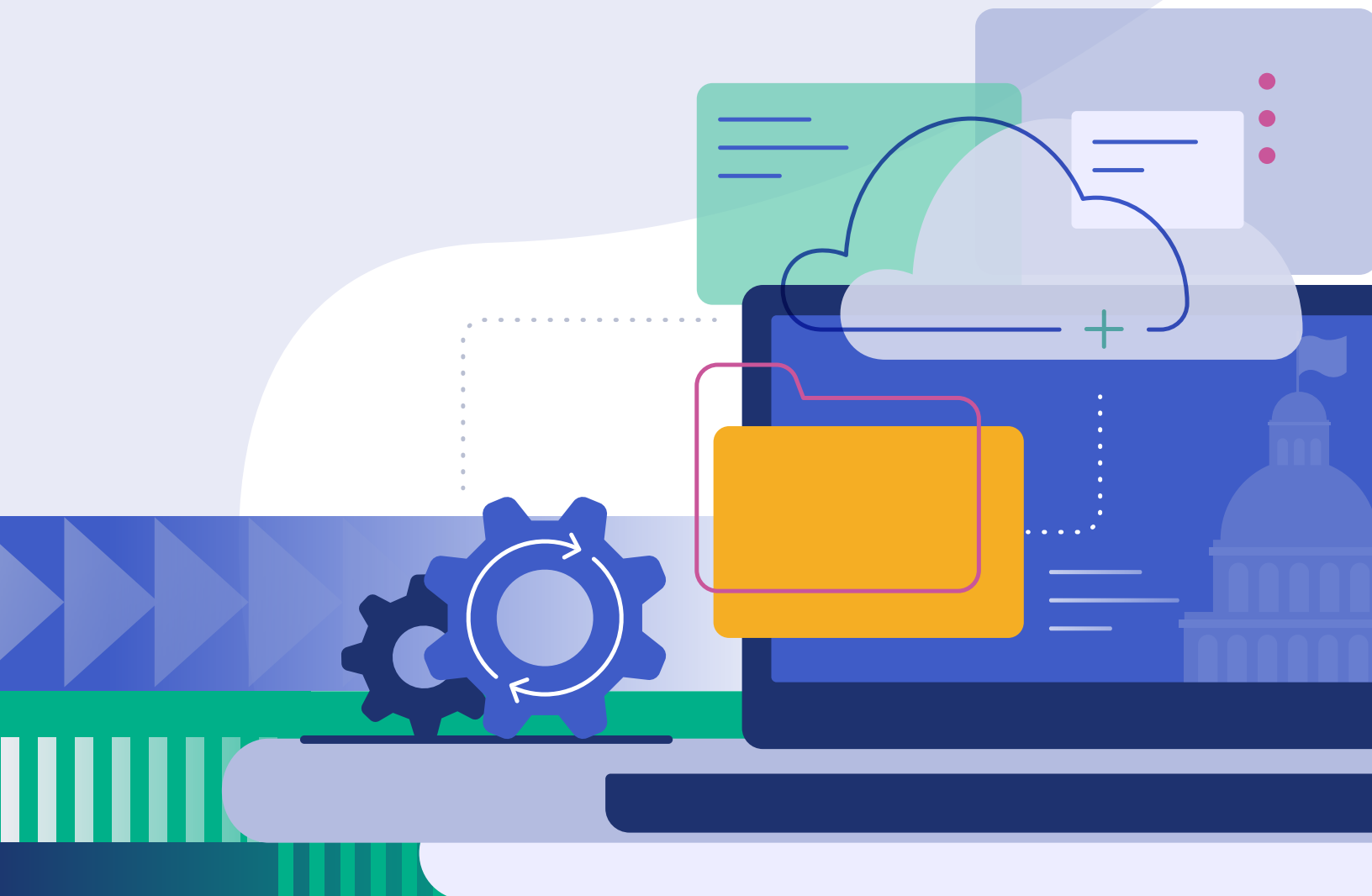


# Advanced API Integrations:

Bridge the gap between legacy back-end systems and modern front-end experiences



## API integrations: A critical component to modernizing digital service delivery

Growing resident expectations, service delivery gaps (highlighted by COVID), and the inflexibility and siloed nature of legacy systems have given new urgency to government modernization projects. Agencies are being pressed to update their tech stacks, from the front-end interface to data storage to back-end systems of record.

**Application Programming Interfaces (APIs)** offer a powerful solution. They provide quick communication between disparate systems and more flexibility for scaling.



### Bridge legacy technology and modern software with APIs

There's less urgency to change when legacy technology is working for you. And we know updating systems is expensive and complex, especially when it has to be roadmapped alongside other priorities.

But modern technology is critical to keeping up with resident needs, current security standards, and evolving internal processes.

## Take advantage of APIs to modernize more efficiently: Separate the front-end and back-end systems

Modernization projects are huge and hard, but API integrations can help government agencies quickly advance digital experiences alongside a gradual, big-picture technical overhaul.

APIs provide an added layer that connects the front-end (user experience) to the back-end systems. By maintaining a distinct separation, agencies can focus on delivering a modern, user-friendly user interface, while still leveraging their existing back-end systems.

With APIs, you can quickly adapt to changing market expectations, connect to the latest applications, take advantage of low-code SaaS solutions, and easily share information with other agencies or departments. You're simplifying updates, maintenance, and service demands – without extensive reconfigurations.

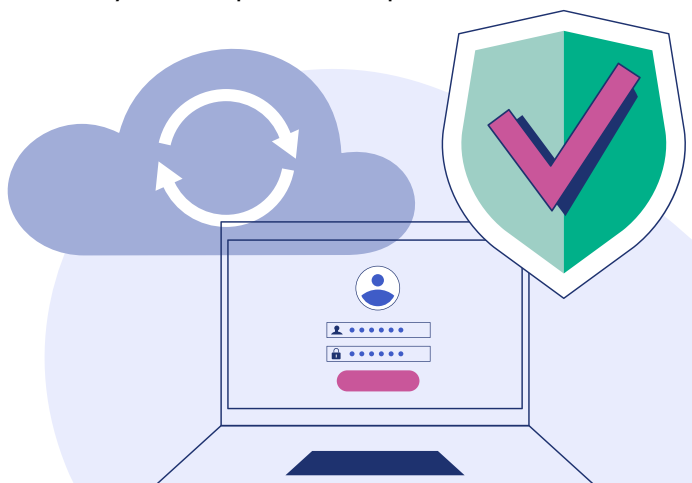
### API integrations + low-code solutions deliver compliance and agility for government agencies

Low-code solutions boost operational efficiency for IT teams and technical staff by accelerating service delivery while maintaining control over system integrity. Because many agencies still rely on legacy systems, ensuring these new low-code applications work with existing infrastructure is crucial. This is where APIs become indispensable.

APIs facilitate integration between new low-code applications and existing back-end systems, enabling secure data exchanges and uninterrupted workflows across different platforms. This flexibility facilitates a smoother transition to modern digital services and enhances interoperability across various platforms and departments.

**The ability to integrate with any type of back-end system, regardless of its age or complexity, ensures that agencies can modernize without the need for costly and disruptive system overhauls.**

By simplifying the development process, low-code platforms enable government IT departments to quickly roll out new services, address resident demands, and modernize outdated processes without compromising security or compliance requirements.



## What's holding you back? (Maybe it shouldn't)

APIs have been around for decades. The first modern API was created in 2000, and although thousands of APIs have been developed specifically for government use, there's still some hesitancy about incorporating the technology into digital government services.

Let's address some common concerns:



### What about back-end system support?

It's ok to use APIs with legacy systems, and even if your agency's back-end system doesn't support APIs, there's middleware to help connect the platforms. (Some vendors offer expensive API toolkits, but a great tech partner should be willing to help get your software connected, no matter what back-end system you're using, and without a big additional bill.)

### Are there more security risks?

APIs, especially those created to transfer sensitive data, have multiple layers of security built-in. Tokenization, encryption, authentication, and gateways are common safety measures you'll see with APIs. And since APIs allow controlled data access, they're useful for enforcing compliance requirements.



### Who manages versioning and maintenance?

APIs do require monitoring, updates, and security checks, but the API publisher handles versioning and maintenance. This means you shouldn't have to worry about vendor APIs. (But we encourage you to ask about vendors' API update and risk management procedures.)

### Can't compatibility be a puzzle?

Compatibility challenges with existing systems can cause apprehension. If you're working with two systems that aren't easily compatible, integration will likely be more complex – but, that definitely doesn't mean impossible. It's common to see government agencies working with diverse software and different IT structures, so tech vendors should be accustomed to various methods of integration. (PayIt addresses this by developing middleware to connect legacy systems to APIs.)



## API integrations: An essential part of the modern tech stack

APIs function as intermediaries that allow different software systems to communicate, facilitating the exchange of data and functionality in a secure, efficient manner. They enable the integration of legacy back-end systems with modern web or mobile applications, ensuring that government agencies can deliver responsive and user-friendly services.

### What sets APIs apart?

APIs are essential parts of modern tech stacks. And they tend to make developers' lives easier – in part, by shortening the learning curve to help keep projects on track.

#### Core characteristics of great APIs:

- ✓ **Standardization:** They adhere to recognized protocols such as HTTP and REST
- ✓ **Audience-specific:** APIs are created with specific users in mind, making them efficient and effective
- ✓ **Clear documentation:** Thanks to detailed specifications (supported types, possible requests, etc.), developers have an easier time working with APIs
- ✓ **On a development cycle:** Like other modern software, APIs are updated regularly, ensuring reliability

#### Benefits of great APIs:

- ✓ **Reliability:** The last thing you need is a system crash at peak traffic. With proper load testing, APIs can handle a lot of traffic at once, ensuring that all consumers have a great experience.
- ✓ **Scalability:** APIs also offer a reliable solution that's easier to scale. They're great for creating modular, adaptable solutions, so your team can connect to new applications (like a CRM, for example) or other databases. And because they scale and update independently from the back-end system, you can always provide users with the latest features.
- ✓ **Automation:** APIs play an important part in automating business processes such as data processing, surfacing real-time updates, and triggering event-based tasks. APIs also make it easier to provide users with things like notifications and accurate account balances.
- ✓ **Improved data and reporting:** Enhanced visibility across systems allows for more accurate and timely reporting. That data can be used internally or set up to automatically inform another tool.



## Types of APIs

Multiple types of APIs could be used for digital government services, separately or in conjunction with one another. These are some common types:

**Public APIs:** Accessible to external developers, these APIs allow the public to build applications using data and services, promoting transparency and innovation.

**Partner APIs:** Restricted to authorized external parties, these facilitate business-to-business interactions, ensuring secure and efficient data exchange.

**Internal APIs:** Used within an organization to streamline internal processes, improving efficiency and data accessibility.

### REST & SOAP APIs

Government agencies use both REST and SOAP APIs for efficient data exchange and service delivery. Each approach offers unique advantages, with REST commonly supporting public-facing services and SOAP providing structured communication for internal and inter-agency systems.

#### REST APIS

(Representational State Transfer)

Agencies often use REST APIs for public-facing services, such as open data portals and digital government platforms. REST’s flexibility and use of standard web protocols make it well-suited for providing easy access to public datasets, such as transportation updates, public health information, and census data. REST APIs rely on underlying transport protocol.

- ✓ Modern web applications work better with REST APIs
- ✓ REST has faster performance (shorter page load times) due to smaller messages and caching support
- ✓ REST supports a variety of encryption methods without an impact on performance, but relies on a secure transport layer, such as HTTPS to protect sensitive data during transmission

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#### SOAP APIS

(Simple Object Access Protocol)

Agencies use SOAP APIs for structured communication, particularly in internal and inter-agency systems. SOAP’s strict protocols make it suitable for applications like tax processing, healthcare records, and law enforcement databases. SOAP APIs can work with any transport protocol, but that makes them complex and slow.

- ✓ SOAP requires more bandwidth because messages are larger and more complex, which slows down page load times
- ✓ SOAP works with various protocols (HTTP, SMTP, TCP), making it adaptable for diverse systems
- ✓ Harder to code and has a high learning curve

**Both REST and SOAP have distinct strengths, with REST excelling in accessibility and flexibility and SOAP providing a structure suited to enterprise-level needs. Agencies choose the most appropriate approach based on the context and goals of the application.**

## The role of flat files in government tech stacks

Flat files have long served as a reliable tool for data storage and transfer in government IT systems. Their simplicity and straightforward structure make them easy to use, especially in environments where basic data handling is required. However, as agencies modernize, it's important to consider both the strengths and limitations of flat files:

### Simplicity

Flat files are generally easy to implement and are reliable for straightforward data storage and transfer tasks.

### Compatibility

They support a wide range of platforms, allowing for use without complex configurations.

### Scalability Challenges

As data volumes grow, flat files may become less efficient, leading to slower processing times.

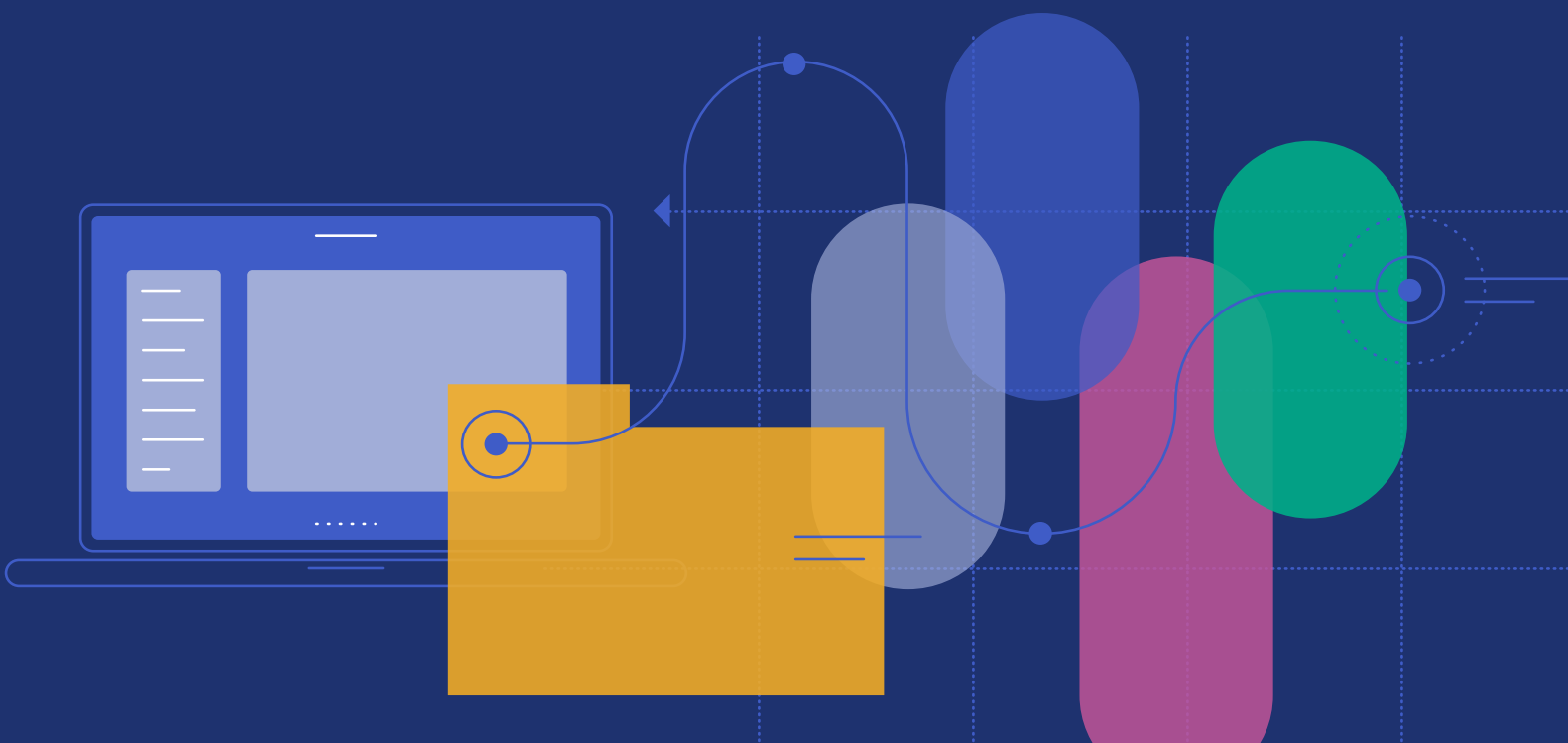
### Data Integrity

Without built-in validation (e.g., checking that a date is in the correct format or ensuring that a numerical value falls within a certain range), flat files can allow data entry errors, which may worsen data quality over time.

### Flexibility

Flat files remain static, which can limit their effectiveness in dynamic or real-time data integration scenarios.

**While flat files still play a role in certain contexts, agencies that aim to enhance data integration and service delivery will likely find that more advanced solutions, like APIs, offer greater scalability, flexibility, and efficiency.**



## Where does middleware fit into all of this?

You have APIs, flat files, legacy systems of record, and SaaS solutions; middleware is what connects your tech stack.

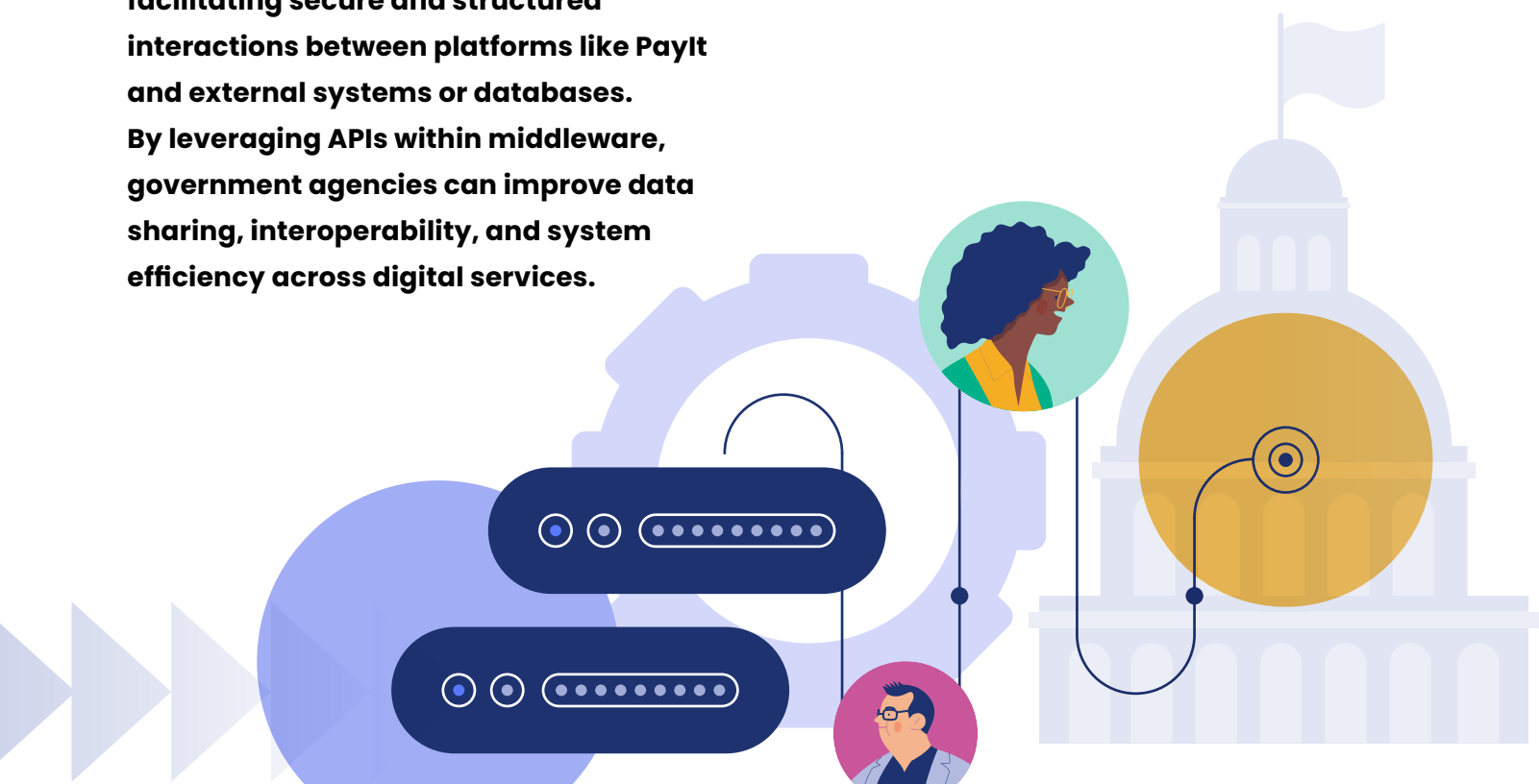
Essentially, middleware connects applications and services that cannot communicate natively (often because they're written in different frameworks); it's a software layer, like an API, between the operating system and applications on each side of a distributed computing system in a network.

Middleware is essential for ensuring smooth communication between various government systems, databases, and applications. It serves as a bridge, providing the necessary infrastructure for different systems to interact efficiently. In this context, APIs play a key role as the communication protocol, enabling software components to exchange data and requests in a standardized way.

**APIs are part of the middleware layer, facilitating secure and structured interactions between platforms like PayIt and external systems or databases. By leveraging APIs within middleware, government agencies can improve data sharing, interoperability, and system efficiency across digital services.**

A common question is whether middleware can work with older, legacy systems. In most cases, the age of a system shouldn't hinder middleware functionality. As long as mechanisms are in place to access and interface with the data, middleware can operate effectively.

For example, even if legacy systems lack modern API capabilities, they can still be integrated using methods like flat files (e.g., CSV or XML exports) and database connectors like ODBC (Open Database Connectivity) or JDBC (Java Database Connectivity). These tools enable middleware to retrieve and process data from older systems while keeping things humming along in modern workflows.





## Integrations for innovation

API integrations are a cornerstone of digital transformation for government agencies, enabling them to deliver efficient, user-friendly services – and these connections allow governments to scale digital services easier and faster.

API integrations also give agencies the flexibility to tap into a whole new set of functions, ideas, and business processes:



**Shift the mindset to digital first**



**Change your approach to modernizing digital government services**

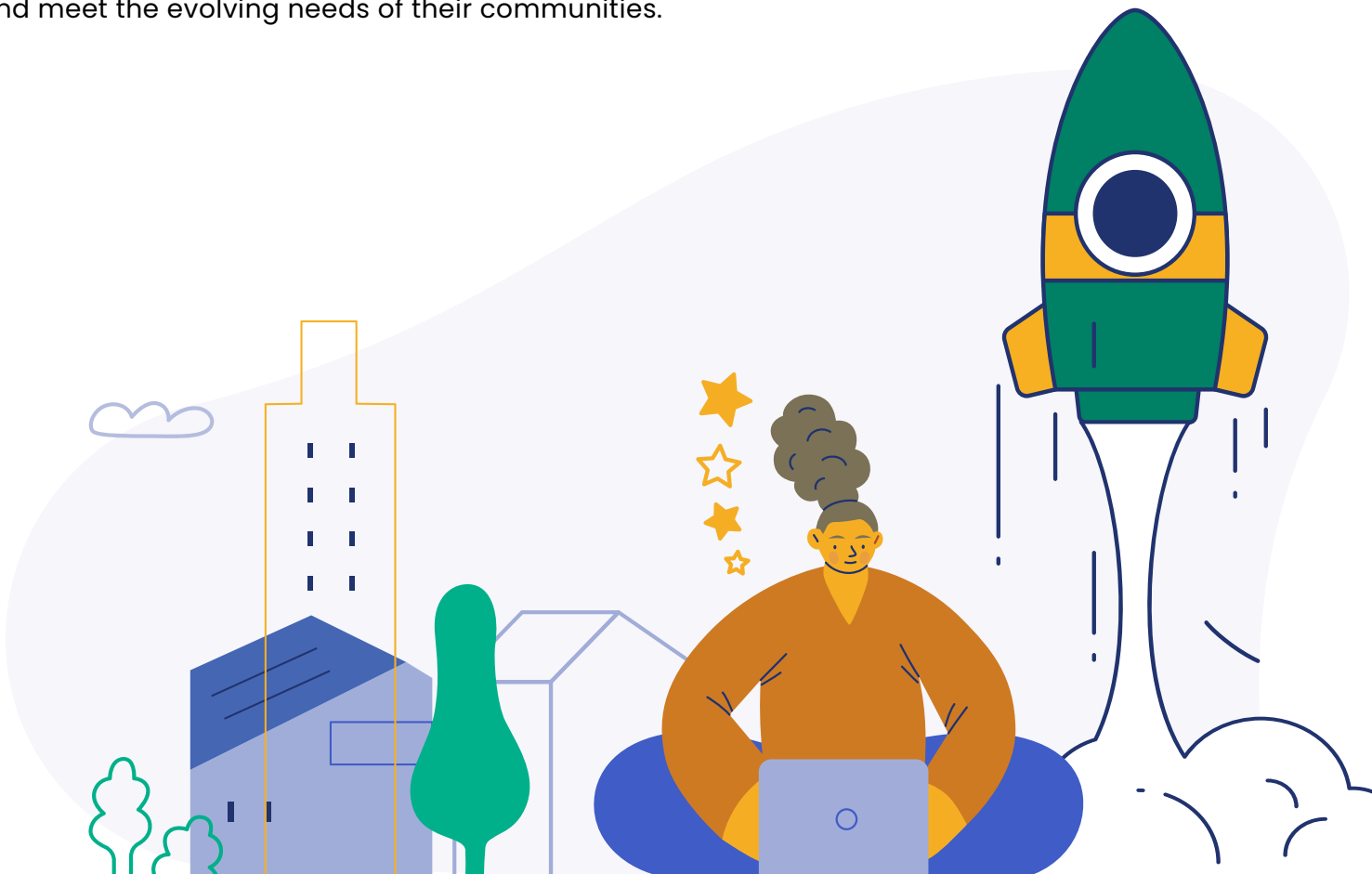


**Create new opportunities and models of operating**



**Agility to scale, change direction**

By overcoming the challenges associated with legacy systems and adopting a strategic approach to API implementation, agencies can better modernize their digital infrastructure and meet the evolving needs of their communities.



## About PayIt

PayIt enables state and local government agencies to deliver a great resident payments experience that accelerates the shift to digital. Agencies choose PayIt to better achieve their mission through improved operational efficiency, customer support, and resident satisfaction. Our solutions span property tax, courts, utilities, DMV, outdoors, and more. PayIt provides a single resident profile across agencies and jurisdictions, integrates into back-office and adjacent systems, and our team helps clients drive adoption of digital channels. Serving more than 100 million residents in North America, we have received awards from Fast Company and StateScoop, and have been listed in the GovTech 100 for 8 years and counting.



Smarter for government.  
Easier for everyone.

To learn more, visit [www.payitgov.com](http://www.payitgov.com)

