The need to integrate the "Digital Twin/Digital Thread"

When we speak about integrating the "Digital Twin/Digital Thread" most people think that we are specifically talking about integrating the upfront design capability into the mechanical product design process. Well, "Yes" we are referencing integrating this capability into the mechanical design process, but we are also discussing the need to extend this concept into software development, manufacturing and service process development. The overarching idea is the need to integrate the product and process digital twin as the key to an organizations' ability to improve its product and process quality, as well as, increasing product development throughput and efficiency. The goal being to improve organization's ability to deliver product and services to marketplace the with speed and outstanding quality.

Incorporating "Digital Twin/Digital Thread" into Mechanical Product Design

Incorporating the "Digital Twin/Digital Thread" into mechanical design is the first step and the one that most organizations have implemented to some degree. Giving digital analysis tools to the design engineer and allowing him/her to understand the characteristics and capabilities that the design components, sub-assemblies and final assembly need to deliver prior to producing physical prototypes, increases the speed of design, as well as, increasing the number of design iterations and producing an optimum design. Bringing this capability early into the design cycle also reduces costs and helps find mistakes early in the "concept" phase of the design. Key technologies such a Ansys. Nastran, Hyperworks, Creo, NX, etc. give you the fundamental capabilities needed to simulate, validate and optimize at today's speed of design.

Incorporating the "Digital Twin/Digital Thread" into Software Design

There is a lot of buzz in industry today around "Digital Twin/Digital Thread" and its easy to see how these tools and thinking can be incorporated into software development. When you think about the speed of design and the process of virtually "error proofing" software prior to production release, it's the next logical step in improving the product and its quality. This is probably just as important, if not more important, than mechanical product design, especially since the percentage of new product capabilities that are now driven via software functionality are increasing at an exponential rate. Keys technologies such a IBM Rationale, Selenium, HPE Unified Functional Testing, etc. gives companies the needed capabilities to simulate and validate software designs.

Incorporating the "Digital Twin/Digital Thread" into Manufacturing and Service Process Design

Incorporating the "Digital Twin/Digital Thread" within the manufacturing and service realm, allows you to visualize and simulate the physical manufacturing/service assets, processes and resources to understand, develop, manage and improve the overall performance, effectiveness and output from the company's manufacturing and service capabilities. The other aspect to this is that the linking of the digital and physical worlds through IoT sensors, data acquisition and synthesis allows for real-time validation. Then, if you extend this by applying analytics and machine learning, we can progress into predictive and prescriptive decision making.

Incorporating the "Digital Twin/Digital Thread" within an organization represent an enormous opportunity for Original Equipment Manufactures (OEM's) and manufacturers. By taking the "what if" analysis from a question to a plausible answer. Understanding, tweaking, improving and assessing, from the digital world to the physical world and linking the learning between the two realms, allows for "limited" surprises as you take an "idea" to a real "product".

Architecting and integrating these capabilities is something we have a great deal of experience in helping our customers implement.

If you'd like to go into a deeper conversation on this subject, don't hesitate to contact us by either:
Phone: 269-281-7567 or by email at info@driven-4.com

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