APIs: BUILDING A CONNECTED BUSINESS
IN THE APP ECONOMY ››
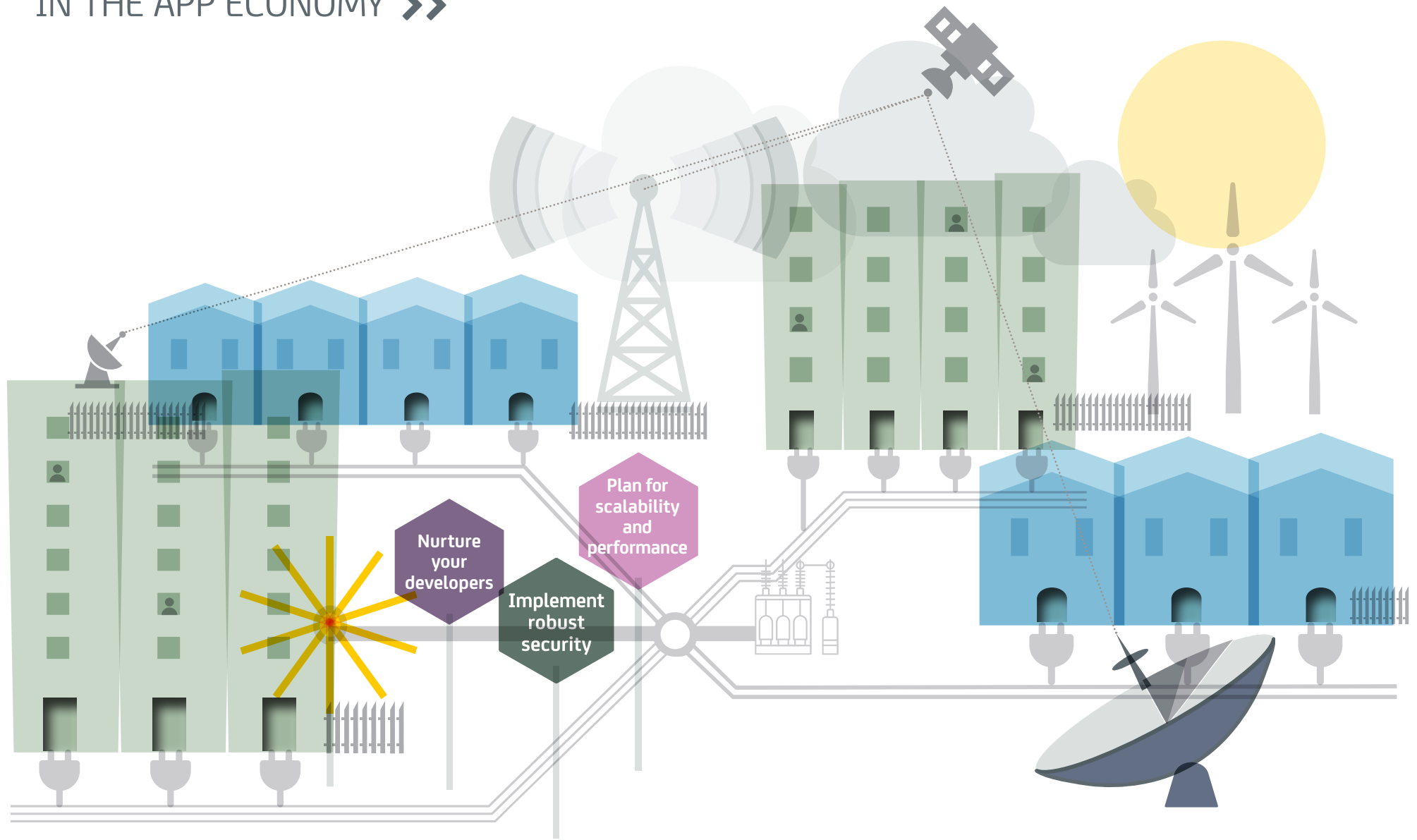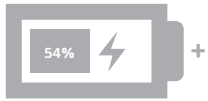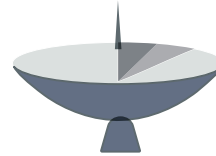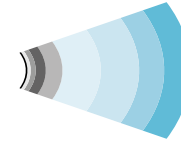
Nurture your developers

Plan for scalability and performance

Implement robust security

Sponsored by **ca** technologies

COLEMAN ✓ PARKES RESEARCH

Contents
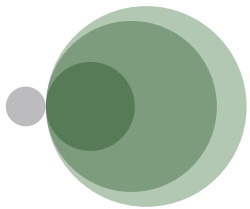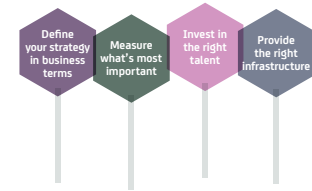
USING THIS INTERACTIVE PDF

Interactivity varies on tablets and smartphones, depending on your PDF reader. You may find interactivity doesn't work when viewing the PDF in email preview mode. We recommend Adobe Acrobat Reader.

HOME
(first page)

CONTENTS

BACK
one page

FORWARD
one page

Executive summary

Application programming interfaces (APIs) are not a new technology. But in today's app economy, they have become vital to almost every aspect of business success. In fact, 88% of enterprises surveyed for this report are currently using APIs.

Connected devices now number in the tens of billions—and their use is still growing fast. It is impossible to reach them in a safe, simplified, and scalable manner without the abstraction layer that APIs provide.

That's why APIs are the building blocks of digital transformation.

APIs cut the development cost of innovation and market entry. They underpin the rapid execution of ideas to seize commercial opportunities. They allow organizations to deliver exceptional customer experiences; create new revenue streams; and connect employees, partners, apps, and devices to the data they require—anytime, anywhere.

Our findings revealed that:

- API adoption is high: some **88%** of enterprises currently use them.

- Around a third of firms use APIs to drive revenue (**33%**) and improve speed-to-market and innovation (**34%**).

- The majority of executives (**54%**) believe that their use of APIs helps differentiate their business from competitors.

- More than seven in ten organizations measure the effectiveness of their API programs through a range of external-facing metrics that go far beyond traditional internal measures. These include:
  - Customer experience (**72%**)
  - Digital reach (**72%**)
  - Customer satisfaction (**71%**)
  - Speed-to-market for new apps (**72%**)

We also employed a unique API Management Maturity Model to compare the effects of advanced and basic API management. In this context, advanced usage means a full lifecycle approach to API management. Our analysis found that:

- Enterprises with advanced API management processes experience up to **47%** better business results than those with basic API management.

- Respondents in advanced organizations are almost **twice** as likely to express confidence about differentiating themselves from competitors.

Companies of all sizes, in all sectors, are using APIs to level the competitive playing field, and cope better with the rising volume, scale and volatility of customer-facing apps. Fifty-four percent of respondents believe their use of APIs improves their competitive differentiation.

Meanwhile, businesses are using APIs to absorb data from partners, in order to add essential services to their apps such as maps and payment functions—without having to write completely new code.

Startups and established firms alike are leveraging APIs to expose powerful data from legacy systems to billions of smart devices. As end-points for data, these connected devices (often called the Internet of Things) require highly scalable and manageable APIs for their connectivity.

But the growing use of APIs presents challenges as well as advantages.

It calls for a formalized approach to API management, which encompasses creating, securing, managing, and optimizing APIs throughout their lifecycle, and at enterprise scale.

It demands the ability to integrate legacy and modern systems, rapidly create APIs to safely expose data, apply the right levels of security and management, and accelerate mobile development.

And it requires the capacity to unlock the real business value of the resulting digital ecosystems through analytics and monetization.

In this context, CA Technologies set out to understand how enterprises are using APIs, the challenges they are facing in doing so, the business impact their API programs are having, and the use of advanced, full lifecycle approaches to API management.

We commissioned Coleman Parkes Research to survey 1,770 senior business and IT executives worldwide.

Our research makes a compelling case for API use—and more importantly, for having a sophisticated approach to managing the full API lifecycle.

Fifty-four percent of respondents believe their use of APIs improves their competitive differentiation.

54% +
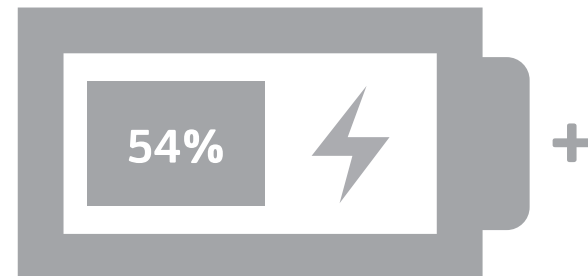
Introduction

Succeeding in today's digital world means connecting products to customer needs, customers to experiences, apps to devices, and organizations to their eco-systems of partners. And it means connecting systems to other systems, software to other software, and data to just about everything.

At the same time, these connections must be made quickly, accurately, securely, with quality, and at scale.

All of this results in almost impossible complexity—which is where application programming interfaces (APIs) come in.

APIs are the central nervous system of the app economy. By allowing pieces of software to communicate with each other, they provide ready-made, universal access to whatever functionality an organization needs to deliver. In fact, the increase in use of APIs has generated growth in what has been called by some industry analysts the 'API Economy'.

The API Economy is an enabler for turning a business or organization into a platform.

Kristin R. Moyer, vice president and distinguished analyst at Gartner

Source: *Smarter with Gartner, Welcome to the API Economy*, June 9, 2016, http://www.gartner.com/smarterwithgartner/welcome-to-the-api-economy/
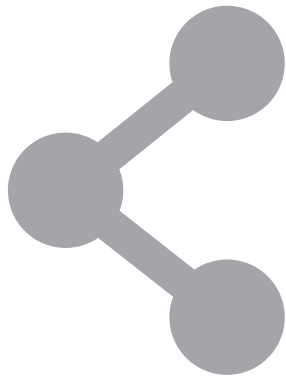
By allowing pieces of software to communicate with each other, APIs provide ready-made, universal access to whatever functionality an organization needs to deliver.

Since API use is crucial to business success, and key to how enterprises are transforming in the digital age, we examined their experiences with APIs.

We asked senior business and IT executives around the world about:

- how their organizations deploy, leverage, and—crucially—manage their APIs

- the impact APIs are having on their businesses, and on their digital transformation initiatives

- the effectiveness of their API management processes

- the barriers preventing them from unlocking the full benefits of APIs

This report outlines our findings, and provides an action plan to help business leaders unleash the true power of APIs in the digital economy.

DEFINITIONS USED IN THE SURVEY

Digital transformation
The use of digital technology and communications to reshape key aspects of an organization, including customer engagement, core operations and processes, working practices, employee productivity, supply chain management, etc.

API management
The technologies, tools, and processes for publishing, documenting, and overseeing application programming interfaces (APIs) in a secure, scalable environment; for monitoring the API lifecycle; and for meeting the needs of the developers and applications that use an organization's APIs.

This report outlines our findings, and provides an action plan to help business leaders unleash the true power of APIs in the digital economy.

01. The state of play

APIs are not a new innovation; modern web APIs surfaced almost 20 years ago. As we might expect, adoption of this tried and tested technology is well established among large global enterprises.

Some 88% of them currently use APIs—and half of the 12% that don't are looking to implement them. Just 6% of the businesses we surveyed have no plans to use APIs (fig. 1).

APIs can be deployed in a variety of ways. Firms typically start out using them for what they were originally intended: to streamline development by taking advantage of reusable code.

But the digital revolution has prompted opportunities to offer new products, create platforms to deliver services, and to provide better experiences to customers—all by using APIs.

> **In the current business environment, we need to increase performance and improve customer satisfaction.**
>
> **IT director,** US government agency

FIG. 1 ALMOST ALL LARGE GLOBAL ENTERPRISES CURRENTLY USE APIs, OR ARE PLANNING TO IMPLEMENT THEM

Currently using APIs — 88%

Don't currently use, but planning to — 6%

Don't currently use, and no plans in place — 6%
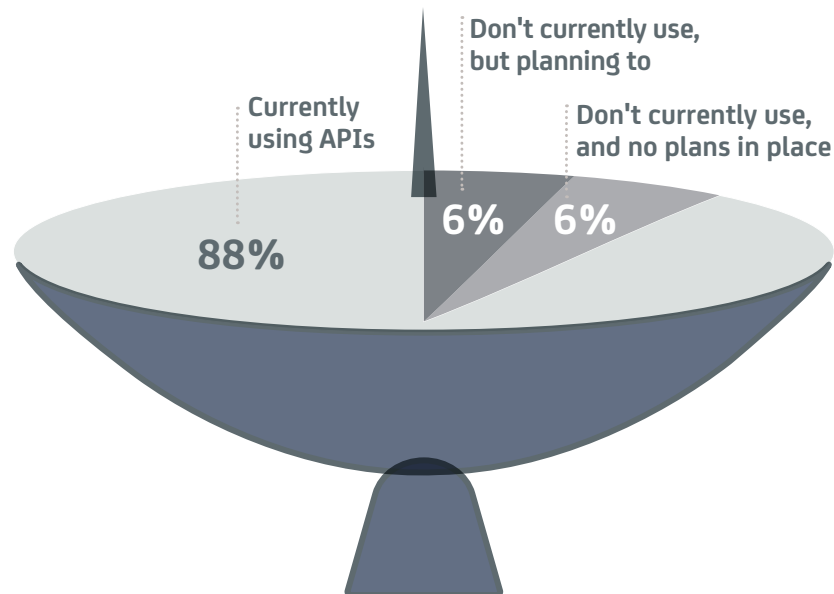
Companies can also open APIs to outside developers to enhance the organization's apps using code developed elsewhere.

Such versatility of use is reflected in how the enterprises we surveyed use APIs. Our respondents recognize the wide spectrum of commercial benefits that APIs can drive (fig. 2).

Around two in five of them are using APIs for internal app development (42%) and data/system integration (40%). About a third are using them to drive revenue (33%), and to improve innovation and speed-to-market (34%).

And tellingly, they make use of a wide range of external business KPIs to measure the impact of their APIs (fig. 3).

Nearly three quarters monitor APIs' effect on crucial commercial indicators such as customer experience (72%), digital reach (72%), customer satisfaction (71%), speed-to-market (71%), and transaction volumes (70%).

FIG. 2 ENTERPRISES ARE USING APIs TO DRIVE A WIDE VARIETY OF BUSINESS BENEFITS

33% We use APIs to drive revenue

33% We offer APIs to developers through a self-service portal or marketplace

34% We use APIs for external partner enablement

34% We consume third party APIs for innovation and speed-to-market

40% We use APIs for integrating back-end systems and data

42% We use APIs for internal application development
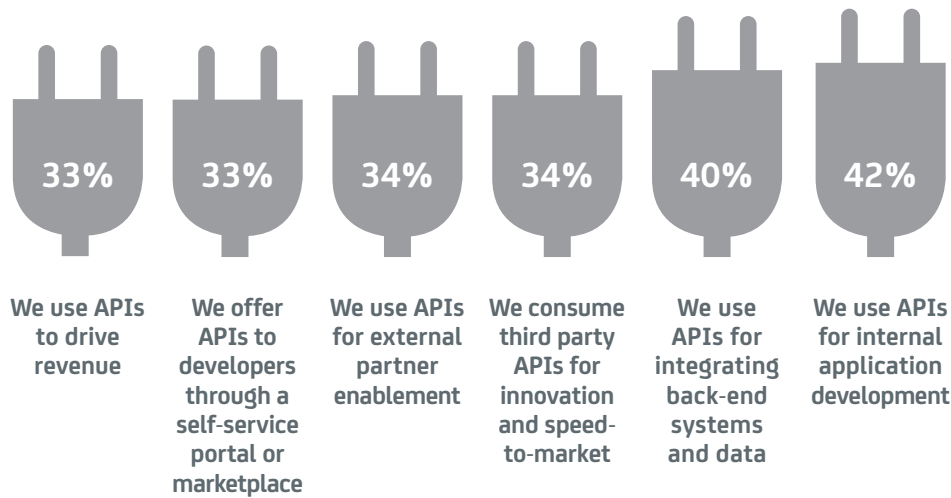
FIG. 3 INTERNAL AND EXTERNAL BUSINESS KPIs ARE USED TO MEASURE THE IMPACT OF APIs

71% Speed-to-market (time to develop/test and release new apps)

71% Customer satisfaction (Net Promoter Score)

72% Digital reach

72% Customer experience

70% IT-related costs

66% Streamlined supply/demand chain

70% Transaction volumes

66% Number of compliance audit failures

70% Partner satisfaction

69% Leverage of third-party developer innovation
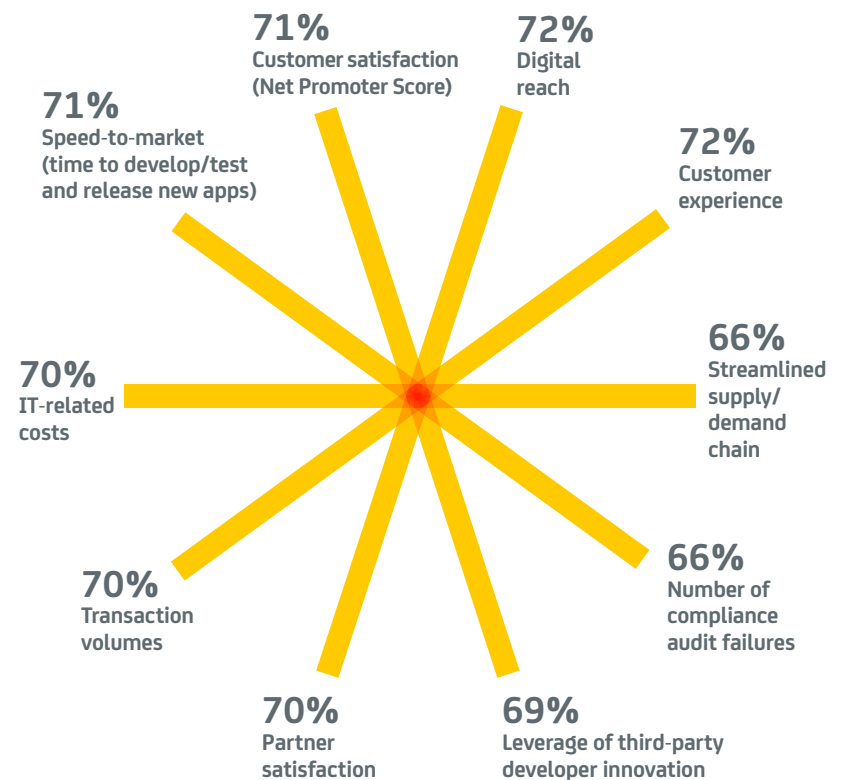
02. The business impact

Firms are reaping the business benefits of API use. The majority (54%) of executives believe that their APIs are highly effective at differentiating their companies from the competition (fig. 4).

In addition, APIs are having a positive effect on all of the measures being used to evaluate their business impact (fig. 5, page 10).

Customers' expectations are on the rise. This affects the performance of systems and software.

Head of planning and production, European rail operator

FIG. 4 THE MAJORITY OF EXECUTIVES BELIEVE APIs ARE EFFECTIVE AT DIFFERENTIATING ENTERPRISES FROM THE COMPETITION

54%

Global average

10% 23% 23% 15% 16%

NOT EFFECTIVE ⟵⟶ VERY EFFECTIVE
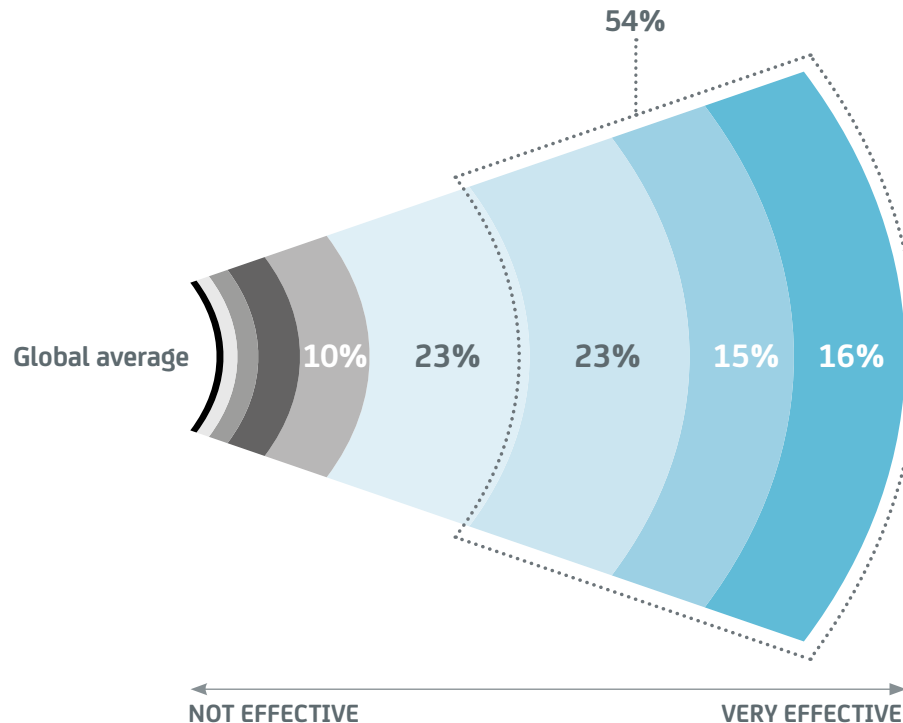
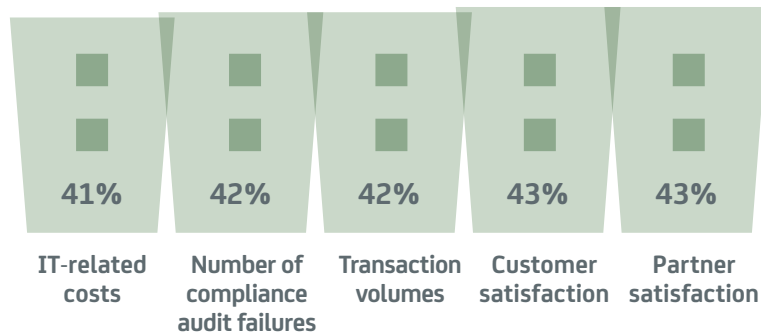Respondents reported significant improvements in KPIs such as customer satisfaction (43%), transaction volumes (42%), and IT cost reduction (41%). And they reported that APIs enable them to get apps to market some 18% faster.

What's more, around three quarters believe that their use of APIs has significantly enhanced their customer experience (75%) and digital reach (73%).

However, simply using APIs isn't enough. Effective management of the API lifecycle is needed to truly reap their benefits. But as we shall see, API management in many organizations lacks the sophistication required to fully exploit the power of APIs in the app economy.

FIG. 5 USE OF APIs IS RESULTING IN IMPROVEMENTS ACROSS ALL KPIs

Average improvement in KPIs

41%	42%	42%	43%	43%
IT-related costs	Number of compliance audit failures	Transaction volumes	Customer satisfaction	Partner satisfaction
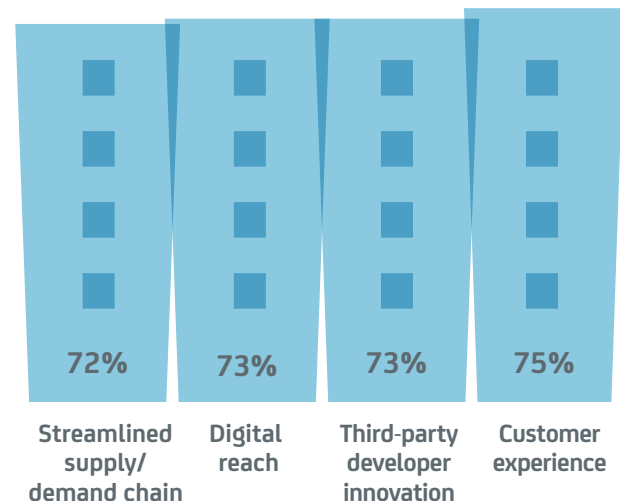
Average increase in speed-to-market
(time to develop/test and release new apps)

18%

ALL API USERS
23.52 → 19.85
weeks before/after implementation

Percentage of respondents reporting improvement in KPIs

72%	73%	73%	75%
Streamlined supply/ demand chain	Digital reach	Third-party developer innovation	Customer experience

03. The maturity gap

To secure and implement APIs at enterprise scale, firms need to effectively manage the entire API lifecycle, from conception to consumption.

This full lifecycle approach to API management requires a wide and complex range of capabilities. It demands the ability to connect legacy and current systems; rapidly create APIs in order to safely expose data; integrate this with back-end data and legacy apps; protect these integrations

with the right levels of security; accelerate mobile development; and unlock the value of the resulting digital ecosystems through analytics and monetization.
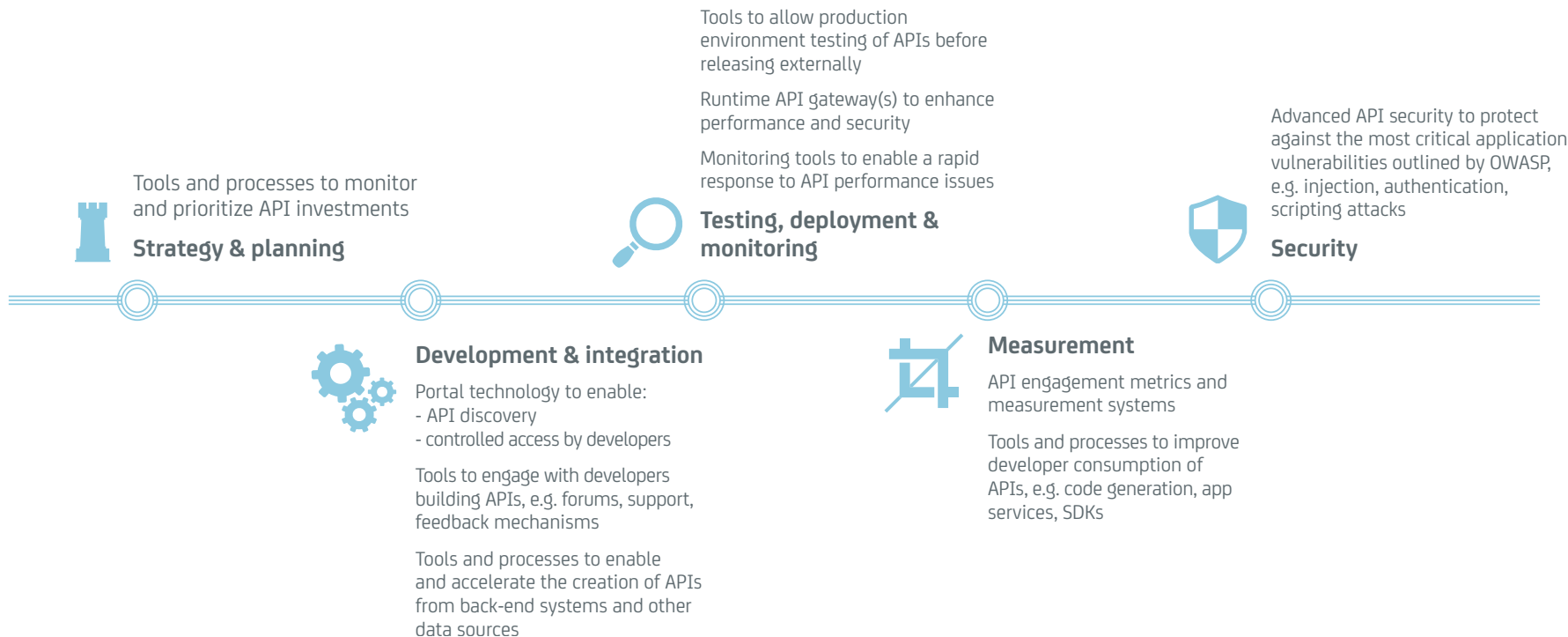
With this in mind, we created an API management maturity model to assess how far organizations have implemented the tools and technologies, systems and processes, and capabilities required for full API lifecycle management (fig. 6).

> **A major impact of our digital transformation programme has been to bring our developers closer to our customers.**
>
> **IT manager,** European telco provider

FIG. 6 API MANAGEMENT LIFECYCLE

Tools and processes to monitor and prioritize API investments
Strategy & planning

Tools to allow production environment testing of APIs before releasing externally

Runtime API gateway(s) to enhance performance and security

Monitoring tools to enable a rapid response to API performance issues

Testing, deployment & monitoring

Advanced API security to protect against the most critical application vulnerabilities outlined by OWASP, e.g. injection, authentication, scripting attacks

Security

Development & integration

Portal technology to enable:
- API discovery
- controlled access by developers

Tools to engage with developers building APIs, e.g. forums, support, feedback mechanisms

Tools and processes to enable and accelerate the creation of APIs from back-end systems and other data sources

Measurement

API engagement metrics and measurement systems

Tools and processes to improve developer consumption of APIs, e.g. code generation, app services, SDKs

We categorized organizations with more than 80% of these elements in place as having an advanced approach to API management that covers most or all of the full API lifecycle.

Our analysis found that almost three quarters of organizations are currently implementing many of these capabilities. However, far fewer have deployed enough of them to be classified as having an advanced approach to API management (fig. 7).

Barely more than half of the enterprises we studied (51%) came in over the 80% threshold.

Of the remainder, 37% have what we would consider basic API management procedures in place. A tenth (10%) have only limited capabilities, and the rest have no API management function at all.

FIG. 7 ONLY HALF OF THE ENTERPRISES STUDIED CAN BE CATEGORIZED AS HAVING AN ADVANCED APPROACH TO FULL LIFECYCLE API MANAGEMENT

2%

10%

37%

51%

Advanced API management

Basic API management

Limited API management
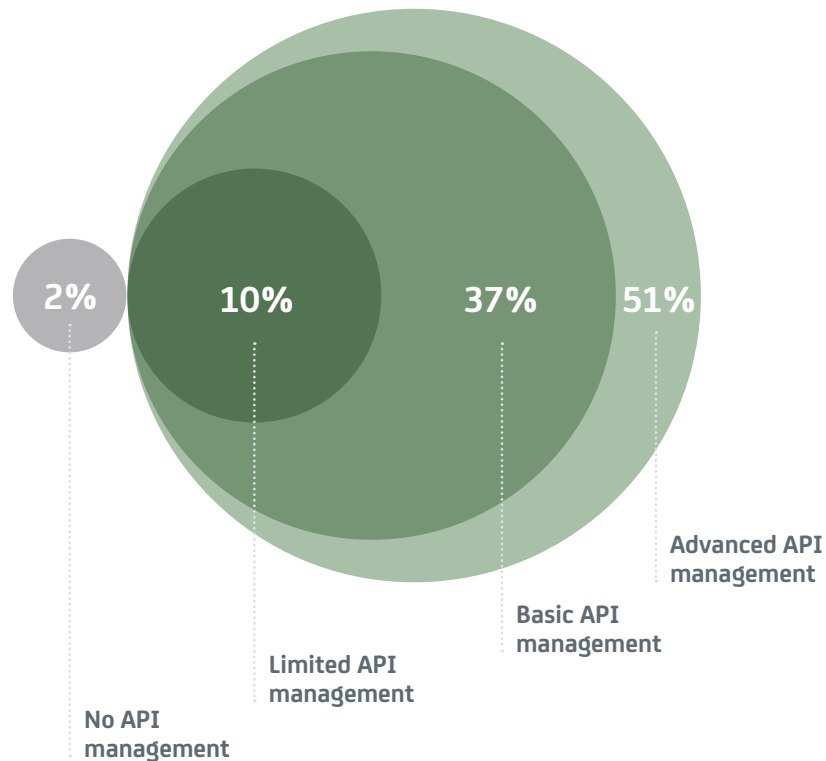
No API management

04. The case for maturity

Our maturity model also enabled us to examine the business impact of advanced API management. We compared the experiences of organizations with advanced versus basic API management capabilities.

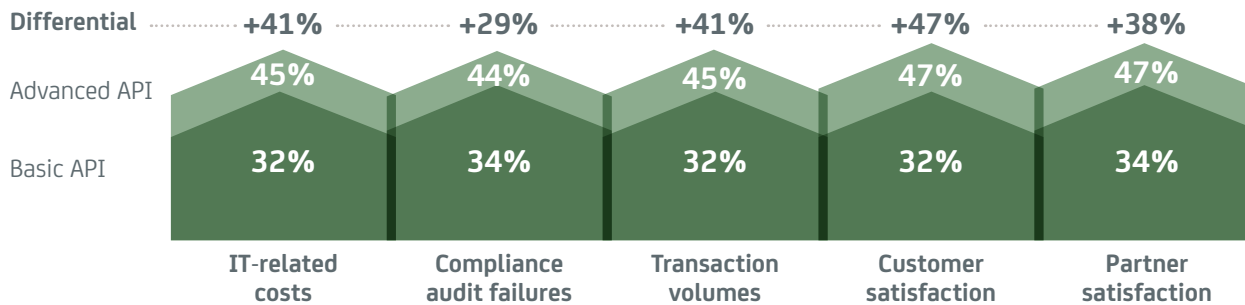We found firms with advanced API management to be almost twice as confident that their APIs help to drive competitive differentiation. Some 83% of them rated themselves as such—compared to just 47% of firms with basic API management.

Similarly, those in the advanced bracket are seeing far larger improvements in the measures used to gauge the effectiveness of their APIs (fig. 8).
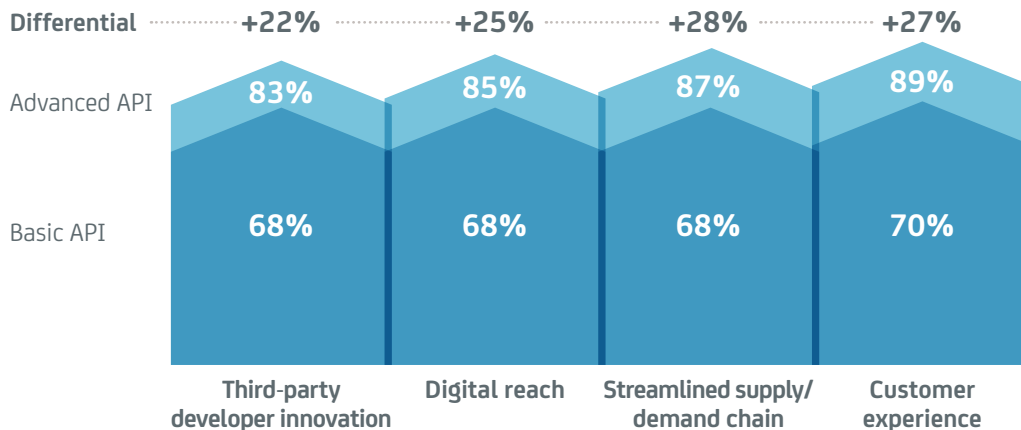
Advanced API management is driving a 47% greater improvement in customer satisfaction levels, and a 41% bigger increase in transaction volumes, than basic API management. It is bringing about 41% more reduction in IT costs. And it is accelerating speed-to-market for apps by 15% more.

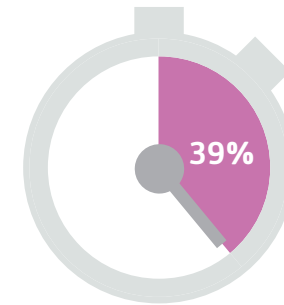**FIG. 8** MOVING FROM BASIC TO ADVANCED API MANAGEMENT IMPROVES KPIs BY UP TO 47%

Average improvement in KPIs

Differential	+41%	+29%	+41%	+47%	+38%
Advanced API	45%	44%	45%	47%	47%
Basic API	32%	34%	32%	32%	34%
	IT-related costs	Compliance audit failures	Transaction volumes	Customer satisfaction	Partner satisfaction

Percentage of respondents reporting improvement in KPIs

Differential	+22%	+25%	+28%	+27%
Advanced API	83%	85%	87%	89%
Basic API	68%	68%	68%	70%
	Third-party developer innovation	Digital reach	Streamlined supply/ demand chain	Customer experience

Average increase in speed-to-market

39%

ADVANCED API MANAGEMENT
10.42 → 6.91
weeks before/after implementation

34%
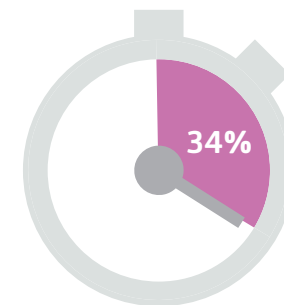
BASIC API MANAGEMENT
11.76 → 7.17
weeks before/after implementation

Digital Transformation Business Impact Scorecard

The business benefits of effective API management are also evident in the results of our Digital Transformation Business Impact Scorecard (BIS).

We created the BIS as part of our research into enterprises' digital transformation efforts. It evaluates the effect of organizations' digital initiatives on overall business performance, based on 14 business KPIs that are essential to successful digital transformation. The overall BIS results are summarized in our report, *Keeping Score: Why Digital Transformation Matters*.

The Scorecard enabled us to compare results for the firms we classified as having advanced and basic API management processes.

Advanced organizations scored an impressive 73 out of 100 on average, while basic firms scored just 48—a differential of some 52%.
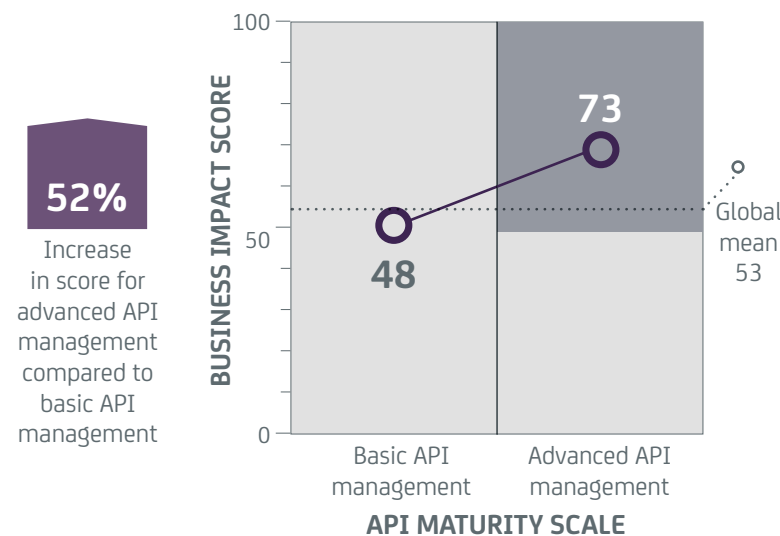
These findings underline the impact that a full lifecycle approach to API management can have on an organization's digital transformation efforts—and on its overall business performance.

Cost savings, efficiency, a more agile IT chain, better competitiveness… these are all the major drivers of our digital journey.

Marketing director, European telecoms provider

FIG. 9 MOVING FROM BASIC TO ADVANCED API MANAGEMENT IMPROVES OVERALL BUSINESS TRANSFORMATION RESULTS

52%

Increase in score for advanced API management compared to basic API management

BUSINESS IMPACT SCORE

73

48

Global mean 53

Basic API management

Advanced API management

API MATURITY SCALE

05. Barriers to maturity

APIs are crucial to success in the app economy. But as we've seen, managing the API lifecycle is a complex and multi-faceted task, which can be difficult to get right.

Our research underlines this challenge. We found a significant number of the enterprises we studied facing a wide range of barriers to successful implementation of their API programs. Around a third acknowledged experiencing each of the barriers to effective API use listed in fig. 10.

Joint top on the list of hurdles is a lack of skilled resources, recognised by 37% of our respondents. This reflects how businesses are taking on broader—and more external—use of APIs in the digital era. This calls for new and different skillsets.

The other top barrier is the time it takes to develop APIs, which signals a difficulty in leveraging the right tools for effective API management. The same goes for the next set of challenges: the ability to secure APIs, scale their use, and manage their performance.
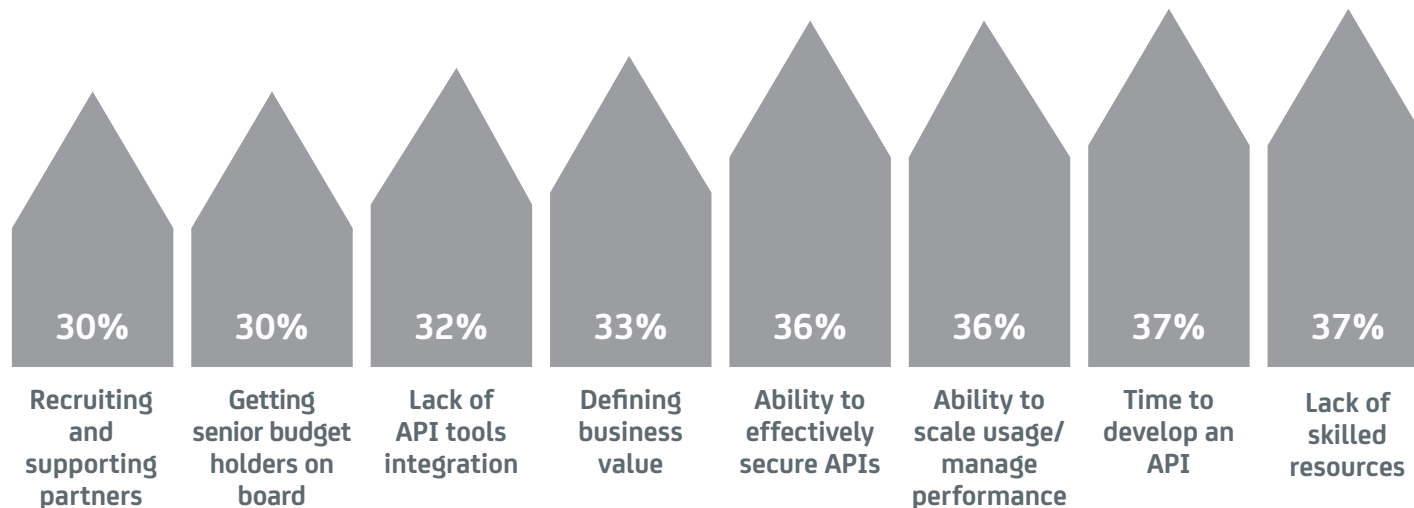
Also on the list are a lack of integration of API tools, difficulty obtaining senior management buy-in, and challenges recruiting and supporting partners. These issues suggest that while enterprises realise the need to address the full API lifecycle, around a third are struggling to do so.

Finally, 'defining business value' is a challenge for a third of firms (33%). As leveraging APIs properly will require investment, the organization as a whole needs to recognize the business value that APIs can bring.

Being able to describe the benefits and returns from APIs in terms that business stakeholders understand is therefore vital. That means using external metrics—such as customer satisfaction, new business revenue, and transaction volumes—to evaluate the success of an API program.

FIG. 10 AROUND A THIRD OF ORGANIZATIONS SAY EACH OF THE FOLLOWING BARRIERS ARE PREVENTING EFFECTIVE API USE

30%	30%	32%	33%	36%	36%	37%	37%
Recruiting and supporting partners	Getting senior budget holders on board	Lack of API tools integration	Defining business value	Ability to effectively secure APIs	Ability to scale usage/ manage performance	Time to develop an API	Lack of skilled resources

06. Your action plan

Our research leaves little room for doubt about the need for a sophisticated approach to managing the API lifecycle in the app economy.

So how do you go about putting an effective API management program in place?

From our experience of helping global enterprises to improve their use and management of APIs, we recommend the following steps:

1. **Define your strategy in business terms.** Developing APIs in a haphazard, opportunistic way will achieve little in terms of business value. Take time upfront to define the vision, strategy, and priorities for what you want to accomplish with your API program. And make sure that you can clearly articulate the business outcomes.

2. **Measure what's most important.** The true indicator of a successful API program is how easily your 'customers'—be they consumers or external developers—can use and leverage your APIs. Adopt metrics that reflect this, such as customer and partner satisfaction, and growth in transaction volume.

3. **Invest in the right talent.** Your own team may be comfortable using internal APIs in their work. But publishing APIs to external developers, and leveraging external APIs, requires different skills and a different mind-set. Be prepared to provide additional training for all your existing development and operations staff. If needed, recruit new talent such as API owners, product managers and analytics specialists.

4. **Provide the right infrastructure**. The foundations of a successful API program are the tools and processes that enable the creation, testing, publishing, and management of individual APIs as they move through their lifecycle. A robust infrastructure reduces cost, time-to-market, and development challenges.
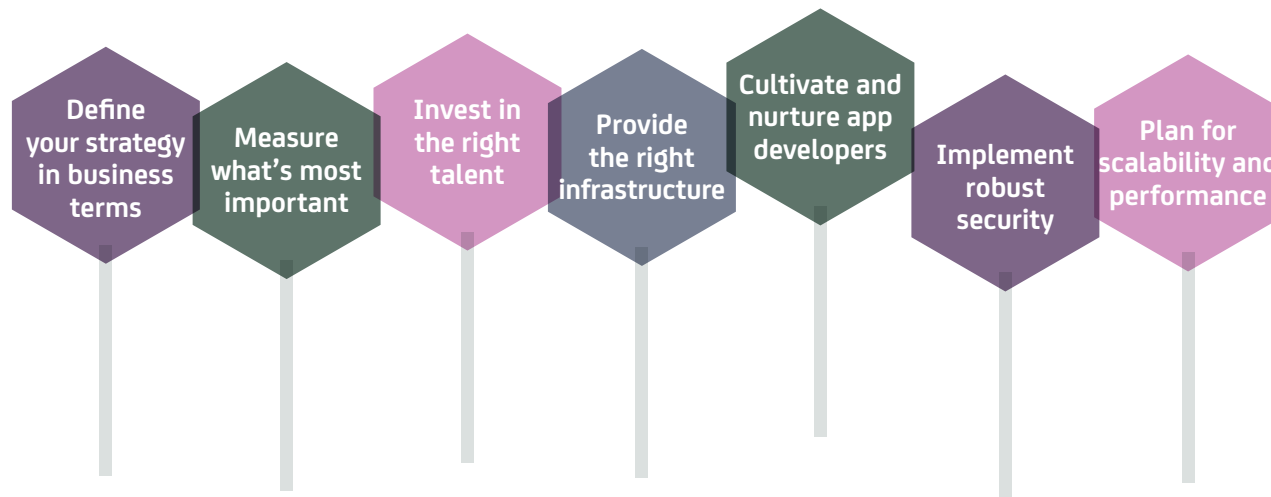
5. **Cultivate and nurture app developers**. Consider the overall developer experience with your APIs. How easy is it for them to discover your APIs? Do you provide sample code and documentation to facilitate their use? Do you support your APIs with problem reporting and resolution management?

6. **Implement robust security**. APIs often provide a connection to highly sensitive corporate data, so make sure that the right users, apps, and devices have the right access. To avoid costly security lapses, build controls into your API program from the start.

7. **Plan for scalability and performance**. As use of your APIs expands, you will need to deploy more robust API management capabilities to enable the full API lifecycle—from design and creation to governance. To maintain a superior user experience, monitoring and management capabilities are essential to ensure that performance is not compromised, even if API usage grows significantly.

Define your strategy in business terms

Measure what's most important

Invest in the right talent

Provide the right infrastructure

Cultivate and nurture app developers

Implement robust security

Plan for scalability and performance

Further information

For practical insight on how to leverage APIs and develop an effective full lifecycle approach to API management, read our ebook, *5 Pillars of Full Lifecycle API Management.*

Research methodology

CA Technologies commissioned Coleman Parkes Research to interview executives about the extent and impact of their organizations' digital transformation activity.

We surveyed 1,770 senior business and IT decision-makers at large enterprises in 21 countries across the Americas, EMEA and Asia-Pacific Japan (APJ) regions. Organizations surveyed had annual revenues of more than US$1 billion (or US$0.5 billion in some smaller economies).

Countries surveyed were:

Americas	**EMEA**	**APJ**
Brazil	France	Australia
USA	Germany	China
	Italy	Hong Kong
	Netherlands	India
	South Africa	Indonesia
	Spain	Japan
	Sweden	Korea
	Switzerland	Malaysia
	UK	Singapore
		Thailand

Sectors surveyed were:

- Automotive
- Banking and financial services
- Energy and utilities
- Healthcare
- Manufacturing
- Media and entertainment
- National public sector
- Retail
- Telecommunications
- Transportation and logistics

The research and analysis were conducted in May and June 2016.

About CA Technologies

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. www.ca.com

About Coleman Parkes Research

Coleman Parkes Research specializes in recruiting and interviewing senior-level respondents across multiple global markets, vertical sectors, and functional areas for a wide range of clients. From thought leadership research for PR and marketing campaigns, to analyzing win/loss opportunities, testing product messages, and conducting in-depth senior executive interviews, we do it all. Coleman Parkes Research works collaboratively with clients to formulate proven strategies that generate market insight based on individual requirements and key hypotheses. colemanparkes.com/

About Grist

Editorial and creative services. Grist is an award-winning B2B thought leadership and content marketing agency with the editorial heritage of The Economist and Financial Times in our DNA and a clear view of the digital future. www.gristonline.com