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Digitization and Modernization in Public Health Organizations

Enabling efficiency, transparency, and proactive decision-making
through technology innovation.

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The drive toward technology modernization.

Public government agencies, departments, and organizations are focused on delivering greater accountability, transparency, and visibility to all constituents. [With shifting customer expectations, officials are focused on offering greater self-service functionality to their constituents.](#) The 21st Century Integrated Digital Experience Act (IDEA) established a framework for US public agencies to improve digital service delivery. These principles continue to serve as the focus of health organizations today. Another such initiative is the Australian Digital Health Agency's [program](#) to modernize the national digital health infrastructure and deliver significant improvements in the quality and efficiency of healthcare.

For these government health agencies, cost and process optimization remain paramount as mission-critical goals. Data sharing and lack of comprehensive insights within and across departments is a key challenge and opportunity. The need for greater access to data drives the need for increased governance and compliance and reactive planning and response to internal and external events drives the need for faster, more accurate data and analysis.

The US Food and Drug Administration (FDA) is responsible for making highly complex and consequential regulatory decisions, which have accelerated exponentially during the pandemic. The FDA's Technology Modernization Action Plan (TMAP) is a strategic initiative toward implementing and managing a long-term technology foundation. It aims to improve communication and collaboration with external stakeholders to deliver value to consumers and patients. This is one example of how public health organizations are striving to transform their processes and systems to power flexible and rapid modernization, meet digital, cloud-first objectives, and increase efficiencies with optimized operations.

These initiatives help them make more informed, proactive decisions while delivering better experiences to their business stakeholders, partners, and constituents.

To achieve these objectives, public health departments have realized they need more efficient systems and processes as well as real-time access to usable data. They have launched initiatives to upgrade decades-old systems and modernize applications through digital transformation. These modernization initiatives will also move departments to cloud-based applications, minimizing infrastructure management and allowing employees to focus their efforts on more productive work.

“Extensive customization stymies efficiency. Workflow and system standardization help achieve transformative business results by enabling the enterprise-wide application of automation.”

Gartner, Strategic Automation Decision Framework: From RPA to AI on the Journey to Hyperautomation in Healthcare

Public health technology challenges.



Public health agencies have a complex network of underlying systems and processes built over decades. Their legacy systems include hard-coded, non-configurable, or pre-built processes that are notoriously difficult and costly to modify and upgrade. This plethora of underlying disconnected systems produces tremendous inefficiencies in processes and business workflows across multiple systems. In addition, each

system and function often has its own database resulting in disconnected data silos. These data silos create barriers to usable data across sources and systems and lead to multiple disconnected applications and delayed decisions. The complexity of information access also results in poor governance and the inability to meet compliance demands.



A common challenge faced by public health agencies in the process of modernizing solutions and moving to the cloud is the inability to manage the journey to the cloud with processes and systems that are either on-premises or only cloud-based. This leads to broken processes during the transition.

For example, the FDA's Center for Drug Evaluation and Research (CDER) launched [modernization programs](#) to drive operational excellence by standardizing workflows, business processes, roles, and responsibilities to improve operational

efficiency and enable scientists to focus on science rather than manual, administrative tasks. This initiative has become even more critical in the race to approve drugs and vaccines in response to the COVID-19 pandemic. Modernization programs enable the CDER to deal with a range of technical problems, including poor communication and information flow of new drug safety information as well as a lack of systemic monitoring of the risks and benefits of drugs after marketing

The [Canadian Institutes of Health Research \(CIHR\)](#) cites these technical challenges in achieving their vision for building public health systems for the future:

- **Fractured data systems for health surveillance:** CIHR cites a lack of appropriate and consistent information systems to support public health surveillance.
- **Difficulty in collating consistent data and managing data governance:** Without a single, aggregated view of data, providing interoperable and comparable data across jurisdictions is impossible.
- **Slow uptake of new technologies, like data science and artificial intelligence:** CIHR states that without these technologies, new insights into complex genetic, environmental, behavioral, and socio-political systems for real-time decision-making are inhibited.

Public health organizations are striving to address these challenges with technology modernization initiatives across departments and agencies.

The need for an adaptable, trusted platform.

Public health organizations need a foundational platform that provides the necessary capabilities for a variety of departments and functions, including dynamic case management, grants management, acquisition management, onboarding, correspondence and communication management, and more. This underlying technology should allow agencies to build the workflows and processes that best meet their requirements, without being tied to out-of-the-box, pre-built, and hard-coded process structures. Workflows and applications should work on-premises, in the cloud, or in hybrid environments that enable technology modernization and cloud transition journeys—not hinder them.

According to Gartner's "Top 10 Application Predictions Through 2025," IT departments are changing the way they deliver services and modernizing their solution stacks. Gartner defines an enterprise low-code application platform as one that provides rapid application development and deployment

using low-code and no-code techniques such as declarative, model-driven application design and development together with simplified one-button application deployment.

Adopting a value-driven, low-code, robotics/machine learning approach will help public health organizations overcome the challenges put forth by legacy systems, data silos, complex cloud and as-a-service journeys, and retiring knowledge workers, and make knowledge retention more achievable.

An effective low-code platform should also deliver the benefits of advancements in automation and artificial intelligence. [Gartner](#), in its 2020 report on Strategic Automation Decision Framework, says, "Automation serves a key role in digital transformation by freeing resources for innovations that drive outcomes and health value. This decision framework arms CIOs with a roadmap and business case for their journey from RPA to AI and hyperautomation."



Case studies.

Centers for Medicare and Medicaid Services.



Appian delivered a robust, massively-scalable case management solution for eligibility verification and processing for the US Centers for Medicare and Medicaid Services (CMS), starting in 2013. This solution was built and deployed in a matter of weeks, and it was agile enough to meet the incredible pace of change that became the hallmark of the Affordable Care Act program of the previous decade.

In the ACA technology landscape, eligibility determinations are made by the marketplace in real time using a consumer's attestations. During the enrollment process, the marketplace performs checks of those attestations against other government data sources, such as IRS for income or DHS to verify lawful presence. When those attestations do not match the government data source, consumers are notified that they need to provide documentation to the marketplace in order to verify the attested information. The system that handles these data matching issues was built by Serco and Appian and is the means by which those documents are associated with consumers' records, routed through tiers of knowledge workers, and ultimately dispositioned. This system plays a critical role in the marketplace.

Consumers who are not able to prove their attestations have their eligibility determinations recalculated, which can have a significant impact on either their coverage status or their eligibility to receive coverage at all. When the program first started, no requirements existed for performing these types of transactions. Serco and Appian designed, developed, tested,

and implemented this system over the course of just a few short months.

The work performed by Appian included all requirements gathering, configuration of the solution, continuous demonstrations and requirements changes from the customer, the writing of performance test scripts, and the configuration and testing of the production environment scaled to handle up to several hundred thousand transactions per day.

Since initial roll-out, Appian has continuously enhanced the system, adding functionality that now covers all application processing (paper and online), all exemptions processing, and call center agent support for the multi-shift ACA contact and document processing center.

With a dynamic case management solution, Appian manages:

- Over 100 million records.
- Document processing actions for at least 45 million documents.
- Triaging millions of pieces of consumer correspondence and mail.
- Logging millions of outbound calls.
- Managing the workload of several thousand service contract staff.

US Food and Drug Administration - Center for Drug Evaluation and Research (CDER).



The US Food and Drug Administration (FDA), an agency of HHS, has a mission to protect consumers by ensuring only effective, safe, and affordable medical and food products are available to the public.

As part of the FDA's technology modernization initiative, in April 2021 it launched a Center for Drug Evaluation and

Research (CDER) Workflow Management Program to streamline, standardize, and completely digitize FDA's drug review and approval process so that life-saving drugs can get to market in a matter of months, instead of years.

The FDA's CDER Workflow Management Program Structure

Oversee drug development and pre-market review

Oversee marketed drug safety performance and promotion

Oversee drug quality and regulatory compliance

Science

Policy

Planning

Management

Information Technology/ Information

Management

Communications

CDER has three core areas of mission activity that are supported and enabled by a number of critical cross-cutting activities.

CDER realized it needed new tools to improve and modernize current approaches to its management, information technology, and communications activities. CDER took a hard look to identify where it could maximize efficiency and launched new projects to help control costs and streamline operations.

The new CDER Workflow Management Program includes a variety of projects:

- **External Correspondence (ECO) application** allows CDER offices to manage correspondence received from external entities. The system reconciles the varied nature of external requests as well as the disparate response protocols by establishing a single workflow system and reducing duplication while increasing end-to-end visibility.
- **LiST (Lifecycle Safety Tracker)** handles the tracking of information from one or more sources that suggest a new potential causal association. It also tracks any new aspects of a known association between an intervention and an adverse event or set of related adverse events.

- **The BIMO Information Tracking Environment (CBITE)** project is a collaboration between the Office of Computational Science (OCS), the Office of Study Integrity and Surveillance (OSIS), and the Office of Scientific Investigations (OSI). CBITE provides a modern platform for enhanced and streamlined inspection decisions to ensure quality in the information used to support regulatory decisions.
- **Purple Book** is a repository of FDA-licensed (approved) biological products and licensed biosimilar and interchangeable products regulated by CDER. CDER Nexus provides a streamlined process for designated users to view product data as well as customize and publish information on the public-facing Purple Book website in an easily digestible format.



Medicines and Healthcare Products Regulatory Agency (MHRA).



Medicines & Healthcare products Regulatory Agency

The MHRA is an executive agency under the Department of Health and Social Care in the United Kingdom. It is responsible for the regulation of the pharmaceutical and medical devices industries, overseeing clinical primary care data for research and the standardization and control of biological medicines. It ensures that all drugs and medical devices are thoroughly tested.

Established in 2003, the MHRA's IT estate had grown organically into isolated legacy technologies without a cohesive plan. As part of its Corporate Plan 2018 to 2023, the agency launched a strategic vision to establish an underlying platform for all of its service, built on innovative technology that would also be fit for the future. Successfully achieving their vision and objectives included transforming end-of-life IT systems, processes, and services into something that better suited customer and agency needs; standardizing the way it managed data; and developing services in an iterative way with customers to improve time, cost, and quality of delivery.

MHRA had 64 different case management and customer experience systems. It rolled out a comprehensive foundation for case management to deliver better customer experiences and eliminate these legacy systems. MHRA also transitioned to the cloud to take advantage of the as-a-service solutions to help its employees focus on higher impact and greater value work.

MHRA endeavors to create a seamless and unique customer experience for its constituents by implementing a configurable, secure, and innovative services platform that offers these benefits:

- Standardized processes for people to interact with the MHRA.
- A consistent experience across all functions and processes.
- Intuitive, simple, and easy-to-use interfaces.
- Multi-device access for executives and field workers to enable access to the right data and services at the right time.

The MHRA had 64 different case management and customer experience systems. They rolled out a comprehensive foundation for case management...eliminated legacy systems...and helped their employees focus on higher value work.

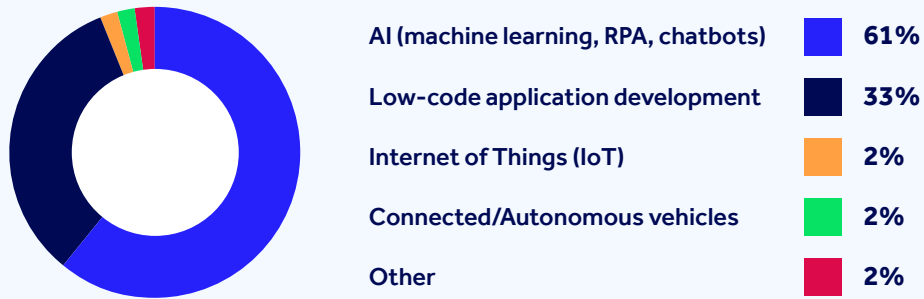
Choosing flexible, frictionless, future-proof technology.



Public health organizations need an underlying innovative and seamless platform that will help them create new applications to meet their digital transformation goals. This platform should be easily configurable to streamline complex processes, ease access to data across sources, and leverage automation and machine learning for better decision-making. With improvements in efficiency, collaboration, and productivity, agencies will be better equipped to achieve mission objectives for speed and cost optimization. These modern applications should work across an organization's journey as it transitions to its cloud of choice to focus on business activities instead of managing and running infrastructure and software. In addition, choosing a low-code application platform will provide public health workers the ability to handle rapid application development and deployment themselves with model-driven application design and development and simplified one-button application deployment.

The value of such technology should enable agency staff to focus on high-impact functions while repetitive tasks are delegated to automation. End-to-end workflows and comprehensive data should deliver greater visibility and accountability of funds and processes. The increase of self-service options should enhance the experience for constituents and improve the overall experience for constituents. Unifying multiple sources of data, including legacy systems, applications, and cloud with access to internal and shared data, will enable decision makers to be better informed, project trends, and gain insights to prepare, plan, and respond to information and events in a timely and proactive fashion. Across the board, such an implementation should provide a greater degree of governance to quickly meet compliance and regulatory requirements.

What emerging IT area will be most impactful in the next 3-5 years?



According to [Gartner](#), "By 2025, 70% of new applications developed by enterprises will use low-code or no-code technologies, up from less than 25% in 2020."

An industry-leading platform for public health organizations' modernization initiatives should have the following capabilities:

1. **Low-code.** Rapidly and effortlessly develop customized applications with minimal coding for current requirements and changes.
2. **Process mining.** Input workflows to quickly and easily identify where improvements can ensure resources are allocated appropriately with native process mining capabilities.
3. **Automation.** Machine learning and robotic process automation (RPA) bots orchestrate personnel, systems, and data in a single workflow, scaling across your entire organization.
4. **Application-as-a Service, cloud-based models.** Enable cloud migrations to run on-prem, in the cloud, or in hybrid environments as you move along your cloud journey.
5. **Data anywhere.** Access your data wherever it resides and make it widely integrated and usable with flexibility and speed.
6. **Case management.** Jump-start your workflow modernization with dynamic case management, grants management, acquisition management, onboarding, correspondence and communication management, and more.
7. **A trusted, future-proof system.** Start phased implementations and grow across agencies and domains to achieve longer-term modernization objectives.





Appian is the unified platform for change. We accelerate customers' businesses and organizations by discovering, designing, and automating their most important processes. The Appian Low-Code Platform combines the key capabilities needed to get work done faster, Process Mining + Workflow + Automation, in a unified low-code platform. Appian is open, enterprise-grade, and trusted by industry leaders. For more information, visit appian.com/government.