



# Two-Speed IT with APIs

Move Fast and Maintain Control

**apigee**

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# Executive Summary

The rapid growth in mobile, big data, and cloud technologies has profoundly changed market dynamics in every industry, driving the convergence of the digital and physical worlds, and changing customer behavior. It's an evolution that IT organizations struggle to keep up with. To succeed, a new approach is required; one that enables agile and web-scale innovation so that IT can meet evolving business requirements while enabling existing systems to continue running reliably, efficiently, and securely.

There's a way to enable the stability of enterprises' operational systems of record while also fostering the speed and agility necessary to create powerful new applications and services that serve customers, partners, and employees in a digital economy that's moving at blinding speed.

Whether you think about this as *bimodal IT*, *two-speed IT*, or *traditional IT/agile IT*, this new approach recognizes the value of both the back-end operational systems and the fast-changing world of user engagement. It manages the trade-off between the agility required to build, deploy, and run applications and experiences for customers, partners, and employees, and the reliability and control required for the systems of record. Operating two-speed IT encompasses agile software development, but it also goes beyond this, to leverage data and analytics, enable developers, and forge new partnerships to participate fully in the digital economy.

Many businesses are effectively barred from the digital world because traditional enterprise software stacks aren't designed connect to and interact with it. Embracing the digital economy requires a new API-centric layer in the enterprise stack, one that enables two-speed IT: agile and web-scale innovation, alongside stable and secure IT systems.

# Introduction : Every business must be a digital business

The rapid growth in mobile, big data, and cloud technologies has profoundly changed market dynamics in every industry, driving the convergence of the digital and physical worlds, and changing customer behavior. According to Forrester Research<sup>1</sup>, by 2017, digital touchpoints, like mobile devices, will influence approximately 50% of U.S. retail sales; approximately 10% of all sales will be online. Seventy-two percent of U.S. adults will use online banking, and 43% will use mobile banking services by 2017, according to Forrester Research.

In short, customers and partners expect the convenience of connecting with any business, whenever and wherever they are, on multiple devices and platforms. To operate in the digital economy, a company must do business where its customers are.

It's one thing to *appear* digital with a basic mobile app or an updated website, but the real challenge is *being* digital. This entails harnessing digital technologies to unlock the value of existing data and services, to participate fully in new digital ecosystems, to effectively leverage the massive amount of data available in the modern business environment, and to drive the agility and operational efficiency needed to be competitive.

Doing so has proven benefits: digitally mature companies outperform their peers and competitors in every industry. According to Accenture<sup>2</sup>, digitally mature companies are consolidating the lead that they have opened up in

recent years. In particular, almost half of high performers (40%, versus 9% of other organizations) are experiencing measurable improvements in IT agility, and 43% are experiencing better alignment of their project portfolios with IT and business goals (compared with 20% of other organizations). Thirty-three percent of high performers say their architecture transformations successfully lead to cost reductions (versus 14% for others).

All this puts CIOs under pressure to transform their IT departments. IT organizations must run stable, mission-critical systems using conventional approaches and proven methodologies—this doesn't change. Yet, at the same time, they have to provide seamless customer experiences across digital and physical channels, respond quickly to fast-changing customer expectations and market conditions, and scale the business and operations to meet the demands of hyper-connected customers, partners, and employees.

<sup>1</sup> Unleash Your Digital Business by Nigel Fenwick and Martin Gill, March 19, 2014

<sup>2</sup> High Performers in IT: Defined by Digital - Accenture

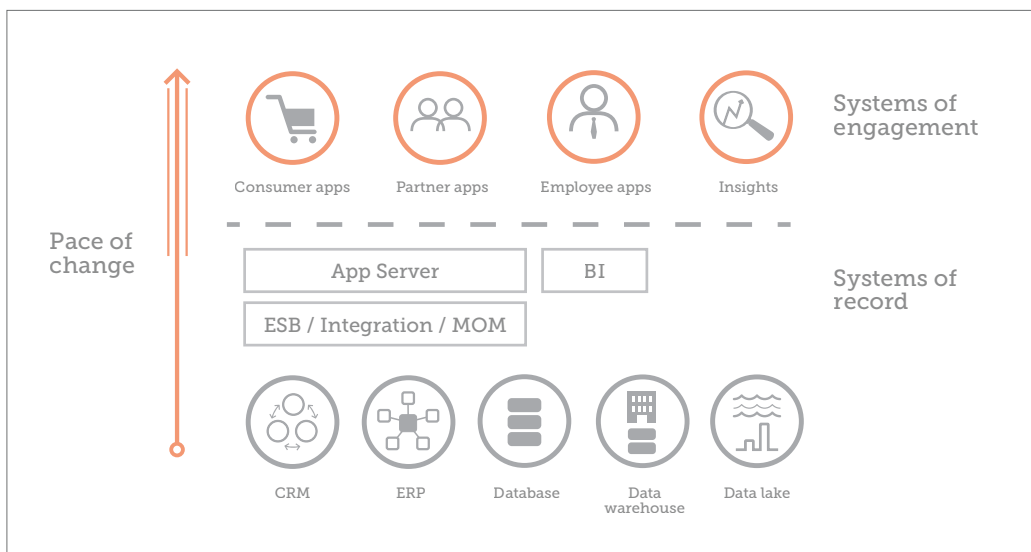
# Systems of record and systems of engagement

Systems of engagement, which are used by customers, partners, and employees to connect with the business, represent a new focus on communication and collaboration with these constituents for the enterprise. Unlike systems of record—the ERP-type systems that companies rely on to run their business (financials, manufacturing, CRM, HR)—systems of engagement are decentralized and incorporate technologies that enable interaction.

Driven by new customer expectations born of the rapid growth in mobile, big data, and cloud technologies, these new systems of engagement harness mobile, social, cloud, and big data innovation to deliver apps and smart products for customers, partners, and employees.

To keep pace with dynamic customer expectations and an increasing amount of data generated by interactions and transactions in emerging digital business ecosystems, the systems of engagement must be faster and more agile than the systems of record.

Organizations continuously strive to make traditional IT more agile, but that’s not the answer here. An entirely new approach is needed. Customers expect to do business with a company on any device at any time. B2B transactions rarely involve just one partner; interaction and collaboration happens inside a complex digital network of supply chains, delivery chains, and partner ecosystems.



# APIs: the foundation for enterprise apps

The approach modern IT uses in this fast-paced, connected world is often dubbed two-speed IT. It's the imperative to keep operational systems secure and steady while allowing a nimble and agile approach to deploying new applications and experiences for customers, partners, and employees. It is a system that must bridge the different speeds of the operational systems of record and the systems of engagement.

It's all but impossible for many businesses to serve the needs of the systems of engagement; traditional software stacks simply aren't designed to connect to the rapidly evolving digital economy.

Most businesses deploy architectures composed of thousands of application servers connecting to databases, other applications, and numerous middleware layers, each using thousands of custom integrations and connectors. The cost and time required to build new services on these legacy architectures prevents them from being opened to developers and partners without significant re-coding and a major corporate directive.

Because of these hindrances—and because businesses are challenged with providing the right capabilities at just the right moment for the right person on any number of devices—IT architecture is moving beyond the integration server/application server pattern formed during the last decade of web application development. APIs and API-centric architecture have become the

foundational technology necessary for the development and deployment of enterprise applications.

Behind every application that connects and facilitates the digital experiences in systems of engagement, there's an API. Applications use APIs on the backend to connect to data and services. They use APIs to enable other applications to connect to their internal data and processes. Modern applications are themselves built out of interconnected “micro-services,” which are wired together via APIs.

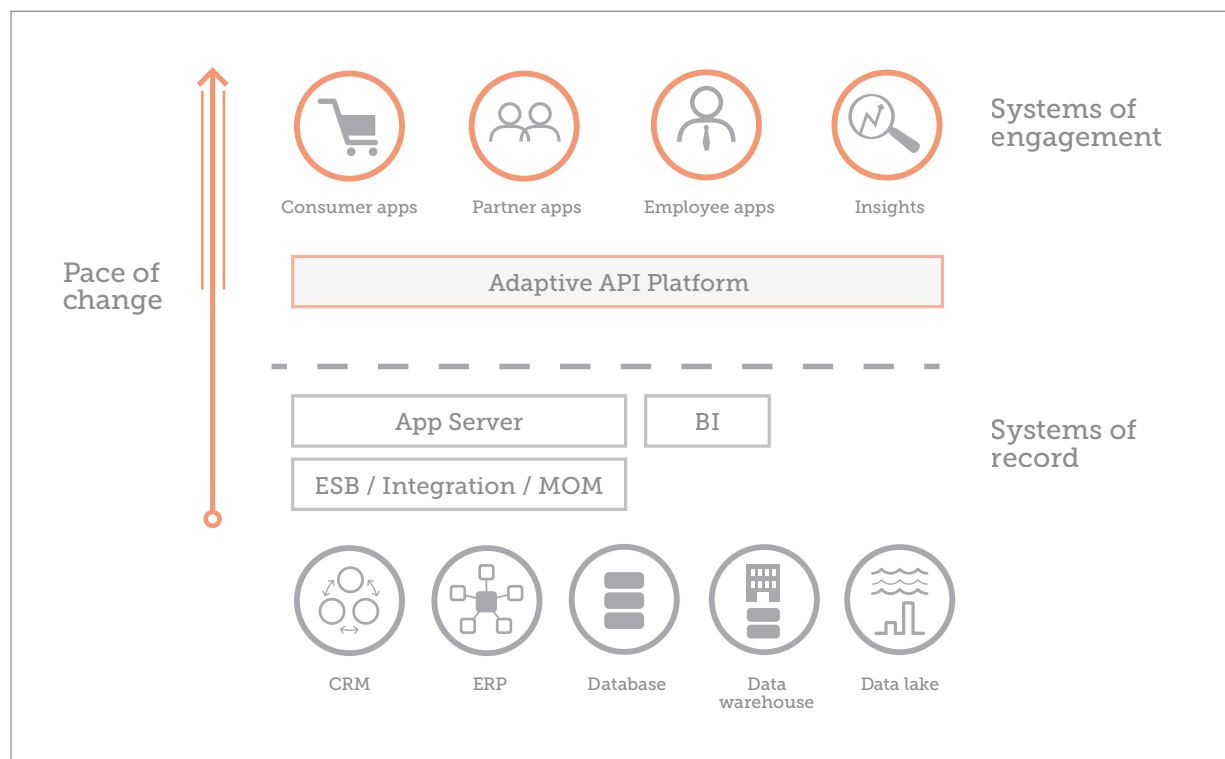
“Systems of engagement begin with a focus on communications. We grew up with letters, phones, telexes, and faxes, and grew into email, shared text databases like Lotus Notes, portals, web sites, and mobile phones. Now we are going to incorporate a third generation of communications, based on 1) connecting people in real time; 2) smart and geographically-aware mobile devices; and 3) ubiquitous and cheap bandwidth.”

Geoffrey Moore (2011)

“Systems of Engagement and the Future of Enterprise IT”

# APIs: the foundation for enterprise apps

## Two-speed IT requires a new API platform



With APIs becoming the de facto integration model for IT systems, a new API tier is required in the enterprise stack. It's the key that unlocks the value of an enterprise's existing assets by securely exposing its data and services via an API. At the same time, it enables fast and iterative development and the delivery of powerful new applications and services that serve customers, partners, and employees.

Apigee's API platform is purpose-built for the digital economy and the data-rich and mobile-driven APIs and applications that power it. The platform securely exposes services for the class of applications and experiences needed to fuel systems of engagement. It also enables an enterprise to control traffic on the APIs, enhance performance, enforce security, and simplify self-service for partners and developers.

# APIs: the foundation for enterprise apps

To enable IT organizations to meet the demands of the business by operating a two-speed model, the API platform must:

- ▶ **enable the speed and agility** required to serve increasingly mobile and connected customers, partners, and employees in the systems of engagement layer, while maintaining control of the back-end systems
- ▶ **make data and analytics a core component** of the IT infrastructure, enabling data-driven business and operational decisions
- ▶ **leverage APIs and data analytics** to power relevant, personalized interactions with customers and help systems adapt automatically to changing conditions
- ▶ **scale to meet the needs of new forms of interaction and connectivity**, like those on the horizon of the Internet of Things—wearable technology, intelligent cars and highways, smart energy grids, and enterprises built of adaptive, connected devices
- ▶ **enable the developers who are building the applications** and experiences of the digital world with self-service and intuitive tools

## Speed: keeping pace with agile change

Traditionally, IT has approached the challenges of connecting systems through “middleware” technologies. These technologies include integration servers, application servers, ESBs, MOM, and various SOA technologies, as illustrated in the figure on page 6. This approach was effective when middleware projects were few in number and had lengthy implementation timeframes. However, the processes for implementing and operating these integration systems are labor-intensive and do not scale when the number of connected systems increases.

Furthermore, IT traditionally has operated via lengthy, centralized planning processes and governance that are often far removed from the business requirements. Companies today, however, need to build myriad digital connections among customers, partners, and employees. To stay competitive, modern digital enterprise IT processes need to abandon centralized planning and governance practices and embrace agile methodologies that allow the organization to scale to meet the demands of the business.

Companies that enable a new agile “high-speed” IT put the developer at the center, and implement self-service systems and processes that empower those who implement the new types of applications required by a digital business.



# APIs: the foundation for enterprise apps

## Hyper-connectivity: keeping pace with mobile demands

Legacy middleware systems were designed primarily for server-to-server communication, not for the demands of the user-facing digital experiences that businesses deliver to mobile and connected devices. Additionally, most middleware technologies were built around the expectation of communications over reliable networks within a company's data centers, so they're difficult to deploy in the public or private cloud environments popular today. New mobile use cases typically have little need for integration server technologies, especially in the DevOps environments that are employed by enterprises to deliver cloud-based applications at scale.

Most mobile operating systems are ill-equipped to deal with the legacy communications protocols used by traditional IT middleware. XML-based protocols such as SOAP often deliver data payloads that consume bandwidth and tax the limited processing power and memory of mobile devices. When, for example, mobile apps consume web services from an ERP backend, an API tier enables the secure exposure of existing data and services via an intuitive API. This makes them consumable by app developers who are building the applications for the new systems of engagement.

## Data: enabling adaptive business

Legacy solutions require significant integration efforts to tap into the various data sources and, more importantly, most solutions deliver analysis well after the fact. In a digital business, analytics is not about delivering reports on last month's sales activity. Rather, it's about generating actions based on predictive insights into both individual user behavior as well as aggregate user activity data.

A key difference between an API-centric architecture and one that depends on integration technologies arises in how data can be leveraged in the system. Most integration architectures are unprepared for the enormous volume and velocity of contextual data that is generated through new digital channels. Much of this data is discarded as it passes from the systems of engagement to the systems of record. This winnowing of the data stream loses the valuable contextual signals necessary to feed big data systems.

The API layer is strategically placed at the center of the application data stream, where it can glean actionable insights from the data. The contextual data leveraged from an API-centric architecture drives context-aware applications. This, in turn, enables a complete feedback loop and drives actions such as the change of behavior in a system, or, in the case of an app, in delivering the right experience, at the right time, on the right device. Personalization and recommendations are common

# APIs: the foundation for enterprise apps

examples of this, as are decision-support dashboards used by customer service personnel. With an integration-based architecture, wiring up this kind of feedback loop would be cumbersome at best.

## **Programmability: powering developers and mobile experiences**

Digital experiences and ecosystems are enabled by programmability. Participants in the programmable world, including the 50 billion connected, sensing devices and a trillion instrumented objects we expect in the next few years, will interact and transact through software. While the number of devices, sensors, and applications is growing at a tremendous rate, the population of available developers to program all of these is growing much more slowly. These developers are often external to the company: they can be partners, contractors, digital agencies, or system integrators.

Software programming tools and internet-based services are building blocks of digital business. Legacy IT infrastructure lacks easy, self-service access to those tools and services for developers and partners, who represent a new base of innovation for building the apps, experiences, and business processes that enable digital business. Further, these systems are not designed to support user interactions on mobile devices.

Lacking a programmable architecture, in which every system is open via APIs, businesses can't share data and services with partners or developers. When the developers—the agents of change—don't have the tools to be effective, innovation is stymied. Successful companies put developer enablement at the center of their digital business strategy, and implement self-service systems and processes that empower them.

## Summary

IT organizations face a major challenge: defining how to implement systems of engagement quickly and responsibly while retaining the checks and balances needed to maintain business-critical IT operations.

To accomplish this, IT is turning to two-speed IT. Two-speed IT is about enabling the people, processes, and technology of a business. Each side of the IT equation—that which controls and secures the operational systems of record, and that which enables the agility and speed to build, deploy, and run the applications and experiences through which customers, partners, and employees now interact with a business—must move at its own pace. A two-speed IT approach places equal value on these necessarily different speeds and capabilities of the IT equation.

On its own, legacy IT infrastructure falls short. The modern business environment demands serving customers on mobile devices, migration to the cloud, agile development, big data analytics as a competitive advantage, and the ability to connect with “things” in the IoT. This confluence of mobile, data, and cloud drives the pervasive need for APIs, which connect a company's business processes, services, content, and data to internal and external developers and partners in an easy and secure way, enabling the creation of powerful new apps and experiences.

Time to market is critical as businesses compete to offer customers new applications and digital experiences. Scaling to meet the demands of a growing number of customers and partners is key to remaining relevant and competitive. Leveraging the massive volume and variety of data in modern digital business is fundamental to driving the right business and operational decisions. Enabling developers and designing systems to support user interactions on mobile devices is critical for full participation in the digital economy.

To accomplish all this, a new API-centric layer is required in IT architectures; it's the way to enable this agile and web-scale innovation while allowing existing IT systems to continue running reliably and securely. This new layer enables enterprises to control and secure operational and transactional systems while enabling the speed and agility necessary to deliver powerful new apps and services that serve customers, partners, and employees in a digital world that just won't slow down.

## About Apigee

Apigee is a leading platform for digital acceleration. Apigee empowers enterprises to gain the speed, scale, insight, and agility required to become a digital business.

Through the Apigee Edge API platform and Apigee Insights predictive big data analytics, Apigee helps businesses move at the new pace and scale of digital, while predicting and continuously adapting to change. Used together, APIs and predictive analytics create a powerful adaptive cycle of continuous improvement—and the faster an enterprise goes through this cycle, the faster it accelerates to become a digital business.

Many of the world's leading businesses, including 20 percent of the Fortune 100, use Apigee for digital acceleration. Apigee customers include global enterprises such as Walgreens, eBay, Shell, Live Nation, Kaiser Permanente, and Sears.

For more information, visit [apigee.com](http://apigee.com).

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