## AWS Announces Strategic Collaboration with Novartis to Accelerate Digital Transformation of Its Business Operations

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Leading pharmaceutical company leverages AWS's broadest portfolio of cloud services to build an enterprise-wide data and analytics platform that will change the way that medicines are manufactured and delivered

Custom cloud-based solutions including 'Insight Centers' aim to put real-time analytics in the hands of associates within Novartis Technical Operations (NTO), empowering them to make better business decisions and increase efficiencies across manufacturing processes and supply chain

Today, Amazon Web Services, Inc. (AWS), an Amazon.com company (NASDAQ: AMZN), announced a multi-year strategic collaboration with Novartis to reimagine this leading pharmaceutical company's core pharmaceutical manufacturing, supply chain, and delivery operations using AWS's portfolio of cloud services. This enterprise-wide data and analytics platform is expected to form the foundation for custom solutions powered by AWS AI and ML services to help drive agility, innovation, and cost efficiencies across Novartis global business processes and systems.

Core to this collaboration is the creation of Novartis 'Insight Centers' that provide real-time visibility across its network of manufacturing operations and distribution centers. Building on the success of its trial operations center SENSE, these 'Insight Centers' can enable manufacturing and planning teams to better forecast and track production lines, detect potential bottlenecks and then make adjustment recommendations to improve accuracy. Using AWS, Novartis can collect inventory, quality, and production data across its network and apply AWS Internet of Things (IoT), analytics, and machine learning (ML) services to gain greater visibility and help drive efficiencies. By centralizing this data, Novartis data scientists can also experiment with new optimization models to help ramp up the production of innovative, personalized treatments that are more complex to make.

In addition, Novartis plans to use AWS IoT services to augment and improve visual inspections of its manufacturing sites by generating images that can be analyzed using computer vision algorithms to monitor for risks to manufacturing production, such as unplanned downtime or delayed orders. With this real-time data, Novartis associates can be better equipped to make data-based decisions that help ensure medicines are efficiently produced and distributed to nearly 1 billion patients in 155 countries around the world.

"I'm really proud of how the teams are working together on the ground to bring Amazon-like user experiences to our associates. There is a lot we can learn from the AWS team, and while manufacturing is a great starting place, we're keen to also explore where else we can apply this technology," said Bertrand Bodson, Chief Digital Officer at Novartis. "Using data science and digital technologies to reimagine the way we manufacture medicines is not only at the heart of our transformation, but also core to our ambition to bring innovative medicines to patients faster."

"We are excited about this collaboration, bringing together AWS's unmatched portfolio of services with deep Novartis expertise in the way they manufacture pharmaceuticals and the way they approach supply chain processes," said Mike Clayville, Vice President, Worldwide Commercial Sales at AWS. "AWS's security, scalability, and highly reliable infrastructure can help Novartis advance its technical operations with greater agility and customer-orientation, and potentially reducing the time it takes to bring innovative medicines to patients."

For more information, please visit: <a href="https://aws.amazon.com/blogs/industries/aws-and-novartis-re-inventing-pharma-manufacturing">https://aws.amazon.com/blogs/industries/aws-and-novartis-re-inventing-pharma-manufacturing</a>

## **About Amazon Web Services**

For 13 years, Amazon Web Services has been the world's most comprehensive and broadly adopted cloud platform. AWS offers over 175 fully featured services for compute, storage, databases, networking, analytics, robotics, machine learning and artificial intelligence (AI), Internet of Things (IoT), mobile, security, hybrid, virtual and augmented reality (VR and AR), media, and application development, deployment, and

management from 69 Availability Zones (AZs) within 22 geographic regions, with announced plans for 13 more Availability Zones and four more AWS Regions in Indonesia, Italy, South Africa, and Spain. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—trust AWS to power their infrastructure, become more agile, and lower costs. To learn more about AWS, visit <a href="mailto:aws.amazon.com">aws.amazon.com</a>.

## **About Amazon**

Amazon is guided by four principles: customer obsession rather than competitor focus, passion for invention, commitment to operational excellence, and long-term thinking. Customer reviews, 1-Click shopping, personalized recommendations, Prime, Fulfillment by Amazon, AWS, Kindle Direct Publishing, Kindle, Fire tablets, Fire TV, Amazon Echo, and Alexa are some of the products and services pioneered by Amazon. For more information, visit amazon.com/about and follow @AmazonNews.

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