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Digitizing the Mainframe: Modernization Unlocks Greater Value

OutSystems is a high-performance low-code platform to help organizations digitize the mainframe by simplifying and accelerating the process.



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Mainframes may not make the lists of “cool” technologies, but that in no way diminishes their critical role as the wheels that drive commerce. Although sometimes overlooked in today’s interactive, mobile, and self-serve environment, the reality is that mainframes are highly effective at what they are designed to do – process large amounts of data very quickly and securely.

Consider: Mainframes handle 90% of the world’s credit card payments and process more daily transactions than Google searches. Two-thirds of Fortune 100 companies use mainframes as their core platform, along with 45 of the top 50 banks, four of the top five airlines, and seven of the top 10 retailers. [About 70%](#) of the world’s data resides on mainframes. What’s more, nine out of 10 practitioners say the mainframe is a [platform for growth](#), according to BMC.

Mainframes have evolved at a faster pace than Moore’s Law. Today’s mainframes are over 500 million percent faster than the fastest IBM System 360 introduced in 1964, while their onboard memory has expanded by more than 60 billion percent.

The need to unlock the mainframe’s value

Mainframes hold vast amounts of data, which has inhibited some organizations from migrating to modern platforms. Rather than replacing mainframes, IT departments have found that they can selectively expose functionality through modern user interface constructs for consumer and business-to-business transactions.

For example, most online or mobile banking applications touch a mainframe on the back end. Similarly, many web-based securities trading and e-commerce applications directly update mainframe data. When you enter a credit card number on a website, that data is probably going into a mainframe. In these and other cases, the complex commands needed to query and conduct transactions have been abstracted into point-and-click simplicity. Much of what powers today’s self-serve economy are mainframe apps fitted with user-friendly front ends.

Other examples include:

- A retailer may selectively expose its mainframe-based inventory records to supply chain partners to ensure that goods are always in stock.
- A manufacturer can give its distributors access to current and historical information about their purchases.
- A credit reporting company may provide consumers with a way to review their current credit reports and request changes.

What does it mean to “digitize the mainframe”?

While mainframes are inherently digital, they weren’t designed for the user-friendly interactive environment of self-serve digital business. Digitizing the mainframe is about exposing data and processes for use in other contexts. These include not only consumer-facing applications such as mobile banking and investment

management, but also business-to-business use cases like the integration between business accounting systems and e-commerce engines or between partners in a supply chain.

For uses that demand high reliability and availability, building on top of a time-tested and reliable platform like a mainframe has considerable advantages over starting from scratch. Developing an entirely new application can be time-consuming and requires extensive testing. Copying data from the host for development and testing creates security risks and versioning problems. Switchovers can be risky. New apps also require constant monitoring, particularly in the early going, as bugs may crop up.

In many cases, the safest and most reliable approach is to work on data in the mainframe exposed through application program interfaces (APIs) and database connectors.

Approaches to mainframe digitization

APIs are functions and procedures that enable applications to access features or data on another platform, operating system, or application.

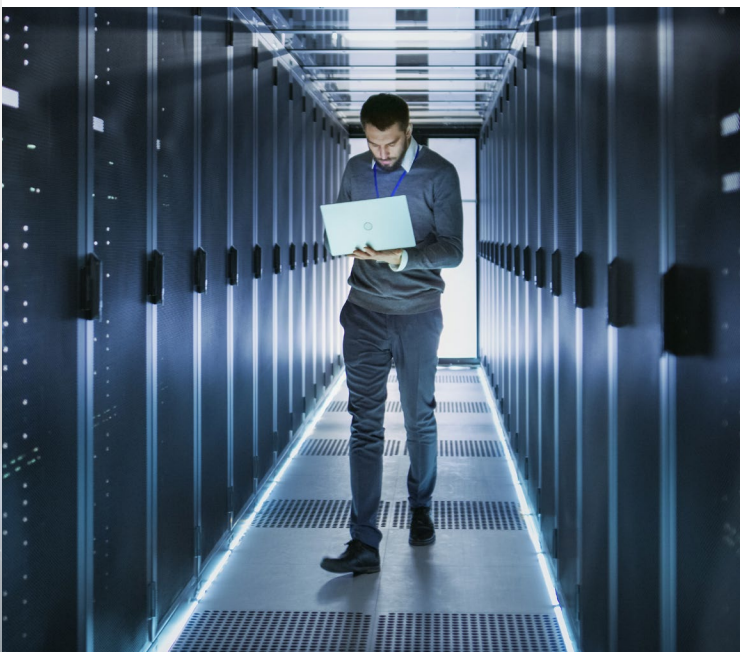
Exposing mainframe data and processes through APIs allows for secure connections to trusted third parties and applications.

Two important APIs for mainframe digitization are Representational State Transfer (REST) and Simple Object Access Protocol (SOAP).

Together, these protocols provide a reliable, standardized, and secure set of tools for unlocking the mainframe's value in a variety of use case scenarios.

Other valuable digitization tools are database connectors and terminal emulators, which are sometimes called "screen scrapers." Connectors enable developers to directly access mainframe data without copying or loading it into an extract database, thereby avoiding the security, data integrity, and consistency issues that are associated with extracts.

Pre-built and tested connectors from an experienced solution provider deliver out-of-the-box reliability and performance that would otherwise take developers weeks or months to manually code. A solution provider can also ensure that connectors are compatible with software updates and meet required service levels.



Screen scraping is a technique used to translate screen data from one application to another. In a mainframe scenario, it can capture information encoded in a native format like the 3270 terminal protocol and reformat it for display on a graphical user interface or mobile device screen. Emulation is a fast and relatively simple way to incorporate mainframe content into modern applications.

Low-code value

High-performance, low-code development platforms like OutSystems can be used to build, deploy, and manage enterprise-grade applications, even complex ones. These application development and lifecycle platforms are simple enough to be used by non-technical businesspeople to develop prototypes and modern, responsive web applications in areas such as workflow and business process automation. However, they are also powerful enough that many professional developers use them to build enterprise-grade applications. [Statista expects](#) the market for low-code development platforms to grow 26% annually to \$65 billion in 2027.

Low-code tools shield much of the programming complexity from the individual developing the application — sometimes referred to as “citizen developers”— replacing traditional coding with simple commands and drag-and-drop procedures. Business users can quickly create mobile and web applications, chatbots, and web applications for many devices. The tools are optimized for modeling data, creating visual workflows, and building user interfaces and interactions. Citizen developers can draw desired business workflows,

data models, and user interfaces for use in building compelling front-end apps, integrations, back-end interfaces, and data connections. Professional developers can extend applications built with low-code tools into production-ready apps by adding their traditional code in their preferred language.

For example, OutSystems, a high-performance, low-code platform provider, helps reduce time to market with built-in templates, reusable components, and responsive user interface designs. Database connectivity is enabled by connectors that support most back-end engines. Data modeling/entity relations can be depicted in visual diagrams with drag-and-drop functionality.

To digitize the mainframe, OutSystems allows data from external sources exposed via APIs to be incorporated without the need for extract and transformation processes. Mainframe data can also easily be exposed to other applications using REST and SOAP. The core logic is stored and can be reused across multiple applications. OutSystems also helps developers use visual code that results in fewer bugs in production.

Among the benefits of low-code development are:

- Lifetime maintenance costs are reduced because apps can be quickly modified with minimal downtime.
- Applications can be deployed more quickly.
- Deployment and management are simplified through one-click provisioning, simple project management tools, and automatic scaling capability.

Use case scenarios for low-code development

OutSystems can significantly reduce IT development backlogs by enabling: the acceleration of software development to meet the pace of the business; the use of AI tools to increase developer productivity; and support for full lifecycle services, allowing developers to rapidly make iterations and changes.

In addition, low-code toolsets are increasingly leveraging technologies such as machine learning, internet-of-things integration, and advanced analytics that expand the scope of potential uses into decision-support and customer-facing scenarios.

The best high-performance, low-code platforms like OutSystems make it easy to integrate such applications with existing processes and data sources. Low-code apps can coexist with legacy back ends and can be used to migrate data from platforms like Lotus Notes, SharePoint, and Microsoft Access to more modern systems.

The bottom line is that low-code tools help organizations envision new software use cases, prototype them, and bring products to market faster. Customers have seen development cycles for some products reduced from two years to eight weeks.

Case study: Accelerating time to market

Artel, a maker of equipment for quality assurance and liquid handling, wanted to accelerate accurate lab test results.

“We began with the idea to develop the most scientifically advanced and productive equipment we possibly could,” said Richard Curtis, co-founder and technical director. “Our vision is that someday all the laboratories in the world should produce results that are error-free.”

In 2014 the company began working with Persistent, which listened closely to Artel’s requirements, as well as the needs of its customers, then recommended an approach that would accelerate time to market.



“Having a partner who understands our customer goals as well as software requirements has helped us to deliver earlier value to our customers,” said Greg Fischer, senior manager of software engineering at Artel. “Persistent’s recommendation of low-code systems — particularly working with OutSystems — has helped us achieve new concepts and bring them to our customers much earlier.”

With global cross-industry experience, Persistent brought perspectives that helped Artel enrich its entire product portfolio, Curtis said.

“In working with clients globally, they’ve learned far more than we could learn, not only about developing procedures and tools, but also about the market,” Curtis said. “Persistent is more than a technology partner; they are also a business partner. Artel has been able to take advantage of the wealth of knowledge that they brought to the table.”

Why Persistent and OutSystems

OutSystems provides the full range of features from development to deployment, supports integrations, and includes [out-of-the-box connections](#) to most major database systems, as well as the ability for users to write connectors.

Persistent is a systems integrator and software development partner of OutSystems, and co-creator of the Persistent + OutSystems Center of Excellence [Center of Excellence](#). Persistent provides a wide range of blueprints, reusable templates, and industry accelerators that help customers build mission-critical applications within weeks.

Persistent Systems has partnered with OutSystems to use high-performance, low-code development to rapidly design, build, and deploy solutions that enable customers to operationalize their innovations and build sustainable competitive advantage.

Start modernizing your mainframe today.

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