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Dr CADx

2017 Sub-Saharan African AI Medical Imaging Visionary Innovation Leadership Award

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2017 BEST PRACTICES AWARD

**SUB-SAHARAN AFRICAN AI MEDICAL IMAGING
VISIONARY INNOVATION LEADERSHIP AWARD**

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Industry Challenges

Radiology is different to other medical specialities, in that it depends entirely on visual perception and identifying specific characteristics on a radiograph. It is one of the specialities most liable to a medical negligence claim, with the most common complaint against a radiologist being the failure to diagnose correctly.

Observations are often interpreted on the basis of a single hypothesis, leading to bias in the early diagnostic stages. According to multiple studies, radiologists misinterpret approximately 3% to 5% of randomly selected cases and 30% of cases with positive findings.

Artificial intelligence (AI) can, however, address the error rates by applying pattern recognition to medical images and learning over time through machine learning, thereby improving diagnostic rates.

In Sub-Saharan Africa (SSA), the lack of radiologists is a huge concern, because an expert diagnosis is in short supply. AI systems are scalable and can bring expert knowledge to regions that need it the most.

Focus on the Future and Best Practices Implementation of Dr CADx

Focus on Unmet Needs

Dr CADx is a medical technology company based in Zimbabwe. The company develops revolutionary technology that can diagnose diseases and illnesses from medical images such as X-rays, ultrasounds, computerized tomography (CT) scan and magnetic resonance images (MRIs) through AI. This innovation is necessary to improve waiting times for diagnosis, eliminate misdiagnoses, and ultimately improve health outcomes for patients.

With radiology expertise in short supply, Dr CADx brings much-needed relief. For example, there are only 15 radiologists in the whole of Zimbabwe, 14 of which are in the capital, Harare. The release of Dr CADx will vastly improve the reach of expert care to the larger population.

Even where radiologists are available, their diagnoses are not always 100% accurate, as complex medical presentations are easily misdiagnosed due to human error. Dr CADx addresses this issue through its machine learning algorithms, which have been tested on a wide database of verified images, and to improve identification of ailments with each new case.

Technological Sophistication

Dr CADx's technology comprises of an artificial neural network that recognises images from a database of labelled images previously diagnosed by experts. The AI learns features and starts to recognise patterns in the data. Over time, the feedback mechanisms of machine learning improve the success rate of diagnosis, and therefore, the AI will become more accurate.

The cloud-based computer system is easily scalable, enabling multiple hospital

departments across countries to access the technology. It is also, therefore, lower in cost than a radiologist.

Vision Alignment and Commitment to Quality

Dr CADx comprises of a small team of developers in Zimbabwe, who have a passion for telehealth and commit to developing cutting edge software. Founder and CEO, Gift Gana, has the vision to transform healthcare delivery in developing countries and underserved regions.

Dr CADx conducts rigorous scientific testing and plans to start clinical trials to achieve United States (US) Food & Drug Administration clearance. The product is currently being prototype-tested and will be released commercially within 18 months. Dr CADx is hyper-compliant and committed to best practice guidelines on healthcare technology issued from the United States, such as stringent security measures and privacy controls. By making it a world-class technology, Dr CADx will have better prospects to be used anywhere in the world.

Visionary Scenarios through Mega Trends

Frost & Sullivan defines Mega Trends as global macroeconomic development forces as well as technological and social sustainable trends that will have far reaching impacts on businesses, societies, and the world across multiple industries in the next 10 to 15 years. Dr CADx aligns itself with a number of Mega Trends to provide enhanced value to future customers and take a leading position in the market. In particular, it embraces the move towards the Cognitive Era, where future business will centre on AI. The industry's approach to AI moved away from developing merely intelligent devices. Technology companies and researchers across the world now set an ambitious goal of developing AI solutions that are not just intelligent in terms of making decisions but can also learn from data like humans do. This approach is driving companies to innovate both machine learning and computing algorithms to develop solutions that resemble the human brain. Dr CADx's diagnostic algorithm illustrates precisely how effective AI is in the medical field.

By embracing the Mega Trend of connected health, which predicts the digitisation of healthcare and the rise in telemedicine, Dr CADx demonstrates its readiness for the future and continues to capitalise on the growth of this fast-changing industry.

Leveraging Market Readiness for Future Growth

Dr CADx is set to enter the market at the right time, as the market is extremely receptive to digitisation and diagnosis via AI. The healthcare market has taken many years to embrace the move away from physical to digital, but it is ready to receive cutting edge technology. Dr CADx aims to target the following markets: Zimbabwe, South Africa, and Nigeria initially, followed by the US and the United Kingdom, once achieving regulatory approval.

Dr CADx's strategy for growth is to partner with medical equipment distributors to leverage existing networks enabling it to sell and distribute its technology. Another astute strategy enabling the access of hospital images, which is vital to train the AI adequately, is to offer hospitals a reward in exchange for the access to the medical database. The

reward for being early adopters is access to Dr CADx technology at a lower usage cost. The benefit to Dr CADx is a larger database of verified and diagnosed medical images, and therefore, better trained AI, whilst the benefit to the hospitals is more affordable technology and improved diagnoses.

Conclusion

Dr CADx is an up-and-coming technology provider solving some of the most pressing problems in the field of radiology, through the use of artificial intelligence (AI). The machine-learning algorithms can improve diagnoses over time, reducing the error rate in radiology and improving patient health outcomes. Dr CADx is lower in cost and reaches more people than traditional radiologists, and can transform healthcare delivery in developing and developed nations.

With its strong overall performance, Dr CADx earns Frost & Sullivan's 2017 Visionary Innovation Leadership Award for AI medical imaging.

Significance of Visionary Innovation Leadership

A Visionary Innovation Leadership position enables a market participant to deliver highly competitive products and solutions that transform the way individuals and businesses perform their daily activities. Such products and solutions set new, long-lasting trends in how technologies are deployed and consumed by businesses and end users. Most important, they deliver unique and differentiated benefits that can greatly improve business performance as well as individuals' work and personal lives. These improvements are measured by customer demand, brand strength, and competitive positioning.

- Stimulate interest
- Anticipate changing needs
- Respond to emerging needs
- Increase share of wallet
- Build long-term relationships

- Inspire customers
- Establish long-term relevance
- Occupy an uncontested space
- Improve equity
- Build a reputation for innovation

DEMAND

BRAND

Visionary Innovation Leadership

COMPETITIVE POSITIONING

- Clarify superior positioning
- Deliver superior value to customers
- Lead through innovation
- Differentiate from the competition
- Take market share

Understanding Visionary Innovation Leadership

Visionary Innovation is the ability to innovate today in the light of perceived changes and opportunities that will arise from Mega Trends in the future. It is the ability to scout and detect unmet (and as yet undefined) needs and proactively address them with disruptive solutions that cater to new and unique customers, lifestyles, technologies, and markets. At the heart of visionary innovation is a deep understanding of the implications and global ramifications of Mega Trends, leading to correct identification and ultimate capture of niche and white-space market opportunities in the future.

Key Benchmarking Criteria

For the Visionary Innovation Leadership Award, Frost & Sullivan analysts independently evaluated two key factors—Focus on the Future and Best Practices Implementation—according to the criteria identified below.

Focus on the Future

Criterion 1: Focus on Unmet Needs
Criterion 2: Visionary Scenarios through Mega Trends
Criterion 3: Growth Pipeline
Criterion 4: Blue Ocean Strategy
Criterion 5: Growth Performance

Best Practices Implementation

Criterion 1: Vision Alignment
Criterion 2: Process Design
Criterion 3: Operational Efficiency
Criterion 4: Technological Sophistication
Criterion 5: Company Culture

Focus on the Future

Criterion 1: Focus on Unmet Needs

Requirement: Implementing a robust process to continuously unearth customers' unmet or under-served needs, and creating the products or solutions to address them effectively

Criterion 2: Visionary Scenarios through Mega Trends

Requirement: Incorporating long-range, macro-level scenarios into the innovation strategy, thereby enabling "first-to-market" growth opportunity solutions

Criterion 3: Growth Pipeline

Requirement: Best-in-class process to continuously identify and prioritize future growth opportunities leveraging both internal and external sources

Criterion 4: Blue Ocean Strategy

Requirement: Strategic focus on creating a leadership position in a potentially "uncontested" market space, manifested by stiff barriers to entry for competitors

Criterion 5: Growth Performance

Requirement: Growth success linked tangibly to new growth opportunities identified though visionary innovation

Best Practices Implementation

Criterion 1: Vision Alignment

Requirement: The executive team is aligned along the organization's mission, vision, strategy, and execution.

Criterion 2: Process Design

Requirement: Processes support the efficient and consistent implementation of tactics designed to implement the strategy.

Criterion 3: Operational Efficiency

Requirement: Staff performs assigned tactics seamlessly, quickly, and to a high-quality standard.

Criterion 4: Technological Sophistication

Requirements: Systems enable companywide transparency, communication, and efficiency.

Criterion 5: Company Culture

Requirement: The executive team sets the standard for commitment to customers, quality, and staff, which translates directly into front-line performance excellence.

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

Frost & Sullivan Awards follow a 10-step process to evaluate Award candidates and assess their fit with select best practice 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 globe	• Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies	Pipeline of candidates who potentially meet all best-practice 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-practice 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-practice 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-practice 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-practice Award recipient	• Review analysis with panel • Build consensus • Select recipient	Decision on which company performs best against all best-practice criteria
9	Communicate recognition	Inform Award recipient of Award recognition	• Present Award to the CEO • 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 future 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 our 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, leading to 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 players 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, enables clients to 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 practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages more than 50 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on six continents. To join our Growth Partnership, please visit http://www.frost.com.