



**Glimpse into the future of
connected care with MedTechs**

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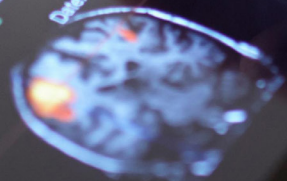


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Scenario Thinking

The Future of Connected Care with MedTechs

Medical device technology is a vital component of public health and driver for many economies, with a market size of more than 400 billion U.S. dollars. The market is changing from a focus on products towards a focus on connectivity and integration. The connected care world is offering promising solutions with new technologies like AI, IoT and predictive analytics, but is still searching for novel ways of capturing and handling data. At the same time, medical device players are also moving into the provider business. The industry is facing key challenges such as new regulations, value-based healthcare and novel technologies which will impact all players. Growing and aging populations as well as the rising number of chronic diseases are already overstraining today's healthcare system and will become a major challenge as cost pressure further constrains healthcare budgets. What is more, the system is affected by a shortage of skilled staff that will lead to significant medical supply issues. All of these factors are challenges for the industry, providers and payors. Incumbents will need to respond if they want to remain at the forefront of the emerging connected care landscape. Digitization is lowering entry-barriers and data enables new business models. Consumer-oriented companies are entering the market, attracted by the possibilities of connected care that we define as using digitization to connect and integrate the products, offerings and services related to healthcare and well-being. However, traditional MedTech players also have an opportunity to find new ways to generate value and keep people safe and healthy, while responding to growing demands for cost-saving solutions in the healthcare industry. Technology can be part of the solution by monitoring, informing and alerting care-givers and patients and generating data and insights that prevent critical conditions and enable

earlier invention. Keeping acute medical issues at bay is considered to significantly reduce hospitalizations and thus reduce costs while increasing quality of life for patients.

Areas where connected care can bring in additional value are the management of chronic diseases, the treatment of patients in remote areas and the real-time monitoring of critical patients, to name just a few. The goal is to achieve better outcomes and a better patient and customer experience while keeping costs low. Mastering and implementing new technologies may therefore require investments beyond current R&D efforts, particularly as the healthcare industry evolves into a value-based model whereby offerings need to show clear benefits. It will require significant investment to completely reshape the MedTech landscape through digitization. The high barriers to market entry have long protected traditional MedTech incumbents from new market players, who balk at the strict regulatory requirements and high investments and do not have the necessary medical expertise. The growing interest in customer/ patient orientation gives these potential newcomers a further advantage, in that they can leverage their direct customer relationships and deep experience with user-driven platforms.

This poses the key question for MedTechs: how can we make sure we create value through 2030? We have developed scenarios focusing on specific aspects of the connected care landscape in various client projects across the globe, enabling us to derive a meta-study outlining what the future holds for the MedTech industry. We developed four plausible scenarios illustrating how MedTech companies are likely to create value in the year 2030.

Scenario 1: In a world where both MedTech players and tech players find their niche within the healthcare ecosystem, we can benefit as a society from predictive diagnoses and position ourselves **Ahead of Diseases**.

Scenario 2: In the **Trust vs. Convenience** scenario, MedTech and tech players offer fragmented product and service portfolios that are fighting for every inch of market share.

Scenario 3: In the **Everyone Doing Everything** scenario, newcomers have given up on entering the healthcare market. MedTech players are now trying to build up their own data platforms fed by their various medical devices.

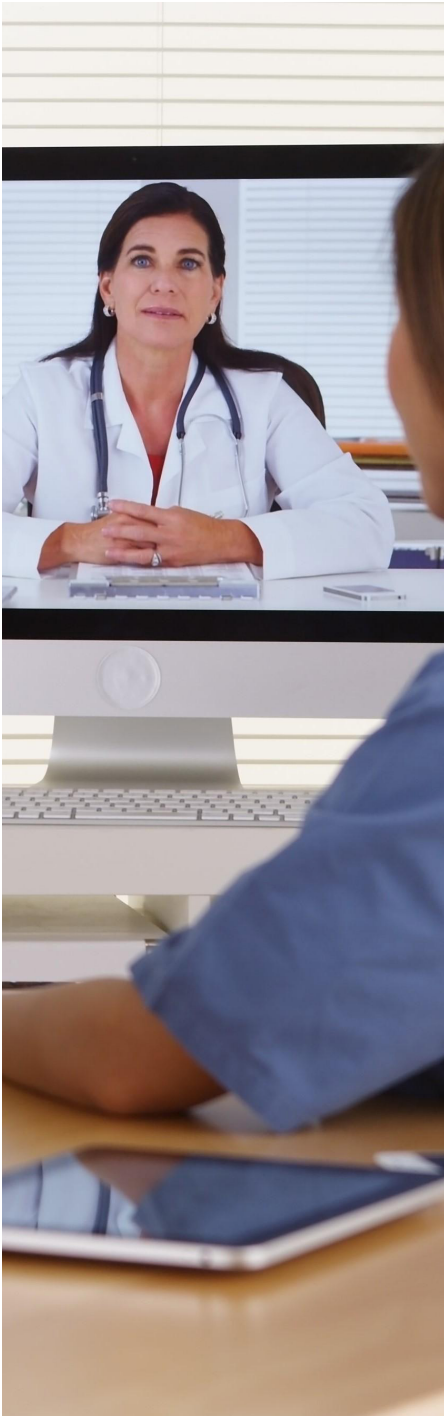
Scenario 4: In the **All about the Patient** world, health-related data is regarded as a commodity, but exclusively for MedTech companies. Attempts by outsiders to gain access fail due to high regulatory requirements. Patients benefit from user-friendly devices and advanced predictive diagnosis.

All of these scenarios demonstrate plausible versions of how the future of the MedTech industry could play out up to 2030 based on Deloitte's scenario design methodology. Let us explore each scenario in more detail to better understand the implications.

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Critical Uncertainties

Drivers that will shape connected care in 2030



We developed a holistic list of future-relevant trends and drivers that have the potential to affect both the connected care market and the MedTech industry in the future. This was done with the help of expert interviews and AI-based natural language processing algorithms. The drivers were rated by subject matter experts based on the degree of uncertainty and their impact. This formed the basis for our scenario analysis, determining the most critical and influential uncertainties in the context of connected care.

According to our experts' ranking, the first critical uncertainty that will determine the future of connected care is the **competitive landscape**, i.e. how far outsiders like tech giants will be able to enter the MedTech market and how much pressure will be put on cost reduction as a result. Currently, we are seeing consolidation within the market, but also external players entering it.

On the one hand, potential market entrants may fail to enter the MedTech market. Disproportionate efforts are required to achieve the high-quality standards, and they may ultimately decide to keep their focus on the consumer segment. In a market where only traditional MedTech players compete, disruptive innovations are incubated in start-ups while incumbents focus on incremental progress. Complying with the high regulatory standards requires enormous financial resources that smaller start-ups will find difficult to raise without investors. Companies cannot launch innovations as quickly as they would like. This puts the spotlight cost reductions in the manufacturing process.

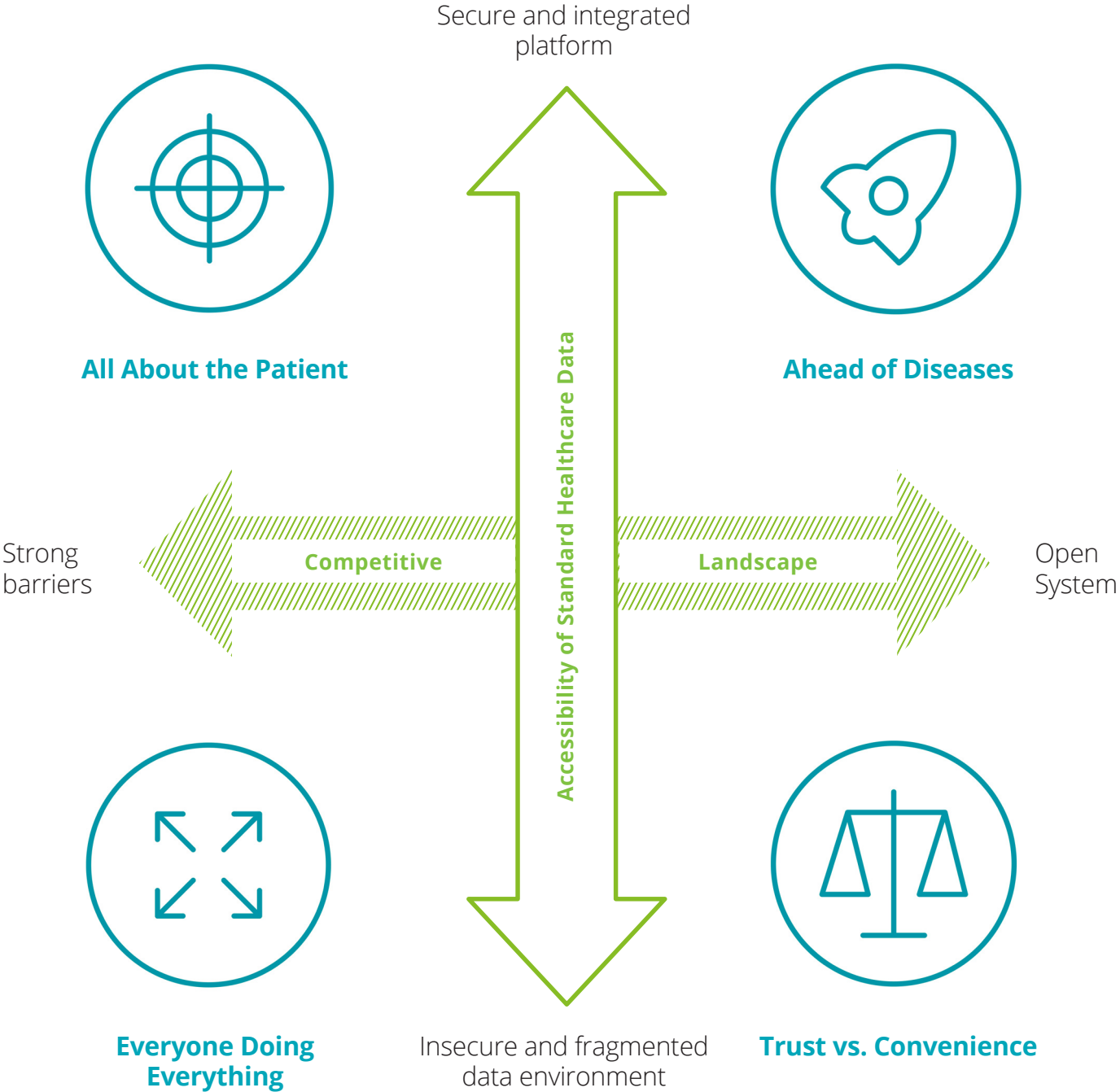
If, on the other hand, the competitive landscape develops into a diverse mix of traditional players and new market entrants, we could see healthcare evolves into a fast-

changing and innovative ecosystem. For this to succeed, the regulatory authorities will have to find a way to speed up patent approvals while still keeping standards high. Besides economic drivers, such as barriers to market entry, start-up culture and the importance of scale, there are also further drivers impacting this critical uncertainty. One key factor will be the development of healthcare platforms to collect patient data. As in other industries, an intermediary can occupy central positions in the value chain to absorb profitability.

We identified the **accessibility of standard healthcare data** to be the second critical uncertainty for a connected healthcare ecosystem in 2030. Restrictive data privacy standards, issues with cybersecurity and the lack of standards for interoperability may limit the potential to utilize artificial intelligence and therefore prohibit predictive diagnosis. If data remains stored in silos and restrictive usage remains the norm, a highly fragmented market will evolve where synergies remain unexploited. On the upside, standardizing data generation and establishing a universal healthcare platform will enable us to leverage the data to its full potential. Medical devices and other wearables will feed the data pool, which can then be used to analyze changes and identify potential patient risks. As a result, the winners of the future will have to master the data game. Physicians as well as patients and medical device manufacturers will be able to ensure best-in-class healthcare services. In addition to a comprehensive regulatory framework and guaranteed data security, another decisive factor will be persuading patients to accept the platform.

Combining both critical uncertainties results in four plausible but highly distinct visions of the future.

Fig. 1 - Scenario matrix to describe the future of connected care with MedTechs



Expert Predictions

Predetermined elements with strong impact on the future of connected care

We see some driving forces that play a major role and have a strong impact in all four scenarios, which we are calling predetermined elements. We can already anticipate how they will play out in the future. Although they only differ among the scenarios in terms of strength and level of interaction with the endpoints of the critical uncertainties, they must be taken into account. These are mainly technology-driven trends that are reshaping relationships within the ecosystem.

The first trend we identified relates to improving the accuracy and versatility of sensors in various devices, especially in wearables. We can use the endless sea of accurate data collected by the devices for treatment purposes. In 2017, the FDA approved AliveCor's KardiaBand as the first medical accessory. About a year later in September 2018, the FDA cleared two new features of the Apple Watch including ECG and irregular rhythm notification functions. Even though, these features cannot be considered equivalent to traditional MedTech products undergoing the full approval process, the industry acknowledges the clearance as trailblazing. In addition, the comparatively short duration of only one month from application to successful clearance is expected to encourage further attempts of adding health-related features to commercial wearables. Bose will introduce another example for a commercialized medical device in 2020. They recently passed the FDA clearing process for their first hearing aid that enables users to fit, program and control the device independent of any assistance from a health care provider.

Compared to the vast global MedTech market, which includes far more products beyond wearables, this is only a storm in a

teacup. However, it could spill over in time. More and more people today are using wearable devices, accessing telemedicine, and going online to search for health-related information, driving healthcare systems to focus on remote patient care as well as preventive measures rather than the mere treatment of symptoms.

With an exponentially increasing pool of data derived from various sources, we will need new methods of data processing. Using artificial intelligence and big data can help healthcare professionals make better, more accurate, and faster diagnoses that lead to better-informed treatment. Predictive analytics can deliver more proactive and targeted care. For example, new technologies can help patients comply with their treatment regimen more effectively. These developments will also be a strong enabler for personalized medicine. Apart for benefits on the patient side, MedTech players need to identify ways that create value for themselves. Technological progress in addition to a shortage of skilled healthcare staff and pressure on healthcare budgets serves as breeding ground for telemedicine. Effective application of remote monitoring technologies, for example, can reduce the number of unnecessary face-to-face consultations. This enables improved patient care in rural areas. According to the Deloitte 2016 Survey of US Healthcare Consumers, patients reported the highest interest in using telemedicine for post-surgical care and monitoring chronic conditions. In a telemedicine world, mobile devices have outsized potential to accelerate the industry's transformation from a provider-driven marketplace into a patient-centric ecosystem.

The level of maturity in advanced technologies will strongly impact decision-making in the connected healthcare ecosystem. We see smart systems supporting healthcare professionals, but not fully replacing them. This will present new regulatory challenges in the connected care landscape and may affect the business model of MedTech players. Further, the liability of artificial intelligence will become more and more important, yet will differ in the scenarios and across different regions and their respective regulatory regime.

Industry experts have long been predicting that the reimbursement system will move towards a value-based approach focusing on treatment outcome. The advantages are obvious: lower costs, more patient-centric focus, fewer unnecessary treatments and overall encouragement of healthy living and preventive measures. To date, we have not seen any concrete implementation propositions and the industry is left without an established method of quantifying "value". Instead of being a passive observer, incumbent players are well-advised to use their expertise and lobbying power to actively shape the regulatory framework.

Four Plausible Scenarios

The future of connected care with MedTechs

Scenario 1: Ahead of Diseases

Society has overcome many diseases through predictive analysis based on diagnosis. From an early age, health-related data is collected and stored in a comprehensive connected care platform

Tech giants entering the MedTech market with wearables to detect cardiac arrhythmia was a watershed moment. MedTech companies recognize these new market players as a serious threat to their traditional business. They invest heavily in their core competencies, namely medical expertise and client relationships with healthcare providers and payors. At the same time, tech giants are leveraging their existing platforms and direct client relationships to gain control of the value chain as an intermediary. Convenient wearables not only track and alert, but also give advice for fitness and well-being. The general public has shown great promise in self-improvement and taking control over their health in the past decades, enabling these devices and apps to reach the broad mass market. Once the healthcare industry

opens up, start-ups sense their chance to introduce innovative solutions that trigger further quantum leaps for the whole healthcare system.

The connected care platform that has evolved over time has excellent machine-learning capabilities and has been enhanced by new medical insights. Patient data is constantly analyzed and when risks become evident, warnings are sent to both patients and attending physicians. Despite these gains, few MedTechs are in the position to succeed under the new rules. They maintain their premium position with own-branded high-quality devices, while other MedTechs have become pure contract manufacturers.





Scenario 2: Trust vs. Convenience

MedTech companies and tech giants are competing based on their unique ability to win patients and other customers. Different providers developed various healthcare platforms in the fragmented market.

When data starts to become a unique selling point, tech giants aggressively enter the market. They offer a variety of health-related apps that integrate already existing customer data into their platforms, reducing overall costs in response to tremendous cost pressure. MedTech players are scared of this bold move and respond by creating their own platforms to close the gap between healthcare providers and patients. Forced to develop interfaces to facilitate data integration on the numerous platforms, healthcare providers are pushed to their limit and lobby to put pressure on regulators. Data integration on this scale, however, requires not only a regional but a global regulatory framework. Political instability in some regions and the rise of protectionism cause negotiations to fail, enabling the rise of a new class of IT service providers to help hospitals and other healthcare providers to build integrative management systems that can manage

different data sources and platforms.

Patients are divided into two main factions. One faction appreciates the benefits of user-friendly monitoring, fitness or well-being apps and the remote healthcare services offered by tech giants. These patients or customers feel a strong affinity for digital products, without any major concerns about data privacy. The other faction does not trust tech players to provide adequate healthcare services and manage their data in an appropriate manner. Additionally, with regard to patient segmentation, the industry sees patients with more critical health conditions making use of MedTech platforms, while patients with no or only mild conditions prefer the convenience of more commercial offerings. The two systems coexist, although they are each fighting to overrule the other.



Scenario 3: Everyone Doing Everything

This is a world dominated by traditional MedTech companies, as tech players gave up any serious efforts to enter the highly-regulated healthcare market.

With healthcare costs reaching unsustainable levels, downward pressure on the industry has reached an all-time high. While developed countries are dealing with an aging population suffering from a variety of comorbidities, developing and emerging countries struggle to provide basic healthcare to all citizens. Attempts to streamline administrative efforts fail, as most of the attention is focused on the pressure to reduce costs. Distrust and protectionism in the political sphere prevent stakeholders from setting global standards for data security. Rising R&D investments and intense price competition emerge, decreasing overall profitability in the healthcare industry and making the market unattractive for tech giants and start-ups. Initially, tech giants hoped for regulatory approval for new radical, patient-

centric offerings that receive strong patient support, but regulators overruled patient preference and levied prohibitive fines on innovative products. In order to tackle exploding healthcare costs, politicians transform the reimbursement to a full value-based approach. This and the demand from patients to digitize the healthcare service, the entire industry is compelled to invest in healthcare platforms.

By 2030, every MedTech player has its own platform fed by data from their medical devices. Interoperability between platforms and devices remains rather poor, incentivizing providers to offer a broad product portfolio for devices connected to these platforms. The more data a platform can gather, the more attractive it is to customers.

Scenario 4: All About the Patient

This is a world in which a global framework for healthcare data security standards and interoperability of devices has been agreed upon, which helps to contain costs.

MedTech companies are able to leverage the full potential of the data they collect, while new market entrants fail to meet the high standards for data accuracy and privacy. The threat from increasing populations of chronically ill patients forces the government to start to invest in prevention rather than the mere treatment of symptoms, and predictive analytics quickly became the method of choice. Finally, tech giants see their chance to enter the healthcare market as intermediaries and leverage their B2C relationships. However, by pushing their own platforms and missing key security loopholes and inaccuracies in their wearables and apps, they have trouble getting through the regulatory approval process. MedTech players use their lobbying power to create even higher barriers to entry and successfully keep tech giants out

of the market. Tech giants remain relevant in the wellbeing market. A smart, secure, and safe interaction among different medical devices and information systems arises as a result. Hospitals, healthcare providers and manufacturers promote interoperability among medical devices, as it soon became clear that each on their own would never be able to build a proprietary platform without the assistance of the tech giants. Data has now officially become a common good.

Convenience and medical accuracy are key factors driving the competition between device manufacturers. Their customers, i.e. hospitals and physicians as well as the patients, appreciate the high degree of patient-centric offerings that have become the differentiating factor in this market.



Conclusions and Outlook

The scenarios do not only have significant implications for MedTech players, but go far beyond this and impact the lives of millions of people. While the four scenarios paint very divergent visions of the future, each has distinct implications for decision-makers within the healthcare market – which appears to be robust no matter how the future plays out.

In all scenarios, we see continued growth in **patient empowerment**. Patients are informed and actively involved in their treatment plans, driving all players in the ecosystem to develop highly patient-centric solutions. Market players need to see patients as equal partners rather than passive receivers of care. Moreover trust in the developed healthcare platforms is a crucial cornerstone.

MedTech companies need to boost their **digital technology competencies**, particularly with regard to exponential technologies like artificial intelligence to reduce costs, increase access and improve care. If companies guarantee a **secure data environment**, patients and practitioners will feel confident sharing their data from a variety of connected devices and enable the kind of real-time analysis required for services such as telehealth and remote monitoring.

Even though MedTech companies are obliged to offer smart devices with accurate sensors and a high level of interoperability and connectivity, they also need to differentiate their offerings from lifestyle and fitness devices by highlighting their superior quality and market expertise. That said, these devices have to offer the same user-friendly experience of commercial devices. **Customer experience** will be a key strategy to win customers, by, for instance, simplifying the

machines and enhancing interactions with MedTechs. The convergence of health-related data from lifestyle wearables and 'real' healthcare data means medical device companies will have to embrace competition and seek partnerships to combine portfolios.

Whether successful or not, tech giants will try to enter the market. Incumbents should anticipate this move and use it as a chance to establish **collaborations and partnerships**. Embracing collaboration within and outside the industry will give industry players a competitive edge and play a vital role in confronting disruption from start-ups. One sure way to access the latest technology is to set up start-up incubators for key technologies and leveraging structured and focused **M&A activities** to attract the best emerging technologies.

Another way MedTech companies can achieve competitive advantage is through **optimization of internal processes**, including offering services that help healthcare providers to increase efficiency and improve interactions. This can be achieved by minimizing errors and duplication of work, e.g. documenting and administrative tasks. Artificial intelligence can play a major role. Particularly in areas where there is a shortage of skilled labor, we need to acknowledge the fact that robotic process automation can play an essential part in reducing the need for staff.

Using real-world evidence to support **cost-saving opportunities** will enable MedTechs to persuade healthcare providers to focus on their ecosystem rather than that of tech players. To that end, they need to strengthen their relationships with healthcare providers and payors. MedTechs are more likely to succeed in the opportunities and challenges

presented by **value-based reimbursement** models if they collaborate with stakeholders in the healthcare system. **Prevention** supported by digital solutions as a fundamental pillar of the healthcare system will make it much more robust.

Not all markets are likely to operate the same way. Industry players will need to differentiate their offerings for developing, emerging and developed markets, based on insightful market and customer **segmentation**. This differentiation will not be based solely on geography, but also on other factors such as age groups of patients and digital maturity. In the future, younger patients will focus more on prevention and have different needs than older patients, who benefit from holistic comorbidity management and maintaining their health status.

Looking at our meta-scenarios through our industry glasses, we can safely say that tremendous challenges are in store not only for MedTechs, but also other players like hospitals, pharmacists and payors. This especially relates to generating and maintaining patient access, and sustaining a premium position by identifying value drivers and by keeping out intermediaries who absorb profits. Smart intermediaries with a high level of customer access will not only be able to attract customers with enhanced offerings, but also provide payors with better data sets based on large samples and proof of outcome for a value-based care model.

MedTech companies will need to ask themselves if they are in a position to play the data game and leverage their knowledge to develop the next big thing for the healthcare industry, or if they must resign to being pure contract manufacturers of healthcare commodities that are easily interchangeable.

Methodology

Introduction to scenario design and methodology

The methodology of this study on the future of connected care with MedTechs is based on earlier achievements developed by Deloitte. A seven-step scenario development approach (see Fig. 2) applies the guiding scientific principles of objectivity, reliability, and validity. The study is the outcome of a series of workshops involving global experts from the Deloitte network with a background in MedTech and digital healthcare as well as experienced scenario practitioners from the Center for the Long View (CLV).

Scenario design starts by identifying the focal question of the underlying issue. Since we could tell an infinite number of different stories about the future of the MedTech industry, we first had to agree on the issue or strategic challenge we wanted to address. This enabled us to support the decision-making of our key MedTech clients in an appropriate way. Scenarios are tools for shedding light on the strategic challenge, while the focal question sets the scope of the scenarios. In the present case we focused on the question “What will the connected care landscape look like in 2030?”.

Scenarios are a way of understanding the dynamics that shape the future. Therefore, in the second step, we pinpoint the forces that drive the focal questions. Driving forces are fundamental sources of future change. They shape the course of events and history and dramatically enhance our ability to imagine future scenarios. These drivers can be grouped into five categories, known as STEEP forces, as they consist of Social, Technological, Economical, Environmental and

Political forces. Since most issues involve more than one of these categories, they are only handles. In order to derive our driver list, we also conducted expert workshops using CLV Deep View, an artificial intelligence (AI)-based trendsensing and analysis machine. CLV Deep View helps to avoid the bias of the traditional approach, which often has a built-in tendency based on the character, mood, or preference of the scenarists.

As a part of the workshop series, we identified in a third step the critical uncertainties for the focal question. Not all driving forces are uncertain, some may be predetermined. These are the trends already in the pipeline, unlikely to vary significantly in any of the scenarios. Critical uncertainties are driving forces with the potential to tip the future in one direction or another. They have two fundamental characteristics: they have an unusually high impact and are uncommonly uncertain or volatile. Initially, all uncertainties appear unique, but by stepping back, we can reduce bundles of uncertainties to bundles that serve as the building blocks for creating our scenario sets.

The scenario framework was developed in the next step by focusing the entire list of related uncertainties into two orthogonal axes. We then defined a matrix consisting of crossing and independent axes that allowed us to define four very different but plausible quadrants of uncertainty.

In the fifth step we developed the scenario narratives by using the previously investigated drivers that became characters in the developed stories. It is not our goal to tell four different stories, one of which — we hope, as

futurists — will be true. We recognize instead that the real future will not conform to any one of the four scenarios, but that it will contain elements of all of our scenarios. Our goal is to pin down the corners of the plausible futures. These corners are exaggerated — the outer limits of what is plausible. Thus our scenarios will have a near caricature quality.

Fig. 2 – Seven step scenario development approach



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