Adopting Agile: Four Best Practices for Innovation

MARKET TRENDS REPORT

govloop EMERGENT™ | Red Hat

Introduction

Federal agencies are "cloud smarter" than ever before, with many moving at least some of their systems and solutions to the cloud. Although mandates to use cloud are behind some of the effort, agencies see the clear benefits of cloud: improved efficiency, accessibility, collaboration and reliability, along with lower costs and better security.

Yet cloud adoption comes with challenges, especially when it comes to applications that may not have been developed with the cloud in mind. These applications may not work as well — or at all — in the cloud. They often experience latency and interoperability and performance issues, and some depend on non-cloud applications. These barriers are unacceptable for the pace of government today, which relies on fast, efficient application development and deployment.

Meeting these needs means finding a way to adapt existing applications to the cloud whenever possible and developing more native cloud-ready applications over time. Increasingly, this means adopting a rapid application development (RAD) approach, which drastically accelerates the software development process and makes it easier to develop new cloud-native applications quickly and efficiently. When combined with an open source approach, agencies can ensure maximum flexibility, security and sustainability while avoiding vendor lock-in.

To learn more about how federal agencies can adopt an open source, cloud-ready approach to rapid application development, GovLoop created this report with Emergent, a solutions provider, value-added reseller and application platform partner with a 360-degree approach to customer support.

By The Numbers

41%
of <u>agency-developed software</u> uses an Agile approach, compared to 35% using a waterfall approach and 18% using continuous integration.

40%
of agencies use 10 or more tools in their <u>software development life cycles</u>.

65%
of workloads will be <u>containerized</u> in organizations within three years.

70%
of developers consider <u>rapid deployment of IT services</u> to be the biggest advantage of containers.

23%
of <u>governments worldwide</u> still use waterfall application development techniques and more than 40% use DevOps or continuous integration/continuous deployment.

40%
of government agencies used <u>open source resources</u> in 2020.

62%
of government developers say their adoption of DevSecOps practices is <u>immature</u>.

2016
The year the White House released the <u>Federal Source Code Policy</u>, which supports improved access to custom-developed federal source code.

How to Get More Value From the Cloud

The Challenge: Working With Legacy Systems

Government agencies are under a lot of pressure, both internally and from the constituents they serve. Constituents and government users are no longer willing to tolerate poorly performing, unintuitive legacy applications. Instead, they expect the same level of responsiveness that they receive from private-sector applications — a level of flexibility and resiliency that is achievable only by accelerating application development. Unfortunately, agencies often encounter several obstacles.

1. Legacy shortcomings

The natural first step is fully embracing the cloud, both for existing and new applications. Easier to do with new, cloud-native applications, it can be a big problem for agencies that depend on applications developed for on-premises environments, which may not work as well in the cloud. These applications often experience latency, interoperability and performance issues, and sometimes depend on non-cloud applications. This makes it difficult to determine how to migrate applications to the cloud without disrupting critical business applications.

2. Lift-and-shift mentalities

In cases where legacy applications have made it into the cloud unscathed, there are other issues to consider. Simply migrating an application to the cloud, for example, doesn't mean it can truly take advantage of the benefits cloud provides. The "lift and shift" method doesn't mean that the ported application is as scalable or flexible as cloud-native applications or those rewritten for the cloud.

3. Vendor lock-in

Even for agencies that have conquered these challenges, another often remains: vendor lock-in. Agencies that have standardized on the application development tool from their current cloud vendor of choice may find themselves locked into using that cloud, unable to switch providers for cost or other reasons.

The Solution: Rapid Application Development

RAD, an Agile development approach, focuses on quickly iterating applications to improve the user experience and performance. It's an effective way to accelerate application release and ensure that applications take full advantage of what cloud has to offer.

"The goal of the Agile approach is to develop and release working software on a more frequent basis, reducing release cycles from months or years to just weeks or days," said Sean Walsh, Director of Sales Engineering at Emergent. The best Agile practices release software continuously, iterating and improving features at the microscale, a process often called continuous integration. With this approach, developers work at the microscale level, getting feedback from every minute change, he added.

Although it's possible to cobble together the tools you need for RAD, it pays to have all of those tools under one umbrella. For example, consider Kubernetes. It provides the technology for container orchestration, but there's much it doesn't provide, such as:

- The services necessary to build and run containers from scratch
- A network to connect application services
- An ingress load balancer to bring traffic into the Kubernetes cluster
- Persistent storage to back stateful application services
- Monitoring and logging to ensure that the platform and applications run smoothly

By standardizing on a platform like Red Hat OpenShift that provides all of these capabilities, agencies can take advantage of all of cloud's benefits. Most importantly, it allows developers to scale containers and microservices as demand increases.

More agencies are leaning toward open source software in many cases, including application development. Open source software has been proven to be sound and cost-effective, and it embraces rapid release.

Best Practices in Rapid Application Development

Practice planning, training and patience.

There's no doubt that RAD is a major culture shift. Take advantage of vendor resources to get developers and other staff on board and up to speed. Red Hat, for example, makes its Open Innovations Lab available to help agencies with transformation. Agencies also should invest in training to ensure seamless adoption. Once your team is ready to dive in, start with moving simple applications to containers. Take the time to run the applications in parallel — the original legacy application on premise and the new containerized version in the cloud. With this approach, your team can learn as it goes, setting the agency up for success.

Take a thoughtful approach to scaling.

Even if you are using the most effective infrastructure and following all of the rules, performance can still be an issue. The solution is taking microservices to the extreme by scaling the unit size down to individual service levels. "The bigger your application, the more it's doing, and the more it has to be scaled for all of the services it's providing," Walsh explained. "The smaller the service, the more you can scale it where demand exists instead of having to scale the larger application body."

Don't be daunted.

Few organizations have the knowledge and experience in-house to choose the right solutions and realize the full value of those investments. The key is finding a partner that works to understand your requirements, budget and long-term goals, and will stick with you from procurement, training and implementation through the long term. Make sure your chosen partner has deep expertise in open source, cloud and platform technologies, and good relationships with vendors.

Start with a trusted container base image to ensure security.

A trusted container base image guarantees that you can run only images you trust in your container environment. Starting from a trusted base image means you will build secure applications from the ground up. It's also a good idea to use separate build and runtime images, sticking to the restricted security context constraint where possible, and protecting the communication between application components using Transport Layer Security.

> "Ideally, agencies would choose a platform that is both cloud-native and cloud-agnostic...That way, it can run on any cloud or any data center, on any infrastructure. You want the ability to take your workloads wherever you want, whenever you want."
>
> **Sean Walsh**
> Director of Sales Engineering, Emergent

HOW EMERGENT HELPS

Emergent is a solutions provider, systems integrator and value-added reseller that has provided solutions and guidance to federal agencies for nearly two decades. A trusted Red Hat public-sector specialist partner, Emergent values the principles of open design, delivering solutions built on a foundation of transparency, collaboration, and continuous testing and improvement. It offers a complete portfolio of open source solutions available through contracts including the NASA Solution for Enterprise-Wide Procurement V and the National Institutes of Health Chief Information Officer-Commodities and Solutions. As a General Services Administration Schedule partner, Emergent also can provide proprietary tools and application platform services such as Red Hat Services Elite to federal agencies.

Emergent's 360-degree approach supports agencies at every stage of engagement, from architecting solutions and procurement to tailored delivery, training and ongoing support. It starts by asking hard questions and listening to the answers. With this approach, Emergent can recommend the best solution for the specific environment, priorities and ongoing challenges. Along the way, every customer is assigned a dedicated team who understands and champions the agency's needs.

Click here to learn about benefits of partnering Emergent and Red Hat.

Conclusion

As agencies increase their dependence on the cloud, they are looking for ways to move existing applications to the cloud, while developing the expertise to create new, cloud-native applications. When successful, these cloud-enabled applications can better support agency requirements, take advantage of modern technologies, enhance security, and improve scalability and elasticity.

Yet legacy applications aren't always easy to move to the cloud. The best approach is to adopt a comprehensive, open source platform for RAD, which streamlines and automates the development and container management process, improving productivity and accelerating application development.

With these capabilities, agencies can satisfy requirements, save money, keep pace with the speed of change and provide the public with the responsiveness they have come to expect from digital interactions.

ABOUT EMERGENT

Emergent is an award-winning solutions provider, value-added reseller, application platform partner, GSA, NASA SEWP, and CIO-CS schedule holders, and SLSA schedule partner based in Virginia Beach, Virginia. Established in 2006, we specialize in solving complex challenges with tailored IT solutions — enabling operations in all levels of government, commercial business and higher education.

Our extensive partner network connects customers with pre-competed, pre-negotiated contracts that streamline procurement. By aligning with leaders such as Red Hat, Emergent gives customers direct access to best-of-breed products in open-source.

Our dedicated teams help organizations architect and adopt the most effective solution for their needs — providing end-to-end guidance to help them realize the full value of their IT investments.

ABOUT GOVLOOP

GovLoop's mission is to "connect government to improve government." We aim to inspire public-sector professionals by serving as the knowledge network for government. GovLoop connects more than 300,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to connect and improve government.

For more information about this report, please reach out to info@govloop.com.