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Market Report | Life Sciences Information Technology

Digital Surgery Technology Trailblazers: Top Start-ups Rapidly Gaining Mindshare in the Digital Surgery Technology Market

December 2023: Complimentary Abstract / Table of Contents

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Introduction

- Digital surgery refers to the integration of advanced digital technologies, including Artificial Intelligence (AI), advanced imaging, connectivity, and data analytics, with robotic surgical systems. This collaboration between digital technology and robots allows for highly precise minimally invasive procedures. The objective of digital surgery is to provide a better experience to both patients and surgeons across the surgery life cycle by bringing data together at one place and deploying digital technology across use cases, the most prominent ones being pre-surgery planning, remote collaboration, and post-surgery evaluation
- Initially, prominent medical device enterprises invested heavily in surgical robots, with an aim to acquire pure-play surgical capabilities through partnerships or acquisitions. However, to scale the level of adoption of robots across the space of surgery, enterprises need to overcome the challenge of fragmented surgeon acceptance, limited training, and technological complexity. Hence, they have now expanded the scope of their capabilities and are now developing solutions to enhance the efficiency and usage of robotic surgery, by investing in complementing digital solutions leveraging technologies such as AR/VR, imaging, data and analytics, and AI
- Recognizing this opportunity, multiple start-ups with a focus on digital surgery technologies have started to gain traction. These start-ups, with a niche area of focus and verticalized expertise, aim to bridge the gap between surgeons and robots by providing a variety of technological solutions enabling surgical training, pre-operative planning, real-time patient monitoring, etc.
- In this research, we present an assessment of start-ups that offer proprietary digital surgery solution, primarily focusing on their core capabilities and market impact. We present an assessment and detailed profiles of leading digital surgery start-ups. The assessment is based on both primary and secondary research and Everest Group's ongoing tracking of emerging technology ecosystem in the medical devices industry

Scope of this report

Geography
Global

Industry
Medical devices

Technology
Digital surgery

Trailblazers
Seven leading start-ups in the digital surgery industry

This study offers distinct chapters providing a deep dive into key aspects of digital surgery technology market; below are four charts to illustrate the depth of the report

Everest Group's view of a digital surgery ecosystem

Stakeholders

Healthcare providers | Surgeons and healthcare professionals | Patients

Surgery life cycle

Level of adoption: Low Medium High

Pre-operative	Peri-operative	Post-operative
Surgeon education and training through interactive simulations	Peri-surgery virtual proctoring and support	Post-surgery evaluation and video recordings
Pre-operative surgery planning	Real time imaging data to support surgical interventions	Post-operative remote patient monitoring
Pre-operative remote patient monitoring	Speech recognition to operate surgical robots	
3D anatomization of patient implants	Remote surgery	

Technology enablers

IoT | Security | AR/VR | Mobility | Big data analytics and AI/ML | 5G

Everest Group's view of digital surgery supply landscape

	Medical device enterprises	Technology providers	Service providers
Overview of offerings	The area of focus lies in developing robotic and planning solutions (surgical navigation, 3D anatomization) leveraging in-house innovation for the pre- and peri-operative part of the surgical interventions	The area of focus lies across the stages of surgical intervention, ranging from solutions to digitize the robot, enabling better planning, training, workflow management, and post-surgical evaluation tools	Provides consulting and implementation services for establishing end-to-end digital surgery platforms, undertakes co-development initiatives to develop digital counterparts (AR- enabled training programs, surgical intelligence systems), and enable a seamless and secure flow of data across the stages of surgical interventions
Key customers	Healthcare providers	Healthcare providers and medical device enterprises	Healthcare providers, medical device enterprises, and technology providers
Logos	Intuitive Surgical, Johnson & Johnson, Medtronic, Stryker	Accuray, Brainlab, Procept BioRobotics, Varian	Accenture, HCLTech, Wipro

Digital surgery trailblazers | assessment framework

Range of capabilities

- What stages of the operative procedure are being targeted by the start-up
- What all use cases are being targeted by the start-up across different operative stages
- What are the key technologies being leveraged by the start-up in its portfolio of offerings
- How are start-ups bringing innovation in their offerings through development of IPs and partnerships

Market buzz

- How is the investor confidence? How much value has the start-up gained based the different rounds of funding?
- What kind of awards and recognitions has the start-up and its leadership received?

Scale and maturity

- What growth rate has the start-up experienced with respect to its revenue, client portfolio, and number of employees?
- What categories of clients are being addressed by the start-ups (healthcare providers, medical device enterprises)?

Leadership and talent

- How large and geographically diverse is the workforce?
- How strong and relevant is the leadership cohort (in terms of digital surgery and from a technology experience standpoint)?
- What are the recent hiring trends of the start-up?

Gen AI in digital surgery

Risk assessment

Generative AI has unleashed robotics to be further scaled to real-world deployments with continuous learning and personalized interactions with users. However, it poses risks such as negligence of vital information, and generation of content from unlicensed or proprietary sources leading to data piracy. Consequently, to mitigate risks, MedTechs need to ensure clear data ownership and set responsible guardrails while leveraging generative AI

Talent upskilling

As generative AI solutions take hold, MedTechs should address fundamental questions about operating models, including the composition of use case design and implementation teams and how generative AI tools will affect the surgical interventions to core processes, building a talent pool that can identify, develop, launch, and maintain generative AI solutions will necessitate training and upskilling.

Tech stack remodeling

Medical device enterprises must navigate both model and data complexities, such as how to select and train models on regulated data, how to manage access, and how to validate model output across the areas of pre-surgical planning, peri-surgery analytics, and post-surgical evaluation results. Generative AI needs strong technology for data management, risk assessment, and accelerated experimentation and delivery

Compliance to regulations

Digital surgery due to its patient specific nature is emerging as an area, prone to high government scrutinization. Governments across the US, EU, and China are indulging in active legislations, protecting health, safety, and data protection. MedTechs should be cognizant of both global and regional implications while integrating generative AI in their existing set of digital surgery solutions

Research calendar

Life Sciences Information Technology

Published | Planned | Current release

Reports title	Release date
Decentralized Clinical Trial Platforms PEAK Matrix® Assessment 2023	November 2022
Decentralized Clinical Trial Platforms Provider Compendium 2023	December 2022
Life Sciences Decentralized Clinical Trial Platforms State of the Market 2023	March 2023
Medical Devices Digital Services PEAK Matrix® Assessment 2023	May 2023
Medical Devices Digital Service – Provider Profiles Compendium	May 2023
Life Sciences IT Services – State of the Market	June 2023
Life Sciences Smart Manufacturing Services PEAK Matrix® Assessment 2023	August 2023
Life Sciences Commercial Technology State of the Market 2023	September 2023
Life Sciences Next-generation Customer Engagement Platforms (CEP) PEAK Matrix® Assessment 2023	October 2023
Digital Surgery Technology Trailblazers: Top Seven Start-ups Rapidly Gaining Mindshare in the Digital Surgery Technology Market	**December 2023**
Life Sciences Next-generation Customer Engagement Platforms (CEP) – Provider Compendium 2023	Q4 2023
Life Sciences Digital Services Specialists PEAK Matrix® Assessment 2023	Q4 2023
Life Sciences Customer Experience Platform (CXP) Adoption Playbook	Q4 2023
Assessing Enterprise Readiness to Conduct Decentralized Clinical Trials	Q4 2023
Preparing the Landscape for the Next-gen Decentralized Clinical Trials (DCT)	Q4 2023

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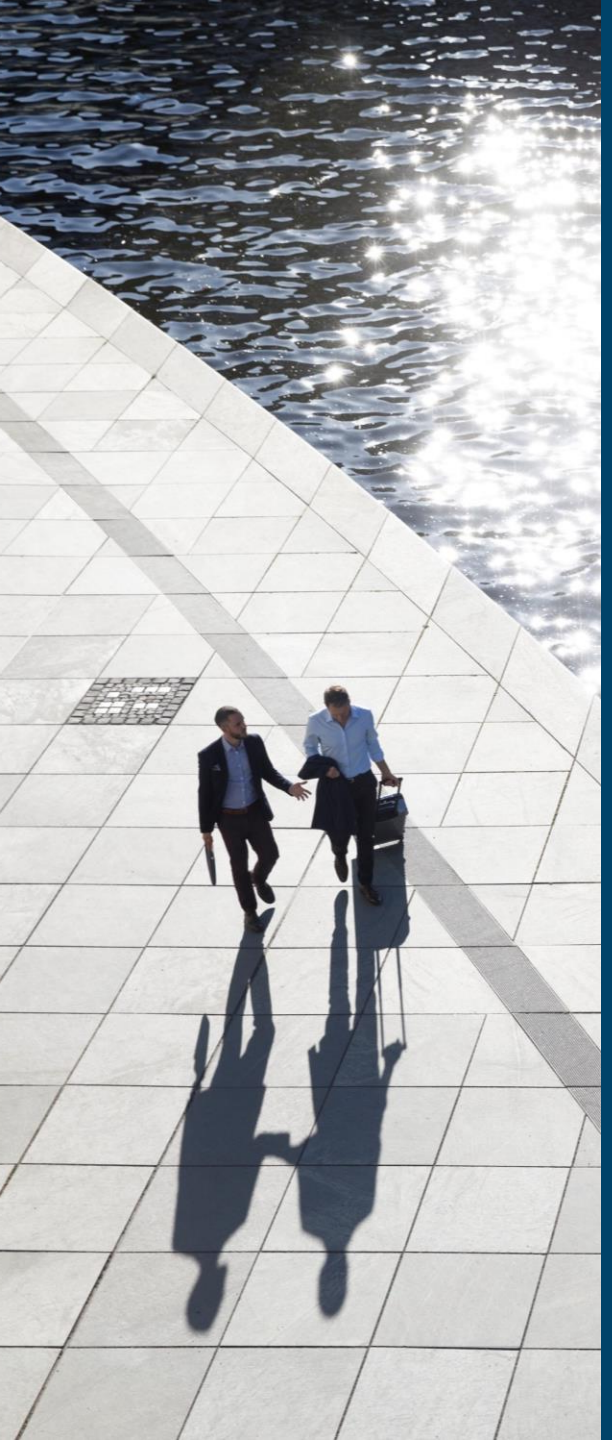

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