

DIGITAL TWINS AND THE DIGITAL TWIN OF AN ORGANIZATION (DTO)



The concept of a digital twin is not a new one, but it has become increasingly popular in recent years, especially in the healthcare, automotive, and manufacturing industries. One reason digital twins have received increased attention is because the concept [was included](#) in Gartner's Top 10 Strategic Technology Trends for 2020, as well as prior year top 10 lists.

Because of the competitive advantage that digital twins can offer, more and more businesses are utilizing digital twins to increase efficiency, maximize optimization, and reduce risks. As a result, it's a concept that leaders should be aware of and working to implement. Further, the Internet of Things has made digital twins more accessible for many businesses, enabling businesses in a variety of industries to take advantage of the many benefits that this technology offers.

Understanding Digital Twins

Gartner defines a digital twin as simply "a digital representation of a real-world entity or system." The concept of a digital twin has long been used in industries from aerospace to mining, primarily to create simulations. It's been particularly utilized to create simulations of engines and windmills. However, in the last few years, it has become increasingly mainstream and utilized to create models of many different things and systems. This change is in large part due to the Internet of Things and Industry 4.0 (IIoT) and the vast amount of information available as a result of the IIoT.

Broadly speaking, a digital twin is a virtual model that simulates the physical components and

behaviors of how an IoT device functions throughout all phases of its lifecycle. A digital twin is created using sensors to collect comprehensive real-time data from real-world elements. That data is then used to create a digital duplicate that can help teams better understand and analyze real-world things or systems.

Data and analytics are the drivers of digital twins. Key elements of digital twins are a model of a real-world object; data including identity, time, context, and events; uniqueness, meaning that the model corresponds to a unique physical thing; and an ability to monitor the real-world object, including an ability to query or receive notifications about specific events or changes.

Benefits of Digital Twins

Digital twins utilize data, machine learning, and the IoT to make systems and businesses more efficient, leading to better outcomes. The key benefit of a digital twin is that it provides real-time data that can help with learning, reasoning, and understanding of how things and systems work. It lets users better understand, model, and optimize performance of a physical entity throughout its lifecycle.

More specifically, digital twins help to highlight operational inefficiencies; allow for an extension of the lifespan of equipment and devices due to improved maintenance and optimization; result in a reduction in downtime; and provide research and development teams with access to key data that can lead to improved future designs and developments.

Due to the many benefits, more and more businesses have begun utilizing digital twin cloud services in order to model and simulate infrastructure assets throughout their lifecycle. Plus, creating a digital version of assets in the cloud helps businesses track changes while making necessary adjustments to optimize performance.

Additionally, as digital twin services have become more advanced, they have become more user-friendly and effective. Current digital twin cloud services allow increasingly advanced digital simulations and models that are able to learn by themselves. These systems lead to increased insights, easy-to-understand data, and user-friendly dashboards that can be utilized by teams without the need of data experts.

Digital Twin of an Organization

As the capabilities of digital twins have become more advanced, more and more industries are creating these models to help improve performance, leading to better outcomes. As digital twins have become more mainstream, it's become increasingly clear that anything can have a digital twin. While the concept has traditionally been used with equipment or hardware, it's no longer limited to these areas. Given that anything--from a building to a pair of shoes--can have a digital twin, it's not surprising that the concept of a digital twin of an organization (DTO) is gaining traction.

The idea of a DTO--developed by Gartner--was driven by the goal of using a digital representation of an organization to support the implementation of changes or new initiatives. A DTO provides a virtual model of a business that leaders can analyze and tweak as needed. When fully implemented, it provides a full twin in the context of operations.

Notably, the data used in DTO models can be consistently updated, which gives businesses real-time information on how the organization is functioning, utilizing resources, responding to changes,

and meeting customer needs. Obviously, access to such a model gives businesses a myriad of competitive advantages.

How and Why Businesses Should Develop a DTO

The obvious first step in creating a DTO is developing a virtual representation of the organization that is accurate and comprehensive. Once a model is created, teams can analyze and interpret data to learn more about systems and processes while anticipating issues and areas of concern.

For organizations that are considering implementing a DTO, it's a good idea to start with a small project and then gradually scale up from there. Regardless of the size of the model, the key components of a DTO are destination, map, performance, situation, and decision. These components allow for the identification of relevant business models as well as the creation of objectives of the DTO, KPIs, a system to monitor performance, and a plan for implementing changes to achieve better results.

While creating a DTO requires a powerful platform and extensive enterprise architecture, it can lead to increased returns as well as a strong competitive advantage. In the current environment, businesses are constantly changing and developing. A DTO reduces the risks that come from these changes, allowing organizations to anticipate issues and make adjustments before implementing the changes in the real world.

When using a DTO, rather than implementing changes in the real world, leaders can implement them in a virtual model. As you can imagine, this allows for easy adjustments and changes. Equally important, it means leaders are able to review different options and scenarios before implementing major changes.

In addition to the criticality of making changes, a DTO is also helpful with day-to-day operations. It lets leaders gather insights about how their organization is working and enables them to identify areas of inefficiencies or weaknesses that can lead to organizational improvement. A DTO also provides extensive past performance data, which can help with strategic planning and optimization of processes.

Further, because it provides insight into business goals and models, a DTO can be a key tool in training new and veteran employees. Using a DTO for training can lead to a more extensive understanding of the overall business operations, its performance goals, its organization-wide strategies, and its key directives. As a result, it allows all stakeholders to understand and align on organization-wide goals and operations.