Wolters Kluwer Recognized for

2021

New Product Innovation

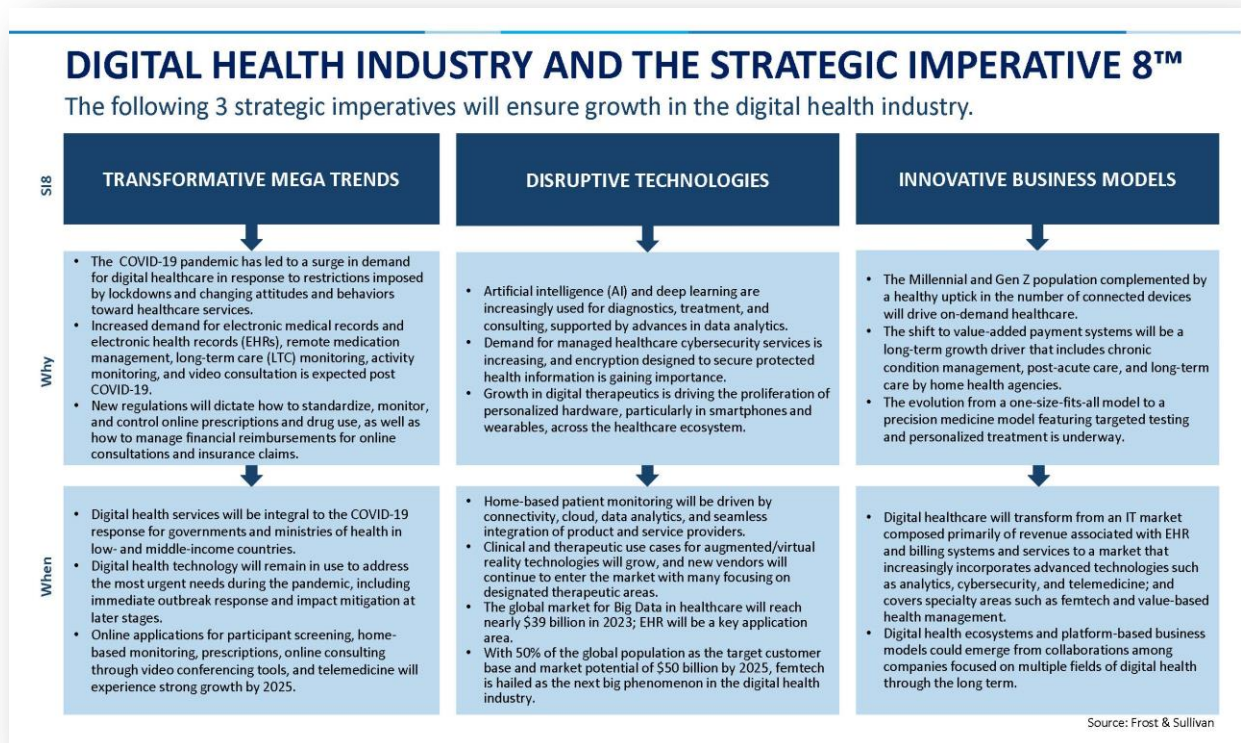United States
Virtual Care Industry
Excellence in Best Practices

FROST *&* SULLIVAN

Strategic Imperatives

Frost & Sullivan identifies three key strategic imperatives that impact the digital health industry: transformative Mega Trends, disruptive technologies, and innovative business models. Every company that is competing in the digital health space is obligated to address these imperatives proactively; failing to do so will almost certainly lead to stagnation or decline. Successful companies overcome the challenges posed by these imperatives and leverage them to drive innovation and growth. Frost & Sullivan's recognition of Wolters Kluwer is a reflection of how well it is performing against the backdrop of these imperatives.

DIGITAL HEALTH INDUSTRY AND THE STRATEGIC IMPERATIVE 8™

The following 3 strategic imperatives will ensure growth in the digital health industry.

SI8

TRANSFORMATIVE MEGA TRENDS	DISRUPTIVE TECHNOLOGIES	INNOVATIVE BUSINESS MODELS

Why

- The COVID-19 pandemic has led to a surge in demand for digital healthcare in response to restrictions imposed by lockdowns and changing attitudes and behaviors toward healthcare services.
- Increased demand for electronic medical records and electronic health records (EHRs), remote medication management, long-term care (LTC) monitoring, activity monitoring, and video consultation is expected post COVID-19.
- New regulations will dictate how to standardize, monitor, and control online prescriptions and drug use, as well as how to manage financial reimbursements for online consultations and insurance claims.

- Artificial intelligence (AI) and deep learning are increasingly used for diagnostics, treatment, and consulting, supported by advances in data analytics.
- Demand for managed healthcare cybersecurity services is increasing, and encryption designed to secure protected health information is gaining importance.
- Growth in digital therapeutics is driving the proliferation of personalized hardware, particularly in smartphones and wearables, across the healthcare ecosystem.

- The Millennial and Gen Z population complemented by a healthy uptick in the number of connected devices will drive on-demand healthcare.
- The shift to value-added payment systems will be a long-term growth driver that includes chronic condition management, post-acute care, and long-term care by home health agencies.
- The evolution from a one-size-fits-all model to a precision medicine model featuring targeted testing and personalized treatment is underway.

When

- Digital health services will be integral to the COVID-19 response for governments and ministries of health in low- and middle-income countries.
- Digital health technology will remain in use to address the most urgent needs during the pandemic, including immediate outbreak response and impact mitigation at later stages.
- Online applications for participant screening, home-based monitoring, prescriptions, online consulting through video conferencing tools, and telemedicine will experience strong growth by 2025.

- Home-based patient monitoring will be driven by connectivity, cloud, data analytics, and seamless integration of product and service providers.
- Clinical and therapeutic use cases for augmented/virtual reality technologies will grow, and new vendors will continue to enter the market with many focusing on designated therapeutic areas.
- The global market for Big Data in healthcare will reach nearly $39 billion in 2023; EHR will be a key application area.
- With 50% of the global population as the target customer base and market potential of $50 billion by 2025, femtech is hailed as the next big phenomenon in the digital health industry.

- Digital healthcare will transform from an IT market composed primarily of revenue associated with EHR and billing systems and services to a market that increasingly incorporates advanced technologies such as analytics, cybersecurity, and telemedicine; and covers specialty areas such as femtech and value-based health management.
- Digital health ecosystems and platform-based business models could emerge from collaborations among companies focused on multiple fields of digital health through the long term.

Source: Frost & Sullivan

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Wolters Kluwer excels in many of the criteria in the virtual care space.

AWARD CRITERIA

New Product Attributes	Customer Impact
Match to Needs	Price/Performance Value
Reliability	Customer Purchase Experience
Quality	Customer Ownership Experience
Positioning	Customer Service Experience
Design	Brand Equity

Match to Needs

Healthcare providers are challenged by the risks posed to hospitalized patients who may develop life-threatening conditions like sepsis, experience rapid deterioration in their condition that goes unnoticed, or develop other infection-related complications during their stay. Patients receiving care for a specific condition or a serious accident may develop a new infection resulting from their healthcare encounter. These infections, known as healthcare-associated infections (HAIs), are a significant cause of illness and death—and they can have serious emotional, financial, and medical consequences. At any given time, about 1 in 25 hospitalized patients have an infection associated with hospital care. These infections lead to tens of thousands of deaths and cost the U.S. healthcare system billions of dollars each year. Physicians and nurses are caring for ever-larger patient loads and more complex patients. They must employ clinical surveillance solutions to identify at-risk patients as early as possible and modify care to prevent adverse outcomes.

Hospitalized patients may also develop sepsis, a life-threatening condition that is difficult to spot before becoming symptomatic. Sepsis accounts for nearly 270,000 deaths each year in the United States—about 1 in 3 of all hospital deaths. The healthcare team must closely watch all patients and identify indicators that suggest the patient is becoming septic, although those can be subtle changes when they first appear. For every hour sepsis goes untreated, mortality increases by about 8%, making early, accurate detection crucial to saving lives and decreasing the cost of care.[1] Caring for hospitalized patients can be chaotic. Given the number of healthcare personnel interacting with each patient, the need for earlier identification than currently achieved, streamlined communication delivered into the clinical workflow, coordination, and data-driven analytics cannot be overstated.

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1. https://www.researchgate.net/publication/261519261_Empiric_Antibiotic_Treatment_Reduces_Mortality_in_Severe_Sepsis_and_Septic_Shock_From_the_First_Hour

One persistent challenge to confirming patients who may be developing a serious HAI or sepsis is that many sources of patient data are available but the relationship among the indicators may have been missed by simply reviewing charts. In February 2021, Frost and Sullivan published an analysis of the growth opportunities for virtual care.[2] The research identified significant opportunities for an expanded view of virtual care. A key finding is that although many providers and companies have limited the definition of virtual care to remote telehealth solutions, such as RPM or virtual visits, the true value-based definition of virtual care extends well beyond this limited view of remote solutions to a much more dynamic view of virtual connectivity that includes various processes that are connected and able to function without a human connecting the dots and triggering an intervention. This potential for this concept to function within the hospital is clearly indicated by the Wolters Kluwer clinical surveillance systems that are able to process various patient indicators and trigger responses by a virtually connected care team within the hospital setting. For example, this virtual network can identify potential cases of sepsis much faster than previous manual methods and trigger interventions before the patient becomes critically ill. There are many applications to utilize virtual clinical surveillance within the hospital, or as part of an eICU solution or within the more traditional remote environment. The Wolters Kluwer clinical surveillance solutions are a precise match to this next generation need which some experts believe will save many lives.

Wolters Kluwer's innovative clinical surveillance suite of solutions focuses on optimizing alert performance and data analytics more than other market participants to target HAIs and sepsis. Moreover, the company's SoleSource® platform can standardize surveillance offerings across a client's system. Hospitals may use Wolters Kluwer data-driven solutions on the platform to drive performance improvements for infection prevention and sepsis clinical programs, among other initiatives. And as large integrated hospital systems often attempt to operate a consistent clinical program across diverse EHRs, the platform offers a consistent approach that integrates with the EHR but is EHR agnostic.

Two of Wolters Kluwer's core clinical surveillance solutions:

- **Sentri7®** aggregates electronic health record (EHR) data to prioritize and send real-time alerts to clinical teams so they can intervene earlier with evidence-based care to improve outcomes. Sentri7 supports clinical aims such as medication management, antimicrobial and opioid stewardship, and infection prevention.

- **POC Advisor™** sophisticated artificial intelligence-powered analysis of patient data detects sepsis early and accurately. By delivering intuitive alerts and notifications to the right person at the right time and at the point of care via devices or in the EHR, POC Advisor consistently provides evidence-based care that improves patient outcomes, sepsis bundle compliance, and reduces the cost of care.

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2. *COVID-19 Pandemic Ignites Enthusiasm for Virtual Care, Frost & Sullivan, February 2021, #K537-48.*

Wolters Kluwer has established a leading position as a supplier of innovative products and solutions in the data analytics market for its virtual care solutions. The company's offerings overcome the challenges that prevent the early identification of patients at risk of developing sepsis and HAIs—two conditions that have a deep impact on patient care and on hospitals' overall quality and financial performance.

Design

Wolters Kluwer has deployed its specialized solutions across providers' infrastructure. For example, the company recently introduced AI-powered surveillance and predictive algorithms into the Sentri7 solution for the hospital pharmacy and infection prevention teams that detects *Clostridioides difficile (C. diff) infections (CDI)* earlier. The gastrointestinal malady is often associated with hospital stays due to the various procedures, environmental influences, and medicines prescribed during the course of a patient's treatment. *C. diff* causes severe gastrointestinal symptoms, diarrhea, severe abdominal pain, and rapid heart rate, which is always unpleasant and can be fatal. Sentri7 is designed with customized dashboards that permit comparative evaluations and progress mapping across the patient population. Using artificial intelligence and machine learning, the solution can determine relative risk of CDI among patients and enable the provider to make specific changes in care to help minimize the risk of developing the infection altogether.

> *"Wolters Kluwer is developing an innovative mix of clinical surveillance solutions that are more focused on data analytics than other market participants. The company has created the SoleSource platform, which offers the capability to standardize surveillance offerings across a client's system."*
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> *- Victor Camlek, Principal Analyst*

Frost & Sullivan finds that Wolters Kluwer can locate at-risk patients much more effectively than other surveillance methods that only identify a problem after it has occurred. Specifically, Sentri7 collects and analyzes data from the rich patient-level information within the EHR, generates findings, and subsequently delivers patients' risk scores that automatically update as the patient condition and risk factors change, allowing clinicians to address modifiable risk factors at appropriate stages.

Quality

Wolters Kluwer has set out to do more than develop and push alerts. Evidence-based algorithms track patients at elevated risk and suggested actions help clinical teams put evidence into practice sooner to prevent *C. diff* infections proactively. When measured for effectiveness, Sentri7's AI-powered CDI risk score alerted pharmacists to modify the medication therapies of patients at highest risk, where 83% fewer *C. diff* infections were observed during a 5-month pilot with Carilion Clinic. Frost & Sullivan is further impressed that early findings indicate the solution can identify at-risk patients 5.3 days earlier than previously possible. Wolters Kluwer's multidisciplinary team-approach to validate the AI model drove its quality alerting. Physicians, epidemiologists, antimicrobial stewardship experts, and data scientists across Wolters Kluwer analyzed millions of deidentified records to cultivate a validated AI model for assessing *C. difficile* patient risk. Once the model was validated, it was operationalized into their Sentri7 surveillance solution.

The sepsis-focused POC Advisor surveillance solution demonstrates another example of high quality. POC Advisor's sophisticated analysis of a broad cross-section of patient data, including clinical notes, is powered by artificial intelligence and natural language processing (NLP). Alerts fire only for those patients who truly have sepsis. POC Advisor analyzes patient data within a hospital's EHR and evaluates hundreds of different clinical scenarios to identify escalating conditions sooner than previously possible. Frost & Sullivan notes the model ensures a much more rapid response than alternative solutions. A peer-reviewed scientific publication—the Journal of the American Medical Informatics Association (JAMIA)—reported highly sensitive (95%) and specific (82%) sepsis alerts for POC Advisor. By identifying sepsis early and accurately and providing patient-specific guidance at the point of care, the journal stated, "POC Advisor demonstrated a reduction in the mortality of sepsis patients by 53 percent and a reduction in related 30-day readmissions by 31 percent."[3]

If we extrapolate these examples of service quality across a broader population, it is quite evident that Wolters Kluwer is offering a game-changing family of clinical surveillance solutions that will overcome long-standing challenges that have simply gone unresolved for far too long.

Positioning

Wolters Kluwer is positioning its clinical surveillance program as an outstanding resource that can spot at-risk patients more quickly than other surveillance products while also delivering very high alert quality. The company effectively leverages its data analytics capabilities and established an array of excellent expert research sources to differentiate it from competitors. For example, Wolters Kluwer can directly integrate its renowned clinical content from Lexicomp and UpToDate directly into its advanced clinical surveillance solutions giving customers a full solution and not just alerts. As such, it can recommend evidence-based clinical guidance through the integration of patient data and the latest scientific findings, allowing for the support of a seamless clinical workflow. As a result, Wolters Kluwer positions itself as a leading provider of artificial intelligence-based data analytics and powerful alerting services within a clinical surveillance and clinical decision support solution. Frost & Sullivan reveals that Wolters Kluwer is putting together a state-of-the-art suite of surveillance solutions that contribute to vastly improved patient outcomes and measurable reductions in the cost of care.

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3. *https://academic.oup.com/jamia/article/24/1/88/2631454*

Brand Equity

The current version of Wolters Kluwer was established in 1987. The company's origins go back to 1836, and throughout its history, the company has supported the need for expert knowledge that is vital to ensure excellence in the endeavors of researchers, scientists, doctors, scholars, and business experts. The company has recently built an outstanding brand as a supplier of expert research tools, software solutions, and services for the healthcare, tax and accounting, governance, risk and compliance, legal, and regulatory sectors. The company has moved beyond its identity as a robust supplier of professional-caliber content to one that delivers expert solutions that enable users to make better decisions much faster than they could without its treasure trove of reference content.

Within the healthcare domain, this includes achieving a level of performance that can measurably improve patient care (e.g., improving patient outcomes by avoiding hard-to-spot critical infections and helping manage healthcare costs). Moreover, Wolters Kluwer has acquired early-phase expert companies such as Pharmacy OneSource, a notable clinical surveillance software business that developed Sentri7 clinical surveillance and has evolved its portfolio to include leading clinical surveillance solutions that deliver its deep domain expertise via evidence-based guidance to the point-of-care. Hence, the company is creating its growth path by virtue of its globally-respected brand augmented by the acquisition of high-potential specialized software and services.

Customer Service Experience

A critical aspect of the Wolters Kluwer customer service experience involves expert training for all clinicians and staff who will use these solutions. For example, all implementations require Wolters Kluwer to normalize data and set up alerts to support the customer's established process flow. Wolters Kluwer's training program utilizes experienced trainers and clinicians to work closely with each client's team. For example, the company offers clinical surveillance solutions to the hospital pharmacy using a training team who have built careers as hospital pharmacists. The team believes that a dedicated training program must not be built around a user manual. The goal is to instead be available beyond basic training and maintain a strong client relationship over time to ensure the solutions acquired by the customer are used to their full potential. This is complimented with a holistic 24/7 support model to help customers whenever they need it and to ensure the best possible outcomes.

Conclusion

Healthcare providers have grappled with the challenges to patient well-being associated with hospital-acquired infections (HAIs), patient decompensation, and sepsis. Building on the foundation of expert clinical resources and reference content, Wolters Kluwer is delivering the next generation of clinical surveillance solutions. The company is leveraging a long heritage of delivering advanced surveillance solutions by offering an innovative and game-changing mix of new AI-enabled clinical solutions. Wolters Kluwer clinical surveillance suite, including Sentri7 and POC Advisor, are delivered on a common technology platform that applies sophisticated analytic techniques to the data in electronic health records and identifies patients at risk for a variety of adverse events, including C. *diff,* sepsis, and patient decompensation with more investments planned in the coming years.

From their legacy as a publisher, Wolters Kluwer has successfully transformed into an information services technology company delivering expert solutions with actionable content. Wolters Kluwer is delivering against a well-articulated vision of how advanced technology can be deployed alongside customer EHRs to improve patient care, reduce costs, and reduce clinician fatigue for the most pressing healthcare challenges.

With its strong overall performance, Wolters Kluwer earns Frost & Sullivan's 2021 New Product Innovation Award in the United States virtual care industry.

What You Need to Know about the New Product Innovation Recognition

Frost & Sullivan's New Product Innovation Award recognizes the company that offers a new product or solution that uniquely addresses key customer challenges.

Best Practices Award Analysis

For the New Product Innovation Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

New Product Attributes

Match to Needs: Customer needs directly influence and inspire product design and positioning

Reliability: Product consistently meets or exceeds customer performance expectations

Quality: Product offers best-in-class quality with a full complement of features and functionality

Positioning: Product serves a unique, unmet need that competitors cannot easily replicate

Design: Product features an innovative design that enhances both visual appeal and ease of use

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at http://www.frost.com.

The Growth Pipeline Engine™

Frost & Sullivan's proprietary model to systematically create on-going growth opportunities and strategies for our clients is fuelled by the Innovation Generator™. Learn more.

Key Impacts:

- **Growth Pipeline:** Continuous flow of Growth opportunities
- **Growth Strategies:** Proven Best Practices
- **Innovation Culture:** Optimized Customer Experience
- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership

The Innovation Generator™

Our six analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- **Mega Trend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

The Growth Pipeline Company™