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A Frost & Sullivan White Paper

Explosion of AI in Healthcare: Why Medtech-IT Collaborations Are Key to Success

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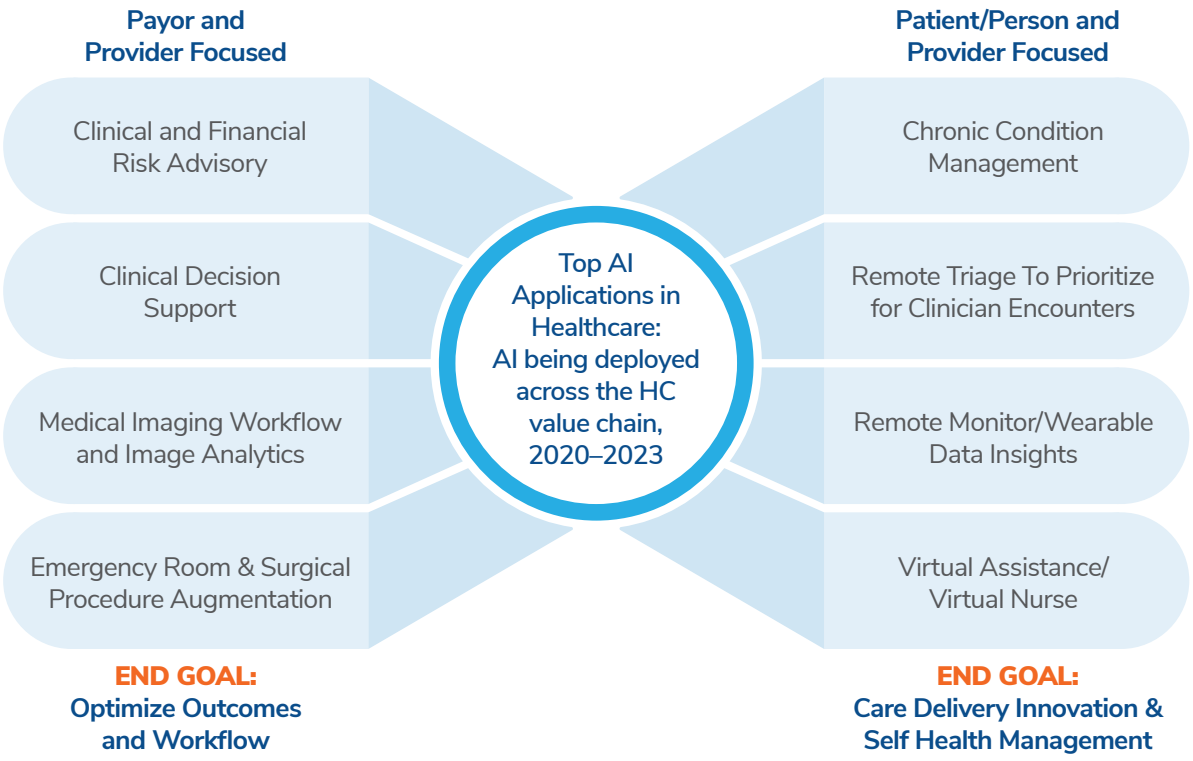
AI Acceptance and Applications in Healthcare

Artificial intelligence (AI) is a new and constantly evolving technology that is finding novel applications in every industry. It has the superior ability to detect statistical patterns from immense amounts of data in short periods, which has a multitude of applications in today's digital world. For this reason, it is logical that the healthcare industry is pursuing innovative uses to adapt AI for health analytics and raw medical data that could lead to new insights in clinical medicine. There is an expectation that the implications of AI can have a significant positive impact on patient quality of care, disease prevention, diagnosis, and treatment options in addition to the potential for efficiency gains and reduction in human error.

AI Being Adopted by all Healthcare Stakeholder Groups



Source: Frost & Sullivan

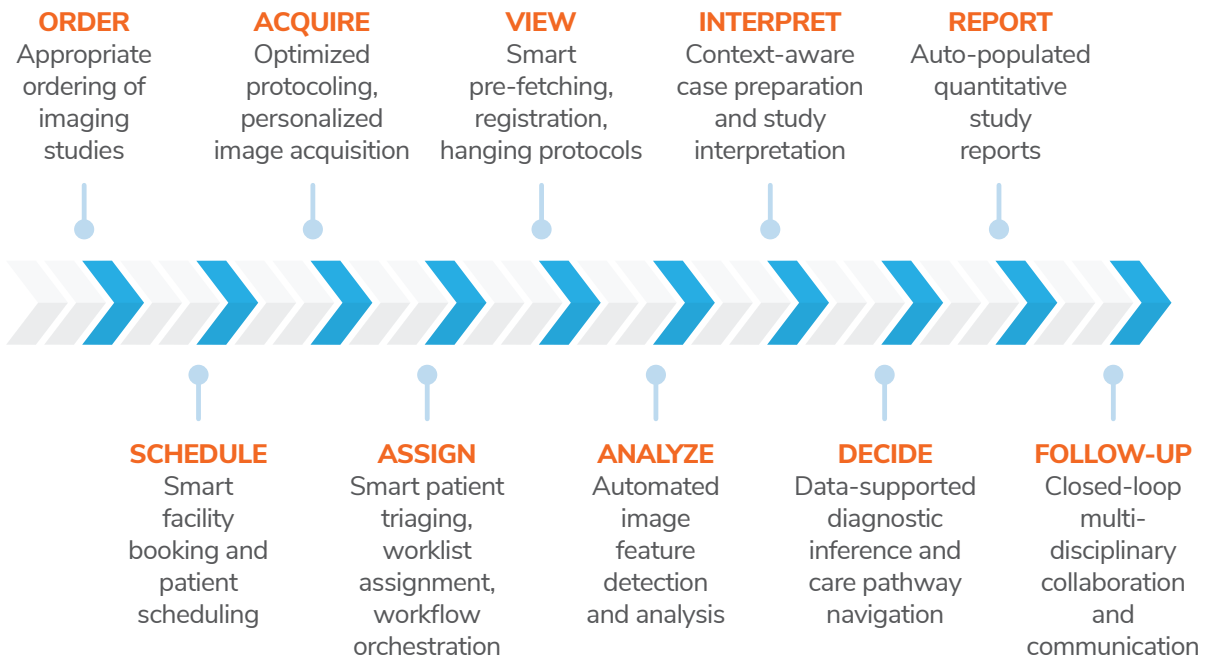
COVID-19 accelerated the acceptance of AI by users across the healthcare value chain. In the midst of a pandemic that strained the limits of medical personnel and the ability of the system to interact with all who needed screening and triage, AI solutions filled needs from hot spot identification to clinical triage to supply chain management to planning for staffing and operations. Given utilization of Artificial Intelligence and Machine Learning tools across many applications in healthcare over the last few years, in the post-COVID world there is less doubt across the spectrum about leveraging these technologies. However, not all applications of AI and ML are equal. Value delivery stems from good technology combined with medical knowledge and experience in clinician workflows, especially in clinical settings.

Medical technology companies realize the immense value in implementing AI to expand their solution offerings and create more value for hospitals, clinicians and patients; however, they face certain challenges in accomplishing this. These can range from attracting the right kind of talent with knowledge of AI and machine learning to the potentially significant investment of time to develop and perfect their AI solution.

It is an effort that not all companies are equipped to successfully accomplish. Working with the right partner that will proactively provide the technology expertise as well as demonstrate an operational knowledge of collaborating with medtech companies in the past can make strides in overcoming these challenges.

Within the healthcare industry, medical imaging and diagnostics has seen the most maturation in AI usage in recent years. AI has been applied to both image analysis and workflow augmentation, including identifying pathological nuances across large volumes of images to advance clinical research. Moreover, AI tools can increase the accuracy of diagnosis and provide an accelerated recommendation of treatment options. The goal is not to completely replace the radiologist's or physician's clinical acumen with AI, rather it is to create a synergy that allows for the most efficacious system to be followed considering the multitude of variables that each patient can present.

Radiology AI Market: AI Use Cases Across the Imaging Workflow



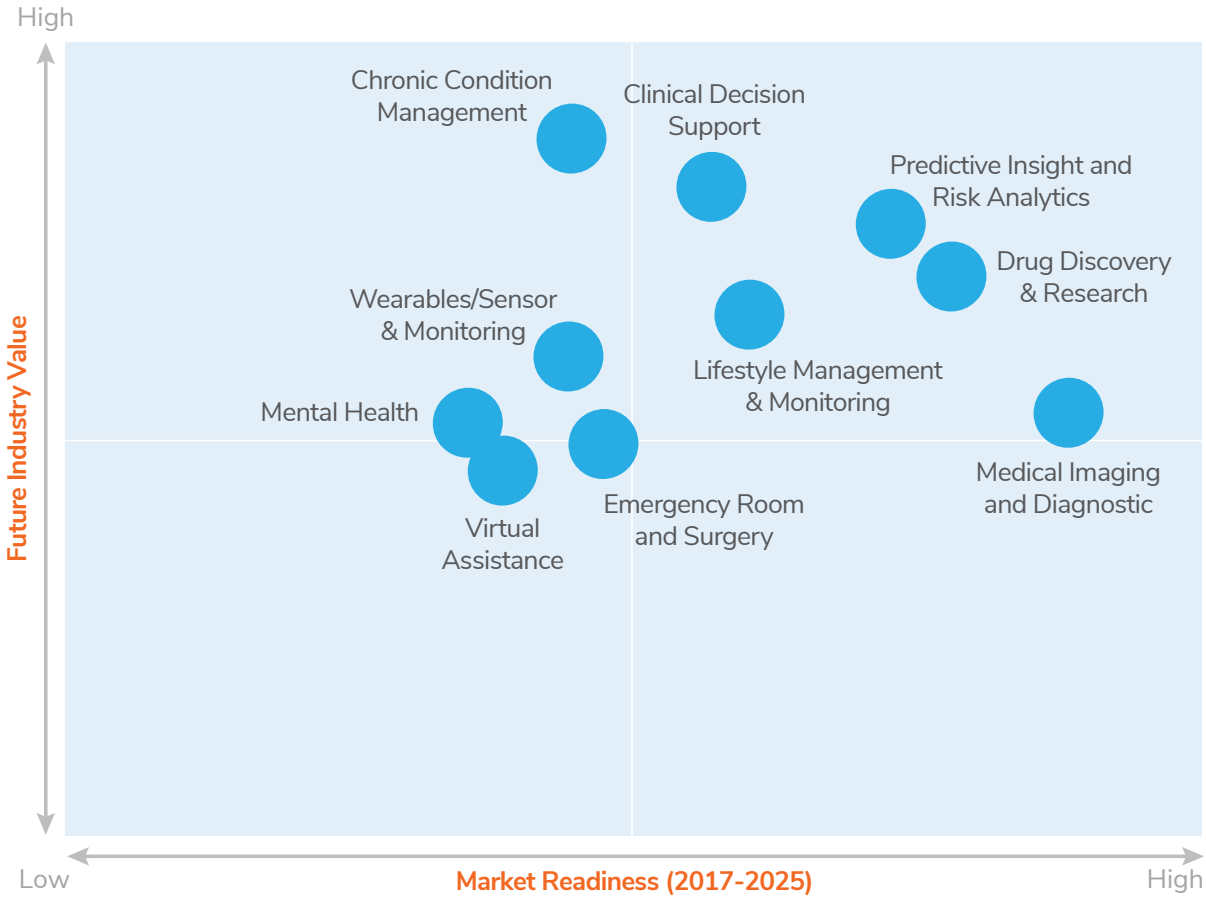
Source: Frost & Sullivan

The next step has also been taken in improving how AI applications fit into radiology workflow. Many AI applications in medical imaging intend to address the challenges of helping radiologists with their workloads, making workflow integration crucial. Solutions are improving their features to help radiologists do more than simply pointing out areas on an image that they must review. More sophisticated vendor solutions are going beyond workflow integration. Instead of leaving it to the radiologist to choose the right AI algorithm, these solutions automatically route the image to the right application.

While medical imaging applications are one of the ways AI is leveraged in providing clinical support, there are many applications outside of imaging that are making AI an integral technology to leverage in filling the gaps of clinical medicine.

Healthcare AI Opportunity Assessment Framework

Top 10 areas in healthcare ripe for innovation using AI and data



Source: Frost & Sullivan

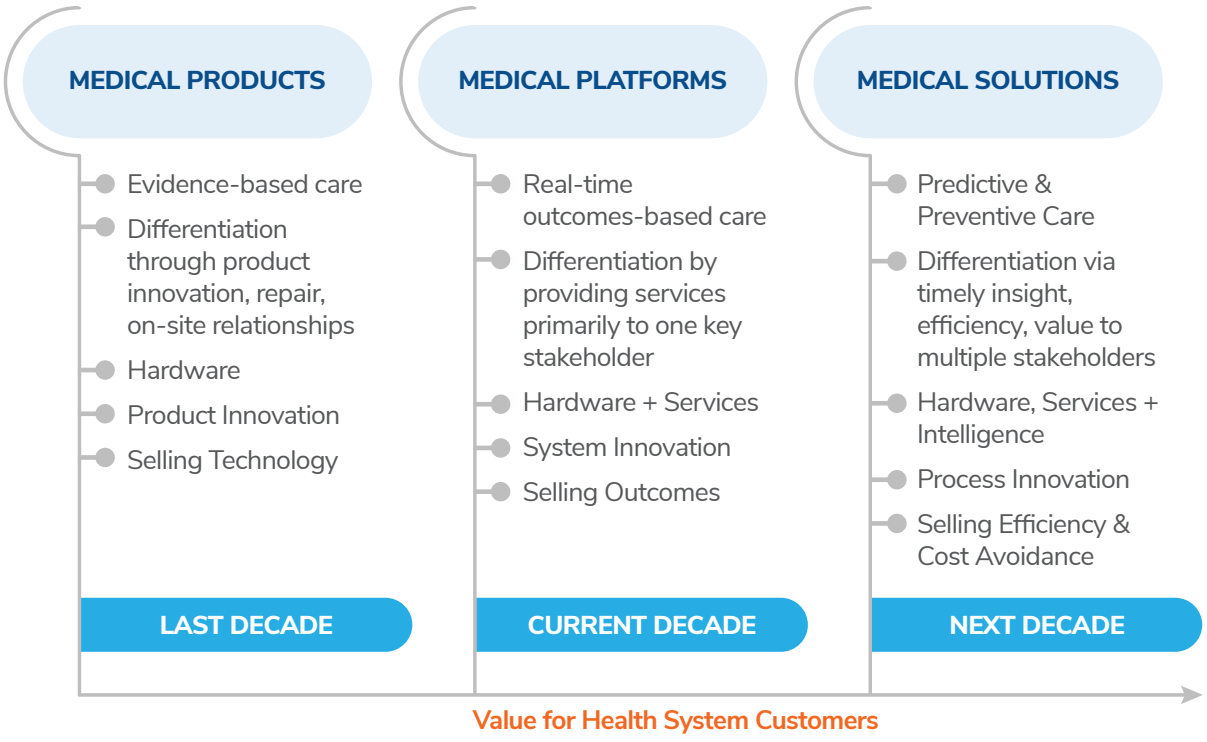
Medtech Solutions in 2021 Mean More Than Hardware

Medtech vendors have seen the market shift away from hardware-focused products, based on iterative technology development sold to specialist physicians, to hardware and service combinations sold to key department leaders and committees focused on improved outcomes.

This reality became increasingly clear to medtech companies during the recent COVID-19 crisis when hardware sales plummeted, and many medtech companies had little to fall back on. For many medtech companies, 2020 provided an impetus to push forward initiatives that involve addressing conditions, not just procedures. Going forward, medtech companies are exploring partnerships to deliver broader solutions that go beyond a single device and to examine how they can leverage data and diagnostic or therapeutic knowledge to have more impact on their customers.

In 2021 and beyond, there is a need to add intelligence and insights that will create not only better outcomes, but efficiency and reduced costs of care as providers are being pushed into a capitated environment with shared risk incentives, and system purchase decisions are increasingly being made at higher levels across consolidated health organizations.

Changes in the Way Medical Solutions are Being Sold to Health Systems



Source: Frost & Sullivan

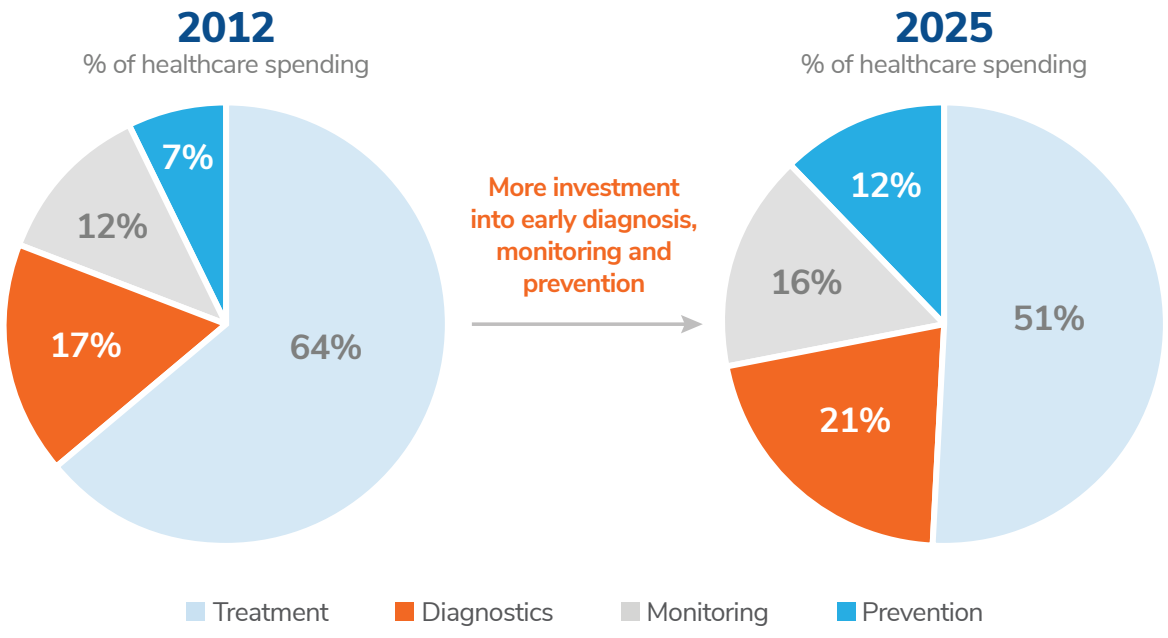
Medical technology companies have a breadth of specialized knowledge acquired through years of research and development of their products. However, many medtech companies struggle with turning their significant knowledge of medical conditions and procedures into new business models that don't rely on more hardware sales. Additionally, while many medical systems spin out significant volumes of data, this data is rarely monetized and often needs to be combined with other information not held by the medtech company in order to discern valuable insights.

With the market-wide shift in focus to AI, many companies who lack the tools necessary to produce a new generation of solutions that adequately incorporate machine-learning capabilities and data analytics risk losing ground in the market for medtech solutions.

This requires medtech companies to move to the next best alternative, which is to find technology partners that will support these companies in achieving their goals of staying relevant and meeting the standards of the changing competitive scenario. The growing uses of AI are making companies with advanced analytics and AI capabilities a necessary partner for medical technology companies looking to expand their role in the diagnostic and treatment decision-making process.

Given the shifting goals of the healthcare system, medical technology companies need to expand from their traditional focus on treatment, i.e., sickcare, to develop solutions that also address diagnosis, monitoring and even prevention. This involves expanding their toolkit to include new capabilities, leveraging data analytics and insights and potentially sharing risk.

Shifting Focus of Care: From Sickcare to Healthcare to Health



Source: Frost & Sullivan

Challenges in Bringing AI Solutions to Market

Sophisticated creation of an AI solution and its competent integration with medtech products and services is not an easy task. While many companies claim to have data science capabilities to develop advanced artificial intelligence and machine learning solutions, there are few that have healthcare industry knowledge, deep and wide data sets and experience bringing cognitive computing solutions through regulatory clearance to market.

The ideal partners are ones with a compelling history of building applicable algorithms utilized by clinical organizations. The capability to commercialize is often an underappreciated, but crucial, criterion for medtech companies in selecting a technology partner. Look for partners with decades of experience in advanced analytics and the resources and experienced minds to deliver a high-value output that healthcare users will trust.

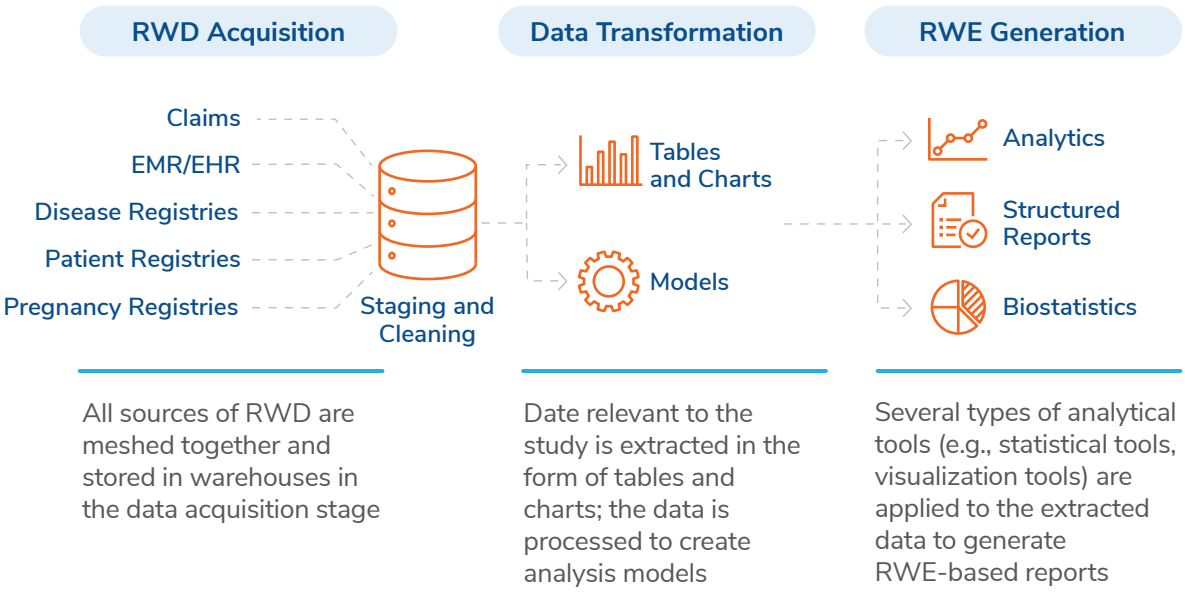
To predicate this success, there are three requirements: data, data and data. First and foremost is the quantity and quality of data. The algorithm must be trained on deep, diverse and plentiful examples to make practical predictions when presented with novel instances; however, if the data does not represent enough variation to match the real world, the trained algorithm will not be flexible enough to generate a sophisticated response in all cases.

> For data to be globally applicable, it must be collected over many years and across many geographies. This will create the best opportunity to develop algorithms applicable to diverse markets and a solution that can deliver results.

Many organizations look to provider partners for patient data to train their algorithm. However, few clinical partners have access to global data sets needed to create the most accurate algorithms. This has resulted in AI solutions that are rejected by clinicians or large investments by vendors to gain access to wide and deep clinical data sets, curated and collected over many years. Vendors should look for ways to address this data gap through global partners that can bring data to the solution development stage. These partners could potentially assist in international market entry, which can be a key success factor to scaling up new digital health solutions.

By itself, even deep and varied data is meaningless. Creating meaning from data requires efficient data curation. This is the organization and normalization of the data. A good partner will walk a company's data through these steps in the most optimized and painless way possible but will also make sense of the results and understand how to fine-tune the system for best performance and interpretation of the results.

*RWE Generation From RWD**



**RWE = Real World Evidence, RWD = Real World Data.*

Source: Frost & Sullivan

There are other considerations to be taken into account in the post-production phase of bringing an AI solution to the market. An in-depth understanding of the FDA regulation framework is an absolute necessity, as much of it is new and still evolving to adapt to AI's capability to evolve the algorithm as new cases are encountered. It requires foresight to prescribe Algorithm Change Protocols, which are methods a manufacturer proposes to use in modifying their AI tools, so these processes can be agreed to in advance by regulatory bodies like the FDA. There is absolute necessity for transparency in communication with all the groups involved in the process. Achieving FDA clearance is a hurdle that requires knowledge of the processes, a proven record of success and the ability to complete the many steps in the process.

In the deployment phase, the partnering company ideally can leverage an existing cloud infrastructure to allow for high computer processing power and customer access, regardless of the size or location. An AI solution must be a practical technology in terms of accessibility to attract a wider target market, so supporting the application in a multi-cloud environment will be important in the rollout phase as well. Finally, data integration with existing platforms in use by the institution must be seamless. This may be another area where an IT partner can support the go-to-market strategy.

Given the high volume of AI tools competing for attention in a crowded and confusing space for buyers, the combined go-to-market capabilities of the medtech company and its IT partner are a critical success factor. While medtech companies have strong reputations and connections in specific therapeutic areas, they need an IT partner that also brings strengths to the table in delivering the solution to customers and deploying it in a way that delivers results as early as possible. Many AI and analytics vendors have struggled in the market because of failures in deployment and go-to-market strategies. Gaining success in building these new revenue streams to drive company growth requires teamwork with a strong IT partner.

Some of the biggest concerns for AI applications in healthcare are data security and possible violations of national health data privacy regulations. To be impactful in both the development phase as well as solution rollouts with provider customers, there will be a requirement to handle patient data as well as potentially integrate with clinical systems. Solution vendors will need to sign a business associate agreement and accept liability under national privacy restrictions concerning health data in many countries.

For medtech companies new to the data management and analytics sector, these may be risks that they do not have experience managing. A good IT partner can be the driver of data security requirements throughout the product lifecycle. This necessitates that the IT partner has a proven track record of data security in a variety of high-risk industries as well as a legacy in healthcare.

Call To Action—How Medtech Organizations Can Deliver Value Through AI and Insights

There is immense potential in gaining insights from data to provide clinical tools that support early detection, staging and monitoring of a variety of health conditions. Medtech companies have deep insights into the medical conditions they address, but will benefit from selecting the right partner to turn their insights into a solution that will move the needle in a data-driven world. Digital transformation for medtech companies is a team sport and requires collaboration with the right partner that can elevate it to success.

For medtech companies looking to make the leap into the next generation of technology with AI applications for their products, the ideal partner must have a legacy of technological innovation paired with a history of being a trustworthy brand. Medtech companies are looking to combine their clinical insights and brand value with a technology partner that can develop a winning AI solution. To successfully execute the digital transformation path needed to bring an AI solution to market, look for a partner with wide and deep data, data management and data curation capabilities, and experience bringing AI solutions to the healthcare market, including clearing regulatory hurdles.

For medical device and medical imaging companies to expand value delivery for all stakeholders—payors, providers and patients—they need to add data insights for clients to their portfolio. This is where both current and future growth opportunities lie.

Success in this transition requires a capable IT partner that will deliver the following:

- Valuable insights from data and analytics.
- Artificial intelligence and machine learning capabilities.
- Deep and diverse data based on global health records.
- Strong data curation capabilities to normalize data.
- Data management capabilities, including cloud storage and compute platforms.
- Experience navigating regulatory frameworks to deliver products.
- Ability to deploy widely, provide flexible access and integrate with clinical applications.
- Demonstrated expertise in commercializing new innovations and go-to-market capabilities.
- Geographic reach into markets where the innovation is targeted.
- Strong security and patient data protection.

For further information, read the full Frost & Sullivan report, Digital Transformation of the Global Medtech Industry: Growth Opportunities to Boost Revenue in this Slowing Industry by an Additional $240 Billion by 2024.

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