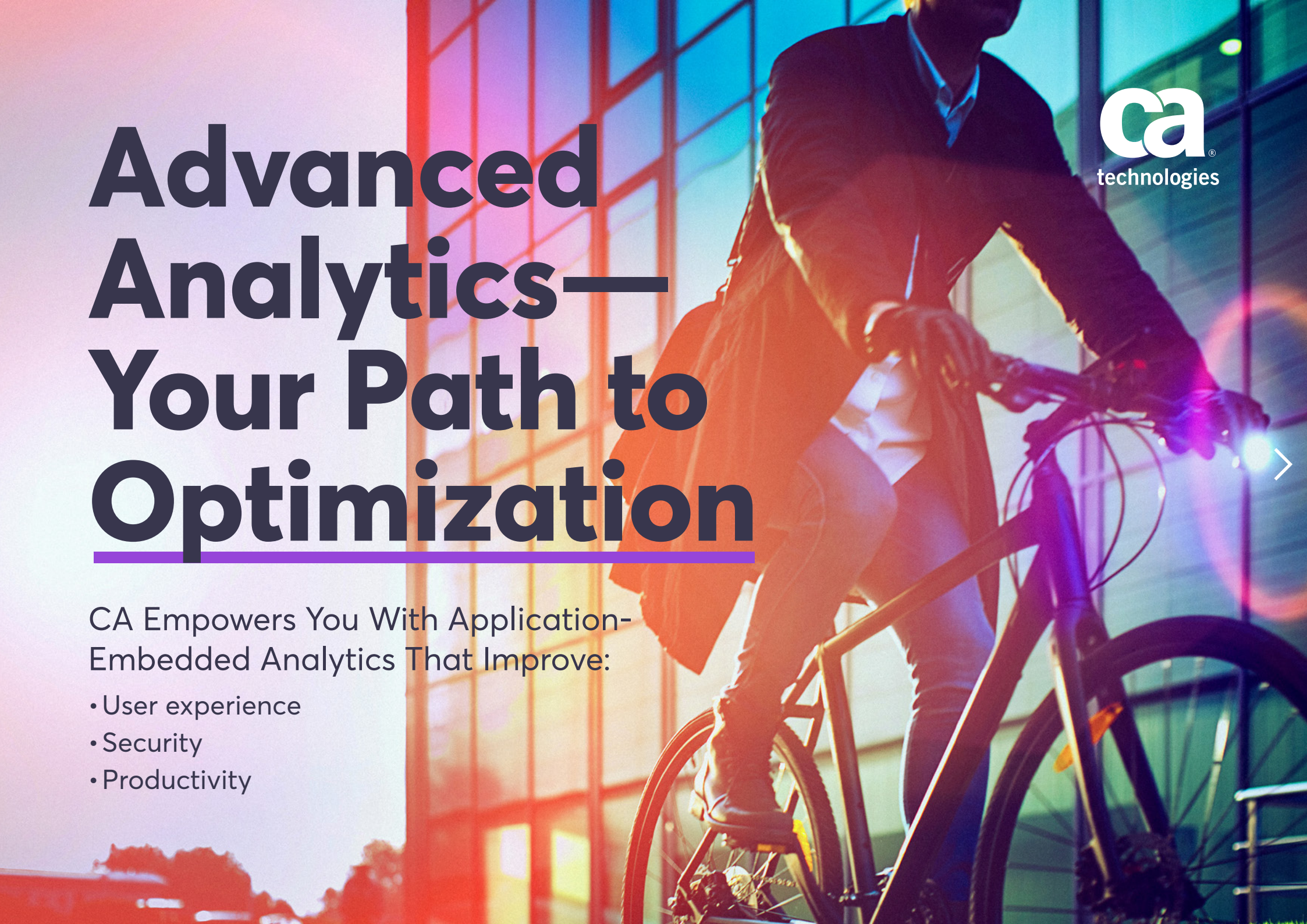


Advanced Analytics—Your Path to Optimization

CA Empowers You With Application-Embedded Analytics That Improve:

- User experience
- Security
- Productivity

ca technologies

Your Modern Software Factory **Demands Advanced Analytics**

We're living in a world of data, with virtually every action tracked, captured and recorded somewhere. The amount of data being acquired and stored is increasing astronomically.

Capturing data is one thing. Turning it into actionable insights is quite another. The sophistication of data analysis has increased dramatically in recent years. The aggregation of big data led to real-time decision support everywhere from retail to the production floor to the car you drive. And now, we're moving into the era of analytics-driven applications, which combine complex data sets with expert systems and machine learning to deliver sci-fi innovations such as self-driving cars.

Meanwhile, the focus of analytics has evolved as well, from using data to explain the past to using it to predict the future. On the front end, you need to manage the experience of jaded users who no longer accept being simply satisfied, but instead demand to be delighted. On the back end, it's no longer enough to locate and mitigate system failures as quickly as possible after they happen. Now the goal is to anticipate them and take the necessary actions to prevent them from ever happening in the first place.

Advanced analytics can help you reach these goals—but it will require a commitment.

Overcoming Challenges With **Advanced Analytics**

Deriving the full benefits of robust advanced analytics capabilities is not without its own challenges. Organizations know there is value in data and analytics but struggle to understand the different analytics capabilities they can leverage and when to use them. And the shifting focus from descriptive to predictive analytics results in a much higher degree of difficulty. The answer lies in building a portfolio of analytics-driven capabilities to address the gamut of business needs.

Unfortunately, most vendors simply sell you non-specific tools. Then they leave it up to you to figure out how to use the capabilities to drive positive business impact. As a result, you can end up spending almost as much time scripting and consulting with domain experts as you previously spent doing analytics manually.

The bright future of analytics rests in the ability to build advanced capabilities into applications specifically designed to optimize performance. Better yet are engines and algorithms that can easily deliver a wide range of analytics capabilities depending upon the needs of the specific application.

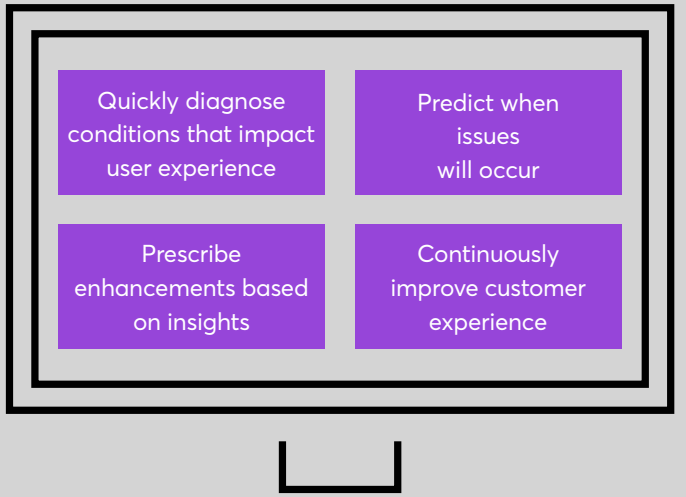
Let's take a high-level look at some real-life business situations where analytics are essential to meeting objectives.

Using Real-Time Analytics to Drive an **Exceptional Digital Experience**

To deliver a flawless customer experience from software, IT operations must ensure that cloud and on-premises systems and microservices stay performant. In today's dynamic environments, traditional approaches cannot scale to manage the increased volume, variety and velocity of metrics and logs. By relying on narrow-view data silos and generic analytics tools, businesses risk escalating cost and eroding digital value.

IT operations need an open, scalable and unified way to collect, search, aggregate and analyze millions of metrics and logs across networks, infrastructure and applications. Together with capabilities that incorporate machine learning in the context of domain expertise, these solutions are transforming monitoring from a reactive, break-fix function into a proactive process that helps future-proof a digital business.

CA Digital Experience Insights, **including app-to-infrastructure correlation, helps teams gain complete visibility across modern application environments**. It leverages an open, extensible platform and incorporates advanced analytics within modern monitoring capabilities that include:



- **App analytics:** Provides real-time insight into performance and user experience across Web, wearable and mobile apps. With detailed metrics such as app usage, retention, and crashes by carrier, device and platform, you'll gain a better understanding of your users' digital experience so you can continuously improve quality, design and performance.
- **Assisted triage:** Delivers real-time insights and automatically generates the workflows necessary to address any detected issues. Working as an "expert in a box," recognizes patterns that indicate trouble, then prescribes the necessary actions to drive a solution.

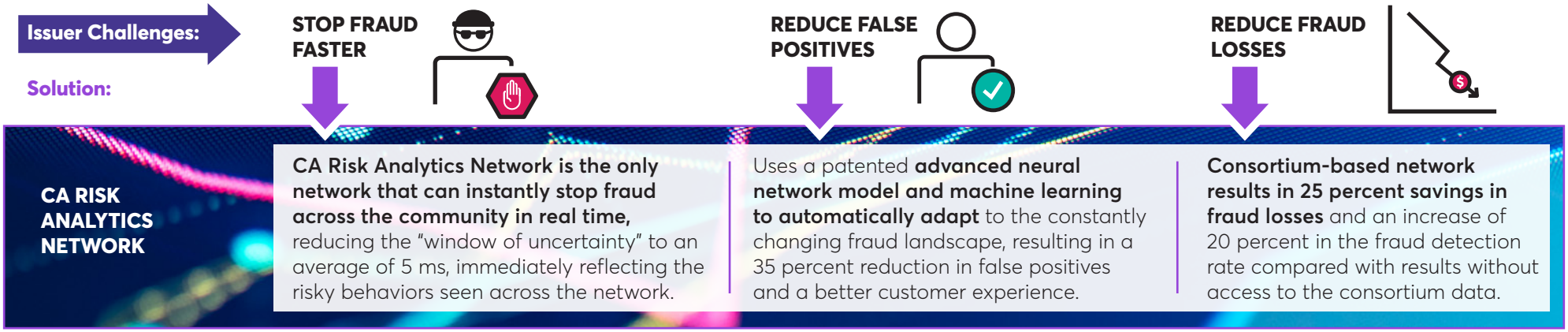
Advanced Security **Without Friction**

The cost of online fraud is skyrocketing – in the US alone, fraud losses incurred by banks and merchants on all credit, debit, and pre-paid general purpose and private label payment cards issued globally will easily exceed $12B.[1] What's worrisome is that this number will only increase as consumers feel more comfortable making high-value purchases via the growing number of active mobile devices. More than 2 billion mobile device users made some form of transaction in 2017 (up from 1.6 billion in 2014).[2]

And while you certainly want to do your best to minimize those losses, it can't be at the expense of user experience—or you risk driving away customers altogether. It's a delicate balance that requires powerful analytics capabilities to execute properly. The traditional one-size-fits-all fraud profiles built into most risk solutions simply don't offer the nuances you need for the level of sophistication fraudsters have reached.

Newly launched CA Risk Analytics Network, on the other hand, **is the payment industry's only real-time behavioral analytics network that stops fraudulent behavior instantly** by leveraging both historical and near real-time information from the largest network of global cardholders and fraud data.

CA Risk Analytics Network: Addressing Issuer Challenges



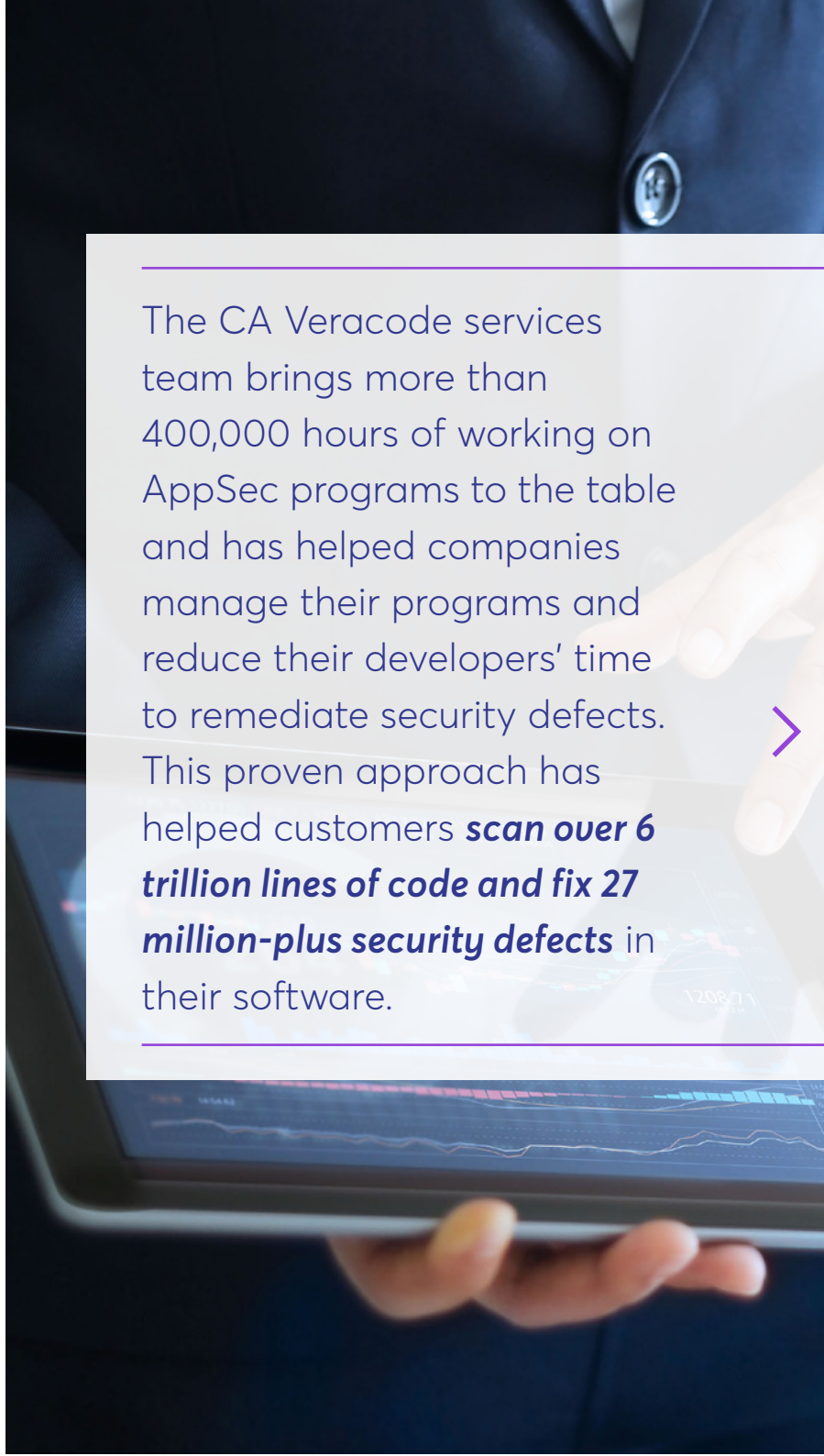
Card issuers can opt in to the consortium-based network and benefit from a **25 percent reduction in fraud losses or a 35 percent reduction in false positives—a potential of $2.2 billion in savings—**compared with results without access to the consortium data.

Use Advanced Analytics to Find and **Fix Security Defects in Software**

Application security breaches have seen increased focus, with one recent example disclosing the financial information of 143 million Americans. The challenge for most companies is not that they don't know what to do, but that the mountain they need to climb just seems too high.

The CA Veracode Application Security Platform uses advanced analytics to help organizations create an intelligent and scalable application security program to thrive in today's threat landscape. The patented engine helps organizations understand which applications are vulnerable and how to make the biggest impact. For example, the platform shows an analysis of which security defects may pose a huge risk but are fast and easy to fix.

The SaaS-based platform also **uses advanced analytics to learn from each scan, reducing the number of false positives over time for the most accurate results every time**. CA Veracode's DevSecOps solution provides this best-in-class analysis in less than three seconds as developers are coding, so software is built securely from the very first line of code.



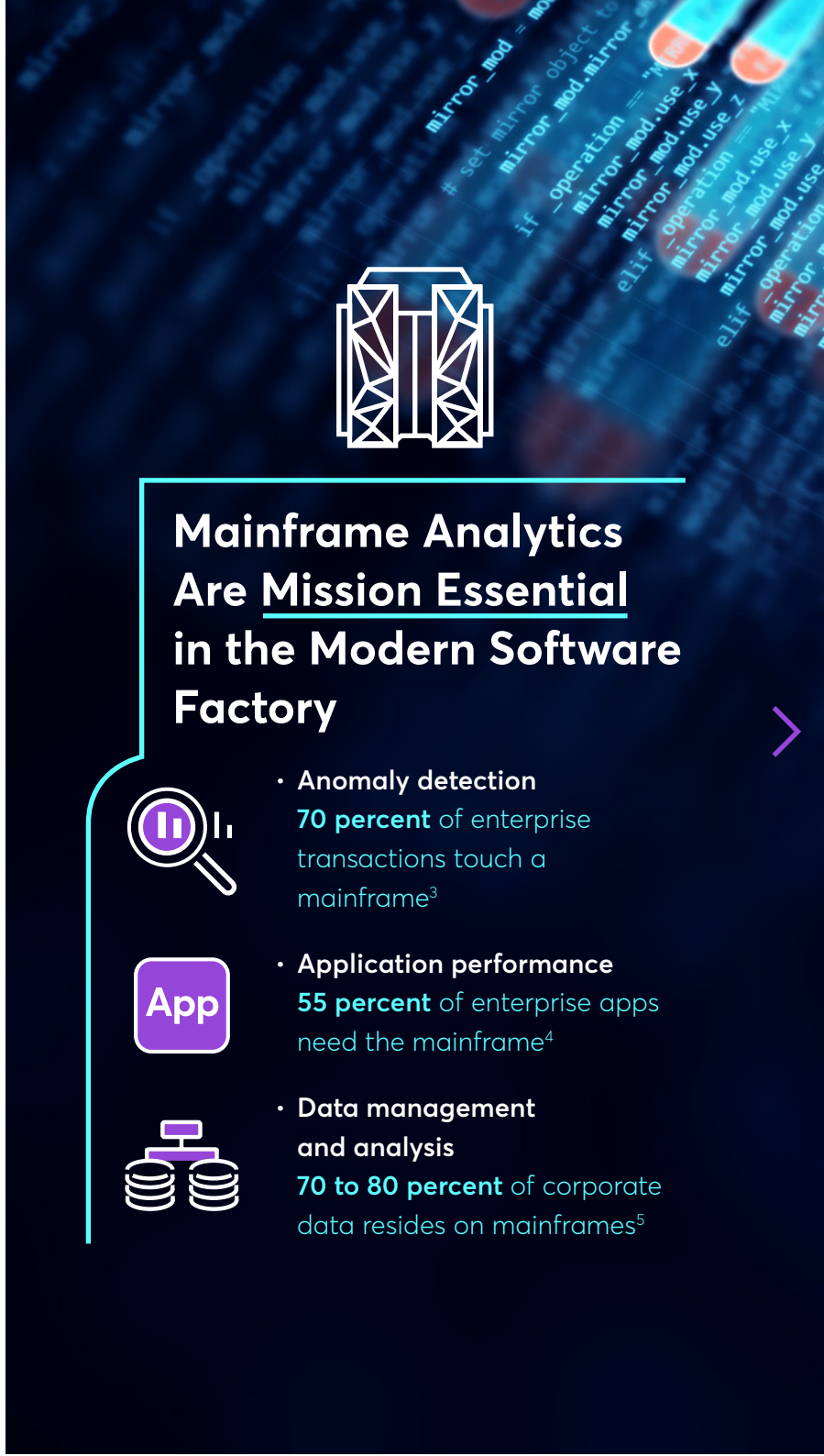
The CA Veracode services team brings more than 400,000 hours of working on AppSec programs to the table and has helped companies manage their programs and reduce their developers' time to remediate security defects. This proven approach has helped customers ***scan over 6 trillion lines of code and fix 27 million-plus security defects*** in their software.

Predicting Problems Sooner With Machine Learning on the Mainframe

Mainframes play an essential role in providing the top-shelf experience users demand. From customer systems to networks to storage, IT operations must monitor and optimize every aspect of mainframe performance. And with many mainframe experts approaching retirement, it's necessary to enable less-experienced application specialists to manage those monitoring responsibilities.

CA Mainframe Operational Intelligence **filters the "sea of red" to eliminate nonessential system noise and focus monitoring efforts** while automating many tasks to ensure that the right people are notified to address issues quickly and appropriately. Configured to support a three-tier system—monitor, triage, remediate—CA Mainframe Operational Intelligence offers you embedded analytics and machine learning to maximize failure prevention and problem avoidance.

Many issues can be addressed through automated workflows, freeing up your experts to focus on the most complex problems. The result is faster triage and mean time to resolution (MTTR) without overtaxing the available skill sets of the people in your organization.



How CA Technologies **Injects Advanced Analytics** Into Applications

The demand for intelligent analytics-driven applications is ***exploding***.

Data insights are enabling competitive differentiation and marketplace success for digital businesses. But for individual teams, applying analytics to solve business problems can be a daunting task.

How we overcame this challenge

Rather than having individual teams reinvent the wheel, we took a systematic approach, enabling all product lines to fast-track their analytics initiatives.

CA Technologies uses an in-house analytics platform, CA Jarvis, to rapidly inject advanced analytics into a wide variety of products. Today, CA Jarvis is embedded across a wide range of portfolio offerings, including CA Digital Experience Insights, CA API Management Portal and CA Privileged Access Manager Server Control.

CA Jarvis

CA Jarvis is a comprehensive, real-time analytics stack that leverages best-of-breed open-source technologies (e.g., Spark, Kafka, Elasticsearch) and big data architectures (e.g., Lambda and Microservices) to process data from various sources, apply advanced algorithms to extract insights and expose those insights to the application.

By applying the latest data science and machine-learning techniques to large and diverse data sets, CA Jarvis provides the **real-time visibility and sophisticated insights** necessary to solve complex business problems.

With CA Jarvis, teams quickly deploy new capabilities while leaving the execution details to the underlying technology.

The time gained by choosing CA Jarvis ensures product teams focus on delivering maximum value to customers rather than having to become experts on underlying analytics tools and the latest data science trends.

CA's Visionary Approach to **Advanced Analytics**

At CA, we see analytics being part of the solution to everything. We believe the key is to embed powerful, advanced analytics capabilities in virtually every app—automatically capturing and analyzing data to generate insights and empower better, faster decision-making.

In keeping with this mission, CA has undertaken several initiatives—such as our Analytics Center of Excellence and our Data Science Lab—to ensure you can unlock the full potential of advanced analytics to fuel business success.

By partnering with CA on this journey, you'll benefit from:

- Domain expertise with an intimate understanding of the data
- Data center to end-user insight for a holistic picture of past, future and the path to optimization
- Analytics-driven apps and embedded analytics that eliminate the need for a separate platform
- A trusted partner to help you thrive in the app economy

Better Insights Lead to **Better Business Outcomes**

At CA, we're dedicated to providing you with analytics-driven applications necessary to assess situations and respond appropriately and automatically. The goal is to help humans and machines make data-driven decisions in real time, and therefore enable time-constrained business opportunities. The result is operational optimization that allows you to achieve key business outcomes, such as:

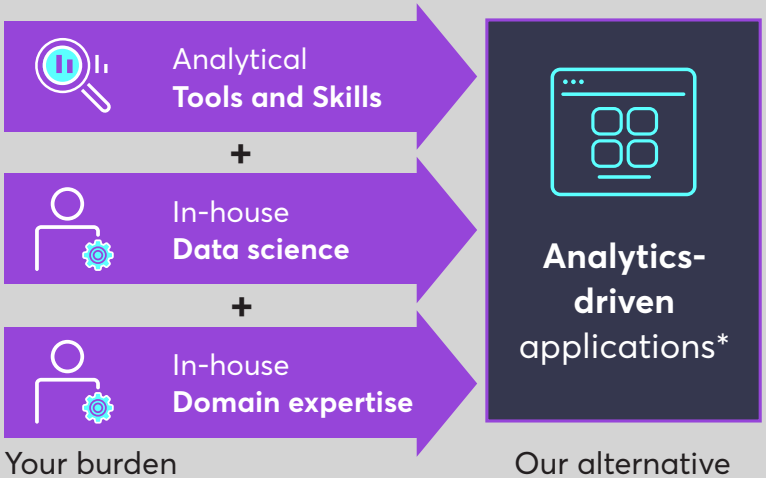
- **Real-time responsiveness** that applies data streams from customers, suppliers and third parties to keep your business relevant and proactive.
- **Optimal utilization of expert staff** through guided decision-making enabled by analytics-driven applications that frees up staff to spend their time on value-add activities and increasing retention.
- **Delightful user experiences** that use myriad data sources including social media and data exhaust to anticipate and exceed customer expectations.

By applying advanced analytics to critical business challenges, CA is already delivering real business value across a range of domains including user experience, security and productivity. Join us on the path to analytics everywhere.

"Advanced analytics has played a central role in the success of the CNN Politics app and its ability to delight users time and time again."

– John Hashimoto, VP of Digital Product at CNN

Road to Outcomes: Analytics-Driven Apps



*Fueled by advanced analytics, algorithms, machine learning...

To learn more about how CA can help you achieve optimization throughout your business, visit **ca.com/analytics**

CA Technologies (NASDAQ: CA) creates software that fuels transformation for companies and enables them to seize the opportunities of the application economy. Software is at the heart of every business, in every industry. From planning to development to management and security, CA is working with companies worldwide to change the way we live, transact and communicate—across mobile, private and public cloud, distributed and mainframe environments.

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