Digital Twins: A Step-by-Step Strategic Plan for Infrastructure Executives

As the industry begins to understand what digital twins are and their value, how do you begin making them a reality?

Keith Bentley
Founder and Chief Technology Officer
Bentley Systems

Bentley®
Advancing Infrastructure

www.bentley.com

With the rise of digital twins in the infrastructure industry, there is much greater executive-level awareness of their impact and value. As digital twins are rapidly advancing into the mainstream, organizations need to begin thinking more specifically about how they can implement digital twins to achieve the best results on all projects and to avoid compromised competitiveness to others who do.

How do you go about creating a digital twins execution plan?

The first step when developing a digital twins execution plan is to work at the top levels of your organization to come up with a strategic plan for your business. Leaders need to study and recognize the opportunities around digital twins, and then energize and incentivize their organization around a plan that maximizes that opportunity. They need to be thinking about digital twin business transformations, particularly about how digital twins can work to your advantage rather than against you. There is absolutely a tectonic paradigm shift coming for the industry, which can either be an opportunity or risk. A strategic plan should thoughtfully consider how to make digital twin expertise an asset versus a threat.

The next step is to think about refocusing your business around preserving your intellectual property (otherwise known as your data), rather than using it as a means for generating single-purposed deliverables. Drawings, CAD files, and BIM files don't cut it. PDFs don't cut it. They're electronic yes, but static, disjoint, opaque, and inscrutable for most intents and purposes. Their content must be transformed into an open, live, and connected database to be useful as part of a true "digital twin" of the long-lived asset they describe. Recognize that it won't be long before every infrastructure asset will have a digital twin that will be relied upon not for just construction, but also for optimizing efficiency and performance, ensuring safety and resilience, and complying with regulatory mandates. If you focus your business around the simple premise that your mission is correlated to your role(s) in creating, curating, understanding, leveraging, and maximizing the veracity and value of the digital twin, you won't go wrong. There's money in the data—make sure it flows towards you rather than away from you.

It's a wonderful idea to have a 10-year "strategic vision" to help calibrate progress for the longer term. But, expect to amend, expand, and adjust that vision every year.

Strategic vision is very helpful for the big picture view, but equally or more important is a detailed execution plan of "what to do and how to do it," so everyone knows how to prioritize their tasks. When we refer to a "tectonic paradigm shift" to a centuries-old business process, it might be tempting to view this transition as slow and gradual and, consequently, think your execution plan should be measured in decades. That's not the way technology shifts tend to play out. Advantage is gained quickly and lost easily. You must be nimble, aggressive, and plan to fail quickly. Form a two-year plan, with many incremental near-in targets, and then expect to adjust them as you learn.

Remember to start out small and slowly work up to your big plans. Get a few iterations with a digital twin under your belt before you begin using it everywhere. Think about what project you could use digital twins on first. Then, once you feel comfortable with the use and the technology, you will be ready to begin completing your overall strategic plan.

What will a digital twin platform look like?

Like most technology stacks, the implementation details for digital twins will be complex, multi-layered, multi-vendor, and ever changing. Nobody will be an expert in everything, and every software, hardware, storage, networking, etc. component will rely on connections to other components in a heterogenous and flexible environment.

There is an opportunity gap that happens between those who can use digital twins and are aware of digital twins, and those who cannot and are not. While digital twins are certainly not going anywhere, it is important to start implementing them as soon as possible to avoid being left behind. As the rest of the industry starts finding ways to productively use digital twins, owners may start to only request contracts with firms that are digital twin enabled. Therefore, if you delay your own digital twin proficiency, you may need the most resources and the most capital, just when you have the least flexibility.

How do I get started?

There are a few easy things that you can do to get started towards your digital twin future. The most important is to find an open, scalable platform that lets you easily create, visualize, and analyze digital twins, such as Bentley's iTwin® Services.

Bentley's iTwin Services provide a few easy first steps that can add digital twin technology to your existing business processes. The first, iTwin Design Review, helps coordinate individuals on projects, either within or across teams. You begin by setting up bridges that synchronize you data with your digital twin . Then, through a cloud service and a web browser, you can review everything in the digital twin, showing the differences across time.

The second, iTwin Design Validation, helps organize your dark data and see how valuable it is. It runs rules that check against reasons why data should be a certain way and gives you reports and potentially warnings about anomalies from rules you define.

The third, iTwin Design Insights, can look for patterns in your data and provide you with Microsoft Power BI reports, showing you what is happening with your data. You can gain valuable insights into your project without having to change your workflows.

What's next?

When considering a digital twin platform, it is important to find one that lets you quickly deliver living digital twins, visualize your data in mixed reality, and use the latest technology to deliver decision makers new insights into the data. As you begin (or continue) thinking about where you and your projects can use digital twins, a good starting point is visiting http://www.bentley.com/iTwin to learn how Bentley can help you with going digital with digital twins.

This perspective is based on Keith Bentley's Year in Infrastructure Technology Keynote address, given on October 24, 2019 in Singapore.