accident occurred. Or you could use 3D-scanned data to demonstrate that a person who claims to have been a witness to such an accident could not have seen it from his or her vantage point. In a premises liability case, you can use 3D data to allow a jury to experience walking down the aisle of a project site in almost exactly the same manner as a plaintiff.

You can also use the technology to create an animation, demonstrating how the facility is supposed to be built, verses how it was actually constructed, including how the operations of the machinery did or did not work, as well as showing in context (almost *in situ*) the impacts of the defective design or installation that have resulted. The lawyer is able to use the technology to emphasize the point, testimony, or photographic evidence, or placement of damage and images of design failures so that they can be moved from the mere conceptual imagery to a “real life” impact, by the inclusion of a photo of the damage or additionally adding an embedded video or animation, of the damages.

The lawyer can also provide perspective of the entire project, the site or the depth/size of an object by the use of drones, giving the witness the opportunity to describe the context, or vantage point that a simple image or photograph just simply cannot convey.

C – But There’s Still Our Old Friend “Murphy”

Although it should go without saying, anyone who has tried cases (or gives presentations) understands that while technology can be incredibly useful, if it does not work well (or at all) it can undermine even the best case with an appearance of weakness or uncertainty (or at least potentially question the lawyer’s preparations). It is therefore important to verify the equipment, cords, connections (physical and WiFi), and use of the technology initially, and prior to trial, as well as each day prior to the commencement of the case or presentation of evidence. Test, test, and test again. Basic considerations should not be overlooked, such as the ability to use the facility WiFi, the need for a dedicated hotspot with greater bandwidth, including a consideration of the bandwidth for playing the specific evidence or demonstratives planned for trial (the size of the files may take time to download or generate to start). The lawyer should inquire in advance as to whether the court requires the parties to toggle or switching laptops or tablets during the presentation, or by witnesses, and how long will that take with the equipment being used; does the court schedule allow locking in equipment nightly, or will it have to be moved for other matters (criminal trials take priority, and dark days in a single courtroom require breakdown and set up daily in many jurisdictions). The lawyer should always consider the risk of loss of WiFi, software updates at inopportune times, or forgotten passwords or security codes, all of which may cause the lawyer to have to quickly improvise with “old school” foam boards, blown-up pictures, or other low-tech methods of presenting evidence that will keep your trial moving forward, while an IT liaison (often the paralegal) brings the innovative technology back online for the next segment of trial.

3. Authentication Obligations

Before using any new or innovative technology, understand the implications of the technology that is proposed to be used and limitations on presentation and/or admissibility. For example, admissibility of 3D scanning is actually no different than the process for authentication of a photograph or video: a properly qualified person testifies as to how the data was obtained and processed. The ultimate issue is whether the 3D scan is a fair and accurate representation of the object or scene. And as with photographs or video, the equipment (and the user) may also be “on trial” before it is considered:

- Was the operator qualified to use the equipment?
- Was the software current?
- Was the licensing proper (software)?
- Was the equipment properly maintained?
- Was the rendering hardware maintained and current?

As the majority of jurisdictions (state and federal court) follow *Daubert*, the standard for admissibility of 3D scanning, for instance, is a methodical walk through of the data gathering and reliability of the software and equipment, along with the qualified user as stated above, and it is regularly allowed in evidence (or as a demonstrative) if so properly authenticated.

Animations, as they are not always as precise as 3D scanning (although the data from scanning can be utilized for such animations), may still be admissible as substantive evidence or demonstrative evidence. Although considered under the *Kelly-Frye* standard, in *People v. Duenas*, 55 C4th 1 (Cal. 2012), the California Supreme Court upheld the trial court’s discretion to allow computer animation with expert testimony as a demonstrative for the jury. The Court analyzed the evidentiary requirements for the use of animations or simulations, as reflected in these excerpts: “Computer simulations are created by entering data into computer models which analyze the data and reach a conclusion... [and] a computer simulation...is itself substantive evidence,” whereas “[a]nimations do not draw conclusions.... In other words, a computer animation is a demonstrative evidence offered to help a jury understand expert testimony or other substantive evidence.” *Id.* at 20-22.

In *People v. Duenas*, the prosecution in a criminal action against a defendant accused of shooting a police officer introduced a four-minute animation showing a frame-by-frame style illustration of the incident scenes, the locations of shell cases, and the accused’s firing locations. The trial court admitted the animation, and the defendant was found guilty. The defendant appealed, on several grounds, including the use of the animation by the experts opining how the victim was attacked and killed. Citing authority from other cases, the *Duenas* Court explained that “[c]ourts have compared computer animations to classic forms of demonstrative evidence such as charts or diagrams that illustrate expert testimony”; “[a]nimations do not draw conclusions; they attempt to recreate a scene or process, thus they are treated like demonstrative aids”; and “[i]n this case, the parties agree that the evidence was a computer animation, not a simulation, and therefore it was admissible if it was – a fair and accurate representation of the evidence.” *Id.*

The Court’s analysis on this issue, citing to several jurisdictions, is illustrative:

Courts and commentators draw a distinction between computer animations and computer simulations. (Annot., *Admissibility of Computer-Generated Animation*, 111 A.L.R.5th 529, 538–539, § 2[a] (2003).) “Animation is merely used to illustrate an expert’s testimony while simulations contain scientific or physical principles requiring validation. [Citation.] Animations do not draw conclusions; they attempt to recreate a scene or process, thus they are treated like demonstrative aids. [Citation.] Computer simulations are created by entering data into computer models which analyze the data and reach a conclusion.” (*Harris v. State* (Okla.Crim.App. 2000) 13 P.3d 489, 494, fn. 6, citing *Clark v. Cantrell* (S.C. 2000) 529 S.E.2d 528, 537.) In other words, a computer animation is demonstrative evidence offered to help a jury understand expert testimony or other substantive evidence (*People v. Hood* (1997) 53 Cal.App.4th 965, 969 (*Hood*)); a computer simulation, by contrast, is itself substantive evidence. (*Commonwealth v. Serge* (Pa. 2006) 896 A.2d 1170, 1176–1177 & fn. 3 (*Serge*); *State v. Stewart* (Minn. 2002) 643 N.W.2d 281, 292–293 (*Stewart*).) Courts have compared computer animations to classic forms of demonstrative evidence such as charts or diagrams that illustrate expert testimony. (E.g., *Hood, supra*, 53 Cal.App.4th at p. 969; *Serge, supra*, 896 A.2d at p. 1176.) A computer animation is admissible if “it is a fair and accurate representation of the evidence to which it relates” (*Dunkle v. State* (Okla.Ct.Crim.App. 2006) 139 P.3d 228, 247 (*Dunkle*), quoting *Harris v. State, supra*, 13 P.3d at p. 495; accord, *Serge, supra*, 896 A.2d at pp. 1178–1179; *Stewart, supra*, 643 N.W.2d at p. 293.) A trial court’s decision to admit such demonstrative evidence is reviewed for abuse of discretion. (See *People v. Mills* (2010) 48 Cal.4th 158, 207; *People v. Williams* (1997) 16 Cal.4th 153, 213–214.) A computer simulation, by contrast, is admissible only after a preliminary showing that any—new scientific technique used to develop the simulation has gained—general acceptance . . . in the relevant scientific community. (*People v. Kelly* (1976) 17 Cal.3d 24, 30; see also *Hood, supra*, 53 Cal.App.4th at pp. 969–970.)

Id. at 20-22.

4. Conclusion

Historically, juries had the discipline to listen to the evidence presented by lawyers using photographs, diagrams, and other “flat” two-dimensional methods of offering evidence. Given the change in both jury composition and commonly available technology, the expectations have changed dramatically, and juries expect to see cutting-edge technology supporting the client’s case presented through the witnesses. Drones, 3D scanning, 3D printing, “skp” files, and partial

animation combined presentations (with photographs and embedded videos) that accurately present the evidence are becoming a necessary expectation of parties presenting the case to retain the jury's attention. Each of these methods are important for all trial lawyers to consider integrating into their trial "toolbelt."