FROST & SULLIVAN

BEST PRACTICES AWARDS

XIFIN®

2019 GLOBAL PRECISION MEDICINE INFORMATICS ENABLING TECHNOLOGY LEADERSHIP AWARD

Contents

Background and Company Performance

Industry Challenges

In today's healthcare industry, patient-related data is generated at every encounter. From the moment a patient is registered within the healthcare ecosystem by personnel, data points are produced at each touch point, such as test results screening, confirmatory testing, treatment planning, and treatment monitoring.

As the healthcare delivery paradigm shifts, precision medicine programs are being crafted to reduce adverse events and provide better outcomes based on individual patient characteristics, all at a lower cost. A major challenge to the efficient delivery of precision medicine is that patient data often reside in multiple data systems. Such difficulties are only expected to increase with the availability of more and more patient data, which is currently estimated to be growing at a rate of 48% per year.[1]

Precision medicine is especially promising in the future treatment of cancer. Yet beyond human expertise, true integration of precision oncology into mainstream medicine requires investments to incorporate patients' test results into electronic medical records for informing their care roadmap. While this is just a part of the process, a truly integrated environment shielded by a technology enabler is required to mine data from different sources and render it in a meaningful format.

Addressing Data Silos

Conducting different types of tests to rule out a disease can lead to several touch points within various laboratory departments. For example, a clinical diagnosis, monitoring, and treatment course for an breast oncology case may require a combination of blood test results (esoteric lab testing), imaging test results (radiology department), and biopsy test results (pathology testing lab). This is a classic case where several sub-specialties are involved. Integrating all the data sets creates a rich profile of the patient's journey.

Need for Unified View of Clinical and Financial Information

In today's healthcare ecosystem where interoperability is still a concern, completely integrated data sets are hard to find. In addition to receiving a unified view, the healthcare space lacks integration of financial data into the existing diagnostic /clinical data set, which if integrated can add value—from tracking metrics compliance to tracking utilization of tests and payor requirements—thus effectively demonstrating the full clinical utility of tests.

Relying on Functionality of LIS, EHR, and Too Many Stand-alone IT Systems such as PACS

Laboratory information systems (LIS) and electronic health records (EHR) offer only 40% of the functionality associated with traceability of a sample, from the time of sample accessioning and result reporting via EHR systems. A whole layer of an IT system is

[1] *The Digital Universe: Driving Data Growth in Healthcare [online]. Hopkinton, Mass: EMC Dell, 2014. Available at: www.emc.com/analyst-report/digital-universe-healthcare-vertical-report-ar.pdf. Accessed January 21, 2019.*

required to tap into the intelligence of LIS and EHR beyond what can be observed from these portals today.

There are massive amounts of data stuck in silos, information that could help with creating RWE (real-world evidence) to understand patient cohorts, and subsequently precision medicine at a higher level. Frost & Sullivan interviews with bioinformaticians and IT lab personnel from various health organizations indicate that it is common practice to use separate systems or ad hoc plug-and-play third-party solutions for case management, real-time communication for team collaboration, claims and reimbursement analysis, clinical decision support capability, quality reporting capabilities, and as tools to refer patients to certified counselors.

Ultimately, sophisticated analytics and visualization tools are urgently needed to help tap into vital metrics from varied health data management IT solutions. An interoperable enabler is the need of the hour to establish a precision medicine ecosystem and to analyze some of the important metrics, such as clinical analytics, diagnostic claims, and financial data.

Technology Leverage and Customer Impact

Commitment to Innovation

Delivering precision medicine involves leveraging a combination of multiple data sets rendered in a meaningful way so different healthcare system stakeholders can digest harmonized information in the most accurate way.

The health IT company XIFIN has been providing healthcare data management solutions for over 20 years and is well reputed as a true enabler of technology that has helped customers identify missing data sets, analyze and decode the data, and render it in a format in which care providers and other health stakeholders can access it to inform meaningful decisions.

In January, XIFIN made its debut into the precision medicine informatics market with the launch of VisualStrata. The objective of this platform is to provide informatics that link up diagnostic, clinical, and financial data to support value-based care initiatives. The platform is able to collate structured and un-structured data sets for a single patient and provide deep insights into disease treatment to drive personalized decisions. The benefits of adopting VisualStrata extend to non-clinical duties, such as improving organizational metrics including clinical initiatives, efficiency programs, physician engagement, and population health efforts.

Four core functionalities of the VisualStrata software solution address the requirements of precision medicine programs, as outlined below.

1. **Record and Case Management**: The tool helps with curating patient biomarker data, whether imaging or diagnostic, into a unified system. Given the interoperable nature of the solution, VisualStrata is able to connect with a wide variety of EHR systems to offer a seamless view into continuity of care for each case.

2. **Communication and Collaboration**: At XIFIN, communication is the key to offering successful and confident diagnosis for complex cases as there is heavy interdependence on imaging, genomic, and other diagnostic modalities, which requires a collaborative approach to solve complex cases that need immediate attention. VisualStrata's collaboration dashboard aids virtual multidisciplinary team conferencing and coordination between healthcare teams and institutions. This feature has resulted in reduced turnaround time for physician diagnosis.

3. **Health Quality Reporting**: As cost of healthcare increases, it becomes necessary to justify the cost of a diagnostic test, treatment, or prescribed diagnostic pathway. The pressure to demonstrate outcome-based methodologies will continue to increase as the burden on healthcare expenditure rises. With the help of VisualStrata's analytics, it is possible to correlate cost of treatment with patient outcomes.

4. **Generate Real-world Evidence**: VisualStrata is able to provide intelligent analytics from several sources including pathology, radiology, genomics with treatment, and clinical notes. A combination of the clinical side coupled with financial data allows for real-world evidence that can lead to new treatment insights for individual patients.

Frost & Sullivan analysis of XIFIN's precision medicine informatics platform VisualStrata reveals that the software solution adds a whole different layer of analytics that is crucial to mining information from various touch points across the healthcare ecosystem. Without this IT enabler, the information would still be trapped in silos, which otherwise could yield a wealth of knowledge.

Commitment to Creativity and Application Diversity

VisualStrata technology is unique because rarely do systems have the capability to digest multiple types of data such as image files, diagnostic test reports, notes from conferences, and information from numerous other sources. The knowledge engineering framework used to construct VisualStrata incorporates technologies that can manage images and text from multiple modalities and specialties across the healthcare system, such as radiology (DICOM) and pathology (text based). The multidisciplinary collaboration, case review patient monitoring, and treatment planning functionalities are built into this framework. By tapping data from multi-nodal points, the solution has extended its range of application diversity to demonstrate the ability to pull data sets from imaging (PACS), EHR systems, LIS/APLIS, billing, and coding to give a unified picture at an organizational level.

The power of annotation enables indexing of non-destructive labels and facilitates intelligent searches to derive meaning from disparate data sets. VisualStrata employs semantic ontological frameworks to promote interoperability, sharing, and reusability of data assets. Designed to be a vendor-neutral and device-agnostic IT platform, this software-as-a-service (SaaS)-based, HL7-fast healthcare interoperability resources (FHIR)-compliant platform will always run on the latest versions without having to deal with maintenance or costly, time-consuming software updates.

Frost & Sullivan analysis confirms that given the product features and the way VisualStrata can help assist physicians, payors, diagnostic service providers, CROs, cancer centers, and other stakeholders, XIFIN is a true technology enabler that empowers customers to stratify data in a meaningful way and address organizational issues to a large extent. By giving stakeholders the ability to visualize different metrics that are of importance to them, VisualStrata has distinguished itself from other healthcare data management providers by addressing critical challenges by which each stakeholder is often measured.

Commercialization Success

As a true technology enabler, the benefits of VisualStrata can be reaped most by diagnostic testing providers, payors, as well as cancer care practices. The cloud-based solution is meant to deliver rich organized data sets to these three important stakeholders in the healthcare system. Since its launch in January 2019, customers have already vouched for the success of this precision medicine informatics platform. Health systems that have implemented VisualStrata immediately sensed its benefits and they have reported reduced time to diagnosis due to the collaborative approach. Notable customers include Intermountain Primary Children's Medical Center, Penn State Hershey Children's Hospital, University of Utah Health Sciences, and Midwest Regional Children's Advocacy Centers.

Delivering Goals that Matter

Without establishing measurable, value-creating goals, healthcare companies often risk huge amounts of expenditure on software solutions they hope will meet the objectives of precision medicine programs. In fact, healthcare stakeholders are seen investing in stand-alone solutions to address parts of the bigger puzzle, that is, a precision medicine program. XIFIN has carefully understood the metrics that matter the most to its customers against which they are often compared within their peer network, such as the following.

Cancer Care Centers: Cancer care centers place high value on patient outcomes, patient safety, and treatment quality. Adopting VisualStrata within a cancer care center can help improve performance and tackle reimbursement issues using real-time reporting and quality measures. Further, it is possible to obtain insights into best practices by mining data for similar patient cohorts. Eventually, the software solution helps with creating a rich patient data registry. By carefully understanding the value-added points, XIFIN is effectively able to address important parameters that play a crucial role in process optimization. During the course of Frost & Sullivan best practices analysis, it became clearly evident that XIFIN has carefully understood the parameters of high importance to end users.

Payors: Payors are always interested in parameters such as patient outcomes, cost savings, reimbursement, regulatory compliance, and legal requirements. XIFIN's VisualStrata helps develop an evidence-based registry that can prove highly beneficial to payors as the industry moves towards value-based care. Further, the tool helps in streamlining claims processing with tests that are pre-approved.

Diagnostic Testing Service Providers: Diagnostic service providers place high importance on revenue generation and hence reimbursement, claims processing, regulatory compliance, financial sustainability, operational efficiency, data privacy, and security. XIFIN

offers RCM (revenue cycle management) and LIS solutions, which when coupled with VisualStrata can offer benefits to streamline reimbursement appeals and to develop real-world evidence to establish clinical utility and cost savings on a new or existing diagnostic test.

Frost & Sullivan finds that by effectively catering to the parameters of high importance to its stakeholders, XIFIN's solution is a true value generator for the precision medicine community. A precision medicine informatics program is the key to establishing a successful ecosystem and serves to help identify pitfalls, in turn increasing the efficiency of precision medicine oncology programs for several hospitals. Incorporating this platform can help establish an industry best practice standard for several health systems and clearly define the success of a program.

Conclusion

XIFIN is committed to envisioning the future of healthcare in terms of trends impacting the laboratory diagnostics industry. By offering innovative solutions, such as its informatics VisualStrata platform, to address healthcare industry challenges like mitigating reimbursement issues, improving operational efficiency, and demonstrating clinical utility for new/existing diagnostic tests, the company has created an uncontested market space within the precision medicine informatics industry. Frost & Sullivan endorses XIFIN for championing business transformation and for constantly creating disruptive solutions to boost its organic growth in the health data management tools market.

XIFIN has earned Frost & Sullivan's 2019 Enabling Technology Leadership Award in recognition of its strategic thought leadership, innovation, and performance exhibited in the precision medicine informatics industry.

Significance of Enabling Technology Leadership

Ultimately, growth in any organization depends on customers purchasing from a company and then making the decision to return time and again. In a sense, then, everything is truly about the customer. Making customers happy is the cornerstone of any successful, long-term growth strategy. To achieve these goals through enabling technology leadership, an organization must be best in class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.

Understanding Enabling Technology Leadership

Product quality (driven by innovative technology) is the foundation of delivering customer value. When complemented by an equally rigorous focus on the customer, companies can begin to differentiate themselves from the competition. From awareness, to consideration, to purchase, to follow-up support, organizations that demonstrate best practices deliver a unique and enjoyable experience that gives customers confidence in the company, its products, and its integrity.

Key Benchmarking Criteria

For the Enabling Technology Leadership Award, Frost & Sullivan analysts independently evaluated Technology Leverage and Customer Impact according to the criteria identified below.

Technology Leverage

Criterion 1: Commitment to Innovation
Criterion 2: Commitment to Creativity
Criterion 3: Stage Gate Efficiency
Criterion 4: Commercialization Success
Criterion 5: Application Diversity

Customer Impact

Criterion 1: Price/Performance Value
Criterion 2: Customer Purchase Experience
Criterion 3: Customer Ownership Experience
Criterion 4: Customer Service Experience
Criterion 5: Brand Equity

Technology Leverage

Criterion 1: Commitment to Innovation

Requirement: Conscious, ongoing adoption of emerging technologies that enable new product development and enhance product performance.

Criterion 2: Commitment to Creativity

Requirement: Technology leveraged to push the limits of form and function in the pursuit of white space innovation.

Criterion 3: Stage Gate Efficiency

Requirement: Adoption of technology to enhance the stage gate process for launching new products and solutions.

Criterion 4: Commercialization Success

Requirement: A proven track record of taking new technologies to market with a high rate of success.

Criterion 5: Application Diversity

Requirement: The development and/or integration of technologies that serve multiple applications and can be embraced in multiple environments.

Customer Impact

Criterion 1: Price/Performance Value

Requirement: Products or services offer the best value for the price, compared to similar offerings in the market.

Criterion 2: Customer Purchase Experience

Requirement: Customers feel they are buying the optimal solution that addresses both their unique needs and their unique constraints.

Criterion 3: Customer Ownership Experience

Requirement: Customers are proud to own the company's product or service and have a positive experience throughout the life of the product or service.

Criterion 4: Customer Service Experience

Requirement: Customer service is accessible, fast, stress-free, and of high quality.

Criterion 5: Brand Equity

Requirement: Customers have a positive view of the brand and exhibit high brand loyalty.

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate award candidates and assess their fit with select best practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP		OBJECTIVE	KEY ACTIVITIES	OUTPUT
1	**Monitor, target, and screen**	Identify award recipient candidates from around the world	• Conduct in-depth industry research • Identify emerging industries • Scan multiple regions	Pipeline of candidates that potentially meet all best practices criteria
2	**Perform 360-degree research**	Perform comprehensive, 360-degree research on all candidates in the pipeline	• Interview thought leaders and industry practitioners • Assess candidates' fit with best practices criteria • Rank all candidates	Matrix positioning of all candidates' performance relative to one another
3	**Invite thought leadership in best practices**	Perform in-depth examination of all candidates	• Confirm best practices criteria • Examine eligibility of all candidates • Identify any information gaps	Detailed profiles of all ranked candidates
4	**Initiate research director review**	Conduct an unbiased evaluation of all candidate profiles	• Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles	Final prioritization of all eligible candidates and companion best practices positioning paper
5	**Assemble panel of industry experts**	Present findings to an expert panel of industry thought leaders	• Share findings • Strengthen cases for candidate eligibility • Prioritize candidates	Refined list of prioritized award candidates
6	**Conduct global industry review**	Build consensus on award candidates' eligibility	• Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates	Final list of eligible award candidates, representing success stories worldwide
7	**Perform quality check**	Develop official award consideration materials	• Perform final performance benchmarking activities • Write nominations • Perform quality review	High-quality, accurate, and creative presentation of nominees' successes
8	**Reconnect with panel of industry experts**	Finalize the selection of the best practices award recipient	• Review analysis with panel • Build consensus • Select recipient	Decision on which company performs best against all best practices criteria
9	**Communicate recognition**	Inform award recipient of recognition	• Inspire the organization for continued success • Celebrate the recipient's performance	Announcement of award and plan for how recipient can use the award to enhance the brand
10	**Take strategic action**	Upon licensing, company is able to share award news with stakeholders and customers	• Coordinate media outreach • Design a marketing plan • Assess award's role in strategic planning	Widespread awareness of recipient's award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practices models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit http://www.frost.com.