



PAVING THE WAY FOR SMART MEDICAID:

How APIs, IoT, the Cloud and Other
Innovative Technologies Can Improve
Medicaid Programs Systems

Medicaid provides health coverage to 73 million Americans,¹ serving as a critical lifeline to expand access to care. However, these programs, which are administered at the state level, often rely on inefficient processes and systems.

Take for example one large state, which uses 92 separate systems to administer \$98.5 billion in state funds to serve 13 million enrollees² and still relies on paper records for much of its federal reporting. Many states also rely on outdated systems, with recent data suggesting 28 percent of state Medicaid Management Information Systems (MMIS) are legacy.³

In recent years, 90 percent of federal matching funds from the Centers for Medicare & Medicaid Services (CMS) has helped states launch projects to modernize their MMIS.⁴ States now have an opportunity to build a “smart Medicaid” system that is modular, interoperable, and capable of incorporating new and innovative technologies, such as the cloud, open application programming interfaces (APIs), machine learning, Internet of Things (IoT) connected devices and geospatial information systems (GIS). Moving in this direction could enable Medicaid systems to make better use of their data to improve program outcomes and drive better quality care.

MEDICAID’S CURRENT TECHNOLOGY CHALLENGES

Some states still use Medicaid eligibility and enrollment systems that are between 30 to 40 years old.⁵



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STATES CAN MODERNIZE THEIR MEDICAID SYSTEMS, BUILDING NEW PLATFORMS THAT INCLUDE CAPABILITIES FOR INTEROPERABILITY AND MODULARITY.



These systems were implemented before today’s “smart” technologies emerged. Legacy MMIS are monolithic and hard-coded and are often so outdated they lack the capability to integrate these technologies. Upgrading or adding new functionality to these systems is expensive and time consuming. One option is to overhaul the entire system, but until recently, budget-strapped states couldn’t undertake this approach.

However, with additional federal funding, states can now modernize their Medicaid systems. They can build new platforms that include two all-important capabilities for administering a modern, service-based Medicaid program: interoperability and modularity.

CREATING MODULAR, INTEROPERABLE MEDICAID SYSTEMS

States are beginning to move away from a “big-bang approach” to IT development, where they completely replace an existing system with an entirely new one.

Instead, federal funding has empowered them to adopt a modular approach in which their MMIS is divided into separate components — or modules — that can be upgraded to improve different business processes, such as financial management, provider management, member eligibility and fee-for-service.

Modularity allows for interoperability so that each newly built part of the MMIS can communicate and share data and functionality with one another and with external systems such as health information exchanges (HIEs), providers’ electronic health record systems, managed care organizations (MCOs), and other health and human services (HHS) agencies.

Modularity enables state MMIS to be more flexible and to add new components and functionalities that can help improve program administration. Agencies can also potentially share data more securely with newer technologies built with privacy by design and a more robust security infrastructure.

When it comes to modularity, it’s important that state leaders begin building new systems that consider the demands and opportunities of the future rather than using blueprints of the past.

With a modular MMIS, states can more easily incorporate innovative technologies — like APIs, the cloud, machine learning, IoT and GIS — that transform these systems into smart Medicaid platforms.

USHERING IN A SMART TECHNOLOGY REVOLUTION IN MEDICAID

APIs

APIs allow different types of software to interact with one another and work together.

Open APIs are key to enable data sharing capabilities within Medicaid systems, since they allow other entities to securely gain access to a piece of software. Currently, sharing Medicaid data with external systems often requires the creation of a unique point-to-point interface. This approach is timely and costly. Instead, with open APIs, Medicaid programs can potentially improve the functionality of their systems and add new capabilities more quickly and at a lower cost.

Several states are embracing this approach. Ohio, Montana, Virginia and Wyoming are set to implement a systems integration solution with pre-defined APIs that will allow them to add new modules to their Medicaid systems. This will extend the capabilities of each state's MMIS and facilitate additional functionalities to meet evolving program needs and requirements.⁶

The Cloud

Medicaid systems are moving to the cloud as they embrace modularity and interoperability.

The cloud provides several cost savings for states, especially when it comes to storing their data since it reduces their reliance on on-premises data centers. The cloud also allows states to incorporate IoT-enabled devices and platforms and cloud-based solutions like machine learning from major public cloud providers at a much lower cost.

IoT & Machine Learning

IoT-connected devices can send and share data with one another, thanks to embedded sensors.

By 2020, an estimated 50 billion devices will be connected to the Internet.⁷ Already, we're seeing this interconnectivity between everyday objects, from refrigerators and thermostats to home security and entertainment systems, which all can be controlled from a smartphone or tablet.

In Medicaid, IoT-connected devices can enhance patient care by collecting patient data, analyzing it to detect patterns and using this information to devise preventive care models that lower health care utilization and improve program outcomes.⁸

Machine learning is one of the tools that enables this analysis. With machine learning, computers apply complex algorithms to large data sets to help organizations improve their decision-making and develop new insights.

This is especially critical in Medicaid, since the program serves 20 percent of the country's population⁹ and collects an ever-increasing amount of data as a result. States need a way to make sense of all their structured and unstructured data to automate every part of their program administration, such as customer service inquiries, the Medicaid application process and improving access to care for at-risk populations.

Machine learning enables this automation, which can lead to increased program efficiency.

GIS

GIS tools help organizations visualize, analyze and interpret data to understand geographic relationships, patterns and trends.

In Medicaid, GIS tools can be used to understand how Medicaid members in a particular part of the country use the health care system. States then can use this data to find correlations between health care utilization and program outcomes or to understand emerging health public trends among a certain population, such as increased rates of diabetes or opioid overdoses. By using GIS tools, Medicaid programs can target interventions more effectively.

THE BENEFITS OF SMART TECHNOLOGIES IN MEDICAID

Smart technologies have several applications that could be beneficial to Medicaid:

IoT can promote independent living through remote patient monitoring (RPM). So much of how people use health care is behavior-based, but sensor-based IoT devices installed in patients' homes and on their person

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that measure weight, glucose levels and blood pressure can enable hospitals and health care providers to access data that allows them to provide better care. With the help of machine learning algorithms, the data collected from these devices can be automatically analyzed to identify patterns. For example, IoT-enabled RPM can allow elderly Medicaid beneficiaries or those with disabilities to continue to live independently by collecting data about when each patient takes their medication or exercises. The sensor readings then can be stored in a database within a Medicaid agency's open API platform and combined with demographic and electronic health records (EHR) data that enables the agency to make better predictions about each member's risk and utilization.

Machine learning also can improve the predictive capabilities of Medicaid programs and develop targeted interventions. In one study, Texas's Medicaid program used predictive models to forecast spending for high-risk, high-need patients.¹⁰

Texas has the third-largest Medicaid program in the country, and by studying claims data researchers identified patterns such as higher health care utilization among patients with chronic conditions like diabetes, which would lead to higher future Medicaid spending.¹¹

By identifying these kinds of trends sooner, Medicaid programs can be more proactive and devise targeted interventions — such as providing more diabetes education during these patients' doctor's visits — that may lower future program costs.

Machine learning also can streamline customer service for Medicaid agencies. With the help of intelligent chatbots that use natural language processing to mimic human conversations, Medicaid

agencies can optimize their call centers and use technology to help answer routine customer service questions from Medicaid members and future enrollees.

Through the cloud, Medicaid programs can integrate chatbot programs that enable more self-service and help guide people through the application process or troubleshoot common eligibility and benefits issues.

Machine learning can also be used in combination with **GIS tools to proactively deploy resources to potential public health hot spots.** For example, the University of Florida Family Data Center leveraged GIS tools to create hot spot density maps using data from several government agencies and community partners to map teen births, low birth weight babies, domestic violence incidents, child maltreatment reports, unexcused school absences and juvenile justice referrals. The maps helped the center identify communities that had the greatest needs. It then built a family resource center to service these populations and deployed mobile clinics to expand access to care in these communities.¹²

THE FUTURE OF MEDICAID IS “SMART”

Smart technologies hold so much promise for improving how Medicaid delivers care to millions of Americans. Medicaid spent \$557 billion in 2017,¹³ but that cost could arguably be much lower if Medicaid agencies embrace smart technologies.

Fortunately, many states are beginning to build modular, interoperable Medicaid platforms that can integrate these technologies. This can lead to innovation that helps agencies make better use of all the data they collect.

With the help of smart technologies, states can transform their data into a powerful asset that improves program administration and allows them to deliver lower cost, higher-quality care to populations who need it most.

ENDNOTES

¹ <https://www.governing.com/topics/health-human-services/khn-outdated-technology-california-medicaid-program.html>

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⁴ <https://www.healthcareitnews.com/news/cms-9010-ruling-increasing-funds-medicaid-it>

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⁹ <http://files.kff.org/attachment/fact-sheet-medicaid-state-US>

¹⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6245495/>

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¹² <https://www2.deloitte.com/insights/us/en/industry/health-care/smart-technology-in-health-care-medicaid-programs.html>

¹³ <https://www.kff.org/medicaid/issue-brief/medicaid-enrollment-spending-growth-fy-2018-2019/>

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