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BEST PRACTICES

AWARDS

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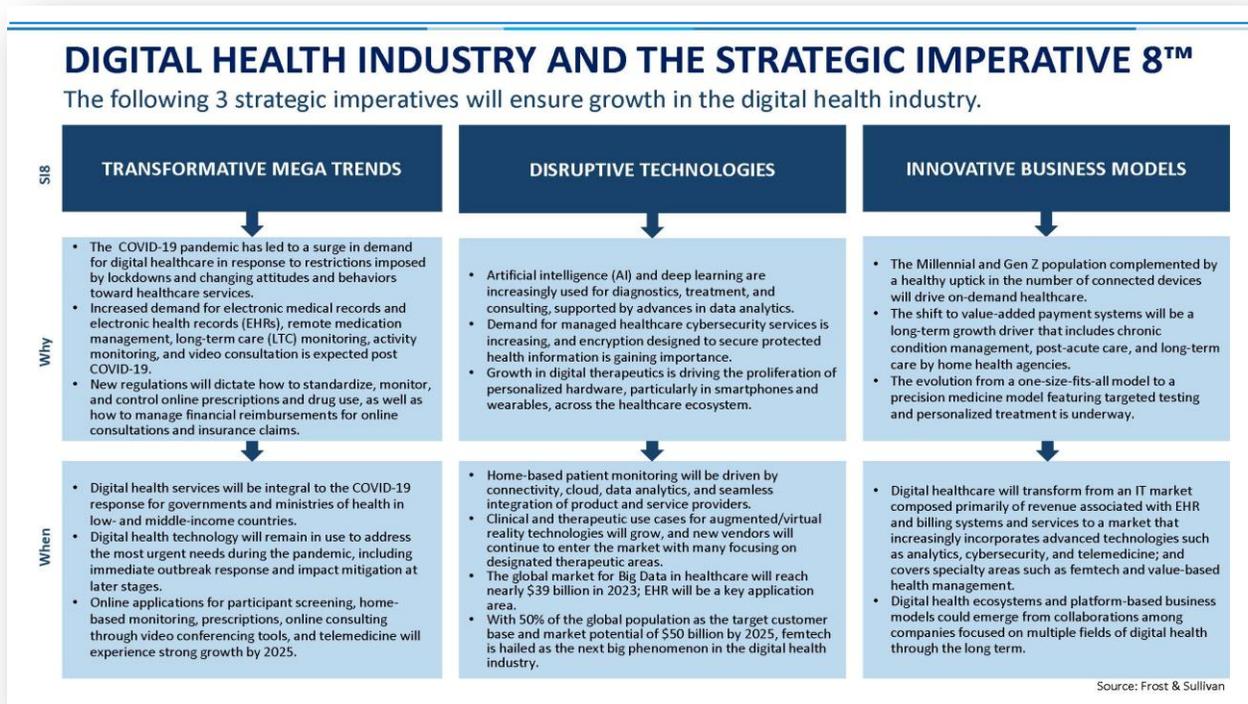
2020 BEST PRACTICES AWARD

CHANGE
HEALTHCARE

**2020 NORTH AMERICAN
CLOUD-BASED ENTERPRISE IMAGING
CUSTOMER VALUE LEADERSHIP AWARD**

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 Change Healthcare reflects how well the company is performing against the backdrop of these imperatives.



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. Change Healthcare excels in many of the criteria in the cloud-based enterprise imaging space.

AWARD CRITERIA	
<i>Business Impact</i>	<i>Customer Impact</i>
Financial Performance	Price/Performance Value
Customer Acquisition	Customer Purchase Experience
Operational Efficiency	Customer Ownership Experience
Growth Potential	Customer Service Experience
Human Capital	Brand Equity

About Change Healthcare

Change Healthcare is a leading independent healthcare technology company, focused on insights, innovation and accelerating the transformation of the healthcare system through the power of the Change Healthcare platform. Change Healthcare facilitates over 15 billion transactions and more than one-third of all U.S. healthcare expenditures. The company is a leader in Enterprise Imaging and manages over 41 petabytes of imaging data annually. Their customer base includes approximately 2,400 payer connections, 3,400 imaging facilities, 1,000,000 physicians, 125,000 dentists, 39,000 pharmacies, 6,000 hospitals and 700 laboratories.

Through the years, the software-as-a-service (SaaS) company has earned a sterling reputation supporting healthcare 'organizations' evolving path towards value-based care.

Focused, Dedicated, Innovative Healthcare Technology Company

“Change Healthcare is one of few tech-enabled companies committed to building services specifically for the healthcare industry. More importantly, its customer-centric approach to service and innovation over the last 15 years ensures delivering solutions and not products, advancing patient care cost-effectively, and establishing a renowned reputation for quality along the way.”

- Norma Vela, Best Practices Research Analyst

Change Healthcare has focused on tech-enabled healthcare solutions, an approach it has maintained since its inception. Its guiding light is becoming a ‘true’ healthcare platform for patients and providers to focus solely on clinical care outcomes.

The company created a cloud data ecosystem, leveraging its central data infrastructure developments. It wields data models and, using advanced digital enablers, like machine learning (ML) and natural language processing (NLP), delivers better, smarter, complex workflows at the point-of-care (POC). Through internal developments, targeted acquisitions, and

partnerships, Change Healthcare steadily advances the ecosystem to manage healthcare 'providers' services cost-effectively.

"We [Change Healthcare] anticipate being a true customer-centric healthcare platform company and ecosystem within the next five years that is a leader in democratization of data to improve patient care and organizational outcomes"

- Archie Mayani, Vice President of Enterprise Imaging, Cloud Solutions, Change Healthcare

The company envisions transforming the United States (US) healthcare system with its Intelligent Healthcare Platform™ that assists organizations across the healthcare ecosystem. The Change Healthcare platform incorporates all the company's technical capabilities. Combined with its customer-centric, consultative, solution-based

services, Change Healthcare continuously optimizes 'customers' clinical and operational outcomes through innovative data, analytics, and artificial intelligence (AI)-driven solutions.

Cloud-native Enterprise Medical Imaging: Dawn of an Era

Exponential structured and unstructured data production poses a substantial challenge for data integration, storage, analysis, and interpretation. Frost & Sullivan reported just imaging storage volume requirements in the US alone at over 1 exabyte in 2017.¹

While once the standard, conventional on-premise enterprise imaging solutions are unsustainable in the current era of Big Data. Comprehensive, quality data is crucial and the first step for analytics 'engines' performance, i.e., meaningful, actionable insights for improved clinical and operational workflows and outcomes. Amidst an industry-wide imperative for greater data usability and interoperability, various stakeholders, e.g., healthcare providers (HCPs) and payers, prepare for realignment around cloud-based service models to drive value-based care initiatives.

Frost & Sullivan classifies enterprise imaging as the single-largest growth opportunity in imaging informatics. In 2018, the global enterprise imaging industry was nearly \$934 million, growing at a compound annual growth rate of 11.3% to reach almost \$1.8 billion by 2024. The US market is the largest segment, generating approximately \$428 million in revenues (2018).²

"With advances in cloud technologies, we realized the value of data early on; hence, beginning our journey with customers as co-development partners was a natural selection for us!"

- Archie Mayani

Change Healthcare began as an enterprise imaging company. It ventured into developing cloud solutions several years ago, trying to solve customers' pain points and problems. With managing imaging data identified as the biggest concern, the company set out to alleviate storage, capacity, and cost concerns with advanced products and services.

From Project

Initially, an incubator project, Change Healthcare aligned the planning for its next enterprise imaging solution to the organizational core tenants: drive costs down, reduce complexity, and improve clinical

¹ *Big Data Opportunities in the US Medical Imaging Market* (Frost & Sullivan, April 2015)

² *Global Enterprise Imaging Solutions Market, Forecast to 2024* (Frost & Sullivan, September 2019)

outcomes. Seamless interoperability also proved essential in the planning process. Sensitive to maximizing 'customers' existing investments in vendor-neutral archives (VNAs), the company fastened imaging data access and availability at the POC to support timely and efficient clinical decision-making.

The project molded into a more compelling, yet practical, grandeur vision, thus, ultimately, becoming a strategic corporate initiative. As it forged ahead in the cloud journey, the company's continuous innovation focal points revolved around two questions,

- How do we realize value for customers now? How do we keep adding value as we move forward?

And responding to the directive,

- Is it truly delivering on clinical outcomes?

...To Shaping the Future

By the end of 2019, Change Healthcare partnered with four leading health systems, 124 hospitals with more than 5.6 million imaging studies per year collectively, to accelerate development. The company built its cloud-native Change Healthcare Enterprise Imaging Network™ (EIN), to migrate over 66 million studies to the cloud, with implementation as a fully-managed SaaS solution going live by June 2020.

Nucleus.io's August 2020 acquisition further strengthens the platform, expanding its advanced, fully-enabled, cloud-native imaging and workflow technology portfolio, and extends its network, incorporating more than 7,500 organizations. The acquisition also accelerates Change Healthcare's plans to develop and release a complete end-to-end cloud-native enterprise imaging solution.

Enterprise Imaging Network™: Seamless Cloud Migration

Change Healthcare's EIN is the only major cloud-native, enterprise imaging SaaS fully-managed service offering. The platform allows customers to fully realize the cloud's benefits and strengths, saving the customer time, money, and hassles over lift-and-shift, i.e., lifted from legacy technologies and re-platformed, and on-premise solutions.

Under its cost, complexity, and care core tenants, the company replaced VNA with a cloud-based infrastructure and cloud-native applications. Infinite scalability and nimble and faster deployments enable more cost-effective, customer-tailored, patient-centered intelligent solutions, streamline operational and clinical workflows, and promote enterprise-wide efficiencies, advancing value-based care.

In early July, 2020, Change Healthcare released the EIN Archive and EIN analytics applications, with the EIN Viewer soon to follow (Q1 2021). Within the platform, all EIN solutions are robust, with various well-designed administrative, clinical, and User Interface and Experience (widely known as UI/UX) tools, and Health Information Trust Alliance (HITRUST) Common Security Framework (CSF®)-certified, Service Organization Control 2 (SOC2)-compliant.

EIN Archive, a conduit between the local network and the EIN. Cloud-native, vendor-neutral imaging data management service enables simple, secure, anywhere- anytime access to 'patients' longitudinal imaging records. It currently uses digital imaging and communications in medicine (DICOM)-based

standards, with ongoing efforts to further consolidate with non-DICOM images. The application features an intuitive UI/UX.

EIN Analytics, an intelligent platform built by Change Healthcare. Automated data set generation, company-wide structured and unstructured data organization empower advanced analytics, delivering smart, actionable insights from large, complex, and seemingly unrelated data for patient-centric business decisions. The Chief Information Officer (CIO) can go to Change Healthcare's website and evaluate various enterprise imaging analytics applications, e.g., departmental solutions and capacity and resource management, leveraging the unified data lake. These different datasets provide the whole story for the healthcare system and individual patient. Report options currently comprise radiology and cardiology insights through various packages.

EIN Viewer, a diagnostic-quality viewer for care team coordination and collaboration tool. It grants HCPs, e.g., physicians, clinical specialists, and relevant staff, security-supported access to patient information, images, and reports, any time from any place, for fast, efficient communication. (In development with release Q1 2021)

The EIN Viewer, together with smart workflow advancements (in development), can potentially revolutionize clinical workflows. With a 360-degree patient view, intelligent clinical dashboards can eliminate existing radiology biases, both cognitive and systemic, e.g., preferences associated with patient interactions, expertise level, modality availability, radiologist burnout, or reimbursement levels. AI-driven workflows being developed will remove subjectivity from the equation using algorithms to prioritize the highest value-add functions and critical patients to meet organizational goals, both clinical and administrative. Thus, whether setting annual or monthly goals – what images, which specialist, and when relative to priority, urgency, and severity—radiologists automatically see their next work assignment instead of the worklist, and CIO's monitor performance in a simple one-page-slider indicating the organization score for turnaround times, productivity, and other metrics.

Seamless innovation is perhaps the EIN 'system's greatest value to organizations. Through rapid development and deployment cycles, Change Healthcare is focusing on enhancing patient care, provider efficiencies, and operational outcomes. While Change Healthcare customizes all its solutions, they offer effective out-of-the-box, ready-to-go solutions. The design and features are focused on improving clinician workflows today with exceptional, ready-to-use, smart tools to simplify complex enterprise imaging workflows.

The company's milestone roadmap envisions an intelligent platform and ecosystem beyond radiology and cardiology, i.e., workflow intelligence in niche workflows like digital pathology and nuclear medicine modalities. From the HCPs' perspective, the platform offers a particularly compelling value proposition beyond enterprise imaging, with holistic insights available and an integrated ecosystem forging the path towards precision medicine.

Simplified Complexity: Effortless, Non-disruptive Customer Experience

Change Healthcare addresses core customer concerns around cloud adoption, i.e., patient privacy and security and data sanctity, to improve 'customers' confidence levels. Combined with its industry-leading

“With actionable insights unlocking the power of data and data security best practices, Change Healthcare’s EIN confidently drives health care clinical and operational decision-making processes, tracking organizational goals, hurdles, and functional activities to manage care quality, cost, and performance.”

- Norma Vela, Best Practices Research Analyst

expertise and cutting-edge technologies, such as cloud computing, AI, ML and NLP, it delivers proven enterprise-wide solutions for exceptional customer experience.

Privacy and security compliance validated through key certifications. Protected Health Information (PHI) under the Health Insurance Portability and Accountability Act (HIPAA) compliance supports adherence to the highest regulatory industry standards, such as the HITRUST

CSF®, and SaaS security requirements, i.e., Service Organization Control (SOC) 2.

Zero downtime data migration and upgrades allow ubiquitous imaging data access and availability, especially significant for 'radiologists' and 'CIOs' mission-critical systems. The platform transfers over 500,000 studies per day versus lift-and-shift 'solutions that could take weeks, months, or years. A multi-tenant system, EIN updates are a single event regardless of users.

Change Healthcare conducted five upgrades within six weeks of going live, i.e., 98% upgradability, without impacting clinical services and organizational processes.

Unlimited scalability, elasticity, and availability support on-demand scale-up or -down to satisfy increasing storage requirements. Furthermore, 'EIN's dynamic capabilities adapt to the evolving value-based landscape without interrupting services, contrasting with hosted offerings pre-planning demands, e.g., storage needs and potential downtimes.

Conventional enterprise imaging solutions usually walk a thin line between data access and security. Change 'Healthcare's EIN does not compromise on ensuring their customer’s PHI is protected and HIPAA compliance is adhered to within their cloud solutions. Change Healthcare’s cloud-native solutions is HITRUST CSF® and meets AICPA SOC2 standards giving organization’s confidence in their ability to have the right providers accessing the right patient images at the right time without risk.

Fully-managed Services: Tangible Simplicity

With a subscription-based model, Change 'Healthcare's end-to-end, proactive, and fully-managed services enable customers to implement value-based care and payment programs successfully per the 'organization's needs.

A cost-effective alternative to conventional on-premise and lift-and-shift models, SaaS enables the company to take over functional data management activities. Thus, Change Healthcare eliminates typical administration and management demands, such as IT capacity planning to flag potential overage, security maintenance, resources, and upgrades, resulting in substantial total cost of ownership (TCO) reductions.

Conservative total cost of ownership estimates from existing customers show 20% reductions, astounding preliminary results given 'EIN's early developmental stages, and launching just a few months ago. Currently, the company facilitates as many service lines as affordable. While tracking three lines to date, Change Healthcare has a higher and loftier goal moving forward.

Zero Trust Security: Protects Patient and Mitigates Data Management Risks

Change Healthcare learned through early adopters to prioritize security compliance standards to enhance cloud services customer confidence. Thus, the company has an agile deployment methodology, working alongside customers to understand their cybersecurity needs, identify vulnerabilities and challenges, and develop a customized solution with strict access controls not trusting anyone by default.

So far, Change Healthcare's Zero Trust deployment approach has been extremely successful, extending its customer base from smaller and mid-size hospitals in the beginning to large integrated delivery networks, or IDNs. Despite all having different storage vendors, VNA/EMR applications, and numerous multi-tenant requirements, the company can provide a 360-degree organizational view, yet, still localize it to individual 'sites' needs.

Future-proof Enterprise Imaging

Change Healthcare scales the power of data to meet every potential organizational need. For instance, while the COVID-19 pandemic struck the world lightning-fast and furious with devastating consequences, its EIN Analytics solution, part of the basic package, proved extremely valuable for healthcare organizations in anticipating COVID-19 surges.

“We did not plan for a pandemic to happen but find comfort that our customers have products like EIN Analytics that can help reduce the burden and get the organization ahead of the curve. Some of our customers have discovered novel ways to leverage EIN Analytics application to deal with COVID-19 surges. They are extremely satisfied, projecting bed capacity and the resources needed based on its predictive modeling.”

- Archie Mayani

The company has multiple analytics packages, i.e., Core, included in subscription, and Premium and Premium+ and is currently working on predicting coronavirus case volumes to help providers plan for capacity, particularly crucial as the impending second peak hits the US.

Promising Outlook for 2020 and Beyond

Before the coronavirus pandemic's sudden global strike, cloud-based enterprise imaging was an upcoming technology for transitioning to value-based care

successfully. Today, digital solutions are a top priority for all healthcare stakeholders. These converging technologies are critical to extending access to high-quality, affordable, contactless care, leapfrogging cloud technology adoption, i.e., a 5 to 10-year jump forward in one year.

Remarkably, Change Healthcare is currently in conversations with huge US government customers, notoriously inflexible, and conservative in data compliance. Pre-pandemic, customer presentations revolved around EIN adoption and non-mission-critical applications, e.g., teaching workflows. Today, customer conversations focus on rapid, enterprise-wide deployment. Indeed, third-party certification factors in driving acquisition. However, the 'company's credibility and reputation in the healthcare sector and long-standing, trustworthy customer relationships are ultimately spurring EIN's adoption.

Conclusion

Cloud-based informatics is becoming the cornerstone for cost-effective, quality care. Until recently, technology adoption remained elusive despite huge progress, mostly because of security and data sanctity concerns. The COVID-19 pandemic became an unexpected catalyst for adoption as healthcare organizations increasingly demand data and imaging accessibility while limiting the risk of COVID-19 exposure to patients and healthcare providers.

Current enterprise imaging solutions extend connectivity and interoperability beyond radiology and cardiology. However, these systems often remain quite difficult to use and share within and across healthcare enterprises, e.g., transferring digital imaging and communications in medicine (DICOM) data between solutions or integrating with electronic medical records and other non-DICOM systems. In turn, siloed data with limited content and context renders suboptimal information for an evidence-based decision-making framework, essential for a real value-driven care model.

Change Healthcare's cloud-native Enterprise Imaging Network™ (EIN) empowers outcomes-focused, sustainable healthcare, helping healthcare providers drive a cost-conscious, quality-demanding volume-to-value-transformation. The cloud-native, enterprise imaging software-as-a-service (SaaS) platform, fully-managed service offering delivers customers a solution, not a product, to advance patient care cost-effectively.

The company's industry-wide recognition as a health technology specialist dissipates customer weariness in working with cloud technologies, and adherence to the highest regulatory industry standards enhances customers' confidence levels. Change Healthcare's customer-centric approach to service and innovation provides cost-effective, customer-tailored, patient-centered intelligent solutions. Combined with infinite scalability and nimble and faster deployments, EIN simplifies operational and clinical workflows and promotes enterprise-wide efficiencies, saving the customer time, money, and resources.

With its strong overall performance, Change Healthcare has earned Frost & Sullivan's 2020 North America Customer Value Leadership Award.

What You Need to Know about the Customer Value Leadership Recognition

Frost & Sullivan's Customer Value Leadership Award recognizes the company that offers products or services customers find superior for the overall price, performance, and quality.

Best Practices Award Analysis

For the Customer Value Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Business Impact

Financial Performance: Strong overall financial performance is achieved in terms of revenues, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

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)**

