



# WHAT IS AN API?

YOUR GUIDE TO THE  
INTERNET BUSINESS  
(R)EVOLUTION

Capitalize on APIs as the  
cornerstone of your online  
strategy.

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The introduction of the Internet and then the World Wide Web unveiled some of the most dramatic transformations that the world of communications has seen. We have now embarked on another transformation to reinforce and extend these trends – the rapid, and increasing adoption of Application Programming Interfaces (APIs). This paper is meant to help executives and managers understand what APIs are, and why they are so important. We illustrate the benefits by drawing on an analogy of the pattern of industrialization that has been repeated many times before. While APIs themselves are not new, we are now entering a “chapter two” inflection point, which opens a whole new spectrum of possibilities. Key trends for future evolution are described, and we summarize the immediate steps that can be taken to capitalize on APIs as the cornerstone of an online strategy.

## APIs create business value on the internet

The internet continues its relentless transformation of every business; however, past investments in web technology are not enough to ensure future success. New technology enablers are emerging to change the playing field. Companies that miss the window to capitalize on the key enablers will be left behind. It is time to do or die...

Among the most important trends shaping the Internet today are social networks, mobile, and location based services. Additionally – and critical in their own as the foundation for these trends – are APIs. Here we will explain what APIs are and why they are becoming so critical.

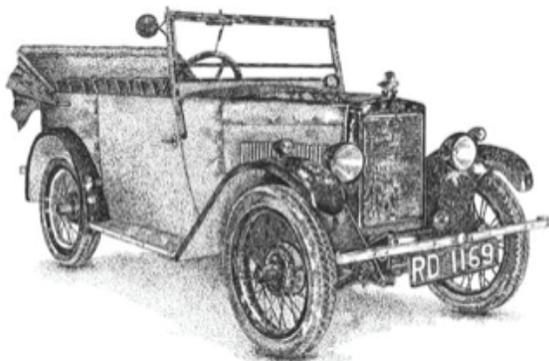
During the dotcom era of the late nineties it became mandatory for every business to communicate to its customers via website. Any business that didn't do so quickly found itself at a disadvantage, with declining mind share, and loss of market share. At the time it was simple to reach an online, connected audience. All you needed was a website and your customers would find you from their desktop with a browser.

The core challenges of attracting and retaining users persist, but today's world is far more complicated and fragmented. Mobile and wearable devices are proliferating. People now access the Internet from countless smartphones, tablets and other gadgets, not to mention the hidden network of connected intelligent devices. The web browser is no longer an exclusive gateway to view content on the web. Increasingly, content is accessed through new media like widgets or mobile apps. And finally, you can't count on your audience coming to you. Instead it's imperative to ensure that digital data and services are available in the context that users choose. Since the web is such an effective platform for serving information to the long-tail, users are more discriminating in deciding how, when and where they view information on the web. Bringing these fragmentation trends together means that companies must be aggressive to indirectly reach the huge untapped, potential audience that does not come to their website.

The big change in mindset is to recognize that data and services – the company's digital assets – must be unlocked from the confines of a website. Once those digital assets are free, and can be accessed from anywhere, then the potential to grow the business can be realized.

## Building blocks for powerful solution capabilities

Before tackling the details of exactly what constitutes an API, it's useful to take a step back to understand parallels with other industries. When you consider how many industries evolve, you notice a pattern that is repeated over and over. Every industry evolves to create more sophisticated solutions over time through a process of modularization and standardization.



It's impossible to imagine how anyone would design a car today without taking advantage of existing modules or vehicle subsystems. In the early days of the automotive industry, pioneering engineers would craft the majority of components as a custom design. Over time, subsystems were identified and elements like the powertrain (the engine and transmission), brakes, steering, suspension, cockpit and body each became areas of specialization. Engineering teams would work on the different subsystems and often entire companies would specialize in one or more of them. So as big automotive manufacturers outsourced more work in their drive for efficiency, their role became one of a systems integrator. Thanks to well-designed interfaces between all the subsystems, when they are brought together at assembly time, the result is a vehicle with great performance relative to cost.

This pattern is repeated across industries. Especially engineering-driven sectors like railways, construction, airplanes, and robotics. Companies carefully choose the area of their core competence, whether at the architecture or solution level, or among the subsystems. Then they cooperate to bring the modules together into a complete product or solution. In this way industries gain better economies of scale, maintain high levels of R&D, and deliver more innovative products.

This same pattern is evident in the software industry and is enabled with APIs. In fact, compared to other industries, the returns for software are exponentially greater because the modularization potential is virtually unlimited, and because the integration cost is an order of magnitude lower.

## The definition of an API

Application programming interfaces (APIs) have been an important part of the computer industry since the early days. They are fundamental to the way that computer, software, and network architecture has evolved. Further, one can differentiate between device APIs and remote APIs. Device APIs allow access to data or functions provided by a device or operating system locally, whereas remote APIs are a way to let a consumer program access data or services of a provider program via a communications network in a controlled way.

In the ebook "[Winning in the API Economy](#)" we define remote APIs as

*"An interface to a software component that can be invoked at a distance over a communications network using standards based technologies."*

Obviously, the most widely used communications network is the Internet and most APIs are designed based on Web standards, so remote APIs are also referred to as Web APIs.

A good example of why and how a company might use an API is a book distributor. They could provide the book shops they supply with an application allowing a cashier to check on the availability of books in the warehouse. Or it could instead provide an API to directly check on stock availability. One benefit is that the query could be made from within the book shop's standard application rather than switching to a different application for each supplier. Another benefit is that the distributor has the flexibility to switch its internal systems however it likes, as long as the behaviour of the API interface remains the same. The API solution is less complex to design, manage and use, and it provides more flexibility.

## APIs: Chapter One

During the growth of the computer industry in the last few decades – even before web became ubiquitous – APIs were at the heart of market dynamics. Frequent competitive battles were won or lost on the basis of API wars. The stakes were high, and it was usually a select few, big and powerful companies or organizations that dominated the directions for APIs. For the winners, to control an open or proprietary standard API, would usually add rocket fuel to a company's growth path.

“[Before our open API platform] we could never deliver on our own all the ideas people have had for using the Guardian brand and assets in the digital world. [...] With this growing partner network we can then expand our reach, engage users both on and off our domain, and become more relevant as the needs and habits of people evolve in the future.”

– Guardian.co.uk Open Platform blog

The reason that APIs were so important to growth is because of the network effect that occurs when more applications created for a platform lead to an increase in the value of the platform itself. As soon as a developer ecosystem takes root it becomes more costly to switch to alternatives (because some applications may not be available on the new platform) and it is a prerequisite for a company to become the dominant provider in its market.

Microsoft was one of the most successful companies to exploit their APIs for business advantage. They made massive investments to attract the largest base of application developers to write apps for MS Windows and the Windows API. Once they achieved critical mass, it became a self-reinforcing cycle of customers choosing Windows because of the large selection of apps, which led to more developers to write apps on this platform in order to reach the largest possible customer base.

During this period before the web was available as a distribution platform, it was extremely hard to grow a developer ecosystem around APIs. In order to be successful, lots of distribution, competition and complexity challenges had to be overcome. It was only at large scale that it was feasible to solve these challenges. So it was inevitable that big companies dominated.

## APIs: Chapter Two

The Internet, and in particular the rise of web APIs, has had a democratizing effect compared to the dynamics of the first chapter. Now anyone can create an API to share data or services. Anyone can define their module or subsystem – to use the automotive analogy – as a web service and it can be integrated into other modules or applications on the connected web.

Today the commercial potential for APIs is no longer limited to a handful of big companies. Anyone can spot an opportunity for a new service and with APIs slot it into a bigger framework. It makes solutions more accessible, more useful, and more powerful. For developers who build on web services it's also easier than ever to take advantage of external services and data to enhance offerings. The result is more value for end users and an explosion in the number of public web APIs.

This API explosion means it is feasible to create products that meet customer expectations and desires more accurately — for example to meet a use case in a small market niche, to have access to data in a unique context, or to meet customers' preference to interact from a smartphone device. It may be to meet a use case in a small market niche, or have access to data in a unique context, or meet their preference to interact from a smartphone device. Ultimately it provides companies with the flexibility to support existing business models or to design completely new ones.

Exposing APIs can lead to a combination of business benefits that include: additional revenue channels or extension of existing channels, wider reach (e.g., increase of an organization's brand awareness), external sources of innovation (facilitating the idea of open innovation), or increase in efficiency. In our ebook "[Winning in the API Economy](#)" we describe five different use cases of APIs for organizations including their characteristics and benefits.

Currently, we see an evolution in the role of APIs, but this is a revolution in how business can benefit from APIs – the API (r)evolution.

## The Next Chapter for APIs

Where to next for APIs? They are gathering momentum, and the potential business benefits of adoption will continue to grow.

Some key trends to watch out for include:

- **Standardization** – The effort and friction necessary to integrate web services will continue to be reduced to approaching zero. Once an accounting web service has been integrated via its API, it should not be necessary to rewrite the integration for a replacement accounting service. An interesting approach to supporting standardization is API Commons ([apicommons.org](http://apicommons.org)) which offers re-usable API specifications and data models.

“The Internet is expanding beyond PCs and mobile devices into enterprise assets such as field equipment, and consumer items such as cars and televisions. The problem is that most enterprises and technology vendors have yet to explore the possibilities of an expanded internet and are not operationally or organizationally ready.”

– Gartner Inc. on technology trends for 2014 and beyond

- **Automated service brokering** – In parallel with improved standardization, brokering will help to make it seamless to dynamically switch service providers, for example, from one accounting web service to another.
- **Service Level Agreements** – SLAs were often treated as “best effort” during the first wave of cloud-based APIs. Increasingly services are being meshed together in more mission critical solutions. This is driving a requirement for service providers to commit to service level guarantees for their APIs and the need to monitor performance and keep track of usage.
- **Programmer-less stitching of web services** – Most of the benefits of APIs are limited to companies and individuals with the programming skills necessary to write the required code. Yet for as long as programming languages have existed, people have envisioned solutions to instruct computers without the need for programming skills. APIs provide higher levels of abstraction and will help get closer to this vision.
- **Completely new application areas** – The exploitation of rich APIs from services or devices has created entirely new categories. For example, devices beyond PC’s and cell phones, such as wearables, 3D projectors, sensor networks, grids of nano technology based devices, and environment-aware technology can now all be accessed and integrated into wider information systems – all enabled via APIs.
- **Marketing targeted at developers** – Developer marketing or B2D is playing an increasingly important role. Developers are the element in the chain that transform an asset offered via an API into value that can then be captured. The notion of providing an outstanding developer experience (DX) around an API is paramount to drive adoption. DX includes a variety of approaches such as developer portals, API documentation, sample code, testing possibilities, lowering barriers to entry, being present in communities (digitally as well as physically), and working with evangelists.
- **API search** – With the growing number of APIs, findability of APIs is of growing importance, both for API providers that want to increase adoption of their APIs, and for API consumers (developers) as they look for APIs that help them solve a problem. [APIs.io](https://apis.io) is an open-source API search engine (maintained and supported by 3scale) which aims to address this issue: to narrow the gap between API providers and consumers.

- **API management for API consumers** – In terms of API management, we currently see a focus on supplying the API provider side. But with the increase of available APIs, it is getting increasingly complex for API consumers (developers) to stay on top of API integrations from various providers. This side of the equation is currently under-supplied. This was the inspiration for [APItools.com](https://apitools.com), a solution for developers to get a better overview of integrated APIs, which are all collected, managed and tested in one place. APItools also provides the possibility to modify API requests or responses. It acts like a proxy where arbitrary modifications such as translating between data formats can be executed.

We cover and discuss these future trends and a lot more at our [API Strategy & Practice](#) (APIStrat) series of global conferences. Although we co-organize this event with the [API Evangelist](#) Kin Lane, the series is vendor-neutral and genuinely interested in sharing knowledge, learning from each other and driving the API space further.

## APIs: The Cornerstone Of Your Digital Strategy

APIs are the current chapter of the Internet. Content and services are the digital assets core to any business. This white paper has shown how an API can open new distribution and solution options and capture more value from assets. An API unlocks the value of a firm's digital assets and expands reach well beyond a website to mobile apps, wearables, partners, developers and more. This greater reach allows partnerships to be leveraged, and creates a multiplier effect for key assets – enabling innovation with completely new business models. Competitors stand still, while customers access content and services exactly the way they want.

“We are nearing the time when opening our supply chains across the web isn't just a good idea, it will be essential for competitive survival.”

– Dion Hinchcliffe, business strategist, enterprise architect, author

Get started on your action plan to boost your business with APIs today:

- Identify your core digital assets and brainstorm what solutions could be created with the help of these assets
- Define a few scenarios for an API-based business strategy and business model
- Scope out requirements to implement your API initiative
- Start with one strategy and business model, and be ready to adapt and change

APIs are a simple way to open up a company's data or services for benefits like additional or extended channels, wider reach, external sources of innovation, or increase in efficiency. To get the most out of an API program, an API provider should have visibility and control over their APIs and the assets behind them. This is exactly where API management comes into play.

At 3scale, we welcome the opportunity to help you at each step of your API program. Our API management solution provides access control and security, usage policies like API contracts and rate limiting, analytics and reporting, a developer portal with API documentation, and monetization support via billing and payment processes.

The earlier you engage 3scale, the better.

The API (r)evolution is here.

# ABOUT 3SCALE

3scale is the leading API Management Platform built with performance, customer control and excellent time-to-value in mind. 3scale makes it easy to open, distribute, control, and monetize APIs. No other solution delivers so much power, ease and flexibility in such a cost effective way.

More APIs are powered by 3scale than any other vendor (600+) because our unique management architecture and self-serve approach serve all categories of APIs, and all types and sizes of customers including Campbells, Orange, GSMA, UC Berkeley, SITA, CrunchBase and Optimizely.

SaaS plans range from free forever to enterprise. 3scale has offices in San Francisco, USA and Barcelona, Spain.

To learn more, please visit [3scale.net](http://3scale.net) or contact us at [info@3scale.net](mailto:info@3scale.net). You can also find us on Twitter at [@3scale](https://twitter.com/3scale)



[www.3scale.net](http://www.3scale.net)

450 Townsend St.  
San Francisco, CA 94107  
+1 (415) 671-6432