MANAGING APPLICATION DEVELOPMENT:

The public-sector perspective

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Contents

About this report

Managing application development: The public-sector perspective is an Economist Intelligence Unit report, sponsored by Google Cloud. The findings do not necessarily reflect the views of the sponsor.

The report draws on two main sources for its research and findings:

- A survey that includes responses from more than 169 senior executives and application developers in the public sector globally. This study is part of a larger survey that received more than 1,000 responses globally.

- An interview with Chuck Grindle, chief information officer, Commonwealth of Kentucky.

We would like to thank the interviewee and survey respondents for their time and insights. The report was written by Peter Krass and edited by Becca Lipman.

Executive summary and key findings

The public sector may suffer from its reputation as a technology laggard, but the reality is often quite different. Around the world, government agencies are about as likely to use cloud technology as any private-sector company, according to our survey. In fact, governments are more likely than their private-sector counterparts to use Agile, an innovative application-development approach. And just as private-sector companies do, public-sector organisations wrestle with the growing challenge of keeping their systems, applications and data secure.

An in-depth review of public-sector survey results uncovered the following insights:

- Nearly two-thirds (63%) of public-sector organisations have adopted some degree of cloud technology, roughly the same as the cross-industry average. Many of the remainder (28%) plan to use the cloud sometime soon, and nearly three-quarters (72%) also encourage the use of cloud services.

- Most (89%) public-sector organisations consider application development important to achieving their strategies. This is only somewhat lower than the average degree of confidence (94%) across industries.

- Nearly half (48%) of public-sector organisations are using Agile, an important development approach, compared with 45% across all surveyed industries.

- When it comes to DevOps and continuous integration (CI) approaches, the public sector slightly lags the all-industry average. Just over a quarter (28%) of public-sector organisations have adopted DevOps, compared with 39% across industries. Similarly, about a quarter (27%) of public-sector organisations use CI, compared with 31% across all industries.

- To measure the success of their application-development efforts, more than half (53%) of public-sector organisations look to two main metrics: customer/ stakeholder satisfaction and on-time/on-budget execution delivery.

- Cyber-security is the number one challenge across all industries, including the public sector. Nearly half (44%) of public-sector organisations say that security is their top barrier to developing better applications. And slightly more than half (51%) says security is their top barrier to cloud adoption, higher than the 46% average across all industries.

CHAPTER 1:
A digital revolution

Does the public sector deserve its reputation as a technology late adopter? Or is it really an application innovator? The truth is a bit of both.

When Chuck Grindle was appointed chief information officer (CIO) for the US Commonwealth of Kentucky in 2017, he discovered that his new IT inventory included some 1,100 physical servers and 3,300 virtual servers managed by nine disparate contractors.

"We had a 50,000-square-foot data centre, and the third and fourth floors looked like a used-car lot," Mr Grindle recounts. "The team discussed that we can't continue like this." Today, after a lot of hard work, Kentucky's systems run on a single streamlined platform, with help from just a single vendor.

Mr Grindle's experience with legacy and outdated technology is hardly unique. According to a 2018 survey, over 95% of US state government agencies still use mainframes—classic computer systems—to support their legacy applications.[1] It also found that one in five (21%) state agencies would, under the right circumstances, consider growing their mainframe portfolio.

Yet the public sector is still innovating, particularly in response to new challenges that include calls for greater accountability, more real-time interaction, and strengthened security and privacy protection. And they innovate with notable budget constraints, which are set and allocated by non-IT agencies that are also hemmed in by whatever funding is available from taxes and other revenue sources.

The Economist Intelligence Unit survey finds that the cloud is now a major area of public-sector innovation. Nearly two-thirds (63%) of public-sector organisations have adopted some degree of cloud technology, roughly the same as all industries. Many of the remainder (28%) plan to use the cloud sometime soon, and nearly three-quarters (72%) encourage the use of cloud services.

Regionally, the public sector's adoption of cloud is strongest in the Europe, Middle East and Africa (EMEA) region, where just over two-thirds (67%) of respondents say they're already using cloud technology. By comparison, public-sector cloud adoption rates were somewhat lower in both Asia-Pacific (64%) and the Americas (58%).

Today, after a lot of hard work, Kentucky's systems run on a single streamlined platform, with help from just a single vendor.

Footnotes:

1. National Association of (U.S.) State Technology Directors: "State Government's Mainframe Dilemma: Should It Stay or Should It Go?", August 2018: https://higherlogicdownload.s3.amazonaws.com/ NASTD/5d6c1d2a-df06-4b31-bf05-51026be46366/ UploadedImages/2018_NASTD_State_Mainframe_ Strategy_Survey.pdf

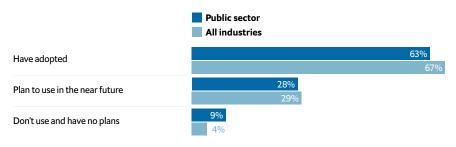# Managing application development: The public-sector perspective

The Agile approach to software application development is another area where the public sector has been a rapid adopter. In fact, the public sector's high adoption rate—nearly half (48%) of public-sector respondents say they've gone Agile—is slightly higher than the adoption rate among all private-sector industries (45%).

Figure 1

Keeping pace in the cloud

"To what extent has your organisation adopted cloud technologies?"

(% of respondents)

■ **Public sector**
■ **All industries**

Have adopted	Public sector: 63% / All industries: 67%
Plan to use in the near future	Public sector: 28% / All industries: 29%
Don't use and have no plans	Public sector: 9% / All industries: 4%

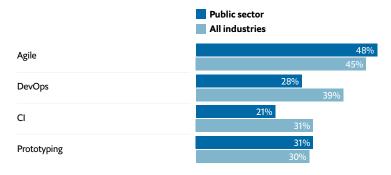*Note: Multiple responses were permitted*
Source: Economist Intelligence Unit "Managing Application Development" survey, 2017.

Figure 2

Leading in Agile

"Which development models and methodologies do your developers use?"

(% of respondents)

■ **Public sector**
■ **All industries**

Agile	Public sector: 48% / All industries: 45%
DevOps	Public sector: 28% / All industries: 39%
CI	Public sector: 21% / All industries: 31%
Prototyping	Public sector: 31% / All industries: 30%

Note: Multiple responses were permitted
Source: Economist Intelligence Unit "Managing Application Development" survey, 2017.

CHAPTER 2:
A bid for success

Nearly nine in ten (89%) public-sector organisations consider application development important to achieving their growth strategies. C-suite respondents were even more enthusiastic, with 96% calling application development important to achieving their goals.

In particular, respondents categorised the sector's top growth goals as acquiring new customers (37%), increasing revenue (31%) and entering new markets (25%).

As applications are so important for achieving growth goals, it is worth noting the barriers to stronger development. Security is cited by nearly half (44%) of public-sector respondents as the main issue they face in developing better applications. But it is a lack of funding that notably ranks as a much bigger issue for the frequently cash-strapped public sector (41%) than it is for the private sector (30%). Other barriers include inflexible culture (31%) and inflexible technology (25%).
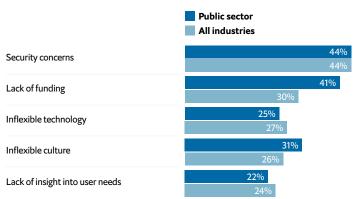
In Kentucky, Mr Grindle also points to the challenge of training enough people to handle his to-do list of projects. "The biggest barrier is what we can accommodate in any given year," he says. "And that depends on the number of people you have to train. The complexity of these systems is a big challenge."

One approach Mr Grindle and his team have tried is "lunch and learn" training sessions, where employees and contractors are invited to listen to a presentation on new developments in the computing environment, generally organised around three main themes: compute, storage and servers.

Like most companies, the public sector uses various measures to assess the success of an application against strategic goals. The survey finds that the most common metrics for success are customer/stakeholder satisfaction (53%), on-time/on-budget delivery (also 53%), customer/stakeholder use (49%), and contribution to strategic goals (42%). Key performance indicators, a common measure for the success of software development, are used by roughly a quarter (28%) of public-sector organisations, compared with more than a third (39%) across all industries.

> **"The biggest barrier is what we can accommodate in any given year...and that depends on the number of people you have to train. The complexity of these systems is a big challenge."**
>
> *Chuck Grindle, chief information officer, Commonwealth of Kentucky*

Figure 3

"What are your organisation's biggest barriers to developing better applications?"

(% of respondents)

Public sector
All industries

Barrier	Public sector	All industries
Security concerns	44%	44%
Lack of funding	41%	30%
Inflexible technology	25%	27%
Inflexible culture	31%	26%
Lack of insight into user needs	22%	24%

Note: Multiple responses were permitted

Source: Economist Intelligence Unit "Managing Application Development" survey, 2017
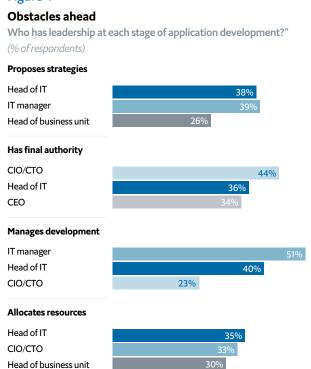
CHAPTER 3:
In the seats of power

As the use and benefits of application development permeate organisations, authority to propose, approve, fund and oversee the application development process has evolved beyond the confines of the IT department.

Yet leadership of application development in the public sector is still almost universally assigned to IT executives, such as the CIO/chief technology officer (CTO), head of IT and IT managers. That includes proposing application strategies, having final authority, managing development and allocating resources. Only about a quarter (26%) of public-sector organisations say their business-unit heads propose strategies, and just over a third (34%) say their C-level executives have final authority over application development.

Figure 4

Obstacles ahead

Who has leadership at each stage of application development?"

(% of respondents)

Proposes strategies

Head of IT	38%
IT manager	39%
Head of business unit	26%

Has final authority

CIO/CTO	44%
Head of IT	36%
CEO	34%

Manages development

IT manager	51%
Head of IT	40%
CIO/CTO	23%

Allocates resources

Head of IT	35%
CIO/CTO	33%
Head of business unit	30%

Note: Multiple responses were permitted

Source: Economist Intelligence Unit "Managing Application Development" survey, 2017

In Kentucky, Mr Grindle, who has authority over IT funding, says application development is split 50-50 between internal and external spending. "Every software package we buy has some development required to fit into our environment," he explains.

He has bolstered that by creating a new office of the chief data officer (CDO). Led by Krishna Mohan Mupparaju, a former IT executive in healthcare and transport, Kentucky's CDO office is currently doing an exhaustive inventory of all the state's databases. "We're data-rich but information-poor," Mr Grindle says. "Once we understand our databases at a card-catalogue level, we'll know who else could benefit from using this data."

Our survey also finds that in the public-sector application development teams are most commonly (41%) organised by department, but there was substantial variation by region. In the Americas, more than half (57%) organise their application development teams by department, compared with fewer than half (47%) in EMEA and fewer than a quarter (17%) in Asia-Pacific.

Across industries, outsourcing and contracting are important means of developing applications without adding staff. Within the public sector, the survey finds more than a third (38%) source the majority of their application development externally. Notably, in the Asia-Pacific region, more than half (53%) say the majority of the application development work is sourced externally, far more than either EMEA (35%) or the Americas (28%).

By contrast, nearly half (47%) of public-sector organisations worldwide do most of their application development internally. Only a small group (15%) split the work evenly between internal and external developers.

"We're data-rich but information-poor…once we understand our databases at a card-catalogue level, we'll know who else could benefit from using this data."

Chuck Grindle, chief information officer, Commonwealth of Kentucky

The way ahead

The public sector is emerging as a true home of innovation, in part due to its embrace of big data analytics, cloud and advanced development techniques. And with the sector's revitalised emphasis on customer service, its need for high-quality applications can only grow.

Public-sector organisations will continue to focus their application in the following areas:

Efficiency: a combination of ageing populations, tax reforms, austerity measures and other recent economic developments require government bodies to do more with less. Many have launched modernisation efforts that include moving to the cloud, adopting advanced development approaches, and consolidating disparate and sometimes overlapping systems.

Democratising data: public-sector organisations are the keepers of vast quantities of data that have the potential to improve transportation, public health, housing and other critical activities. To make these data far easier to understand, analyse and use, some in the public sector are experimenting with data visualisation, mobile technology, and even artificial intelligence.

Updating legacy systems: the mainframe lives on in the public sector, often supporting decades of historical data. But these aren't your father's mainframes. Essentially high-end servers, modern mainframes can take advantage of the cloud, DevOps development approaches, big data analytics and more. New applications will be needed to make legacy data available in the ways that today's users want to consume it—with smartphones and other mobile devices, and on an anywhere/anytime basis—while enabling data-sharing with modern data systems, and all while delivering high levels of cyber-security protection.