

Digital Twin as Enabler of Sustainability and Risk Management of Medical Devices

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Abstract. This paper discusses how the implementation of a digital twin approach can assist organizations in attaining two related but non-competitive objectives: promoting transparent risk-based decision-making and demonstrating that sustainability objectives can be accomplished in a more direct and cost-effective way. When developing a digital twin, it is crucial to consider its intended use, anticipated advantages for the organization's personnel and processes, and usage. Creating a digital twin of a medical device, its aggregates, and components has significant downstream impacts, including affecting supplier partnerships and influencing design and manufacturing processes. Through its simulation and training features, it can bolster users' and patients' confidence in using the technology and simplify the medical staff's job. Furthermore, a digital twin can serve as a repository for the knowledge required for treatment, medicine, and monitoring the patient's condition's progress. This paper highlights a digital twin implementation which case-focused or goal-driven, thereby simplifying activities such as collaborating with a supplier. However, it also necessitates the participation of multiple stakeholders and may affect their behavior..

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