API-Centered Modernization

How an API integration platform lets government agencies modernize faster with lower risk

Government organizations at all levels are focused on modernization and digital transformation efforts. But not all modernization methods are created equal. Rip-and-replace initiatives can be disruptive and risky. Conventional waterfall-style projects are often plagued by cost overruns and long development times.

A safer route — with a faster return on investment — is to use application programming interfaces, or APIs, that allow data sharing across multiple apps, databases and business needs. An API-centered modernization frees IT leaders to take an incremental, step-by-step approach. This strategy helps agencies improve productivity, break down silos and accelerate the development of innovative new public services. Best of all, government IT leaders no longer have to wait years to implement technology that's out of date the day it goes live.

But how can an agency best leverage an API-centered approach to ensure a smart, measured modernization initiative? One option is to implement an API integration platform to centralize, automate and streamline API operations.

This brief from the Center for Digital Government (CDG) explores the rationale for API-first modernizations and the potential of API integration platforms. We outline the advantages of implementing an integration platform and detail best practices for using APIs to improve productivity and elevate public service.

How APIs are Helping Transform Government IT

APIs are everywhere. What started as a quick fix for highly specific problems has become standard practice in many IT departments worldwide. APIs are compelling because they break down the walls around technologies — expanding the freedom to share data and application capabilities.

Government agencies have long used APIs to connect new generations of applications to legacy technologies and databases. But even as private sector developers combined APIs and Agile methodologies to speed solutions to their customers, many public sector agencies continued to rely on traditional waterfall-style modernizations that depend on a linear progression from the beginning to the end of a project. The sequential nature of these efforts can result in long timelines that result in outdated technologies: Many government organizations have found that in the five years it took to finish a project, their "modern" solutions weren't modern anymore. Meanwhile, the rise of cloud-based software-as-a-service (SaaS) applications has given IT teams the ability to build rich, robust API-connected ecosystems.

Today, agencies can modernize in place, keeping legacy systems that are still valuable and using APIs that link them to new SaaS-based applications and databases as needed. Moreover, government IT teams aren't stuck with monolithic applications whose shortcomings cause constant aggravations. Instead, they can use APIs to deploy best-of-breed technologies that resolve specific problems.

APIs and 'Composable' IT

API integration platforms are helping digital merchants implement "composable commerce," part of a growing move toward composable business. In principle, a composable business consists of different instruments — like the horns, woodwinds and strings in a symphony — that can be orchestrated to produce a desirable outcome. It's a way for business leaders to use the best available technologies to compose solutions that please an audience of customers while advancing business goals.

This same approach can apply in the public sector, says CDG Senior Fellow Bill Rials.

Agencies just need the foresight to compose solutions that eliminate the "wrong door" experiences that frustrate constituents when they visit brick-and-mortar government offices.

"Your average constituent doesn't care where the service is coming from," he says. For example, people applying for a permit or a license just want to take care of their business. They're not concerned about whether the permit or license comes from the Department of Human Services or the Department of Environmental Quality.

"If we create a composable portfolio of services, the resident can interact with this system regardless of where any individual element is," Rials says. Composing this portfolio would require IT leaders to pick and choose the optimum SaaS platform for their needs. An API integration platform would help them manage the portfolio.

For instance, a government IT team could partner with a third-party identity and access management service to implement a Zero-Trust cybersecurity strategy. Or an agency could implement a public API that grants constituents access to government data on issues like traffic, permitting and public safety.

Conceivably, residents could even develop their own applications to converge real-time GPS data from their smartphones with government data from traffic cameras, IoT sensors and other devices. "The ideas that can happen are limited only by our imagination," says Bill Rials, a CDG senior fellow who spent decades in public sector IT leadership roles.

Rials notes that APIs in government IT traditionally created one-to-one connectivity between a new frontend and a legacy backend. An API-first architecture, by contrast, makes connectivity one-to-many (a database serving multiple applications) or many-to-one (multiple databases serving a solution).

While API-centered ecosystems have unlimited potential, they do pose a challenge: keeping everything organized and coordinated. That's where API integration platforms drive value.

Understanding the Value of API Integration Platforms

The COVID-19 pandemic forced government agencies to implement public service applications within narrow time frames. Constituents grew accustomed to doing their government business online — using services on their own terms, with their preferred devices.

"Citizens expect to be able to do things themselves," says Bob Jeffcott, principal system engineer at Software AG Government Solutions, a leading provider of API integration platforms. "They've gotten used to the COVID world where they don't have to do things in person anymore."

Government IT leaders who want to meet these new self-service expectations can choose from a rich ecosystem of SaaS application options. APIs plug agencies in to this ecosystem, enabling deployment of applications in days or weeks rather than the months or years they used to require.

Working with a small handful of APIs might not be a formidable challenge for many agency IT teams. But what if they have dozens? Or what if they want to launch one-to-many or many-to-one applications? That's when things get complicated. Indeed, the more APIs agency IT teams deploy, the more they need a unified way to keep everything organized and operating at peak efficiency. API integration platforms fulfill this role.

As an example, Jeffcott points to an API-enabled service designed to assist in the transition for people leaving jails or prisons. The solution uses an integration platform to coordinate data from local colleges, public services agencies and probation offices, making it easier for formerly

What to Look for in an API Integration Platform

- **Access and identity controls to protect APIs, data and microservices**
- **Analytics to measure the impact and efficiency of API operations**
- **Automated continuous integration/continuous delivery (CI/CD) of APIs**
- **Zero-downtime API deployment**
- **Graphical API creation with low-code/no-code connectivity to diverse data sources**
- **Support of API standards such as OpenAPI, Swagger and OAuth**

incarcerated people to sign up for training, housing, drug treatment programs and other transition and reentry services. Bringing all those resources together in a single platform connects people with services they may not have even known about, and it enables them to access programs far faster than they otherwise could, Jeffcott says.

"What used to take days to weeks and sometimes had people slipping through the cracks now takes seconds to minutes," he says.

An API integration platform also paves the way for greater efficiencies that help agencies clear backlogs and cope with chronic staffing shortages. This happens in two ways:

1. Low-code/no-code applications
The revolution in low-code/no-code applications enables almost anyone to be a developer. Agency leaders and technically inclined staff can use these tools to build applications that accomplish more work in less time. Of course, these apps must have data to generate useful outcomes, which requires API connectivity. An API integration platform can help IT departments supervise and regulate access to data for low/no-code development.

2. Robotic process automation (RPA)
RPA leverages digital tools to automate the performance of rote, repetitive tasks. Many agencies have big backlogs because their employees must manually move data from one application to another. Automating these manual tasks with RPA solutions can help agencies address these backlogs without adding staff. An API integration platform is crucial for agencies deploying multiple bots that must access an array of databases and applications.

The best API integration platforms use the SaaS model, which has the advantages of a cloud-native service. With no hardware to manage and the service provider handling software updates and security, solutions are reasonably easy to implement and use, while costs are consistent and economical.

Best Practices for Implementing an API Integration Platform
Implementing an API integration platform doesn't have to be difficult. But there are some important points to understand. For starters, agencies will likely have to negotiate new data-sharing arrangements.

"Everyone wants you to share your information with them, but they're not quite as willing to share their information with you," Jeffcott cautions.

Relatedly, it's important to identify and address all security concerns in advance. "If I open up an API to you, how do I know it's not opening me up to ransomware or data breaches?" Jeffcott says.

Adopting an API integration platform is a process that follows certain key steps:

- **Getting started:** Start talking to integration platform providers, asking how their services work. You'll want to compare fees, capabilities, support and security. Once you've picked the right integration platform for your specific needs and implement it, you can start adding new API functionalities right away.

"You don't have to connect everything together perfectly to be successful in the beginning," Jeffcott says. "Small steps make a big difference."

- **Building a strategy:** Once a few API-centered projects are producing good results, it's time to start thinking about the big picture and folding API capabilities into your overall strategic approach.

"Develop a long-range strategy and ensure short-term projects or decisions support the larger strategy," CDG's Rials advises. While APIs let you create stand-alone applications to plug in as needed, an integration platform can help you build a technology ecosystem of components that solve micro problems while pursuing macro goals.

■ **Developing an API governance layer:** Proper API governance helps address data-security concerns by controlling access to specific information, applications and users. This will also help you reassure various data owners that you have data-protection protocols in place.

A governance layer also helps reduce total APIs in use, which simplifies the supervision of your API ecosystem.

"With an API governance layer, a single API can serve multiple functions for multiple audiences," Jeffcott says. For instance, a single API could route data to multiple agencies in law enforcement, courts and human services. One state saved millions of dollars by deploying an API solution to ensure currently incarcerated persons were not eligible for unemployment benefits, Jeffcott says.

■ **Enabling citizen developers:** Look for new ways to help constituents tap government data, Jeffcott advises. For example, APIs and low-code/no-code tools can enable individuals or civic groups to turn government databases into beneficial applications.

Of course, public-facing APIs create wrinkles to iron out. Legislation may be required to govern data sharing and security. Agencies that own the data will have to be confident that it can be made public in ways that are useful and safe. But over-sanitizing the data can render it worthless.

Moreover, government organizations will have to help constituents see the value of a public API. "Adoption from the public is not automatic," Rials says. "Agencies have to

build an awareness around it." There's no point making data available if the public doesn't know about it.

■ **Nurturing developer communities:** Individuals aren't the only ones who can be enabled to build applications. Local civic groups, nonprofits, higher education institutions and technology-oriented organizations can provide a wealth of talent and commitment that can produce applications agency leaders might not think about.

"Start by building a developer community with an array of partners to access the data with various methods and applications," Rials suggests. Build partnerships with local colleges to generate momentum.

"Combine these efforts and you'll be able to answer questions that haven't even been asked yet," Rials says. Public information campaigns are essential to build these communities.

Conclusion: Embracing an API-First Government

Building solutions in increments with APIs does more than reduce risk and enable speedy time to value. It also makes IT teams integral to the operational effectiveness of governments. Moreover, an API-first approach gives agencies the flexibility to add services as needed and drop them when they're no longer useful.

With a sound strategy and a well-planned approach, agencies can use APIs to get more done with limited staff and budget resources. These benefits enable agencies to develop constituent journeys on par with applications and self-service processes in the private sector.

An API integration platform can give agencies a fast, effective route to the API-centered future of government.

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