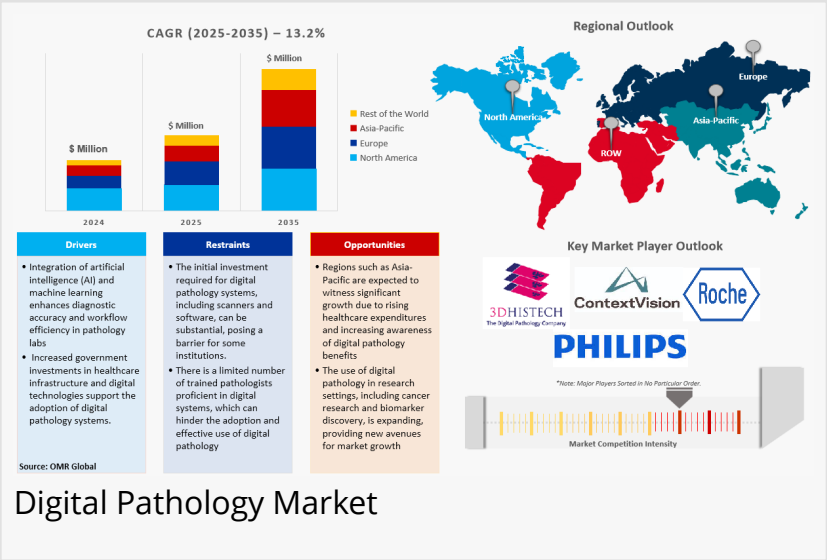
From Slides to Software: AI Ignites Rapid Growth in Digital Pathology Market

Digital Pathology Market is projected to reach USD 4.6 billion in 2035, growing at a CAGR of 13.2% during the forecast period 2025-2035.



Digital Pathology Market

INDORE, INDIA, April 21, 2025 /EINPresswire.com/ -- Digital pathology devices have become essential tools for pathologists as it streamline laboratory workflows and enhance diagnostic efficiency. It supports pathologists in delivering accurate diagnoses and plays a critical role in R&D, particularly in the creation of personalized and targeted therapies. A major driving factor of the global digital pathology market is the rapid integration of artificial intelligence (AI) technologies, which are revolutionizing diagnostic capabilities and workflow efficiency. AI-powered image analysis tools can accurately detect patterns, anomalies, and disease markers in digital slides, significantly reducing human error and enabling faster, more consistent diagnoses. Moreover, AI facilitates the automation of routine tasks such as cell counting and tumor grading, allowing professionals to focus on more complex decision-making. As healthcare systems increasingly adopt digital solutions, the synergy between AI and digital pathology is expected to play a pivotal role in advancing personalized medicine and improving patient outcomes worldwide. According to the National Library of Medicine, the integration of AI with other clinical data sources, such as genomics, clinical records, and patient demographics, is transforming pathology from a purely visual discipline into a data-driven science. AI, particularly with tools like natural language processing (NLP), can extract and synthesize relevant information from unstructured text and combine it with histopathological insights for more informed decision-making. In addition, AI supports advanced tasks like aligning images from adjacent tissue sections to study protein-genomic correlations. Despite its potential, AI faces challenges like interpretability, legal concerns, and ethical regulations. Rather than replacing pathologists, AI is expected to enhance their capabilities, enabling more accurate and comprehensive diagnoses, especially as new techniques like one-shot and reinforcement learning emerge in the medical space.

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Market Trends

Integration of AI, machine learning, and image analysis tools

The integration of AI, ML, and advanced image analysis tools is creating massive scope for the growth of the global Digital Pathology Market. These technologies enable automated and high-throughput analysis of whole slide images (WSIs), significantly enhancing the speed, accuracy, and consistency of diagnostic processes. AI algorithms can detect minute morphological patterns and disease markers that may not be easily visible to the human eye, supporting early and precise diagnosis of various conditions such as cancer, neurological disorders, and infectious diseases. ML models such as deep learning are being widely adopted to perform complex tasks including tumor detection, cell classification, nuclei segmentation, and mitotic figure identification. For instance, in March 2025, Aiforia Technologies partnered with PathPresenter to accelerate the adoption of digital pathology and AI-driven diagnostics. This collaboration will expand the reach of Aiforia's AI-powered image analysis solutions by integrating them into PathPresenter's widely used platform, which streamlines pathology workflows and enhances collaboration among pathologists. The partnership focuses on improving diagnostic efficiency and accuracy by providing seamless access to advanced AI tools, particularly for tasks like image analysis in cancer diagnosis (e.g., breast, lung, and prostate cancers). Through this integration, pathologists will be able to leverage cutting-edge AI models within their existing workflows, enhancing diagnostic capabilities and ultimately improving patient care. Both companies aim to provide pathologists with the tools necessary to enhance workflow management, drive collaboration, and empower professionals in their diagnostic roles.

Increasing incidence and prevalence rate of chronic diseases

The increasing incidence and prevalence rate of chronic diseases around the globe are driving the global digital pathology market. As the global population ages and lifestyle-related factors continue to rise, the incidence of chronic diseases such as diabetes, heart disease, and cancer is also escalating. According to the US Centers for Disease Control and Prevention, in July 2024, Chronic diseases are the leading cause of illness, disability, and mortality in the US, driving up healthcare costs significantly. Conditions like heart disease, stroke, cancer, diabetes, obesity, arthritis, Alzheimer's, epilepsy, and tooth decay account for a large portion of the nation's $4.5 trillion in annual healthcare spending. These diseases result in substantial medical costs and lost productivity. For example, heart disease and stroke alone cost $254 billion annually, while cancer care costs are expected to exceed $240 billion by 2030. Interventions to prevent and manage these diseases could offer substantial health and economic benefits by reducing healthcare expenditures and improving quality of life. This growing disease burden places immense pressure on healthcare systems, making early and accurate diagnosis crucial for effective

treatment and management. Digital pathology, enhanced by AI and machine learning, provides a powerful tool for pathologists to diagnose these conditions more efficiently and accurately. By enabling faster analysis of high-resolution images, digital pathology facilitates the detection of subtle abnormalities in tissue samples, which is particularly important in cancer diagnosis, where early detection is linked to better treatment outcomes. As the demand for more precise and timely diagnostic solutions increases, the adoption of digital pathology technologies is expected to grow, helping healthcare providers address the rising challenges posed by chronic diseases and cancer.

Market Segmentation and Growth Areas

The device segment is expected to dominate the market, holding the largest share.

The device segment, which includes scanners and slide management systems, is projected to hold a prominent share of the global digital pathology market. This growth is driven by the increasing demand for high-resolution imaging and efficient management of digital slides for diagnostic, educational, and research purposes. Scanners are essential for converting traditional glass slides into digital formats, enabling remote access, faster analysis, and easier storage. Meanwhile, slide management systems streamline workflow by organizing and retrieving large volumes of digital pathology data, improving lab efficiency and accuracy. As healthcare providers and research institutions continue to adopt digital solutions to enhance diagnostic precision and collaboration, the demand for these devices is expected to rise significantly, securing their dominant role in the market.

The software segment is expected to capture a significant share of the market.

The software segment is expected to capture a significant share of the global digital pathology market, driven by the growing need for advanced image analysis, data management, and integration with laboratory information systems (LIS). Digital pathology software enables pathologists to annotate, share, and analyze digital slides with greater accuracy and speed, enhancing diagnostic efficiency and collaboration. The increasing adoption of AI and ML in pathology software further contributes to its growth, offering predictive analytics and decision support tools that assist in disease detection and prognosis. As healthcare providers seek to optimize workflows and improve diagnostic outcomes, the demand for robust, interoperable software solutions continues to rise, positioning this segment as a key contributor to market expansion. For instance, in December 2024, Abbott’s new GLP Systems Track automation solution received FDA approval, marking a significant advancement in clinical laboratory technology. This innovative system features smart CAR technology, allowing self-propelled sample carriers to move independently, reducing mechanical failures and enhancing flexibility. The system can process up to 25,000 test tubes daily, helping labs meet high-volume demand, increase productivity, and minimize errors. While it improves lab safety and performance, it is not approved for use in blood donor and plasma testing laboratories.

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Market Limitations and Challenges

• Complex Integration and Training: Integrating digital pathology into existing laboratory information systems (LIS) and workflows can be complex and time-consuming. Additionally, it requires extensive training for pathologists and technicians, further raising the implementation cost.
• High Initial Costs: The significant investment required for purchasing whole-slide imaging (WSI) scanners, AI-driven software, and necessary infrastructure may be prohibitive, particularly for smaller healthcare facilities or those in resource-constrained areas.
Market Opportunities
• Integration of AI and Machine Learning: The continuous advancements in AI and machine learning provide an opportunity to enhance digital pathology systems with more accurate and efficient image analysis, improving diagnostic accuracy and speed while reducing human error.
• Cohesive Government Support and Investment: Governments around the globe are recognizing the value of digital health technologies and providing support, funding, and grants to encourage the adoption of digital pathology.

Regional Outlook

The global digital pathology market is further divided by geography, including North America (the US and Canada), Asia-Pacific (India, China, Japan, South Korea, Australia and New Zealand, ASEAN Countries, and the Rest of Asia-Pacific), Europe (the UK, Germany, France, Italy, Spain, Russia, and the Rest of Europe), and the Rest of the World (the Middle East & Africa, and Latin America).

Strong Presence of Key Market Players in North America

Digital pathology in North America has rapidly evolved, it involves the digitization of traditional glass slides using high-resolution scanners, allowing pathologists to view, analyze, and share images electronically. This shift enhances collaboration, particularly in remote consultations and second opinions, and supports integration with AI-powered tools for faster and more accurate diagnoses. The strong presence of key market players is a major driving factor in the growth of the North American digital pathology market. Industry giants such as Roche, Philips, Agilent Technologies, Danaher Corporation, Hamamatsu Photonics, and Leica Biosystems have established a robust footprint in the region. These companies continuously invest in product innovation, strategic partnerships, AI integration, and clinical trials, which accelerates the adoption of digital pathology solutions. Their presence ensures easy availability of advanced technologies, supports scalable infrastructure, and fosters a competitive environment that drives improvements in diagnostic accuracy, workflow efficiency, and regulatory compliance. For instance, in September 2024, Roche expanded its Digital Pathology Open Environment by integrating over 20 advanced AI algorithms from eight new collaborators, further enhancing its

capabilities in AI-driven cancer diagnostics. These tools, accessed through Roche's Navify Digital Pathology software, aim to support pathologists with high-value insights for more accurate and personalized cancer diagnosis and treatment. Collaborators include companies like Deep Bio, Lunit, and Mindpeak, offering AI solutions for prostate, breast, lung, and colorectal cancers. This expansion highlights Roche's ongoing commitment to advancing precision medicine and improving patient care through innovative digital pathology technologies.

Europe Holds Major Market Share

Europe holds a major market share in the digital pathology market due to several key factors, including advanced healthcare infrastructure, strong investment in research and development, and widespread adoption of innovative medical technologies. The region benefits from well-established healthcare systems, particularly in countries like Germany, the UK, and France, where digital transformation in pathology is supported by government initiatives and funding. Additionally, the presence of major companies in Europe, such as Leica Microsystems GmbH, Definiens AG, Barco, 3dhistech Ltd., and Aurora Interactive Ltd. is further driving the European digital pathology market. For instance, in March 2025, Aiforia Technologies formed a partnership with Quorum Technologies to expand its reach in Canada and promote the adoption of its AI-assisted image analysis solutions in the country. This collaboration aims to enhance the accuracy and efficiency of digital pathology workflows, benefiting both researchers and pathologists. Aiforia's AI solutions will become more accessible to Canadian healthcare providers, addressing the growing demand for advanced digital pathology tools. Quorum Technologies, with its expertise in workflow integration, will help optimize the use of Aiforia's technology, ultimately improving diagnostic precision and patient outcomes. Also, in March 2025, Aiforia Technologies secured a deal with the regional health authority of Sardinia, Italy, to provide AI-assisted diagnostic solutions. This two-year contract involves using Aiforia's clinical AI tools to analyze biopsies from breast and prostate cancer patients across seven hospitals in the region. The partnership, part of a procurement led by the GPI S.p.A. consortium, aims to improve the diagnostic workflows of Sardinia's pathology laboratories. This deal marks a significant milestone in Aiforia's European expansion, reinforcing its commitment to delivering innovative and impactful solutions to healthcare providers.

Market Players Outlook

The major companies operating in the global digital pathology market include Hamamatsu Photonics, K.K., Koninklijke Philips N.V., Olympus Corp., Danaher Corp., and F. Hoffmann La Roche Ltd. among others. Market players are leveraging partnerships, collaborations, mergers, and acquisition strategies for business expansion and innovative product development to maintain their market positioning.

Recent Developments

• In March 2025, Deciphex, raised $35.1 million in a Series C funding round, led by Molten

Ventures and supported by several key investors. The funding will help Deciphex address the global pathology shortage by expanding access to high-quality diagnostics and reducing backlogs in healthcare systems. Its platforms, Diagnexia and Patholytix, leverage AI to help pathologists work faster while maintaining accuracy.

• In March 2025, Aiforia Technologies and Techcyte announced a strategic collaboration to advance AI-powered digital pathology. By integrating Aiforia's AI diagnostic applications, such as its breast cancer suite, with Techcyte's Fusion Digital Pathology Platform, the partnership aims to enhance diagnostic accuracy, efficiency, and patient outcomes. The collaboration focuses on creating fully integrated, AI-driven workflows that seamlessly fit into pathology labs, enabling pathologists to utilize advanced AI tools without disrupting their routines.

• In January 2025, Deciphex launched Diagnexia Analytix, an AI-driven pathology service designed to enhance translational research and drug development. This service integrates advanced analytics with expert-led diagnostics to provide critical insights for faster, more precise decision-making throughout clinical trials. Diagnexia Analytix utilizes a global network of over 250 subspecialty pathologists, cutting-edge AI technology, and a fully digital infrastructure to meet the unique needs of drug development programs.

• In February 2024, Roche announced a collaboration with PathAI to advance digital pathology for companion diagnostics. Under this agreement, PathAI will exclusively develop AI-powered image analysis algorithms for Roche Tissue Diagnostics, which will be integrated into Roche's Navify Digital Pathology platform. This partnership aims to enhance precision medicine by combining AI interpretation with companion diagnostics, streamlining lab workflows, and improving access to targeted treatments. The agreement builds on a previous collaboration and reinforces both companies' commitment to making digital pathology a clinical standard.

• In March 2023, Agilent Technologies announced a distribution agreement with Hamamatsu Photonics K.K., incorporating Hamamatsu's NanoZoomer S360MD Slide scanner system into Agilent's end-to-end digital pathology solution. By integrating Hamamatsu's technology, Agilent enhances its open, agnostic platform, designed to support flexible, future-proof workflows that can scale with the evolving needs of pathology labs. This agreement underscores the companies' commitment to advancing precision medicine and improving patient outcomes.

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Some of the Key Companies in the Digital Pathology Market Include-

- 3DHISTECH LTD.
- Apollo Enterprise Imaging Corp.
- BARCO NV
- ContextVision

- Corista
- Danaher Corp.
- F. Hoffmann la Roche Ltd.
- Hamamatsu Photonics K.K
- Huron Technologies International Inc.
- Indica Labs, LLC.
- Koninklijke Philips N.V.
- Leica Microsystems GmbH
- LigoLab Information System
- Mikroscan Technologies, Inc.
- Nikon Instruments Inc.
- Olympus Corp.
- Proscia Inc
- Sectra AB
- SunQuest
- Sysmex America, Inc.
- ViewsIQ Inc.
- Visiopharm A/S
- XIFIN, Inc.

Digital Pathology Market Segmentation Analysis

Global Digital Pathology Market by Products
- Devices
- Software
- Storage System

Global Digital Pathology Market by End-user
- Biotechnology and Pharmaceutical Companies
- Hospitals
- Others

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