



Microsoft Recognized for

2021

New Product Innovation

North American Vaccine Administration

Management System Industry

Excellence in Best Practices

Strategic Imperatives

Frost & Sullivan identifies three key strategic imperatives that impact the life sciences industry: geopolitical chaos, disruptive technologies, and internal challenges. Every company that is competing in the life sciences 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 Microsoft is a reflection of how well it is performing against the backdrop of these imperatives.

SIB	GEOPOLITICAL CHAOS	DISRUPTIVE TECHNOLOGIES	INTERNAL CHALLENGES
Why	<ul style="list-style-type: none"> Supply chain stability, manufacturing capabilities, and residual healthcare budgets will dictate the industry’s growth trajectory despite the nondiscretionary nature of pharma products in the COVID-19 scenario. Supply chain resilience will continue to be tested as companies scramble to reallocate and ramp up manufacturing to address supply shortages and tackle government protectionism measures. COVID-19 will likely result in higher demand for access to remote treatment solutions and methods. 	<ul style="list-style-type: none"> The global life sciences industry has benefited from a combination of novel technologies, including artificial intelligence (AI) platforms, the Internet of medical things, and blockchain. Adoption of advanced analytics, automation, and cloud solutions results in increased productivity and better decision-making. Life sciences firms are digitizing operations to address inefficiencies and create patient-centricity and personalized, value-based healthcare solutions. 	<ul style="list-style-type: none"> Fragmented channels in customer communication, lower margins, and intensifying competition challenge the life sciences industry. Companies are seeking to shift focus to from existing therapeutic portfolios to COVID-19- related developments and treatments. Mergers and acquisitions are directly impacting central pharma and instrument developers by exerting cost pressures and mandating consolidation to achieve economies of scale and operational synergies.
When	<ul style="list-style-type: none"> Healthcare organizations will accelerate innovation to respond to the COVID-19 crisis while rethinking post-pandemic care delivery and financing. Government-funded COVID-19 testing initiatives will boost revenues in the next 1 to 3 years. Pharma companies will experiment with new point-of-care (POC) testing, digital supply chain tools, and patient-doctor connectivity programs based on digital platforms. The pandemic will drive new digital-tech adoption in drug discovery and testing services, and federal funding will encourage deeper product pipelines and inventory. 	<ul style="list-style-type: none"> The revenue from AI solutions used in drug discovery is expected to grow 26.3% and reach \$455 million by 2020. New technologies such as augmented reality will be incorporated into labs, processing lines, and drug manufacturing sites to increase safety, reliability, and efficiency. In addition to reinventing R&D through technology-enabled drug discovery and clinical trials, digital transformation will improve commercial and supply chain processes during the next 5 years. Significant growth opportunities await in sensor development for medical instruments and equipment management for connected labs, which will enable remote monitoring and controlling. 	<ul style="list-style-type: none"> The challenge of economically scaling-up manufacturing will remain a major impediment to advancing therapies from the lab to clinics in the short term. Big Pharma companies will decentralize and outsource the manufacturing of novel cell and gene therapies to contract development and manufacturing organizations. Companies must pursue acquisitions of digital solution targets to leverage data monetization opportunities and drive growth in precision medicine. Pharma companies must aggressively invest in improving last-mile connectivity with patients and focus on improving overall health outcomes.

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. Microsoft excels in many of the criteria in the vaccine administration management system space.

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

Managing End-to-end Vaccine Distribution and Administration to Meet Burgeoning Throughput Requirements

Fortifying the public health infrastructure and processes through technology-enabled services is vital to support the global coronavirus (COVID-19) relief efforts at scale and in line with the World Health organization’s (WHO) guidelines.

Founded in 1975 and headquartered in Redmond, Washington, United States (US), Microsoft deployed more than 230 COVID-19 emergency response missions globally through its Microsoft Consulting Services

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- Supriya Lala, Best Practices Research Analyst

(MCS) since March 2020 to support the global battle against the pandemic. The company collaborated with partners and customers with its best-in-class technical support to address broader challenges such as testing and disease tracking and research, development, and manufacturing of diagnostics tests, treatments, and vaccines. Microsoft commits to enabling seamless vaccine distribution, administration, and meeting vaccination site’s evolving throughput requirements successfully as demand rises over time. By partnering with global public and private-sector organizations,

the company drives quick, equitable, and secure vaccine delivery.

Per WHO, as of mid-February 2021, at least seven different COVID-19 vaccines across three platforms were introduced in countries worldwide, with a primary focus on early and seamless vulnerable population vaccination.¹

Besides, more than 200 additional vaccine candidates are in development, of which more than 60 are at the clinical stage. Among its several initiatives, WHO's priority is to curtail COVID-19's acute phase by ensuring fair and equitable vaccine allocation to all countries through collaborations with governments and manufacturers. However, COVID-19 vaccine procurement, distribution, administration, and management pose unique challenges. More products awaiting approval and proper vaccine supply logistics to meet the growing demand raise further complexities, particularly if sites administer two products with different requirements and dose schedules. With the US current throughput levels, it will take an estimated five months to vaccinate 75% of the population with a two-dose vaccine.²

The US's technological capabilities support Microsoft's mission to safely administer vaccinations at customer sites (healthcare and government) through its Microsoft Vaccination Management template. As the next-generation version of its earlier Vaccination Registration and Administration Solution, Microsoft Vaccination Management bolsters its COVID-19 solution portfolio with a comprehensive set of compliant and accelerated vaccine distribution and administration capabilities. The company leverages its already proven technology and approaches earlier applied to COVID-19 use cases such as contact tracing, COVID-19 testing, and return-to-work and school programs. A Power Platform-based template, Microsoft uses Dataverse on Azure as the data source and Power BI for Microsoft Vaccination Management.

The Microsoft Vaccination Management components include public portal registration and booking for the public-facing site, vaccination site management application for frontline workers, and command centers for vaccination site operations using Power BI. The system allows patients and providers to check eligibility, pre-register or sign-up for the waitlist, book appointments through phase-wise scheduling (of 2nd dose), record and report, manage workflow and dashboard, and conduct analytics.

The booking capability confirms the appointment and provides a quick response (QR) code notification to individuals. The system also sends scheduled appointment reminders to prevent no-shows and call center support to book a vaccination slot on the citizens' behalf. Additionally, the frontline workers' mobile application (at the vaccination site) allows for rapid check-in, walk-in registration, vaccine administration, vaccine shipment records. In addition, Microsoft is a part of the Vaccine Credential Initiative (VCI) and a leading contributor to the SMART Health card standards. Microsoft Vaccination Management will support SMART standards as they become available.

The template's command center enables reporting to manage either a single site or multiple sites, providing summary and real-time views to customers. Microsoft Vaccination Management supports supply ramp-up and increased throughput, handling appointment slots versus available vaccine volumes and appointment no-shows in addition to tracking and reporting immunization progress.

With Azure and proactive telemetry in the backend, the scalable and robust system can back the growing

¹ "COVID-19 Vaccines." World Health Organization, World Health Organization, Mar. 2021, www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines.

² "More Than 400 Million Shots Given: Covid-19 Tracker." Bloomberg.com, Bloomberg, Mar. 2021, www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/.

demand of state and local governments and meet the rising vaccination administration volumes.

Easy-to-use Portal Design and Extensible System Facilitating Secure Data Exchange

The simple and easy-to-use system design is a market differentiator for Microsoft. Notably, the application's pre-registration feature ensures that all citizens get a slot, maintaining equity and eliminating queue or a first-come, first-serve approach. The browser-based capability with a highly responsive interface is accessible from both desktop and mobile devices. Besides, a large-screen-optimized dashboard enables presenting the information at the operation center. The frontline worker app optimizes for use on a tablet for frontline workers, who tend to be more mobile, thus enabling them to scan the booking QR codes and vaccine lot numbers conveniently.

Microsoft Vaccination Management leverages industry standards, such as Health Level Seven (HL7), Fast Healthcare Interoperability Resources, and an open application programming interface - tuned to fit into a vaccination system familiar to the public. The interoperability allows the system to transfer the data to state-wide immunization systems and other medical information systems (electronic health record systems), following the highest safety and security protocols. HL7 messaging automates data entry, thus addressing error-prone manual data entry challenges. An extensible system, Microsoft Vaccination Management has potential other use cases apart from supporting vaccination management, a key market differentiator versus other business systems. Built on the HL7 and Microsoft's Cloud for Healthcare schema allows the application to structure data for other purposes.

Microsoft is training its healthcare ecosystem partners to quickly deploy the system to vaccination sites and consult on change management.

Enabling Last Mile Patient Connectivity through Real-time Monitoring to Meet Clinical Endpoints

With a rising volume of people applying to get vaccinated, improving the vaccine administration scale is vital. To streamline this process requires expanding the system from a single-tier capability (at state and local government levels) to a multi-tier capability due to increased vaccination sites (healthcare providers, hospitals, clinics, schools, employers, and retail pharmacies).

"Microsoft Vaccination Management provides detailed information and creates a summary report to track and measure vaccination goal progress at all sites simultaneously. It helps to understand population- and geography-specific vaccine uptake and assess equity achieved. Additionally, streamlined reporting allows better vaccine demand at sites and status of on hand inventory."

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To that end, the Microsoft Vaccination Management enables scaling an organization's vaccination management capabilities and creating end-to-end experiences for citizens, frontline vaccinators, and providers. Compared to other commercial business applications that involve complex integration and setup procedures requiring an average of two to six weeks, Microsoft Vaccination Management is quickly deployable with an easy-to-setup configurable system.

The platform can begin to operate, communicate, and resource the sites within market-disruptive two weeks, providing a competitive advantage over existing solutions.

Furthermore, Microsoft Vaccination Management has an ability to record vaccine shipments, draw down from doses in the shipment as patients are vaccinated, and see in real time the doses on hand and any vaccine loss (vaccine inventory). The platform provides a real-time hourly view of appointment status, slots, and the number of administered doses, demographics, and registration backlogs.

Microsoft Vaccination Management provides detailed information and creates a summary report to track and measure vaccination goal progress at all sites simultaneously. It helps to understand population- and geography-specific vaccine uptake and assess equity achieved. Additionally, streamlined reporting allows better vaccine demand at sites and status of on hand inventory. It enables public health systems to remain updated and focused on delivering the vaccines, resources, and services to locations that lack them. Thus, Microsoft Vaccination Management helps agencies conduct community outreach to resolve supply and equity-related issues by adjusting vaccination programs and eligibility rules. It facilitates monitoring the operational effectiveness of vaccine clinics and collecting the data that would potentially support evaluating vaccine efficacy in the long run. The data shared with health administrators will also help summarize vaccine deployment goals against key performance indicators in large population groups. Such assessments are vital to measure reinfection risks and predict the need and timing for revaccination. By facilitating such cross-agency collaboration, Microsoft Vaccination Management will allow public health and government officials to make informed policy decisions, improve vaccination education, deliver uninterrupted trusted services, and avoid supply disruption.

Collaborating with Covid-19 Vaccination Ecosystem Partners for Increased Market Adoption

Over the last few months, Microsoft has worked closely with federal, state, and local governments and healthcare organizations to define vaccination supply chain requirements, from global suppliers to regional distribution and administration. Several government health organizations have already deployed the company's solutions to manage the end-to-end process, from screening and scheduling to administration and follow-ups. Notable customers include the State of Oklahoma and Los Angeles Unified School District.

In mid-January, Microsoft joined the Washington State Vaccine Command and Coordination Center, a public-private partnership formed to deliver vaccines across the state effectively and efficiently, leveraging its technological expertise. Shortly after pledging its commitment, a cross-functional team started developing the technology to help government agencies, healthcare organizations, and vaccination centers increase the number of "shots in arms." Microsoft also operates a vaccination site at its campus to support rapid vaccination efforts. It partners with King County to keep a mass vaccination site at Auburn Supermall operational and at maximum throughput.

In another initiative, the company collaborated with Starbucks to design a four-station process for mass vaccination sites that optimizes for the best experience and highest throughput. It includes a health check-up point followed by a check-in process to register, confirm appointments, handle walk-ins, a vaccination administration station, document screening information, and record vaccine dose and type. The final observation station checkpoint requires individuals to spend 15 to 30 minutes to assess adverse effects, automatically updating the Immunization Information System's information.

Microsoft plans to deploy Microsoft Vaccination Management in March 2021, providing customers gated access through MCS and certified service partners such as Accenture, Avanade, PWC, HCL Power Objects, and Tata Consulting Services. In the initial rollout, the company will deploy in the US, closely monitoring the customer experience, and will evaluate scaling outside the US in the subsequent months of 2021.

Conclusion

Microsoft designed the Microsoft Vaccination Management for seamless, safe, and equitable vaccination distribution, enabling providers and healthcare agencies to scale and adapt to meet the growing vaccination capacity needs as demand changes over time.

The platform enables governments, public health agencies, healthcare organizations, and vaccine centers to manage the end-to-end process, from screening and scheduling to administration and follow-ups. A scalable and flexible system that automates mass vaccination sites, private clinics, and mobile vaccination units, Microsoft Vaccination Management's simple-to-use template allows citizens to book vaccination appointments and receive reminders and notifications. Likewise, it enables frontline workers and providers to check patient eligibility, schedule, and records from a single app. The vaccination reporting and facility dashboards available for health administrators and site leaders help track key performance measurements against vaccination delivery goals. Also, streamlined reporting allows understanding population- and geography-specific vaccine uptake and assesses equitable distribution. Built on the Microsoft Power Platform, Microsoft Vaccination Management enables seamless patient-provider engagement, and real-time monitoring of the vaccine inventory on hand and operational effectiveness of vaccine clinics.

With its strong overall performance, Microsoft earns Frost & Sullivan's 2021 North America New Product Innovation Award in the vaccine administration management system market.

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

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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.

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

