

# Agile and DevOps in Healthcare: Now and Beyond

## Abstract

The ongoing COVID-19 pandemic has created a demand for remote operations and an enormously faster time-to-market in the healthcare industry. That said, Agile delivery and DevOps practices have become an unprecedented need of the hour. Given the highly regulated nature of the industry that involves multiple entities – governments, payers, providers, and patients – stakeholder communication plays a crucial role in realizing qualitative and expedited value-based care.

Agile and DevOps speak more about accelerating the processes and bridging the gaps between development and operations, thus speeding up delivery and customer feedback. This white paper tries to explore the importance of Agile delivery and DevOps now, and more importantly, even after the pandemic subsides.

## Healthcare and the call for accelerated innovation

One of the most important responsibilities for any organization is the need to deploy applications and logistics quickly to end users and, based on their feedback, improve the products. Agile and DevOps' innate doctrines mandate a parallel process of development, quality, and operations. This applies to healthcare as well, where the focus is on building products and making it right incrementally, rather than investing time in building the right product and then deploying, because every minute counts when working to save lives.

Some examples of the way's healthcare adopted Agile and DevOps practices during the pandemic include:

- **Innovation of new products:** In the US, Zipline, a company that specializes in delivering medical supplies to remote areas, quickly formed a partnership with Novant Health in North Carolina to distribute supplies to hospitals via drones.
- **Acceleration of existing trends:** The adoption of telehealth exploded from 11% consumers using it in 2019 to 46% in April 2020<sup>1</sup>, and more than half of the healthcare providers polled indicate higher comfort with this care delivery method more than ever before.

## Embracing Agile values and DevOps principles during the pandemic

Agile Values	Healthcare Perspective
Individuals and interactions over processes and tools	Timely incorporation of stakeholder's feedback and coordination will improve healthcare products and get them to market faster.
Working software over comprehensive documentation	With limited time on hand, organizations have adopted Rapid Application Development (RAD) of medicines, diagnostic devices, surgical kits, vaccines, and healthcare applications, and are releasing them in the market with limited initial trails. New business models with simplified workflows have evolved, thus accelerating remote care.
Customer collaboration over contract negotiation	Collaborating with the end users to understand their pain points and coming up with business models will allow accelerated online pharmacy purchases and help meet the demand for telehealth and IoMT devices.
Responding to change over following a plan	With principles like 'fail fast,' even governments had loosened restrictions and regulations to help healthcare products and vaccines reach markets faster. Newer medical devices like ventilators, surgical gloves, PPE kits, etc., and acceleration in growth of medicines and vaccines were a direct outcome.

[1] <https://www.mckinsey.com/industries/healthcare-systems-and-services/our%20insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality>

DevOps Principles	Healthcare Perspective
Customer-centric action with the end product in mind	More than ever before, customer centricity has helped healthcare sail through the pandemic with increased focus on how the product will change a patients' life.
End-to-end responsibility with cross-functional autonomous teams	A single team can work on the products from development through to any changes, and maintenance. This will save time while fixing issues as the teams will be having full knowledge on the product developed.
Automate everything you can	Reducing operational activities and investing in accelerating the development and deployment for early feedback will help innovate and roll out newer products in market in short time.

## The Role of Agile and DevOps in Accelerating Care Delivery and Driving Innovation

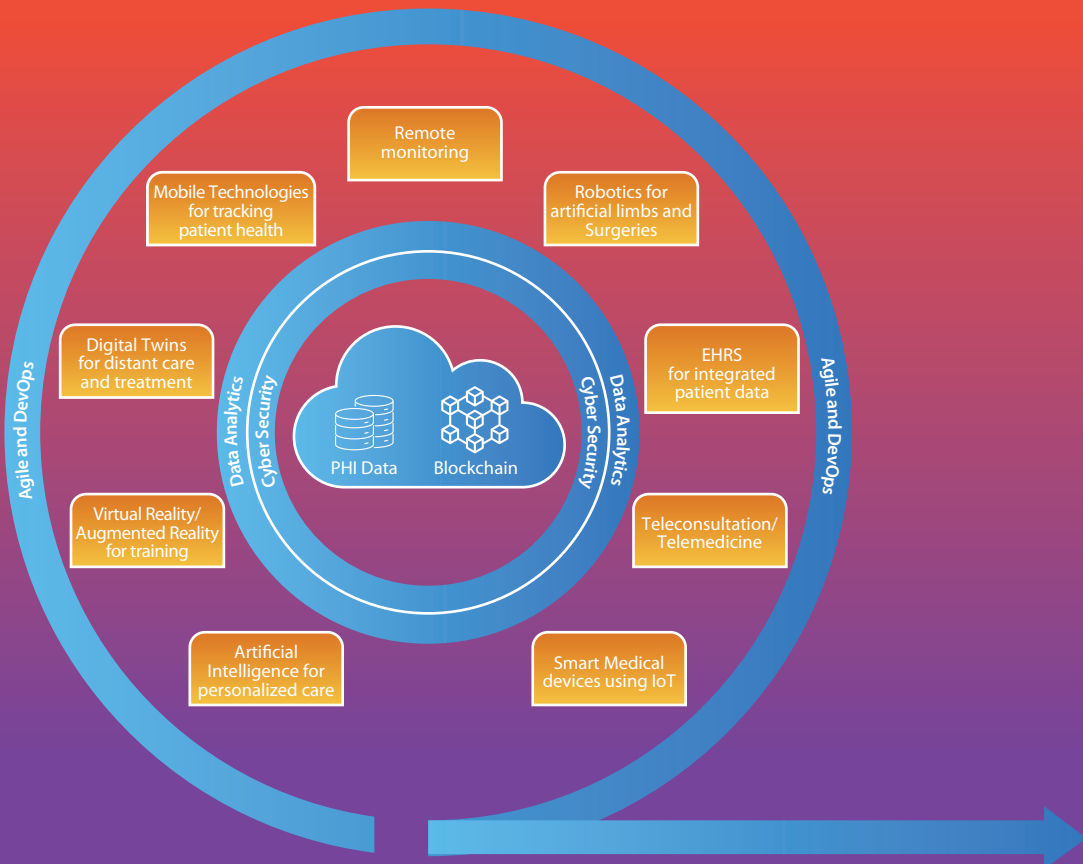
In healthcare, all complexities of a certain application cannot be documented or realized upfront as they evolve gradually during the course of the project and end use. The best example is the recent pandemic, which can be categorized into four phases:

- **Phase I:** During the initial phase, there were heavy fatalities, and the primary concern was to increase the capacity of hospitals and equip the ecosystem to deal with the pandemic. This was done by changing the business and delivery models. Protocols of admissions were changed and considerably simplified to save time. Payment models were changed to address the pandemic and healthcare applications were modified to accommodate protocols for COVID treatment. All these changes were made within weeks due to Agile and DevOps being in place for most healthcare IT teams.
- **Phase II:** As we progressed and people started understanding the pandemic, remote care became the priority and there was an acceleration in adopting telehealth, EHR, and cybersecurity. Healthcare organizations quickly acquired and partnered with telehealth providers and delivered these to end users.
- **Phase III:** When the number of cases started reducing, organizations started focusing on AI and ML technologies for preventive care and for devising vaccines. For the first time in history, a vaccine could be devised within months of outbreak of the pandemic.
- **Phase IV:** By the time the second wave hit, we were almost ready to face it and the impact on human lives was much less than the first wave.

This quick response to changing scenarios of the pandemic and how healthcare organizations adapted themselves as per the need is a practical example of Agile and DevOps adoption.

## Post-pandemic technology adoption in healthcare

The following diagram depicts the ways digitalization will be driven by Agile and DevOps practices post the pandemic.



As Agile and DevOps speak about incremental delivery, automated testing, and ongoing improvement, following these methodologies will have a positive impact on healthcare organizations. Use cases like telehealth, remote care using IoMT, and leveraging patient data for predictive analysis and prevention would benefit greatly from continual evaluation, improvement, and incremental delivery.

Healthcare leaders can adapt to Agile delivery framework for supporting Clinical/Non-Clinical and operations improvements. Healthcare industry works on two principles:

1. Provide the right patient care at the right time with quality.
2. Optimizing the costs of healthcare delivery.

Both of these can be achieved by delivering the value to end user and continuously improving. As Agile is based on continuous improvements so this way of delivery can help in deploying the prototype and then

continuously improving it based on the customer inputs and feedback. Below are some of the innovations powered by agile ways of working:

- With ongoing pandemic many new improvements were made to existing telehealth products to encompass vaccination tracking tools.
- Dyson was able to develop ventilators within 10 days.
- Indian railways were quickly able to spinoff COVID isolation centers in railway coaches and improve them based on customer feedback over the time.

All these innovations were powered by principles of Agile where customer feedback is at the center of delivery, building the products and improving them through iterations is the priority rather than investing time over analyzing the build process. Agile can be an excellent tool to deliver increments to improve products, optimizing as you build at the same time managing the budget.

## Conclusion

At the end of the day, adapting to Agile and DevOps principles will help embrace change and fuel integration and automation in order to ensure qualitative patient care during a crisis. While Agile and DevOps have the potential to replace healthcare's centralized control model to one that hinges on efficiency, by distributing responsibilities to teams, it also calls for individual duty. Each member of the healthcare continuum must also be agile, embrace disruption and learn from it, as rightly said by Darwin: only the species that evolve over time survive, and immutable species perish over time

## About The Authors

## Kamini Bhargava



Kamini Bhargava has 21+ years of industry experience in technology, solutions, and consulting.

She has a vast experience in Banking and Finance (BFS), Insurance and Healthcare, and technology and domain-focused solutioning for various customers in the US and Europe.

She is a Chief Architect with the Transformation and Engineering Group of the Healthcare Industry Solutions Unit. She conceptualizes strategic solutions and platforms for healthcare customers including payers, integrated payer-providers, specialty providers, and Pharmacy Benefit Management companies. With a vast experience in executing large-scale transformational program, she is also an expert in Microsoft technology, integration, DevOps, and Agile.

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PVS Jyotsna has 15+ years of varied industry experiences starting from databases/data warehouses designing to

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