

## Amazon Web Services collaborates with Novartis

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Amazon Web Services has announced a multi-year strategic collaboration with Novartis to reimagine this 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.

Bertrand Bodson, Chief Digital Officer at Novartis said, "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. 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."

Mike Clayville, Vice President, Worldwide Commercial Sales at AWS said, "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. 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."