Putting Your Health in Your Pocket

How Government is Investing in Mobile Health

INDUSTRY PERSPECTIVE

redhat.

EXECUTIVE SUMMARY

Today, nine out of 10 Americans own a mobile phone.
Of that group, more than 65 percent own a smartphone. And these days it seems like you can do everything on that smartphone. Everything from email to banking to dinner reservations can be done with the swipe of a finger. And now those smartphones are giving patients the ability to monitor their own health any time, anywhere. Mobile phones are transforming the way we monitor, engage and report our health to our doctors.

It's not just the average citizen who's using mobile health to improve health results. The government is investing in mobile health, too. For example, the Department of Veterans Affairs allocated more than $66 billion to fund veteran medical care in fiscal year 2016. A portion of that funding was dedicated to increasing patient access and use of mobile health applications. Those dedicated funds are part of a program known as the VA Mobile Health Initiative. The initiative aims to "focus on data mobility that will increase opportunities to empower veterans and caregivers to be active participants in their health care and lead healthier lives," according to the program's mission statement.

The VA's Mobile Health Initiative is a good first step in the arena of public-sector mobile health investments. But in order to truly make successful mobile health applications a reality across government, agencies need to consider the development, deployment and use of applications as well as how these apps can hook into critical healthcare systems that support the delivery of quality healthcare. In order to better understand these considerations, GovLoop spoke with experts from Red Hat, a company with decades of open source, application development and platform technology experience. In this report you'll hear from Red Hat's Mobility Specialist, Josh Bentley.

"Almost everyone has a mobile device, and everyone goes to the doctor and other healthcare providers. It just makes sense to pair mobility and health together," said Bentley. "For health care providers the end game now is a patient checking their own health so they can be their own personal health advocate. This brings it down to a different type of engagement between patients and clinicians – whereby better and more timey information can empower patients to make informed decisions but with the support of their healthcare network."

After reading this report, you'll have a better understanding of:

› **The market drivers leading to mobile health adoption**
› **The barriers to mobile health application adoption**
› **The dos and don'ts of building a mobile health strategy**

Let's begin with a brief overview of the market drivers that led to the explosion of mobile health applications in government.

A CLIMATE RIPE FOR MOBILE HEALTH

The last decade ushered in tremendous changes to mobility.
Just consider the fact that a majority of businesses in the U.S. now dedicate up to a fifth of their IT budgets for mobile initiatives, according to a recent study by IDG Enterprise. The public sector similarly experienced a major increase in mobile adoption due, in large part, to the White House's 2012 Digital Management Strategy. The strategy focused on two overarching goals related to mobility: enabling citizens and an increasingly mobile workforce to access government information and services anywhere, anytime, on any device; and to ensure government procures and manages devices, applications and data in smart, secure and affordable ways – and uses them to spur innovation.

"The government workforce is much more mobile now," said Bentley. "An Army doctor, rotating from one base hospital to the next, can log onto an app and book an operating room, or check on their patient's blood pressure results from their phone so they can make decisions faster and more efficiently. The key is data access on the go and in a user-friendly, secure and timely manner."

It's not just IT investments and mandates that are making mobile health applications a reality. Bentley noted that the general digital intelligence of doctors and patients alike is helping with that growth too.

"Ten years ago people didn't have a mobile device where they could do more than email or check the Internet," he said. "Now you have people that are retiring from the military and people who are just coming out of high school with the same aptitude for using a mobile device."

With an increasing number of tech-savvy citizens driving the demand for more robust applications that can actually track and monitor patient health data, an abundance of new opportunities for developers to create a range of innovative apps exists.

For example, due to the increased mobile adoption of patients, the VA is able to successfully leverage its caregiver app so that patients can chat with doctors without calling the office or logging onto a desktop.

"A few years ago, patients wouldn't be comfortable trusting an app to have those conversations, but now that trust is there," said Bentley. "Patients are no longer logging into their computers when they have a question; they feel comfortable doing it from their phones."

Finally, the emergence of big data analytics solutions allowed the government to help doctors sift through all of the data that is coming in from these mobile devices.

"The VA has one of the largest Electronic Medical Record (EMR) systems in the world. Their backend system has so much electronic health record data that it's one the truest examples of big data out there," said Bentley.

In fact, the VA has so much data that its records can also be a benefit to other agencies.

"The VA can take the power of analytics and give that data to all the other organizations. However, the data collected by the VA doesn't just stay in the VA's data coffers. For example, if the Department of Health and Human Services is looking to build an urgent care facility in a new region, HHS can use VA datasets on where the most in-need veterans are located to help inform the decision," said Bentley.

To help with collaboration, HHS created the Health Data Initiative. The initiative aims to make health data openly available, disseminate the data broadly across the health and human services ecosystem and continuously educate internal and external participants about the value of data. Right now the site is home to more than 2,000 datasets on topics such as Medicaid, community health and Medicare costs.

Just because the government market is ripe for mobile health applications, however, doesn't mean the move to mobile is an easy one. In fact, there are plenty of obstacles – secure data access being one of the largest.

BARRIERS TO MOBILE HEALTH APPLICATION SECURITY

Unsurprisingly, security topped the list of concerns raised by government agencies interested in creating mobile health applications, according to a recent study in the Journal of Medical Internet Research.

"When it comes to health care, agencies are worried about security. Health records contain very private information, and it's the government's job to make sure that data is protected at all times," said Bentley.

And that concern is founded: According to the Office of Civil Rights under the Department of Health and Human Services, there were 253 health care breaches that affected 500 individuals or more with a combined loss of over 112 million records in the U.S. last year.

"We have found that agencies are slower to adopt mobile health applications than those in the commercial space because their concern of having data leaked and being hacked is so high," said Bentley. "Not that the commercial sector isn't worried about being breached, but they can rebuild a database or change things at a more agile speed than those in the public sector that have these systems. Agencies are not allowed to fail."

In order to ensure data security, Red Hat focuses on enhancing the security an agency already has in place.

"We can reroute an agency's data through their existing systems of record. If they have certain algorithms already in place, such as HIPAA-compliant regulations, we don't take those away – we work in conjunction," said Bentley.

In other words, Red Hat takes frontend application developments and then ties those new datasets into the agency's backend systems after authenticating with the agency's own security systems.

For example, Red Hat's Mobile Device Management solution allows a doctor who manages his or her device with security solutions like AirWatch, MobileIron or Blackberry to continue doing so.

"We truly are talking about getting away from device management and security of the device layer, and moving into the application layer," said Bentley.

Red Hat adds a custom application program interface (API) and an application ID through their mobile application platform onto the application that is then supported on a managed, secure and authenticated device.

On the patient side, the application is secured not by the individual mobile device, but by the application layer as well. Patients are able to take advantage of application ID to protect both security and privacy.

"We work in conjunction with those existing systems of record, to make sure we never lose security, and all the security we add is in conjunction with what patients are already happy using," said Bentley.

In an effort to increase security, flexibility and reduce associated costs, Red Hat takes advantage of the open source community.

"We're an active part of the open source community," Bentley said. "We care about open toolkits, the ability to develop and use things that you're comfortable using because there is no one universal solution for security, every agency is different. If an agency has certain security requirements like logging in their users and authentication processes, we can adapt to those."

The value of open source – especially in terms of security – is that solutions are scalable, and repeatable, allowing for a faster ROI than proprietary systems. And Red Hat curates the open source so that it meets the rigors of industry and the public sector.

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> **MOBILE HEALTH SPECIALIST, RED HAT**

HOW TO IMPLEMENT A SUCCESSFUL MOBILE HEALTH APPLICATION

In order to help agencies on their mobile health applications journey, Red Hat created a three-tiered platform to assist with development, deployment and use of mobile applications. The Red Hat Mobile Application Platform is especially helpful to agencies that are publishing applications for the first time. Those agencies are asking, "How do I market the app, how do I publish it to Android, Windows Phone and iOS, how do I get user feedback?" said Bentley. "Mobile applications are a completely new dynamic for people who've never published something like it in the past so it can be scary." That's where industry partners like Red Hat come in.

Red Hat's Mobile Application Platform helps agencies develop, launch, market and streamline mobile app development via a **three-tiered approach**.

TIER ONE
Frontend Device

The frontend, or presentation layer, is what the user actually sees when using a mobile device. In order to make the application as simple and effective as possible, Red Hat supplies government developers with toolkits that specifically focus on frontend development.

"For example, if an app developer from the VA or HHS is looking to create an app where a patient needs to send their data to a clinician, we have toolkits that help those developers set up those applications properly," said Bentley.

The toolkits do not push developers down one specific avenue of development. The platform supports a range of common developer tools so they are free to make that choice.

"Rather than forcing a case of one-size-fits-all, we believe that developers should be to free to bring their own tools," said Bentley.

The Red Hat Mobile Application Platform is equally comfortable with both native and hybrid approaches and is focused on the idea of getting information to a variety of form factors of any type.

TIER TWO
Middleware

Think of middleware as the string that connects the frontend system with the data access layer. Middleware is what makes the shiny new application feed data back into large data centers or legacy technologies, and do so as securely and efficiently as possible.

"For the past five years, Red Hat has deployed a Node.js-based middleware solution that optimizes the frontend performance while also converting and exposing backend data in a lightweight and efficient manner," said Bentley.

The Node.js glues together the frontend experience with backend data that could be very tied to legacy programs. Think of it as tying together a very fancy and easy-to-use interface with older data that might be stored in a legacy system or format. That format could make it difficult to tie the two datasets together, but middleware allows for this connection.

"In the past, no one ever would have tried to write an application for that data because it was too hard to access, but now they can," said Bentley.

TIER THREE
Backend

The backend, or the data access layer, is the server side of the equation.

"Enterprise mobile applications are islands unless they are connected to something, and islands are of limited use as far as enterprise apps go. This is where the backend functionality in the Red Hat Mobile Application Platform comes in," said Bentley. "By using our Node.js-based mobile backend-as-a-service, which has staggering performance and responsiveness, developers can easily integrate with heterogeneous backend systems, without having to build everything from scratch each time."

Working in conjunction, the three tiers expose your backend data to your frontend users in highly scalable solution, with heavily optimized and demarcated datasets.

WHEN CREATING A MOBILE STRATEGY:

☑ **DO:**
Focus on the experience and start your application development with the end user in mind.

☑ **DO:**
Make your applications dynamic with an accessible user interface.

☑ **DO:**
Bake security measures into the application from the start.

☑ **DO:**
Gather necessary input from key stakeholders beyond IT department.

✕ **DON'T:**
Create an application that is only usable on one platform like an Android or iOS solution.

✕ **DON'T:**
Create your application in a silo where the first time the application is tested by users is in the launch phase.

✕ **DON'T:**
Create extra work by not connecting your frontend system to your backend data layer.

✕ **DON'T:**
Forget about your developers. Empower them to focus on user interaction by implementing a cloud-based backend.

CONCLUSION

While mobile health applications are still fairly new to government, some agencies like the VA are well on their way to making mobile health an integral part of veteran care. The Mobile Health Initiative already features more than 20 health-related mobile applications, including a pilot app that is testing scheduling doctors appointments from your smartphone. The Veteran Appointment Request (VAR) App allows patients to request and view primary care and mental health appointments at VA facilities where they already receive care. VAR will also allow you to schedule and cancel selected primary care appointments directly through the app at facilities where you have a Patient Aligned Care Team (PACT). The app is currently deployed to 180 test patients and doctors. If the pilot proves successful, the VA plans to roll out the application nationwide to various VA facilities.

Bentley sees the VAR as just the beginning: "Just think: What if doctors could improve follow-up care, monitor diseases like diabetes, schedule follow-up appointments and ping patients remotely to let them know the next steps they need to take to improve their care, all with an easy-to-use mobile app? That could be revolutionary for patients and doctors."

Red Hat is investing in the future of mobile application development.

> "**We see this as a real growth area, because patients want to be more in charge of their health care and doctors want more accurate and reliable information. We now have the technology to make this happen.**"

- JOSH BENTLEY
MOBILE HEALTH SPECIALIST, RED HAT

ABOUT RED HAT

Red Hat® is the world's leading provider of open source solutions, using a community-powered approach to provide reliable and high-performing cloud, virtualization, storage, Linux® and middleware technologies. Today, Red Hat is at the forefront of open source software development for enterprise IT, with a broad portfolio of products and services for commercial markets. That vision for developing better software is a reality, as CIOs and IT departments around the world rely on Red Hat to deliver solutions that meet their business needs. Solutions that provide technology leadership, performance, security, and unmatched value to more than 90 percent of Fortune 500 companies. **Learn more here.**
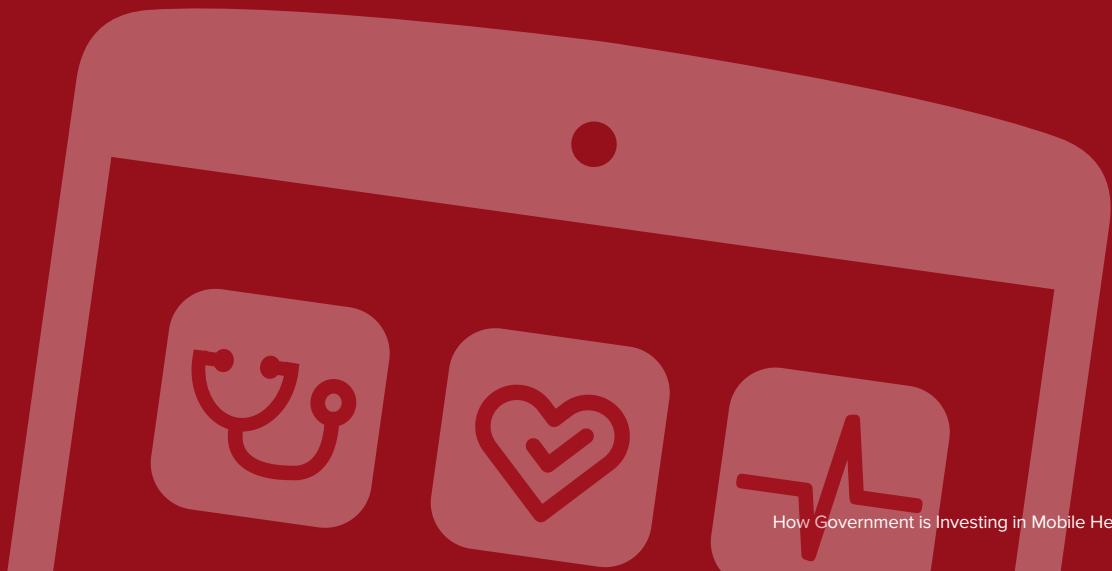
ABOUT GOVLOOP

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 250,000 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.

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