Modernizing Legacy Applications in the Public Sector with DevOps and Cloud

IT leaders are interested, but want to see the value in adopting new application technologies

What makes a modernized application? In part, it is the application's functionality and user experience. But another component is whether the application is developed using modern infrastructure, processes, and resources.

The private sector is already moving beyond traditional forms of application development to new technologies such as DevOps, microservices, containers, and cloud. Now the public sector is giving these technologies a closer look as well.

DevOps is an evolution from traditional waterfall and newer agile development methods. It creates an environment where application features and services are built, tested, and released frequently and incrementally. The DevOps model is a direct contrast to a traditional development approach, where the complete application is built and perfected before it is released for use.

In the public sector, a DevOps model helps create applications that are easier to keep up-to-date with the changing needs of agency programs and services. More frequent software releases and the ability to deploy improvements as needed also makes it easier for applications to maintain high levels of quality and compliance.

Microservices are sets of application code that provide standard functionality, such as printing, that is used in many applications. Microservices change the concept of an application from a single, monolithic system to a collection of distinct processes, with some processes written specifically for that application and other processes using a standard microservice. Because microservices operate as independent components, they can be created in parallel and shared by multiple applications for faster development.

Linux **containers** provide a dynamic runtime environment for microservice-based applications, instead of using specific physical or virtual servers. This environment orchestrates all hardware and services as they are needed by the application, including storage, networking, and security.

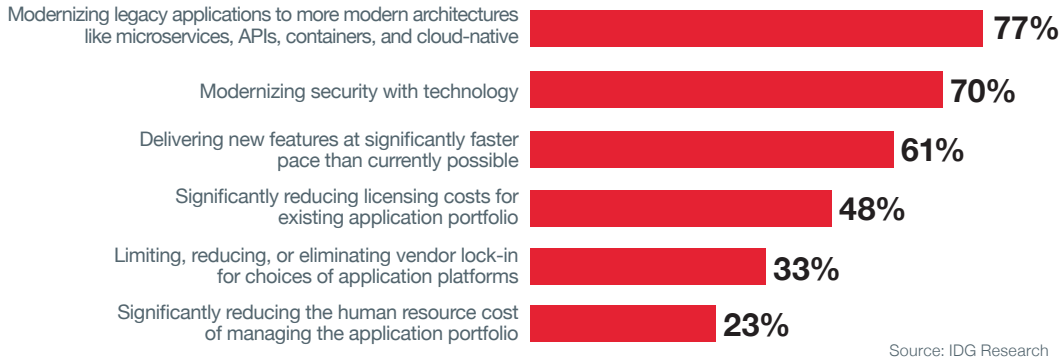
The **cloud** makes application hosting and access universally and securely available over the Internet, as opposed to hosting applications in an on-premises data center. The cloud also offers the advantages of a flexible and scalable infrastructure for application development and delivery.

State of the Application Development Union

Although the public sector recognizes the importance of exploring new models for application development, actual adoption of DevOps and related technologies has been limited. To find out why, IDG surveyed IT leaders in the government, defense, and education sectors about their application plans.

The interest in modern development approaches is high, with 77% of respondents citing consideration of microservices, APIs, containers, and cloud-native design. Yet only 18% of respondents have embraced DevOps and only 6% are using container technology

Modernizing Applications and Security are Top Priorities



Source: IDG Research

5 Strategies for Application Modernization

Agencies can increase the likelihood of a successful move to DevOps and cloud-based application development by applying these five strategies:

1. Identify the need to introduce change by defining the purpose or "big why" for your development organization.
2. Baseline current application development capabilities using a DevOps maturity model, then define goals for improvements along all model dimensions.
3. Introduce DevOps tools and processes, especially those covering end-to-end infrastructure automation and container-centric application development in the cloud.
4. Choose a few applications for a modernization pilot project; showcase results, and apply lessons learned to the next project.
5. If multiple applications are ready for modernization, define a streamlined process for intake and development activity.

for application development. These lower numbers likely indicate that IT leaders in the government, defense, and education sectors are in the early stages of awareness, evaluation, and adoption for these new technologies.

One public sector entity, a U.S. court system, is making an early move to develop applications faster and support self-service capabilities for developers by using the Red Hat OpenShift container application platform.

Farther along are cloud deployments by government, with 69% of respondents using a private cloud, 48% using a hybrid private/public cloud, and 39% using a public cloud service. Additionally, 11% of respondents report that although their agency does not currently have any production applications running in a public cloud, it is a strategic direction for the future.

Why the Hesitation to Change?

Given the advantages of modernized application development, it may be surprising that adoption by the public sector has been slow. But IT leaders in these organizations face several internal challenges for moving to new methods of application development and delivery.

Organizational resistance. Any new way of developing applications brings new skills and concepts to learn, new ways of working, and new dynamics among teams. These changes are often perceived negatively by employees, but concerns can be addressed by a strong plan for change management.

Sizable investments in existing IT assets. An agency's major systems may have recently gone through a significant upgrade or replacement. In this case, IT will find it hard to promote new application development, even if that effort can deliver efficiencies and capabilities.

The "uncharted territory" factor. Without substantial evidence of DevOps success in other public organizations, agencies may be reluctant to adopt a development model that seems unproven.

Business misperceptions. Any modernization effort may be viewed by business leaders as an IT pet project that carries large risk of disruption and may deliver only limited value.

The Benefits of Modernized Application Development and Delivery

In the IDG survey, 61% of respondents said their interest in DevOps came from the ability to deliver new application features at a significantly faster pace than is currently possible. Indeed, lead times in a DevOps environment shrink from months to days or weeks, which also reduces application costs.

But, perhaps unexpectedly, adopting modernized application technologies can be a transformation catalyst for the entire organization. With a focus on continuous, responsive improvements instead of fixed plans for change, IT can enable an experimental approach to application development. And these experiments can be low-risk, because frequent software releases make it possible to recover quickly from application design or coding that misses the mark.

Making the DevOps Leap

Any IT leader seeks ways to modernize applications while reducing costs and development risk. By considering a model based on DevOps, cloud, and other new technologies, public sector IT leaders can meet these goals.

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