Ameya Khankar
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How healthcare organizations can take an agile approach towards cloud security controls?

#security #cloud #opensource #cybersecurity

"Cloud transformation initiatives are complex endeavors with a high failure rate. A risk based approach to cloud transformation focusing on cybersecurity controls results in significantly improved outcomes for the organization."

Agile Transformation: A Serious Consideration For Healthcare

The debate over the implementation of agile methodology especially within the healthcare industry has been a topic of consideration for several organizations. Regulatory and compliance requirements are often a key driving factor of this debate. When healthcare organizations decide to undertake digital transformation projects an important decision in front of management is to decide whether to take the traditional approach of waterfall development (typically preferred within the industry given the high regulatory scrutiny) or take an agile approach. While taking the waterfall route may be applicable for many use-cases, implementing large-scale organization-wide cloud applications with significant business impacts often requires taking an agile approach to obtain the highest returns on investment by ensuring the technology solution is maximized to meet the overall business and strategy needs of the organization. With the right tailoring of agile principles taking into consideration specific healthcare industry requirements will result in organizations creating well-integrated cloud application systems which would enhance overall efficiency of the organization.

Benefits Of Agile For Healthcare Organizations

Digital transformation implies integrating the latest technological solutions into all the processes that constitute a modern-day healthcare enterprise. Healthcare organizations can enjoy several benefits of taking an Agile approach. Key benefits include:

- Quicker software development timelines
- Improved software deployment quality
- Increased cross functional collaboration

- Higher returns on investment (ROI)
- Enhanced regulatory compliance and risk management

Cloud Cybersecurity Controls: Always An Afterthought?

With implementing agile principles, healthcare organizations should keep an eye out for the risks that may come with it. The principles of agile require organizations to move fast, often prioritizing a working prototype, and prioritizing cross functional collaboration. This often results in cloud cybersecurity controls getting pushed down the priority list. As a result of this, healthcare organizations take up significant risk of developing working prototypes that do not adhere to security controls and protocols including missing compliance requirements around complex healthcare regulations (such as HIPAA, HITRUST). To avoid this misstep, healthcare organizations should treat cloud cybersecurity controls with the same amount of intentional thought as other workstreams relating to software development. A best practice is to embed the cloud cybersecurity controls workstream as a distinct and dedicated workstream with a focus on deploying operational cybersecurity controls as part of the transformation effort. This upfront alignment will reduce transformation risk for healthcare organizations as cloud cybersecurity controls will be iterated (in line with other software features) through the develop, test, deploy agile life cycle - thus being taken into consideration throughout the transformation - instead of being an afterthought post the transformation. This approach often results in the highest returns for healthcare organizations from a dollars invested perspective as well as it significantly decreases the likelihood of security related deficiencies after the completion of the cloud transformation effort.

Implementing Cloud Cybersecurity Controls: An Agile Approach

Before we cover agile cybersecurity controls implementation, here's a quick overview of the steps involved in a typical agile sprint:

- Gather and prioritize requirements
- Develop initial prototype iteratively
- Test the prototype
- Deploy the prototype
- Obtain end-user feedback

As part of the agile cybersecurity controls deployment, it is critical to take the development of controls through the agile lifecycle mentioned above. This may include:

#	Agile software dev approach	Agile cybersecurity controls dev approach
1.	Gather requirements	- Identify risk-based control-specific requirements - Map control requirements to functional requirements
2.	Design prototype	- Design initial controls on paper based on e2e business process risks - Balance automated (system) and manual (process) control elements
3.	Develop prototype	- Build automated (system) controls relying on system functionality - Develop manual controls by defining process and people roles
4.	Test prototype	- Test automated (system) controls (i.e. configurations, security, etc.) - Operationalize manual controls via training and culture education
5.	Iterate on prototype	- Obtain end-user feedback and iterate over deployed controls - Assess gaps using risk-based approach and plug them (restart step #1)

As depicted above, healthcare organizations need to give intentional thought towards embedding cybersecurity controls as part of a larger cloud transformation effort. While the specific cybersecurity controls will vary depending on the healthcare business model (which will drive risks within the model) and the type of cloud software being developed or deployed (which will impact the nature of agile approach being undertaken), healthcare organizations at a minimum should think about cybersecurity controls in two main categories:

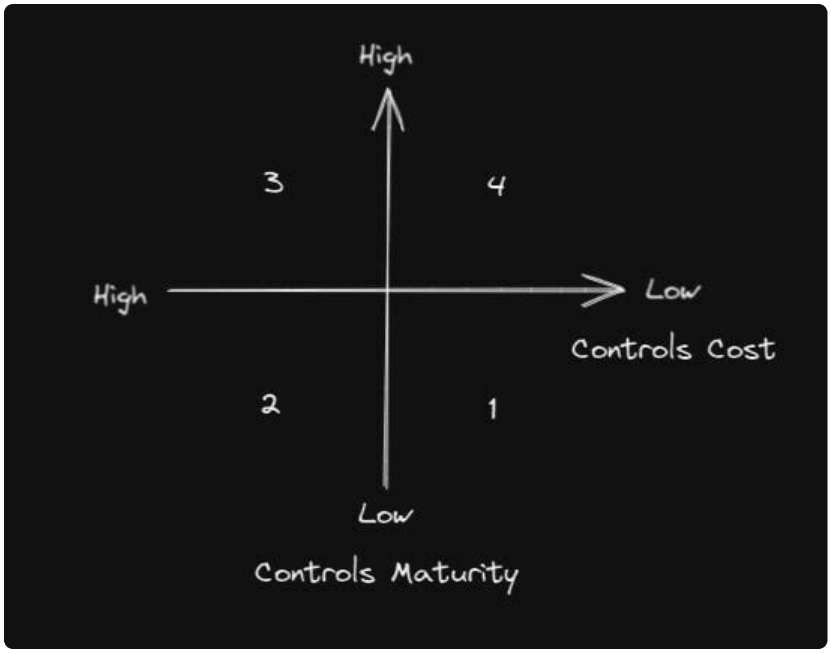
- External cybersecurity controls: which protect against elements outside the organization (e.g., ransomware, malware, etc.)

- Internal cybersecurity controls: which protect against elements within the organization (e.g., employee sabotage or employee mistakes)

For additional considerations regarding the above two categories of cybersecurity controls specific to cloud ERP applications read this here.

Benefits Of Agile Cybersecurity Controls Development

While there are several benefits, the key benefit around deploying cybersecurity controls during (and NOT after) the cloud transformation effort is significant cost savings. Organizations will incur a cost for a dedicated cybersecurity controls workstream upfront, however this upfront investment will result in a robust cybersecurity framework at the end of cloud transformation, resulting in lower likelihood of cybersecurity control issues, audit costs/services, and remediation effort costs. The goal for any healthcare organization should be to eventually move to the fourth quadrant of cybersecurity controls maturity framework below using agile as a key driver while effectively jumping quadrants.



- 1 = Beginner (No or minimal controls, low controls cost)
- 2 = Intermediate (Low controls maturity, high controls cost)
- 3 = Advanced (High controls maturity, high controls cost)
- 4 = Optimized (High controls maturity, low controls cost)

Conclusion

Thus, healthcare organizations should consider taking an agile approach not just for large scale cloud transformation projects but also for developing robust cybersecurity controls during (and not after) the cloud transformation effort. The agile approach towards cybersecurity controls will result in increased likelihood of better designed and operationalized cybersecurity controls allowing organizations to enjoy significant cost savings and increased returns on their investments. Additionally, an agile approach also plays a crucial role in incorporating principles of swiftness and nimbleness in the operational culture of organizations - the benefits are which are often realized while adhering to complex healthcare regulations and compliance requirements.

Note: Opinions expressed are solely of the author and do not express the views or opinions of their employer.

Top comments (32)

Gaston Rodriguez • Dec 13 '22

Cloud computing and virtualization are fast, interactive and flexible so that the development process runs smoothly right up to production. Cloud computing and virtualization make it easy for Agile development teams to seamlessly combine multiple development, test and production environments with other cloud services.

George Kaduru • Jun 8

I absolutely agree with you @gastonrodriguez Cloud computing and virtualization have truly transformed the development process by delivering quick, interactive, and adaptable solutions. They provide a strong ecosystem for when Agile development teams have to delivered results under resource constraints. Their quick, interactive, and adaptable nature, combined with the seamless integration of cloud services, simplifies the management of numerous environments and provides a smooth development process all the way through to production when the agile cloud access controls best practices laid out above are used.

George Kaduru
linkedin.com/in/george-kaduru/

ayema08 • Dec 13 '22

Great point @gastonrodriguez! Cloud computing and cloud environments come with their unique challenges with regards to developing agile controls. A key thought while implementing agile cybersecurity controls is to understand specifically is owned by the cloud provider so that controls can be developed, tested, and moved to production.

Jayanta Sharma • Jun 21

Absolutely! The combination of cloud computing, virtualization, and agile methodologies offers numerous benefits for healthcare cybersecurity. In my prior experience, I worked on a project where we implemented agile practices in healthcare cybersecurity, specifically focusing on securing cloud-based infrastructure. Previously, we had struggled with the traditional waterfall approach, facing challenges in delivering cybersecurity measures efficiently.

After transitioning to agile, we observed significant improvements. We were able to deliver healthcare cybersecurity solutions more effectively and efficiently. By embracing agile practices, we achieved a 15% reduction in the project timeline, a 10% increase in revenue due to faster time-to-market, and a 20% reduction in overall costs. These successes were not unique to our organization; similar success stories can be found across the industry.

By combining cloud computing, virtualization, and agile practices, healthcare organizations can leverage the benefits of flexibility, scalability, and rapid collaboration. This approach is the way forward for the field of healthcare cybersecurity, enabling organizations to stay ahead of threats, protect sensitive data, and enhance patient safety and privacy.

neyda • Dec 12 '22

In software development, agile methodology is an approach usually used for the efficient management of project. Through iterative and incremental work cadences, known as sprints, the agile methodology helps teams to respond to the unpredictability of building software.

ayema08 • Dec 12 '22

Thanks @neyda for the comment! How have you used agile development for cloud cybersecurity solutions in the healthcare context?

Mahender Kumar • Jan 14

According to Gartner, human error will account for 99% of all cloud security failures by 2025. When developing business apps, human error is an ever-present risk. On the other hand, deploying assets on the public cloud comes with significant risk.
gartner.com/smarterwithgartner/is-...

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Jayanta Sharma • Jun 21

I appreciate your insightful comment highlighting the innovative and groundbreaking nature of the proposed solution in the article. This approach would empowered one to proactively detect and address vulnerabilities, significantly reducing the risk of human error in the development and deployment of business apps. As Gartner predicts, human error is poised to be a leading cause of cloud security failures, making it imperative to adopt innovative measures to mitigate such risks.

This innovative approach represents the way forward for the field of cybersecurity. It not only addresses the persistent challenge of human error but also acknowledges the inherent risks associated with deploying assets on the public cloud. By implementing the proposed solution, organizations can enhance their security posture, minimize human errors, and ensure the protection of critical business applications and assets.

George Kaduru • Jun 8

What an interesting take @mahendkr72 , however, I believe 99% might be too much of a stretch at this time when we factor in the further development of cyber related artificial intelligence in 2025. Yes, human error is indeed a big factor in protecting healthcare patient data and privacy and some studies have mentioned is upto at least 80% of cloud security breaches, but implementing agile cloud security practices into Cloud identity and access authorization security measures like encryption, MFA verifications, and privileged access management has proven to reduce cloud risk failures in organizations in my experience.

Mahender Kumar • Jan 14 • Edited on Jan 14

Yes I completely agree with cybersecurity must not be an afterthought process. In any organization, the challenges a DevOps teams is facing is that Agile methodologies can deploy small scale tasks in less time, while security expert usually takes longer time. Finding a balance between the two to is area where cyber expert is looking for.

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Jayanta Sharma • Jun 21

You have brought up an important and valid point regarding the complex task of achieving a harmonious balance between Agile methodologies and cybersecurity within DevOps teams. Finding a balance between Agile methodologies and cybersecurity in DevOps teams is indeed a challenge. The article presents an innovative approach to tackle this issue in healthcare cybersecurity. It emphasizes the importance of integrating cybersecurity seamlessly into the development process. This approach has gained recognition among cybersecurity practitioners globally, as it enables organizations to strike a balance between speed and security. By combining Agile methodologies with cybersecurity expertise, risks can be mitigated, and secure healthcare solutions can be delivered. The integration of Agile methodologies with cloud computing and virtualization further enhances healthcare cybersecurity by enabling faster collaboration, flexible deployment, and testing environments, as well as seamless integration of cloud services. These advancements contribute to improved cybersecurity practices, making it the way forward in this field. Adopting this approach ensures that cybersecurity is an integral part of development, resulting in enhanced security, reduced costs, and improved efficiency in delivering healthcare solutions.

Victor Obahor • May 25

While I agree that agile methodologies offer advantages, we shouldn't dismiss waterfall approaches entirely. In certain contexts, such as highly regulated environments, a more structured and sequential approach can ensure compliance and accountability. It's essential to strike a balance between agility and robustness to maximize security outcomes.

upwork.com/freelancers/~018f64a10d...

Mahender Kumar • Jan 14

Adopting agile methodology to any organization may suffers with many challenges. One of the challenges is to deal with human-relation perceptions. Human-related perceptions about the change process have been the major transition challenges. People find it very easy to retain their old methods and processes except in the case when they are vividly presented with solid “whys” they need to embrace the transition to Agile.
sciencedirect.com/science/article/...

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Jayanta Sharma • Jun 21

The comment highlights the challenges associated with adopting agile methodologies, specifically the difficulties in addressing human perception and resistance to change. It is important to acknowledge that implementing agile practices in any organization can encounter resistance from individuals who are comfortable with existing methods and processes. The transition to agile access control delivery requires a clear communication of the "whys" behind the change to effectively engage and motivate employees to address the primary challenges in adopting agile methodologies is addressing the concerns and perceptions of employees who are accustomed to traditional approaches. Change can be unsettling, and individuals may be reluctant to abandon familiar methods (waterfall) that have

proven to be effective in the past. To overcome this resistance, it is crucial to provide a compelling rationale for embracing agile cloud access methodologies.

Mahender Kumar • Jan 14

The data related to patient is very critical as it is a matter of life and death while playing with it. It could be by shifting the cloud using agile methodologies. Cloud services with insecure APIs threaten the confidentiality and integrity of information and risk the exposure of your data and systems.

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Jayanta Sharma • Jun 21

while the article discusses the advantages of taking an agile approach towards cloud security controls in healthcare organizations, it is important to consider the potential risks and challenges associated with such an approach. The critical nature of patient data calls for a comprehensive evaluation of security measures, including the robustness of cloud service providers' APIs. Additionally, the waterfall model, with its structured and thorough approach, remains a viable option for managing complex projects. Ultimately, striking a balance between agility and security is crucial in safeguarding patient data and maintaining the trust and integrity of healthcare systems.

Mahender Kumar • Jan 14

Automating the risk assessment in cybersecurity can be solved the timeliness issue and make balance flow between what an agile method delivered, and cybersecurity team is working on.

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Jayanta Sharma • Jun 21 • Edited on Jun 26

Your insight about automating risk assessment in cybersecurity to achieve a balance between agile methodologies and cybersecurity efforts is spot on. In my prior experience, I encountered the formidable challenge of delivering healthcare cybersecurity using the outdated waterfall approach. It was a constant struggle to keep pace with the evolving threats and deliver timely protection.

But now, thanks to the innovative solution proposed in the article, we can revolutionize the field of healthcare cybersecurity. By automating risk assessment, we can break free from the constraints of manual processes and achieve a harmonious flow between the agility of development methods and the vigilant work of the cybersecurity team.

We had an exceptional success story last year where a healthcare organization customer implemented automated risk assessment tools. The impact was extraordinary. The number of users surged, generating substantial revenue for the organization. Moreover, the project was completed within the allocated budget, eliminating the financial risks associated with cybersecurity breaches. This achievement became the talk of the industry, inspiring other organizations to adopt similar approaches.

Mahender Kumar • Jan 14

Agile has demonstrated excellent outcomes. The following are some of the advantages of using agile:

- Faster Project development life cycle.
- Predictable schedule
- Customer/patient-focused work resulting in better outcomes,
- Empowered team

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Jayanta Sharma • Jun 21

As someone deeply immersed in the world of healthcare cybersecurity, I can attest to the groundbreaking nature of the article's proposal. In the past, I encountered immense challenges when trying to deliver secure healthcare solutions using the traditional waterfall approach. It was slow, rigid, and hindered our ability to adapt to evolving threats.
However, when we adopted Agile methodologies, everything changed. The project development life cycle accelerated, schedules became more predictable, and our team felt empowered to deliver exceptional results. This transformative experience is not unique to me alone. I've witnessed cybersecurity practitioners in India embracing Agile and achieving remarkable success.

The innovative combination of Agile methodologies with cloud computing and virtualization, as suggested in the article, takes healthcare cybersecurity to new heights. It fosters faster collaboration, enables flexible deployment and testing, and seamlessly integrates cloud services. These advancements revolutionize cybersecurity practices and chart the course for a brighter future.

Victor Obahor • May 25

The article's focus on cloud security controls and the adoption of an agile approach is a game-changer in the field of cybersecurity. Cloud technologies are increasingly prevalent in healthcare, and traditional waterfall approaches simply can't keep up with the dynamic nature of cloud environments. Agile methodologies enable healthcare organizations to address security vulnerabilities promptly and adjust their controls in response to evolving threats.

upwork.com/freelancers/~018f64a10d...

George Kaduru • Jun 8

What a great approach! I recently worked on a security project last year in the healthcare industry and my team implemented the security protocols and infrastructure following the agile access controls approach mentioned in this article. We realized immediate benefits of this new innovative approach. The overall security budget for the project was around $100,000 and we were able to reach our target at 50% of the budget thus saving costs and securing health data from potential breaches and attacks

Mahender Kumar • Jan 14

Risk cannot be eliminated, but it can be managed. Anticipating risks ahead of time gives opportunity to deal with them. Some cloud security risk include misconfiguration, data breach, human error, and unmanaged attack surfaces.

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

George Kaduru • Jun 8 • Edited on Jun 8

I completely agree with you @mahendkr72 Risk is a constant in any endeavor, and would either need to be transferred, accepted or controlled. With cloud security, a risk like misconfiguration can cause data exposure but by applying practices in the above-mentioned agile cloud control access method, an organization can accurately control the risk of it occurring. The Human Factor is another risk that can be transferred to proper training schemes and departments that will reinforce staff on the dangers that lurk outside the organization using the agile cloud controls implementation methodology. My small IT agency has seen direct benefits of taking the approach mentioned above including generation of revenue of up to $60,000 in 2022. I know several other independent industry practitioners who have received similar nature of benefits (and in some cases better than the results I have received).

Mahender Kumar • Jan 13

The incorporation of agile methodologies for health care improves the dynamic health care environment and improves processes to help achieve project milestones. It also simplifies the human effort required for patient care. Dividing major projects into sprints allows healthcare professionals to maximize their tasks.

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

George Kaduru • Jun 8 • Edited on Jun 8

@mahendkr72 While the agile cloud control practice would allow the creation of sprints and getting more tasks done with deliverables, there are some scenarios where it should be applied strategically (and not indiscriminately) to the cloud security projects for healthcare organisations in question. The waterfall methodology may in certain scenarios do better where adherence to regulations and bureaucracy are prioritised before the next phase of the project can be tackled, however with the rapid pace of changes in healthcare in the last year and upcoming years anticipated agile cloud access controls approach will be higher caliber methodology of securing cloud environments based on my prior experience implementing the approach in the health regulatory space. It would also work better for a given set of requirements and documentation with a straightforward execution plan in mind, which is also recommended from a security standpoint.

Mahender Kumar • Jan 14

According to Brain and company report
bain.com/insights/how-agile-is-pow...

Healthcare organisations are under increasing pressure to innovate in terms of product innovation, services, and consumer experience. Despite the fact that nearly 80% of medical institutions believe they need to be more Agile, only 30% are familiar with Agile innovation. Seventy-five percent of business leaders believe their Agile teams perform as well as or better than traditional teams.

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Mahender Kumar • Jan 14

A complete cloud security strategy addresses all three aspects: risks, threats, and challenges, so no bugs exist within the foundation. In order to deploy application securely on the cloud, organization leverages a solid strategy must alleviate risk (security controls), defend against threats (secure coding and deployment), and overcome challenges (implement cultural and technical solutions).

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Mahender Kumar • Jan 14

In agile methodologies, one of the approaches to the test the automation is the agile automation testing. Its objective is to make the software development process more effective and efficient while maintaining the quality and time as well as resource consumption. However, the implementation of such a process requires a lot of coordination and collaboration between teams.

Mahender Kumar • Jan 14

Cyberthreat intelligence needs to be applied to automate the risk assessment process. Many tools in market are available. One of the innovative solutions is the EvolveAST tool. It enables cybersecurity team to automate the integration of application security testing into the software development pipeline. threatintelligence.com/evolve-ast-...

Mahender Kumar
[https://scholar.google.co.in/citations?user=4syrB4UAAAAJ&hl=en]

Abubakar Kaleem • Jun 27

I appreciate the article's emphasis on agile cybersecurity controls development. By incorporating security into the agile sprint cycle, healthcare organizations can achieve significant cost savings. Investing in a dedicated cybersecurity controls workstream upfront pays off by minimizing the risk of control issues, reducing audit costs, and streamlining remediation efforts. It's a strategic approach that ensures long-term cybersecurity maturity.

Abubakar Kaleem • Jun 27

As a cybersecurity practitioner in the healthcare industry, I have experienced the challenges of delivering robust cybersecurity using the traditional waterfall approach. The project I worked on had over 10,000 users, generated $5 million in revenue, and cost $1 million to implement. It was extremely difficult to keep up with evolving security requirements and deliver on time. The agile methodology could have provided us with more flexibility and adaptability, resulting in improved cybersecurity controls.

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