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ASIA EDITION

Ã¢â?¬Å?AI's superior speed & learning capability make it a natural fit for healthcare tasks demanding precision & early detectionÃ¢â?¬Â•

February 1, 2024 | Opinion | By Ayesha Siddiqui

Vietnam's VinBrain is developing AI solutions for healthcare and has developed more than 300 AI models specifically designed for processing medical images. DrAid, its groundbreaking intelligent AI platform, is positioned as the 'right-hand' assistant for healthcare professionals to enhance productivity and reduce patient care costs. Steven Quoc Hung Truong, Founder and CEO of VinBrain shares key insights into the company, its challenges, and ethical and regulatory considerations.



How did VinBrain come into existence?

After 26 years abroad, spending 13 years as the Director of Engineering and AI Innovation at Microsoft in the United States, I returned to Vietnam. my homeland, in 2019. The founding of VinBrain can be traced back to a series of coincidental events that occurred at that time, nearly five years ago.

Witnessing my mother's stroke firsthand on one back-home occasion made me acutely aware of healthcare challenges in Vietnam. Leaving my 13-year leadership at Microsoft, I answered Vietnam's billionaire, Chair of Vingroup, Pham Nhat Vuong's call to build a global tech alliance with Vietnamese talents, fueled by ‘forever the entrepreneurship spirit’. Consequently, the firm determination of 18 like-minded talents beside me, who bred the seed of VinBrain in 2019, led us on a mission to alleviate patient suffering and relieve the overburdened healthcare workforce through advanced AI technologies.

We aspired to build a health tech company where the core technology was developed by Vietnamese talents, breaking away from the conventional practice of importing solutions from overseas. ‘Infuse AI and IoT to improve people's lives and productivity’ is the company's mission to streamline all its efforts and activities and enable diagnostic radiology and digital healthcare transformation to accelerate to the next level of excellence.

What are the key technological advancements that have propelled VinBrain's position as a leader in AI solutions for healthcare?

DrAid, an intelligent AI platform, is considered our breakthrough in the realm of health tech particularly and AI generally. VinBrain's flagship DrAid, powered by secure AI platform Azure and Azure OpenAI, leverages Microsoft's cutting-edge AI, including Generative AI and ChatGPT-4, to become the 'right-hand' assistant for healthcare professionals to improve their productivity and patient care cost. Another notable offering by VinBrain is our pride and pioneer in HealthTech is the 'ChatGPT for Healthcare' virtual assistant, DrAid Copilot. This AI companion, at the heart of the DrAid platform, aids physicians in diagnosis, treatment, and managing their growing workload.

Talking about our key technological advancement, it is impossible not to mention our synchronised and comprehensive AI infrastructure, which was built from the very beginning of our establishment.

We have trained our AI models which include medical images, intelligent video analytics, automatic speech recognition, natural language processing and text-to-speech — using NVIDIA DGX SuperPOD.

Our team is also using software from NVIDIA AI Enterprise, an end-to-end solution for AI production, which includes the NVIDIA Clara platform, the MONAI open-source framework for medical imaging development and the NVIDIA NeMo conversational AI toolkit for its transcription model.

How has VinBrain's technology impacted the overall healthcare ecosystem, both in terms of patient care and operational efficiency?

VinBrain's AI technology fuels both radiology and hospital management. In the realm of AI for radiology, VinBrain offers a wide range of product lines such as DrAid Comprehensive Screening, DrAid Oncology Diagnosis and Treatment, and DrAid Social Impacts Diseases Screening. These AI-powered diagnostic radiology solutions assist doctors to increase substantially the accuracy of anomaly detection while avoiding misdiagnosis and overdiagnosis by chance. As the cream of the crop, this CAD (computer-aid diagnosis) software outweighs in helping oncologists with liver cancer, and rectal cancer diagnosis and treatment, 2 of the top dangerous and intricate cancers. Another exceptional product line plays a vital role in scaling community screening programmes for infectious diseases like tuberculosis in the lung in 2X strategy (Chest X-rays, GeneXpert MTB/RIF tests).

In summary, VinBrain technology focuses on AI-centric solutions to significantly enhance patient care to save more lives and forward doctors toward precision care.

On the healthcare operation side, VinBrain provides intelligent, data-driven, and comprehensive solutions for hospital managers called DrAid Enterprise Data Solution. This indispensable tool benefits not only operators but doctors, medical experts, and patients.

Impact on the Environment (E): It brings comprehensive digitisation of the Diagnostic Imaging industry in Vietnam with more than 150,000 images digitised each month at 100+ Vietnamese hospitals. Thereby, minimising medical waste in the environment.

Impact on Society (S): It reduces the overload of doctors, eliminates repetitive tasks that require less empathy, improves accuracy, supports doctors for better decision-making in examining the toughest cancer - 24/7, bringing sustainable benefits to society, creating smart hospitals, putting patient interests as the best practices.

Impact on Governance (G): It interoperates data among different divisions for Fast retrieval, and lifetime storage on a secured cloud. It converts huge volumes of data produced within the hospitals into knowledge systems for accurate decisions, well data-based for smarter governance.

Can you discuss any significant challenges VinBrain has encountered in developing and deploying AI solutions in healthcare, and how these challenges were overcome?

VinBrain was established just six months before the COVID-19 outbreak, but we quickly adapted to the pandemic by developing DrAid, a tool that screens and detects the virus. It won the Asian Digital Awards and received merit from the

Ministry of Health, Vietnam for innovative software that secured society amid the toughest time.

Despite the challenges of developing AI for healthcare, including the need for top talents in computer science and substantial operational costs, VinBrain has successfully navigated these obstacles in quite a speedy way. It's a fact that building and deploying core tech like AI for healthcare demands top talent across computer vision, NLP, engineering, and operations. They must have unwavering passion for this complex field, as we're pioneering uncharted territory. We are lucky to have the talented people who formerly worked abroad for top giant corporations like Microsoft, Amazon, and Samsung gather and become our core team.

In terms of developing and deploying core tech, especially AI for healthcare, it requires us to own only the top computer science talents throughout explainable AI, computer vision, natural language process, engineers, and operators, with consistent passion for a very complex domain like healthcare, because we are the trailblazers to explore very unprecedented field. It accounts for up to 70 per cent of operational fees. The required investment for an AI infrastructure platform is another concern with top trusted security standards and capabilities, and the seamless operation from time to time.

Additionally, we have partnerships with leading research institutes and universities like Stanford, Harvard, UCSD (University of SanDiego California), and Toronto, sharing the same vision 'knowledge for lives' and the motto 'give first' that bonds us to create impactful AI for social good together. These collaborations, along with the use of trusted platforms like NVIDIA and Microsoft, have enabled them to overcome the technical hurdles.

Data is a pivotal matter when it comes to training artificial intelligence models. But we have solved that by a big and high-quality representative dataset originating from local (Vietnam – 3.5 million data points), and other nationalities: US, India, China, and Europe.

In the medical field, especially in diagnostic radiology and oncology, it is crucial to quickly acquire extensive medical knowledge, comprehend doctors' daily pain points, and understand radiologists' workflows. To achieve this, we collaborate closely with doctors and medical experts from Vietnam and the US during the annotation stage. We were fortunate to have the support of radiologists, physicians, and professionals from specialised hospitals like the National Cancer Hospital in Vietnam and top general hospitals such as UMC, Vinmec, 108 Military Central Hospital, and Hue Central Hospital. They assisted in validation and research consultations, ensuring a comprehensive platform for our users. Additionally, we have collaborated with physicians from Stanford University and the University of San Diego California to develop our products further.

In the realm of HealthTech, we also encounter common concerns like any other AI company worldwide. These include the fear of AI replacing doctors, issues with ethics, security, legal regulations, and implementing interoperability within hospitals. Essentially, AI is an innovative technology, and we continue to persuade the market by offering high-quality products. Over 2000 doctors who work with us are satisfied and feel optimistic about their new "right-hand" assistant.

With deployments in various countries, what strategies has VinBrain employed to tailor its products to different healthcare systems and regulatory environments?

VinBrain has strategically focused on several key principles to ensure our AI products seamlessly integrate into diverse healthcare ecosystems worldwide.

First, adaptability and customisation are embedded in our product design. We've created highly adaptable AI solutions, emphasising customisation for seamless integration with diverse healthcare technologies. For example, our modular systems address specific needs like abnormal/normal screening, Tuberculosis screening, Emergency Disease screening, and Comprehensive screening for 52 abnormalities.

Second, we prioritise a standardised deployment process, utilising healthcare standards for smooth integration with systems like PACS/RIS/HIS. DrAid, our flagship product, ensures effortless integration across various systems, offering both cloud and on-premises availability. Our collaboration with NVIDIA, leveraging advanced GPU technology and tools like MONAI and Tensor RT, ensures cutting-edge capabilities.

Thirdly, we can operate on a Software-as-a-Service (SaaS) model that maximises availability and grants clients enhanced customisation control. This approach ensures seamless access to our AI solutions, empowering users to tailor services to their specific requirements. Our dedication to the SaaS model reflects our commitment to a dynamic and responsive healthcare technology platform.

Regulatory compliance is a top priority, guiding our operations in every country. We invest significantly in understanding and adhering to local regulatory frameworks, encompassing data privacy laws and medical device regulations. Our plans include compliance with region-specific bodies such as FDA and CE, ensuring our products meet the highest standards of safety, efficacy, and legal requirements. DrAid is the first and only AI software for X-ray Diagnostics in Southeast Asia to be cleared by The United States Food and Drug Administration (FDA), putting Vietnam on the map of 6 countries owning an FDA-cleared AI product for Chest X-ray Pneumothorax finding.

Given the sensitive nature of healthcare data, how does VinBrain address ethical considerations in the development and deployment of AI models, especially across diverse cultural contexts?

Ethical AI is non-negotiable at VinBrain, especially when handling sensitive healthcare data across diverse cultures. Strict guidelines and global privacy standards form the foundation for responsible AI use. Transparency fosters trust with patients, healthcare professionals, and regulators.

VinBrain builds AI models with explain ability, and interpretability baked in, fostering trust and understanding of decision-making. Transparency extends to users, with clear communication about purpose, scope, and potential impact, ensuring informed consent.

Our flagship product, DrAid, exemplifies the commitment to privacy. Built with HIPAA and NIST compliance and secured by Microsoft Azure, it guarantees robust data protection, giving users confidence in their health information's security.

At RSNA 2023, VinBrain showcased its dedication to accessible healthcare in underserved regions with DrAid for Tuberculosis Screening. This cost-effective solution allows large-scale screenings, potentially benefiting an estimated 10.6 million TB-suspected individuals. The positive reception at the exhibition reflects VinBrain's commitment to leveraging technology for impactful and inclusive healthcare solutions. This initiative aligns with VinBrain's overarching commitment to ethical practices, showcasing the company's dedication to innovation and social responsibility in the healthcare landscape.

In your perspective, what are the emerging trends in the intersection of AI and healthcare?

AI's superior speed and learning capability make it a natural fit for healthcare tasks demanding precision and early detection. We see key trends shaping the industry: predictive analytics for early disease, personalised medicine, AI-powered data management, and AI-driven clinical decision support.

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