

SP@TLIGHT ON: Tech

PROFILE



Advancements in automation

Aerial cameras, 3-D integration, and virtual reality are sharpening design and impressing clients in the A/E/P and environmental consulting industry.

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Gary Sheets,
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Today's firms embrace an array of technological advances in imaging – laser scanning, high-definition aeriels, and virtual reality – that drive office and worksite efficiency, marketing, and project deliverables.

IDENTIFYING REPEATABLE PROCESSES. Gary T. Sheets, Jr., director of geospatial services for **Larson Design Group** (Williamsport, PA) – a more than 300-person engineering, architecture, and surveying firm – says his firm is focused on improving its methods and project deliverables by identifying “repeatable” processes.

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DATA ACQUISITION. Over the last few years, Larson has made significant investments in advanced data acquisition technologies that not only streamline the company's efforts, but provide a much clearer understanding of a project site's existing conditions and environment.

“Our use of laser scanning, Mobile LiDAR and low altitude/high definition aerial imaging from UAVs provide our planning and design personnel with the highly accurate, incredibly detailed view of the project site in a fraction of the time it would take with more traditional methods,” Sheets says. “The information is available for use in both 2-D and 3-D and permits team members to virtually visit a location and gain the detailed information they as individuals need to do their jobs.”

PROCESS AUTOMATION. Many of the tasks associated with developing deliverables – plan sets and construction inspection forms, among others – are repetitive in nature and can result in basic human error. In an attempt to allow its professionals to focus their talents and to improve the overall quality of the product, Larson has made and continues





to make investments in the area of process standardization and automation. Specific examples include the use of internally developed and commercially available tools for sheet layout and version controls.

“We are also implementing software that focuses on managing, processing, and distributing the large datasets resulting from the Advanced Data Acquisition Technologies,” Sheets says.

“This ‘map-centric’ approach allows our project managers to visualize where resources, with the appropriate skills, are located and reduce the time and costs associated with execution logistics.”

PROJECT AND LOGISTICS MANAGEMENT. As much of its workload is distributed across a large geographic area, making sure the appropriate resources are allocated to a project is critical. At Larson, project managers have traditionally used workflows that manually compared detailed project schedules, human resources information, and equipment inventories to develop project management plans. While this method has proven to be effective, it can be very time consuming and challenging, especially when applied to long-lasting, large projects where variables can change often.

“Today, Larson is developing a geographic information system, or GIS, that integrates project schedules, worksites, and information about our personnel to streamline and automate the process,” Sheets says. “This ‘map-centric’ approach allows our project managers to visualize where resources, with the appropriate skills, are located and reduce the time and costs associated with execution logistics.”

GEODESIGN. In the early stages of the project’s life cycle, Larson’s planning and design teams take into account numerous constraints, while studying multiple design concepts or routes. The application of commercially available software, such as ESRI CityEngine and Autodesk InRoads, are “game changers” for how Larson approaches its work.

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“These geodesign tools allow project teams – our professionals, clients and partner firms – to work collaboratively, regardless of their locations, to quickly compare benefits and costs associated with a concept,” Sheets says.

TAKING A PAGE FROM THE GAMING COMMUNITY. At **BRPH Architects-Engineers Inc.** (Melbourne, FL) – a 320-person

international architecture, engineering design, and construction services firm – Todd Reed, a graphics manager, says there’s a new way to experience a future facility, and it has nothing to do with physically stepping foot inside one.

“Using technology to the fullest isn’t just about improving internal processes,” Reed says. “BRPH is also using it to create better client experiences. Through virtual reality technology, a variety of industries are experiencing a new way to conceptualize, view, and plan their facilities of the future.”

The technology involves the use of an Oculus Rift stereoscopic virtual reality headset which allows clients to navigate through a virtual facility while looking in any direction they choose via the headset’s head tracking ability.

The technology behind the wow factor starts in the 3-D world.

“Since BRPH designs in 3-D, the next logical step was to view designs in 3-D,” Reed says. “Using Oculus Rift, the project geometry is ported, via Autodesk’s Maya, into the Unity game engine. This process creates a realistic real-time visualization that allows the viewer to see all areas of a future factory.”

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“We were able to go back and determine things like weather conditions and were clearly able to view date stamps,” he says. “This feature alone saved us \$2 million.”

Companies also like to use the fluid, high-definition time-lapse construction videos for interacting and communicating with the public, and for public relations and marketing campaigns.

For example, a large project with great public interest was being spearheaded by Jamestown Properties and Green Street Properties. They transformed the Sears building-turned city hall in Atlanta into a mixed use business and residential complex.

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BRPH essentially took a platform that is extremely popular within the gaming community and made it work in a business sense.

Before the use of virtual reality, clients were relegated to 2-D plans. This new integration means clients get to visualize, and feel like they are actually inside their new facility, before the design development phase of a project is complete.

From a marketing perspective, it allows for an added layer of creativity and exposure.

“We market the program externally for companies to ‘step inside their next facility ... before it’s even built,’ because that is essentially what the virtual reality experience provides,” Reed says. “It’s a totally immersive viewing experience combined with the interactive control of perspective that results in a unique and memorable client experience.”

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WHAT DOES THE FUTURE HOLD? Technology, and the potential for automation, is ever changing.

At Larson, the Innovation and Technology committee recently discussed what the developing game changers were and from their vantage point, they see two specific areas that they plan on monitoring for development strategies. They are:

1) The Internet of Things. Larson believes that in the very near future the concept of “smart” vehicles and equipment will not only help their clients manage their facilities and asset portfolios, but will also allow Larson to further improve its project and logistics management. As the technology progresses, and industry standards evolve, GIS tools will be able to receive and use key data elements from the field. This will not only allow them to improve their resource allocation and response time by tracking the physical location, but also monitor equip-

Sandi Parker was the senior manager for creative and marketing at the time and says that the technology provided them with two major benefits – the ability to communicate with the outside world and to also serve project development needs.

The addition of the 24-MP camera rounds out OxBlue’s existing lineup of 6-, 8-, 12-, and 16-MP construction cameras. Every OxBlue camera is part of a complete system that includes all hardware, cellular data connection, intuitive user tools, and three kinds of time-lapse movie capabilities.

“If you are keen on managing developments and restricted on resources, OxBlue will save you money and time and allow you to capture each one of your projects on a daily basis,” Morgan says. ▀

ment run times and environmental conditions that may lead to safety issues and/or down time due to equipment failure.

2) Augmented Reality. This is quickly gaining acceptance in the

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construction industry, but has seen a much slower growth with design professionals. However, as the use of geodesign becomes more common place, and the limitations associated with dataset size begin to be resolved, AR will be a valuable tool.

“We envision developing a series of ‘concept designs’ within our offices, then visiting a site with a client, equipped with AR devices,” Sheets says. “While in the field, we will be able to visualize the design, make alterations, and understand the impacts of those adjustments in real time.” ▀

