

## **The digital era in the MedTech industry**

Digital supply networks and MedTech

# Opportunities and key considerations for MedTech

Opportunities for digital transformation are available throughout life sciences organizations' business, from business operations such as production and enabling functions to engagement with patients, physicians, health systems, and payers to developing new products and services. Realizing each opportunity requires the capabilities of a digitally maturing organization, including an overall strategy, culture of collaboration and experimentation, and supportive leadership.

Digital transformation offers MedTech companies opportunities to execute efficiently, engage effectively, and innovate new products and services.

**Execute:** Digital can help companies execute better by improving performance and reducing costs through collaboration, centralization of digital technologies to streamline delivery, and enhanced capabilities across the organization or division.

**Engage effectively:** Digital can help companies deliver a differentiated, engaging, digitally enabled impactful experience to key customers, the workforce, and ecosystem partners. Key elements include using digital platforms to engage patients and other stakeholders remotely, leveraging social and other community networks, and personalizing experiences with user data to deliver greater value.

**Innovate products and services:** Digital transformation offers opportunities to envision and deploy products and services with new or enhanced value. Opportunities also exist to improve the return on research and development.

This paper focuses on digital transformation execution within the MedTech industry by identifying key areas to leverage digital technologies and guidelines for building a strategy that will enable growth.

## Key considerations



In recent years, increased pricing pressure and stringent regulations along with the slow pace of product development and chronic operational inefficiencies have given many MedTech companies pause about their existing operating model. By leveraging digital supply networks, MedTech players now have the opportunity to spur growth and differentiate their entire organization by digitizing their supply chain functions.



Our analysis has identified five supply chain areas (inventory management, logistics and distribution, device maintenance, product development, and warehouse operations) where MedTech companies can reap the most benefits when adopting digital technologies. By doing so, they can enable increased supply chain visibility, reduced maintenance and R&D costs, greater customer satisfaction, and improved patient experience.



To embark on a digital journey, MedTech players are advised to build a digital strategy road map around the following four steps: getting started now with small and immediate incremental changes, developing a more tech-savvy workforce, addressing cyber risks, and adopting agile methodologies.

# Introduction

Moore's law dictates that the density of transistors in an integrated circuit doubles roughly every two years. This rule of thumb has since extended into advancements in other technology systems, across storage, computing power, and even the number of pixels on a digital camera. As a result of the exponential growth, dramatic boosts in the performance of digital systems and the affordability of individual components have ushered in a new era of disruption and paved the way for data-driven decision making. From a supply chain perspective, such advances have initiated a fundamental shift from linear, sequential supply chain operations to interconnected and dynamic networks, termed digital supply networks or "DSNs" (see figure 1).

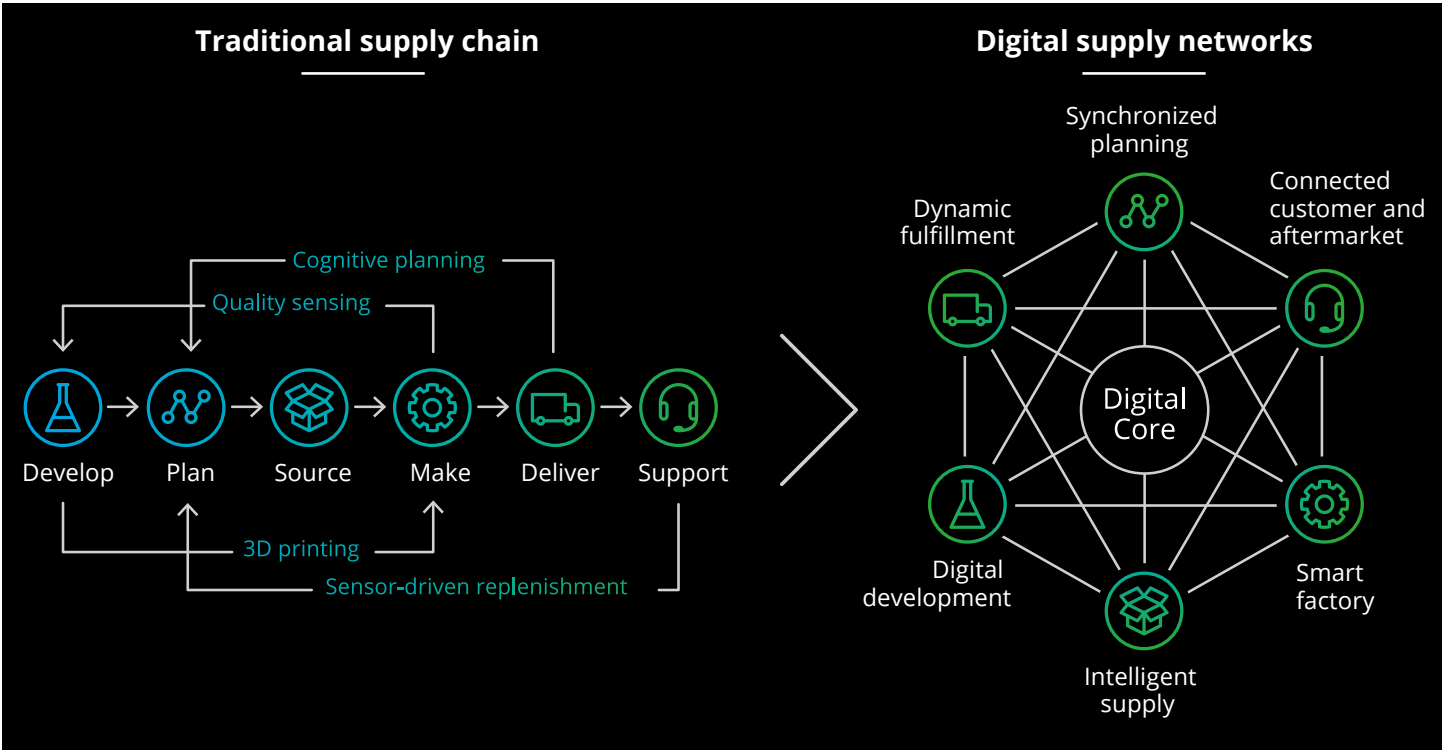
By integrating a company's entire supply chain to inform and achieve business objectives rather than narrowly manage and optimize discrete functions, the applications of DSNs promise to enrich day-to-day operations and serve as a source of strategic differentiation for businesses in the very near future (see figures 2 and 3).<sup>1</sup>

Companies in sectors as diverse as information and communications technology (ICT), financial services, and consumer and industrial products (CIP) have already begun to reap the operational and strategic benefits of digital adoption. Faced with rising price pressures imposed by health care providers and challenged with ever increasing operational costs

along with lower returns from maturing products, companies in the medical devices and products industry (referred to in this paper as "MedTech") must now also look at new ways to improve their bottom line. Embracing digitization in operations is becoming less of a choice and more of an imperative to remain cost competitive in the coming years.

In the following, we will explain why the time is now for MedTech companies to digitize their operations and how, by doing so, they can build the necessary momentum for enduring profitability growth.

Figure 1: Traditional supply chain versus Digital Supply Networks



# Drivers for digitization

In recent years, forces ranging from increased pricing pressure, to more stringent regulations and operational inefficiencies arising from a general trend of consolidations have reshaped the MedTech landscape. These trends show no signs of reversing.

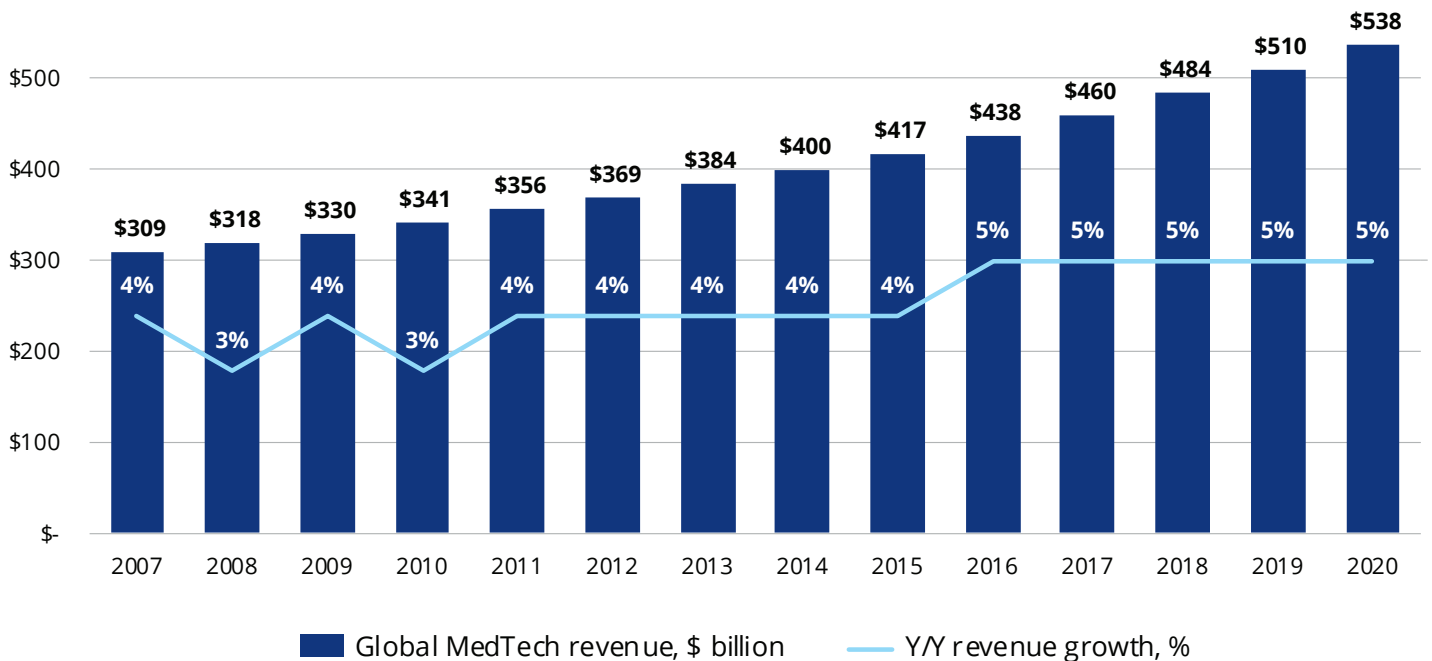
## Increasing pricing pressure

Stiff price competition and downstream pressure in the MedTech sector continue to be growing concerns for business leaders, as demonstrated by recent surveys of managers in medium and large MedTech

companies.<sup>2</sup> Forced to reduce health care spending in an uncertain economy, payers, providers, and governments constantly demand lower-cost devices, value- and outcome-based payment models, and more stringent regulatory processes.<sup>3</sup> Moreover, patients themselves have become value-conscious consumers in an era of rising out-of-pocket (OOP) expenditures. Although willing to pay out of pocket for quality premium services, patients are increasingly sensitive to prices and susceptible to bypassing treatments when faced with high deductibles, especially in the United States.<sup>4</sup>

As a result, prices for MedTech products have continued to decrease. For instance, market analysis has shown that the average sale prices for 71 common cardiac and orthopedic devices have fallen by about 4 percent from 2010 to 2016, and the price for basic pacemakers in hospitals decreased by about 5 percent from 2013 to 2016.<sup>5</sup> To combat these falling prices, MedTech players must not only provide superior technologies or features, but also deliver outstanding value to patients and providers while keeping costs to a minimum.

Figure 2: Year-over-year growth of global MedTech revenue



Source: GlobalData Medical, as of November 2017

Although it has historically experienced a constant and steady growth worldwide, averaging a 4 percent year-over-year revenue growth in the last 10 years, and is projected to hit \$540B in revenue in 2020, the MedTech industry has not seen its profit margins follow the same upward revenue trend. In the United States, profit margins have declined slightly from 6.7 percent in 2012 to 6.6 percent in 2017, and are projected to further fall to 6.3 percent in 2022.<sup>22</sup>

**More stringent regulations**

In addition to a downward pressure on pricing, MedTech companies face additional challenges in recent legislations that look to elevate operating costs, especially in mature markets. For example, the recent European Union Medical Devices Regulation (MDR) will enforce a more thorough assessment of product safety and performance by placing tighter requirements on clinical evaluation and traceability of devices throughout the supply chain. By 2020, manufacturers will have to fully comply with the new regulation, and as a result, face increased operational complexity and considerably

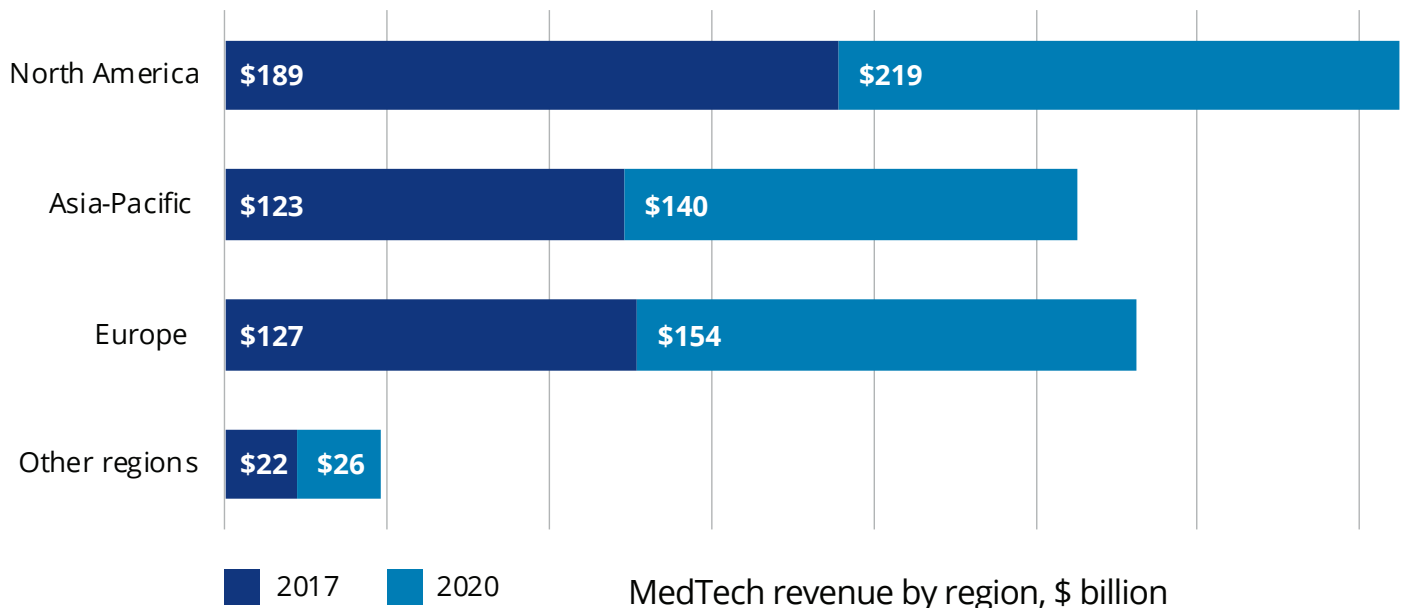
higher compliance costs, potentially in the millions. Ultimately, organizations may have to consider whether specific products have sufficient returns to remain on the market.<sup>6</sup>

**Operational impacts of M&A**

On top of the additional costs of new regulations, operational issues from merger and acquisition (M&A) activity will continue to be a major hurdle for MedTech companies in the near future. The consolidation trend within the industry shows no sign of slowing down in the coming years, mainly driven by a desire to achieve shorter product life cycles and combat

high costs of developing new technologies.<sup>7</sup> Although M&A activities help to achieve scale and help position companies for success by delivering a wide portfolio of products to hospital buyer groups, they also present a source of operational inefficiency and quality-related risks.<sup>8</sup> In the process of making acquisitions to maintain a competitive edge, large MedTech companies tend to absorb older legacy designs and systems, giving rise to multiple design platforms for similar devices within the same company as well as disparate quality enterprise resource planning (ERP) and planning systems overall.<sup>9</sup>

**Figure 3: 2017 Medtech revenue by region and projected revenue for 2020**



Source: GlobalData Medical, as of November 2017

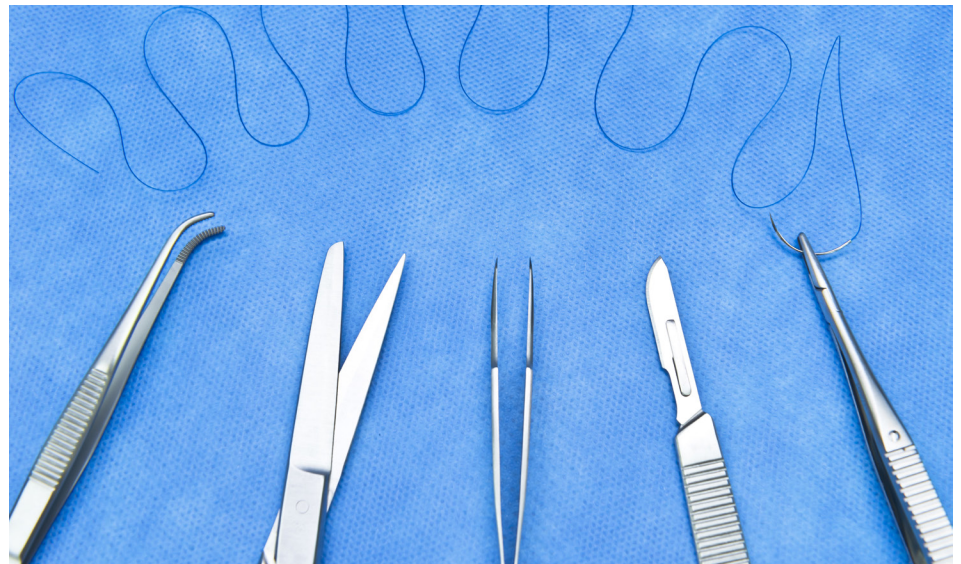
# Potential benefits of digitization

While the challenges may seem daunting, MedTech companies can focus on new technologies and frameworks as a way of countering these threats and positively impacting their bottom line. Increasing operational efficiency and providing increased value to their customers through DSNs would certainly be a start. But which MedTech functions would benefit the most from digital supply networks, and what specific technologies would best justify their implementation costs?

## Internet of things (IoT)

### **Inventory management**

Digital supply networks can leverage data from digital sensors and connected packaging to provide real-time visibility of inventory at all locations, connect smart cabinets that automatically track inventory transactions, and trigger replenishment requests. Surgical kits represent an apt example of an area ripe for improvement. Typically, the kits contain several devices and are sold on consignment. Today, hospitals generally send back the kits for reprovisioning after certain items have run out, at which point the manufacturer discovers and replenishes the necessary items, often giving rise to a 30-day lag in the process.<sup>10</sup> To avoid this, most manufacturers keep a high level of consigned inventory, at the expense of excessive and obsolete inventory. Taking advantage of IoT—a network of devices, machines, and other items embedded with sensors to enable interconnectivity and exchange of data—can help connect manufacturers with suppliers. For example, having the kits tagged with RFIDs, which are in turn tracked by a hospital's smart cabinets, allows for immediate inventory



replenishment and customer billing as soon as parts of the kit are removed. Our estimations indicate that, in addition to the time that sales representatives gain by not having to manually monitor the status of the kits, companies are potentially able to lower consigned inventory by 25 percent and reduce their excessive and obsolete inventory by more than 50 percent.<sup>11</sup>

### **Logistics and distribution**

Achieving a higher degree of visibility over the end-to-end supply chain constitutes another long-lasting challenge for MedTech companies. Having historically struggled to effectively manage the tracking, tracing, and monitoring across all steps of the value chain, MedTech players have borne the costs of physical product damages, encountered deterioration during distribution, and faced the consequences of widespread counterfeiting in the market. Taking advantage of the IoT could

let MedTech companies reap the desired benefits of supply chain visibility. Although pieces of the supply chain today are already connected to track and monitor packages, tinier embedded sensors can enable more accurate tagging and an unprecedented degree of real-time tracking and tracing of medical devices. This results in greater visibility and control over manufacturing, storage, and transportation conditions such as temperature, light exposure, humidity, pressure, and location. IoT can also ensure a greater level of integrity and security in an industry where fraud and security are widespread concerns (according to the World Health Organization, 8 percent of medical products are estimated to be counterfeited worldwide and theft is becoming more widespread and sophisticated.<sup>12</sup> Ultimately, the patient can benefit from this supply chain performance through having access to consistent, well-functioning products



### Device maintenance

Service contracts have long been one of the most profitable lines of business for medical devices manufacturers, and in many cases, generated much more lucrative profit margins than the sale of original equipment. Nonetheless, service managers are experiencing increased pressure to maintain a high level of customer satisfaction at lower costs, and medical devices organizations need to look for new ways to minimize the occurrence of external failures and schedule product maintenance before a major event occurs.

In this context, medical devices manufacturers can make use of IoT to enable remote connectivity and record data ranging from environmental conditions to operational settings and rates of failure. By doing so, MedTech companies can improve the efficiency of supporting operations, increase their customer satisfaction by reducing potential equipment downtime, and ultimately maximize their service contract profit margins.<sup>13</sup> However, realizing this ideal state is only possible if equipped with the right capabilities to extract meaningful data. Analyzing an outpour of information coming from embedded sensors calls for machine learning. This concept constitutes a subset of artificial intelligence (AI) and refers to the ability

In the time of online and social media, news of recalls of medical devices and lawsuits against their manufacturers spreads across the globe faster than ever. The impact of a company's share price can be as high as 10 percent after a major quality event,<sup>24</sup> not to mention the long-term implications for a company's brand.

of computer systems to improve their performance through exposure to large quantities of data without the need to follow programmed instructions. At its core, machine learning is the process of unsupervised learning in data. Once discovered, such patterns help to make educated predictions.<sup>14</sup> In the context of medical device maintenance, machine learning can optimize the maintenance schedule by best balancing variables such as cost, customer satisfaction, and resource management. In addition, machine learning has the potential to develop deeper strategic insights and create a data-driven business model by aggregating and summarizing the data on customer habits and utilization patterns. Through a combination of IoT and machine learning, medical devices manufacturers have the potential to minimize downtime and interruption in health care practices while realizing benefits in terms of reduced maintenance costs and increased provider and patient satisfaction.

### Additive manufacturing and augmented reality

#### Product development

A major challenge faced by MedTech companies is to move beyond the traditional R&D model involving one-at-a-time design iterations (see figure 4). Due to its inherent slow pace and long duration, the classical model constitutes a major source of cost (see figure 5) and does not always guarantee the desired product specifications in terms of manufacturability, reliability, and quality. This is particularly true given the increase in patient demand for personalized options, thus making it more difficult for companies to accelerate product development while minimizing R&D and manufacturing costs.

DSNs can have a deep impact on companies' R&D and manufacturing functions by opening up a whole new frontier of digital and manufacturing development. Whereas traditional product development implied one-at-a-time design iterations that could last for months, digital manufacturing has the potential to drastically reduce R&D spend by shortening development cycles and letting companies increase the number of design iterations to deliver higher-quality products at a dramatically reduced cost.<sup>15</sup>

Recent technological advances in augmented reality (AR) and additive manufacturing (AM) illustrate the magnitude of this paradigm shift. AR enhances human decision making by bridging the gap between the physical world and a digital space dominated by data and information that is traditionally displayed on two-dimensional screens and pages. With the help of AR, 3D models come to life, eradicating the gap between physical and digital and enabling R&D departments



to fully conceptualize and optimize their designs for manufacturability and reliability. AM ("3D printing"), the process of creating objects by joining or solidifying materials under computer control, constitutes a rapid methodology to move from digital design to prototyping to even mass production. The conjunction of AR and AM has paved the way for MedTech companies to streamline product life cycle, accelerating the launches of new and personalized products at

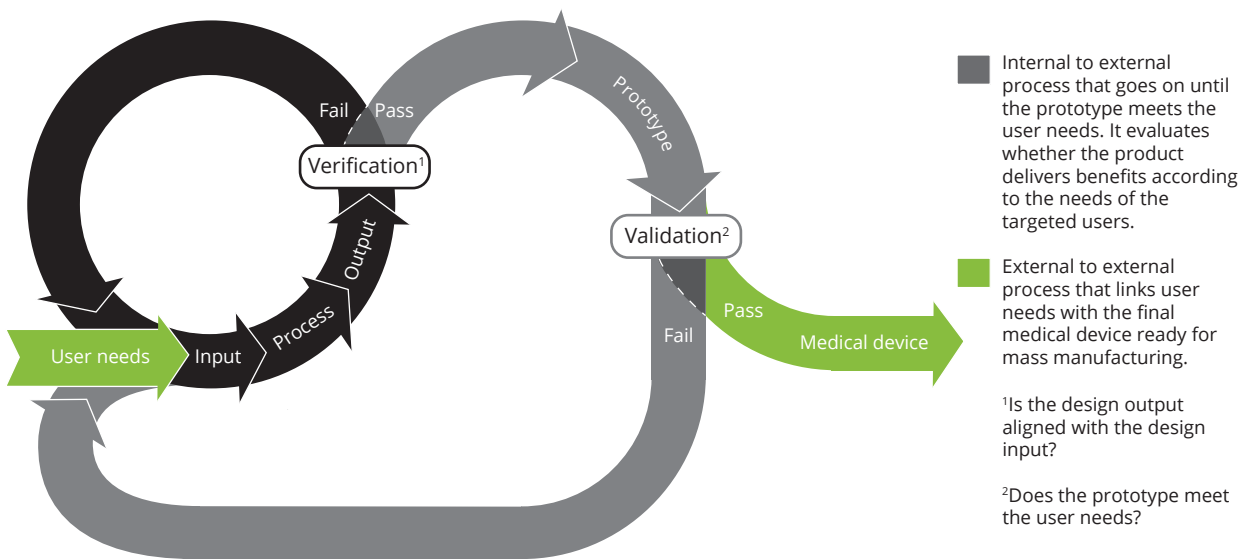
minimum costs, and enabling a more efficient maintenance and provision of servicing elements.

**Warehouse operations**

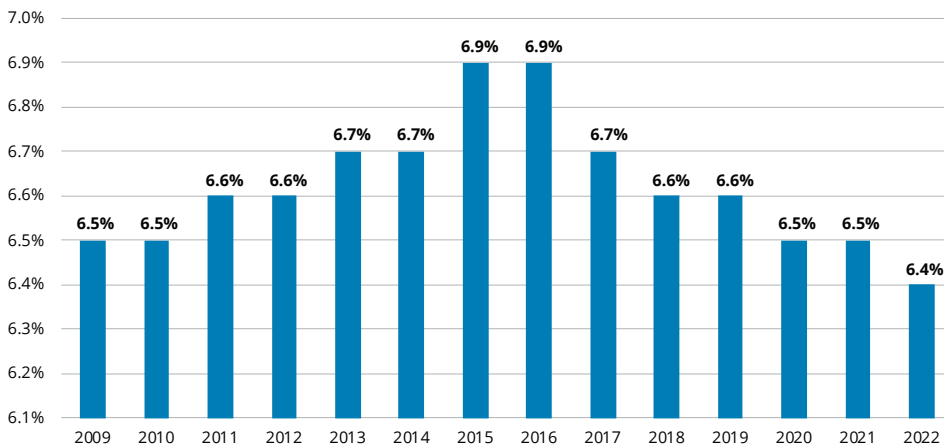
In addition to the value delivered to physicians (e.g., in trainings and in OR<sup>16</sup>), R&D, and manufacturing departments, augmented reality can prove valuable for other critical functions in the MedTech industry, such as warehouse operations.

Said operations account for roughly 20 percent of all logistic costs;<sup>17</sup> their reliance upon paper-based checklists introduces human operators to a swath of logistical nightmares, including delays and man-made errors. AR could greatly enhance the accuracy of inventory selection, by instructing workers to the exact location of products and empowering them with the most optimal route to get there.

**Figure 4: Medical device prototype evaluation process**



**Figure 5: R&D spending as a percentage of revenue from 2009-2022**



Source: Statista.com

Research and development is one of the highest sources of cost for MedTech companies, estimated to be between 6 and 7 percent of a company's revenues.<sup>23</sup> This is a result of a long and cost-intensive process, which requires the completion of steps such as identification of worthy ideas, patent development, creation of strategic alliances, FDA registration, clinical trials, sales, marketing, and design for manufacturability.



# How to start on the digitization path

The question for MedTech companies is not whether they should embark on a digital journey for their supply chain and global operations functions. Rather, it is about where and how to start. Our analysis suggests that MedTech players should build a digitization strategy around four main steps.

## Think big, start small, act fast

While these changes can have widespread implications, Deloitte recommends a “think big, start small, act fast” methodology when adopting digital technologies. Developing a future state vision in which the supply chain is optimized from suppliers—to providers and patients—is the first step in the process, followed by starting with small incremental changes to mitigate the risk of change and to demonstrate early success to the organization.<sup>18</sup> MedTech companies should keep growth in mind and prioritize areas that can unlock several stages of potential value while acting fast to achieve quick wins. By focusing on low-hanging fruit, companies can build on early successes and continue to establish DSNs where they make strategic and financial sense.

## Develop new workforce skills and capabilities

To fully take advantage of the possibilities offered by DSNs, MedTech companies should recognize that they need to train their workforce innovatively and plan time and resources accordingly. For example, R&D technicians and engineers should be capable of not only running an injection molding machine or a 3D printer, but also sending a digital model of a product under

development to a third-party manufacturer, or analyzing production data to improve the design for reliability. In general, the workforce should become more tech-savvy and adapt to multifaceted tasks, rather than focusing on department-specific activities. The imperative for the workforce to be well versed in digital solutions is threefold. First, as consumers of the underlying technology, users must be able to extract value from digital solutions. Second, as buyers of these solutions, users need to be educated on the solutions and recommended a suite and sequence of technologies that drive the most substantial impact. Third, as implementers of digital solutions, teams need to be prepared for a different working relationship with IT. Since many of the technologies require minimal integration, individual teams may supplant IT as the primary owners of the technology.<sup>19</sup>

## Address cybersecurity risks

In enabling holistic decision making through an increased transparency of information across all areas of the value chain,<sup>20</sup> the connected nature of digital supply networks makes cybersecurity more important than ever. Whether it is a risk related to the possibility of someone changing a machine setting on an automated process that makes life-saving devices or switching a pacemaker off in a patient’s body, the time is now for MedTech companies to address cybersecurity in the supply chain. Based on our experience in other

industries also involved in the digitization process, we believe there are three main areas where MedTech players should focus. First, companies should choose the right technology along the digitization path and address cybersecurity as a top priority to avoid potential issues down the road. Second, MedTech companies should continuously train employees on the latest security threats and corresponding countermeasures. Third, companies should appropriately develop backup solutions and build safeguards to potential threats.

## Adopt agile systems for DSN development and deployment

In order to secure approval and adopt meaningful change throughout the organization, MedTech companies can take an agile approach to DSN development and deployment. This approach enables the development of requirements iteratively rather than at the onset of the project. The opportunity to refine and adjust gives adopters the required flexibility to continually tweak development based on ever-changing goals and provides them with increased confidence toward the final success of the initiative, cycle after cycle.

# Conclusion

## The bottom line

While other sectors have embraced the fourth Industrial Revolution by leveraging DSN capabilities, the MedTech sector has been a more conservative follower, relying on established products, technologies, processes, and systems to conduct business. However, due to the current shift in the MedTech competitive landscape, companies are now faced with an array of challenges that will continue to impact the bottom line. Downstream pricing pressures, non-traditional challengers, stringent regulations, and operational inefficiencies due to industry consolidation are forcing many MedTech companies to react and implement effective cost reduction strategies to remain competitive. No longer can MedTech companies rely on their previous business models to drive growth; they should adapt to the environment and take advantage of current solutions in the marketplace.

Fortunately, in a time characterized by sharply declining costs of digital technologies and an exponential growth of computing power,<sup>21</sup> there are many solutions to these problems. MedTech companies now have the potential to effectively tackle their most pressing challenges and counterbalance bottom line impacts by applying solutions such as IoT, machine learning, additive manufacturing, and augmented reality. By doing so, MedTech players can complement and expand the classical functionalities provided by IT (e.g., ERP systems) while enabling a full integration between IT and operations technology (OT). These technologies can positively drive change throughout each stage of the MedTech supply chain, ultimately leading to increased value delivered to the end customer or patient.

The time to act is now. Acting proactively and leveraging the recent advancements in digital technologies are critical for the future success of MedTech companies. And although the MedTech sector has not yet fully embraced DSNs, the current environment and availability of such digital technologies will likely cause DSNs to soon become a prerequisite for competitive MedTech corporations rather than a differentiator. While establishing DSNs may appear intimidating, there are tactical steps organizations can take to get started immediately. By starting small, developing new skills in the workforce, addressing cybersecurity risks, and taking an agile approach, companies can make a sustainable and tangible impact to their operations.

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# End notes

- 1 Adam Mussomeli, Doug Gish, and Stephen Laaper, *The rise of the digital supply network*, Deloitte University Press, 2016, [https://www2.deloitte.com/content/dam/insights/us/articles/3465\\_Digital-supply-network/DUP\\_Digital-supply-network.pdf](https://www2.deloitte.com/content/dam/insights/us/articles/3465_Digital-supply-network/DUP_Digital-supply-network.pdf).
- 2 *Medical device manufacturing in the US*, IBISWorld, 2017.
- 3 *2017 Global medical device industry outlook*, Emergo, 2017, <https://www.emergobyul.com/resources/research/outlook-medical-device-industry>.
- 4 *2017 Global life sciences outlook*, Deloitte, 2017, <https://www2.deloitte.com/global/en/pages/life-sciences-and-healthcare/articles/global-life-sciences-sector-outlook.html>.
- 5 Julie Meehan, Marc Abels, Anand Sairam, and Omer Saka, *Capturing the value of Medtech ingenuity*, Deloitte, 2015, <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/strategy/us-cons-capturing-the-value-of-medtech-ingenuity-the-case-for-pricing-innovation.pdf>.
- 6 Joe Carlson, "Medical device makers face challenge of falling prices," *Star Tribune*, February 6, 2016, <http://www.startribune.com/medical-device-makers-face-challenge-of-falling-prices/367872781/>.
- 7 "Medical Devices Regulatory Framework," European Commission, 2017, [https://ec.europa.eu/growth/sectors/medical-devices/regulatory-framework\\_en](https://ec.europa.eu/growth/sectors/medical-devices/regulatory-framework_en).
- 8 Fink Desford, "Why the medtech contract manufacturing M&A trend isn't slowing down," *Medical Design & Outsourcing*, August 8, 2017, <https://www.medicaldesignandoutsourcing.com/medtech-contract-manufacturing-ma/>.
- 9 *Understanding barriers to medical device quality*, Food and Drug Administration, 2011, <https://www.fda.gov/downloads/AboutFDA/CentersOffices/CDRH/CDRHReports/UCM277323.pdf>.
- 10 *The digital edge in life sciences: The business case for digital supply networks*, Deloitte, 2017, <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/process-and-operations/us-cons-business-case-digital-supply-networks-life-sciences.pdf>.
- 11 Ibid.
- 12 Toby Hay, "Comment: Internet of Things will revolutionise how healthcare is delivered," *Digital Supply Chain*, August 2, 2017, <https://www.supplychaindigital.com/distribution/comment-internet-things-will-revolutionise-how-healthcare-delivered>; Barry McDonogh, "Combatting counterfeiting in Medtech," *Medical Product Outsourcing*, 2016, [https://www.mpo-mag.com/contents/view\\_online-exclusives/2016-05-05/combatting-counterfeiting-in-medtech](https://www.mpo-mag.com/contents/view_online-exclusives/2016-05-05/combatting-counterfeiting-in-medtech).
- 13 "MTS Blog: The big, bad, and ugly costs of medical device recalls," *Medical Tracking Solutions* (website), 2017, <http://medicaltracking.com/about/news-updates/the-big-bad-and-ugly-costs-of-medical-device-recalls>.
- 14 Charles Florin and Abhinav Srivastava, *MedTech Prognostic IoT: Predictive maintenance for medical devices*, Karvy Analytics, <http://www.karvyanalytics.com/MedTech-Prognostic-IoT-Predictive-Maintenance-for-Medical-Devices.pdf>.
- 15 Patrick Laurent, Thibault Chollet, and Elsa Herzberg, "Intelligent automation entering the business world," *Inside*, issue 8, April 2015, <https://www2.deloitte.com/lu/en/pages/operations/articles/intelligent-automation-entering-business-world.html>.
- 16 "Worldwide medtech research and development spending as percent of medtech revenue from 2009 to 2022," Statista, 2017.
- 17 Rob Bodor, "Gaining a competitive edge with digital manufacturing," *Medical Design and Outsourcing*, January 9, 2017, <https://www.medicaldesignandoutsourcing.com/gaining-competitive-edge-digital-manufacturing/>.
- 18 Youngiun Kim, Hannah Kim, and Yong Oock Kim, "Virtual reality and augmented reality in plastic surgery: A review," *Archives of Plastic Surgery* 44, no. 3 (May 2017): pp. 179–187, DOI:10.5999/aps.2017.44.3.179.
- 19 Steve Adams and Steve Pierce, "Considering the costs of warehouse automation," *Manufacturing.net*, July 13, 2017, <https://www.mbtmag.com/article/2017/07/considering-costs-warehouse-automation>.
- 20 Adam Mussomeli, Doug Gish, and Stephen Laaper, *The rise of the digital supply network*, Deloitte University Press, 2016.
- 21 Mike Daher, Joe Chmielewski, and Vivek Jayaraj, *The future of procurement in the age of digital supply networks*, Deloitte, 2017, <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/process-and-operations/us-cons-digital-procurement-v5.pdf>.
- 22 *The rise of the digital supply network*.
- 23 Ibid.



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