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Seven Steps of Tech Design Success

by Steven J. Thorburn, PE, CTS-D, CTS-I



Inside the StoneFire Pizza Company family restaurant and entertainment center

Technical systems design is integral to today's themed attractions and leisure projects – for that matter, it's integral to modern architecture. Entertainment systems, security systems, life safety systems, audio, video, control systems, acoustics and building infrastructure all fall into this category. We won't go into detail on all of them here; rather, we'll focus on the broad strokes: What are some primary things that designers, architects, general contractors, project developers and project managers need to know when it comes to technology and technical systems design? Here are seven points that help facilitate good understanding and teamwork and pave the way to a quality result.

1. Even the most problem-solving genius of a tech designer cannot overcome the laws of physics. Light will only travel about 300 million meters per second in our current

environment. Likewise sound will travel at about 340 meters per second in areas that humans would like to be in. This means that when your tech designer tells you something like, "it will sound bad that way," or "the image cannot be that big or bright given the constraints," you have run up against certain rules outlined by Newton, Einstein and Maxwell.

2. Technology requires space. Creating that high quality image requires space for the projection equipment and the projection cones as well as viewing space. The projection process and the image size are factors that dictate optimal viewing distances, sightlines and projection throw distance. If it comes down to size versus quality, a decision has to be made. And while audiovisual equipment and computers are getting smaller, our rack rooms and server rooms still

need to be the same size so we can keep up with all of the extras that have been added to the systems. You must locate these rooms properly within the facility, to house the gear that makes the magic. They require special power and air conditioning. Your tech crew needs a hut in the center of the venue so they can get their systems out and utilities in to the rack and server rooms.

3. Wireless (as in battery operated) is for short term events only – parade floats or concerts, for instance. You need power. Without an un-interruptible power source, wireless systems will fail. (Just take a look at all of the travelers re-charging their wireless devices next time you are in the airport.) Are you sure you want to gamble on the guest's experience with what should amount to a disposable (but recyclable) battery?

4. Technology takes time. The tech crew will always be the last crew on site. Because their wires and equipment are delicate, a clean and air-conditioned space is needed before you even consider turning on the system. If the gear is exposed to too much dust, things fail later on. If the gear gets too hot, things fail. The commissioning process can take weeks and it usually cannot be shortened. If your tech designer estimates during the design phase that it will take six weeks of time on site to bring a system online, it will likely take six weeks, even if you triple the manpower (on a technology project, multiplying the manpower seems to decrease efficiency and lengthen the timeline rather than shorten it).

5. Technology fails over time. You cannot afford a system that will not fail. Even with the best systems, there will be failures. Therefore, you must implement a regular maintenance and testing schedule. (When was the last time a steel ride was installed without the cars, track and systems being checked on a



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regular basis? Technology requires the same consideration.)

6. Wire is wire. We are seeing our wiring systems simplified to computer network cables. What is run on the network cables can be entirely different from one system to the next, but it all uses “wire.” It is the equipment at either end of the wire that creates the magic, so the quality of your presentation depends on the quality of this equipment – the playback source and projection, the loudspeakers and amps, the control system, lighting, etc.

7. Get the whole team at the table early, including the tech designer. Technical problems that might threaten a

project in later stages can be anticipated and solved early, in the development stage, by a tech specialist. Your team will be able to address important technical issues at the formative stages and incorporate them into the design. This helps to make the best use of the square footage available, facilitate an efficient construction schedule and conserve the budget.

Ultimately, be realistic – technology is essential to experience design, so learn what you can and can’t expect, and how to get the best results. Applying a double standard is unproductive, so know that technology fails. (I challenge you to go a day without a technical glitch

somewhere – if it’s not on your computer or company network, it will be your phone, the GPS in your car, or perhaps the touch-panel on your dishwasher.) The laws of physics can’t be denied – neither in terms of what the technology can do, nor in terms of the space your systems require and the timeline your crew needs. To paraphrase a past client, for best project results, you and your tech designer need to cultivate the serenity to accept the things you cannot change (laws of physics), the courage to change the things you can (innovative moxie), and the wisdom to know the difference (professional judgment based on experience and observation). ■



Inside the New London Presbyterian Church in New London, PA.