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COMPLETE CONTROL COMMUNIQUÉ

Your local guide to building automation

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A DIGITAL TWIN

A digital twin is a virtual model aimed to mirror a physical product, process, or service. It replicates the elements and movements of a certain product, with the ability to comprehend how it is composed and works. It is a dynamic model, meaning it changes and advances as it continues to receive information and data from the field. By obtaining real time data through installed sensors, digital twins are able to connect the real world to the virtual world. It gathers information from current and past behavior and learns from it, aiding its future performance. It is able to observe the operations and behaviors of the actual products and processes used, predict the methods of failure based off of the operations data, and establish corrective actions and improve future applications.

REFERENCES

1. Steps to Accessing the Value of the Digital Twin
2. How Does a Digital Twin Work?

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HOW IT CAN HELP

Digital twins can help in many ways and are used in a variety of industries, such as—automotive, construction, manufacturing, utilities, healthcare, and more. Through the data that is collected, evaluated, and simulated in this virtual duplicate, digital twins are able to optimize the performance of the real product by applying what was learned through the virtual representation. By analyzing the data and tracking the systems, it can calculate problems that were set to occur in the future and therefore avoid them. This prevents downtime and influences how devices are designed, built, and how it operates.

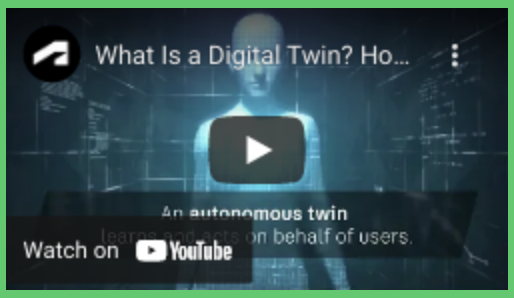
They create new opportunities for future technological advancements. At the current moment, digital twins are helping professionals in each step. Those on site can determine what materials are needed and their work schedule, lowering waste percentages and increasing work safety. Operations and facilities managers are quicker in their responses, spending less time on time consuming documents for maintenance. Owners are able to make faster and more practical business decisions that will save them money on maintenance and operations.

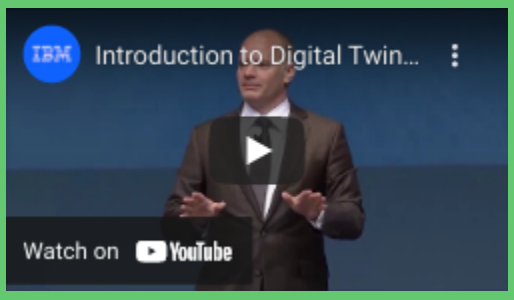
These virtual replicas can also accumulate information on population growth, supply levels of natural resources, evidence of previous environmental disasters. By doing this, stronger and safer cities and buildings will be constructed as the world evolves. With the continuous use of digital twins, industries will be able to react to future worldwide issues.

HOW TO USE IT

The main source that allows a digital twin to inherently work, is that of the continuous collection of data. This data is obtained from each stage—planning, proposal, design, engineering, manufacturing, operation, etc. While digital twins rely on acquiring data from this stages in order to operate, these phases are also influenced by that same data. The 3 most affected steps include the phases of designing, building, and operation of a device.

VIDEOS FOR MORE INFO





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The design phase is where the physical engineering elements, such as the materials, and the virtual elements, like the software, come together to create a functional design. By combining these two aspects, the design focuses on operability to make the greatest quality product.

During the building stage, the digital twin gathers information to understand the inner workings of the actual product. It works on making sense on how the product's design and strengths are influenced by the device that make up the product itself.

The operation step is when the digital twin not only gathers information, but acts upon it. This is when it facilitates the operation of the product through the recalibration that occurs along the way from the lessons learned.

DIGITAL TWINS VS. SIMULATIONS

Digital Twins and Simulations are very similar because they are both used to gain information by replicating processes. However, they do have some key differences. For example, a simulation is only used to study one aspect of process. Comparatively, because Digital Twin is a virtual system, it has the capacity to process large amounts of data to conduct various simulations at once. It also benefits from real-time input. Unlike simulations which only use past data, Digital Twins are able to study a wider scale of information from a broader perspective. Therefore, it seems that Digital Twins are more useful and effective than the average simulation.

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