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Exponential innovation in MedTech: Unleashing the full potential of digital technologies

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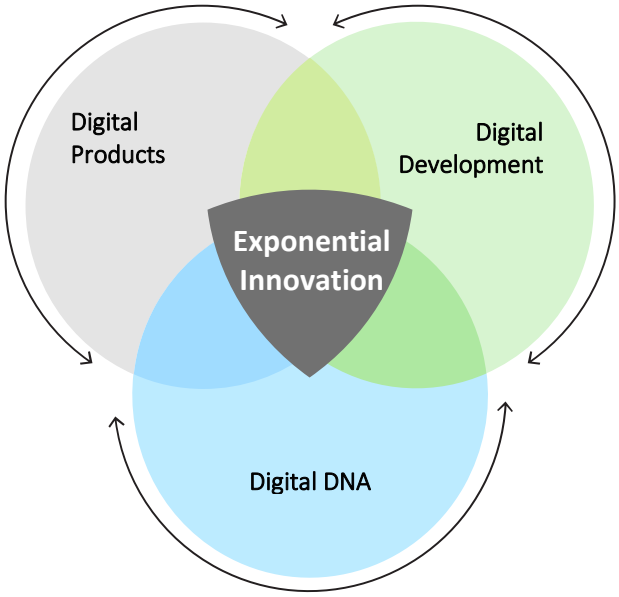
Digital technologies are already recognized as being a major force in transforming health care. Expanding use of digital and virtual tools and connected medical devices is powering advances in care delivery, health management, intervention, administration, and clinical research. Established medical device companies, keenly aware of technology's transformative powers, are actively incorporating digital capabilities into more and more of their product offerings, as well as creating entirely new categories of digital devices. But are their leaders looking more broadly and holistically at how digital technologies can help them change not only what they innovate but also *how* they innovate?

Our industry is in the midst of a dramatic shift in focus from developing and selling hardware-centric medical devices to value-added medical technology solutions. I see digital technology as both core to changing the nature of solutions the industry develops and vital to developing these solutions more quickly, more efficiently, and with more value for customers.

What is exponential innovation?

Exponential innovation in MedTech is the intersection of digital technology deployment in three areas—digital products and services, digital development, and digital DNA (figure 1):

Figure 1. Exponential innovation in MedTech



It is abundantly clear that major MedTech companies are prioritizing and directing investments toward products that are better prepared to compete in a data-driven, connected, and patient-centric health care system. Consider, for instance, patient engagement, clinical, and tele-rehabilitation services to help improve outcomes for orthopaedic care; and implantable, connected cardiovascular defibrillators and diagnostic tool alerts to improve cardiac care outcomes. And in a shift from selling improved features to leading through evidence-driven-demonstration of outcomes, developers are integrating data-generating technologies and analytics that create closed-loop, real-world data to demonstrate the value of devices to health care payers and patients. Meanwhile, agile new entrants are making customer-centric care a reality by leveraging virtual technologies to create integrated platforms that collect, aggregate, curate, analyze data, recommend actional steps, and execute a care plan.

Despite these advances, larger MedTech companies generally lag other industries in employing digital technologies to drive new product development. To illustrate, the aerospace, automotive, and consumer products industries have demonstrated significant value from digital development, such as:

- Using integrated digital twins/simulations to rapidly model customer problems and iterate design solutions for hyper-speed and scalability
- Applying seamless data integration and artificial intelligence (AI) to accelerate customer need analysis and evidence-generation to achieve faster time to revenue
- Automating processes for hyper-efficient quality and compliance management.

A more aggressive application of these and other technologies can help unleash the greater levels of innovation needed by MedTech companies to compete in the world of digitally driven health care. Deloitte's experience with organizations across numerous industries shows that the benefits of digital development can be dramatic:

- 50%-80% improvement in cycle time
- 15%-40% improvement in efficiency
- 10%-40% reduction in cost to quality
- 3-4X advantage in revenue from new products.[1]

Comparable gains have been demonstrated in other highly regulated industries, such as aerospace and automotive. However, to achieve these results requires more than just digital technologies: Driving toward exponential innovation requires significant change to how the people in the organization think, work, and collaborate–the company's digital DNA (figure 2).

Figure 2. Driving toward exponential innovation requires significant change

From		To
How We Think		
Design products features	→	Deliver demonstratable outcomes
"Make it and break it" development	→	"Digital-first" development
Improve product generation	→	Enable flexible customization
How We Work		
Document-centric	→	Data-centric
Manage and trace requirements	→	Create and manage "executable digital twins"
Mange to milestones	→	Orchestrate continuous releases
How We Collaborate		
Mange structured teams	→	Facilitate dynamic networks
Translate the "voice of the customer"	→	Enable continuous, experiential co-creation
Standardize workflows	→	Optimize the creation and use of knowledge

An effective transition calls for agile ways of working and support systems that move and adapt at the pace of digital change; intelligent augmentation and experiential learning systems that optimize high-skilled workforces; and mission-focused, real-time collaboration across internal capabilities and with ecosystem partners.

Lessons learned from exponential innovation leaders

Digital technologies are changing the nature of MedTech products and how companies create them. It affects all product development functions—R&D, quality, regulatory, clinical, operations and commercialization. Our work with exponential innovation leaders in numerous industries provides important lessons learned for MedTech companies, especially larger, established organizations that may be challenged to move away from traditional development processes:

- An integrated and comprehensive vision of digital capabilities is vital to creating an exponential innovation strategy.
- It's not about a single digital capability but the integration of multiple capabilities into a completely different system of innovation and product/solution development.
- The greatest value is unleashed by taking a full-stream, cross-functional, and integrated view of the product life cycle.
- A key element is leveraging digital technology to rapidly cycle and learn "in the virtual world" to reduce the need for development, testing, and documentation "in the physical world".
- A company doesn't have to move to an exponential innovation approach all at once. Vendors offer many digital capabilities as cloud service offerings that can be added and integrated over time.
- Digital technology continues to advance at an accelerated pace so it's a journey of continuous adaption to new opportunities.

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[1] *Based on Deloitte analysis of client experiences and public case studies.*

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