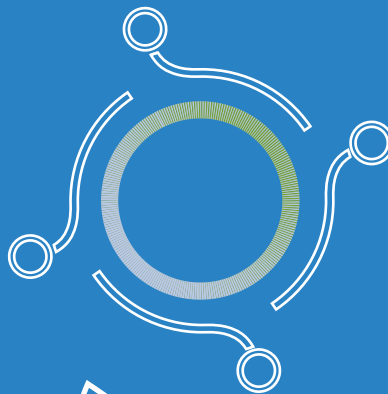


Apigee API Exchange

An API Interoperability Platform
to Power App Ecosystems



apigee

Contents

Introduction	1
APIs: A New Frontier for Business Value and Innovation	2
Developers: Key Players in the New Value Chain	2
The Challenge of Industry Fragmentation	3
The API Exchange	4
Learning from Successful Models of the Past	4
Enabling a New Kind of Ecosystem	5
How Does Apigee API Exchange Work?	7
Apigee API Exchange: Powering App Ecosystems Across Industries	10

Introduction

With the adoption of connected devices, user consumption patterns have shifted from the Web to apps. Enterprises have begun to compete for developer attention, as developers create the new experiences (apps) through which a company's data and services are consumed.

Companies are striving to open APIs and create digital ecosystems to compete for developer attention and industry dominance. However, in some industries, markets are fragmented by historical competition, regulation, or both, preventing the healthy growth of digital channels for all participants.

To unlock value in these industries and enable growth of their digital channels, API providers need to interoperate to present the largest possible market opportunity with the simplest experience to developers. Apigee API Exchange provides federated interoperability to unlock value in these industries and allow them to innovate and grow.

In this eBook, we explore how API Exchanges provide API federation and solve the industry fragmentation problem. We explain how API Exchanges benefit API providers, developers, and app users.

APIs: A New Frontier for Business Value and Innovation

We have entered the post-PC era. The shift is as significant as, and even larger than, the migration of consumers to the Web in the 1990s. Consumers and businesses alike are adopting high-function mobile devices at an incredible pace and subsequently, as they move from desktops and laptops to these devices, their consumption pattern has shifted from browsers to apps. Entire businesses have been reduced to apps. We've gone from Garmin and navigation devices to a Waze app, from a DVD player and a trip to a Blockbuster store to a Netflix app.

Most apps are fed their data and functionality via web APIs, so APIs have become the conduit through which a company's value is consumed. Just as the Web, via browsers, was the new conduit of business in the last decade, APIs via apps are the new conduit of business in the coming decade.

Both digital natives and digital migrants are executing API strategies. For example, both Amazon's cloud datacenter and Facebook's social and ad platforms are consumed via APIs, while at the same time Walgreen's in-store photo printing and Financial Times content are delivered via APIs. Companies across all industries are pursuing API strategies to participate in the mobile revolution and app economy.

Developers: Key Players in the New Value Chain

Developers of apps, whether at larger companies like Rovio or in small two-person teams, are the kingmakers of the app economy. Developers have emerged as the key players in the new value chain between users, apps, and the enterprises that are exposing the data and services they want users to consume.

Developers are trying to create experiences and solve problems for a target market of users, and generally the greater the target market, the larger the value to the developer.

The ubiquity of connectivity and the flattening of the world has enabled developers to easily target whole countries, regions, or in the case of digital companies like

Google, Facebook, or Twitter, the world. Developers now expect unimpeded access to their target market and straightforward simplicity in the APIs they use.

Some industries, either because of competition, regulation, or both, are fragmented. When an industry is fragmented, the solution is to enable API interoperability so that the complexity of fragmentation is hidden from developers and does not impede their progress in creating new experiences for users.

The Challenge of Industry Fragmentation

Consumers today rely on a variety of API-enabled apps and services delivered through their mobile devices. To provide broad access to the services and data in specific industries, app developers must often work with multiple APIs and therefore have relationships with multiple API providers. For example, in the telecommunications (telco) industry, app developers often work with many different operators' APIs to deliver apps that can be accessed by consumers worldwide.

The market for services is global. Companies are no longer competing exclusively in their 'home' markets. To be competitive, companies in all industries need to think about regional or global markets. This means releasing services not necessarily tied to your geography or network (in the case of telcos) and finding ways to interoperate with other API providers to make the largest possible market of users available to developers.

For industries that are fragmented, there is no way for a single provider to project a coherent, addressable market to developers. For example, in telco, despite their massive size, neither AT&T nor Verizon represents the telco subscribers of the U.S., much less of North America. In healthcare, Kaiser and United Healthcare both represent huge patient populations, but neither represents the addressable market of patients in the U.S. In travel, American and United are both giants in air travel, but do not represent the market of possible flight destinations in the U.S. or globally.

Fragmentation creates a massive barrier to adoption for developers, slows innovation, and limits the number of apps leveraging rich APIs in telco, healthcare, travel, and many other industries.

The telco industry offers a strong example of these challenges. In this industry, large players, the operators, have deep relationships with massive collections of customers, their subscribers. Developers must choose between operators' APIs when developing certain types of apps. The apps created for one operator don't work to reach the customers of another operator.

The API Exchange

How do we fix these broken, fragmented markets to enable companies to be successful with their API strategies? Thankfully, there are successful models from the past that we can learn from and apply to this problem.

Learning from Successful Models of the Past

Charge cards were introduced in the 1920s by merchants like department stores, restaurants, and hotel chains. They issued charge cards to their customers as a way to buy goods and services. However, it wasn't until the 1950s when American Express and Bank of America started issuing cards that worked across merchants, and later when Bank of America licensed its system to other card issuers, that charge cards and credit cards really took off. The key insights were simplicity and interoperability.

Visa provides interoperability across merchants and issuers, presenting much larger markets to both parties, which allows the entire credit card industry to grow. Visa also provides simplicity in the relationship; consumers want to have one relationship with a card issuer, yet be able to make purchases at many merchants. Merchants want to have one relationship with their merchant bank, but be able to accept payments from any consumer. Merchant banks and card-issuing banks still compete for merchants and consumers, but interoperate to provide the largest markets possible to both constituents.

Similarly, network roaming allows independent telco providers to offer subscribers worldwide network connectivity, regardless of which operator they are a customer of. Again, simplicity and interoperability work in tandem. Subscribers have one relationship with their home telco provider, but their phone works everywhere they go.

These same principles of simplicity and interoperability are core concepts of the API Exchange. Through an API Exchange, API providers, fragmented by competition or regulation, interoperate to present the largest addressable market to developers and to offer a seamless experience for consumers. Because they are separate entities, these providers still compete for developers and users, but both the developer and the user have a single, simple experience with their provider of choice.

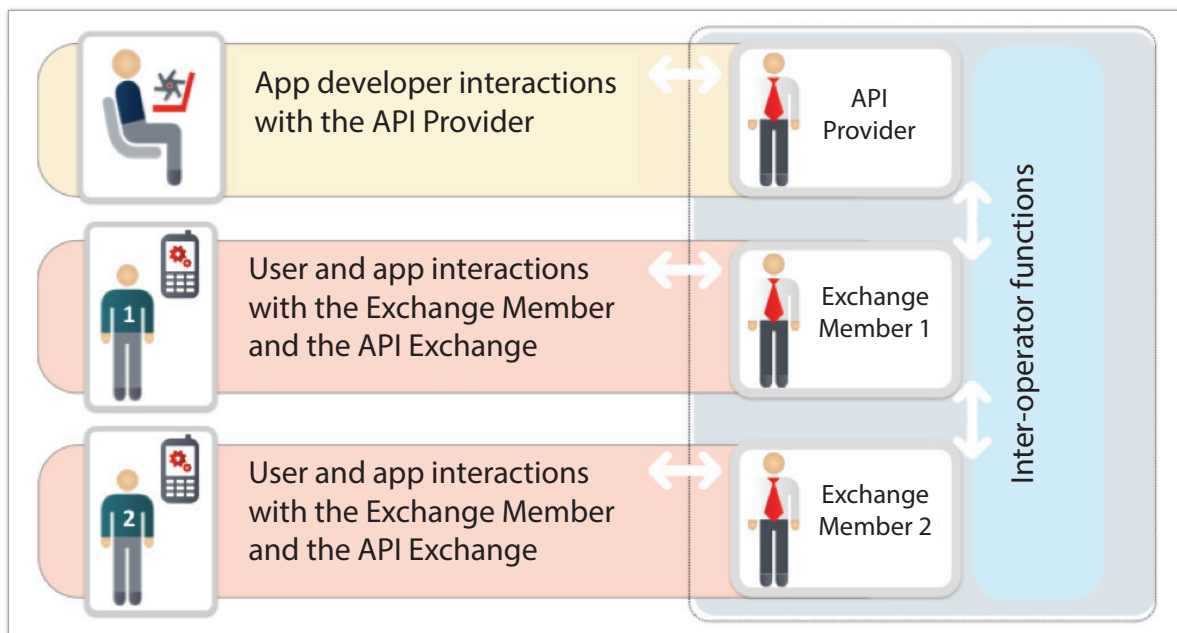
Enabling a New Kind of Ecosystem

Apigee API Exchange enables a new kind of ecosystem by delivering API federation and simplifying development of cross-enterprise APIs. This is especially valuable in the telco industry, as well as in any other industry where market fragmentation or data portability is an issue. The reason an API Exchange enables the ecosystem is that it drives value to the key person in the value chain: the app developer. They can build apps with APIs from their preferred API provider and can make their apps available for consumption by users beyond that of their preferred API provider.

Apigee API Exchange:

- Expands an API provider's reach by connecting the provider's APIs to an exchange that reaches users of other API providers
- Builds on a direct relationship between API providers and their developers for broader innovation
- Expands the reach for developers who want their app to be available to consumers outside their API provider's reach

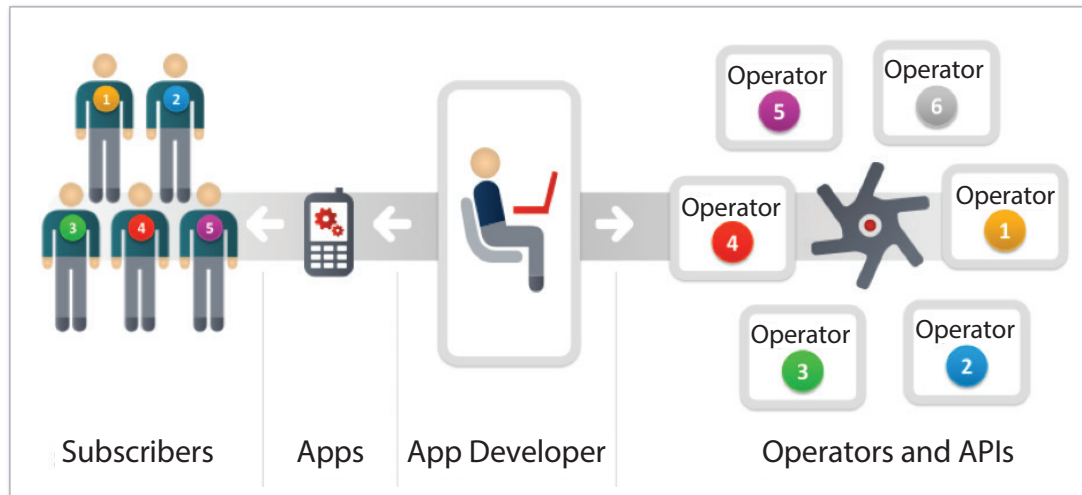
- › Enables API providers without developers to participate in the exchange and benefit from revenue sharing by allowing their users to use apps delivered through the API Exchange
- › Allows developers to create applications once, based on one API from one API provider, and then have the app work for users of many other API providers connected through the API Exchange.



Apigee API Exchange Platform

How Does Apigee API Exchange Work?

Apigee API Exchange enables a new kind of ecosystem. Take, for example, an API Exchange for telco operators.



A new kind of ecosystem for operators

Business Relationships in an API Exchange

Here are the business relationships required for an API Exchange to work, from the perspective of both developers and operators.

As a developer, you:

1. Sign agreements with at least one operator to cover API access across operators
2. Register your apps and use the APIs of your preferred operator
3. Receive payments and/or pay for API usage for your app with your operator

As an operator with a developer program, you:

1. Sign up developers for cross-operator APIs
2. Sign agreements with other operators and the API Exchange and connect to the API Exchange

3. Register your developers and their apps on the API Exchange and accept apps from other operators' developers
4. Pay developers and operators and receive payment from other operators for app usage based on settlement documents

As an operator without a developer program, you:

1. Sign agreements with the API Exchange and with other operators, and connect with the API Exchange
2. Accept apps from other operators' developers
3. Push transactions and provide billing (and settlement) for traffic generated on your network by other operators' developers

The Ecosystem Experience

Here's a step-by-step look at how the ecosystem experience works:

1. An app developer joins an operator's developer program and builds an app using that operator's API
2. A subscriber of a different operator downloads the app
3. The app is validated by the API Exchange based on the terms agreed upon by the developer's operator and the subscriber's operator
4. API calls from the app are routed to the subscriber's operator
5. The subscriber is authenticated and allowed to use the app
6. Any transactions from the use of the app are recorded in the transaction logs and shared between the operators
7. At the end of the billing period, cross billing documents are generated based on the transaction logs for settlement among operators

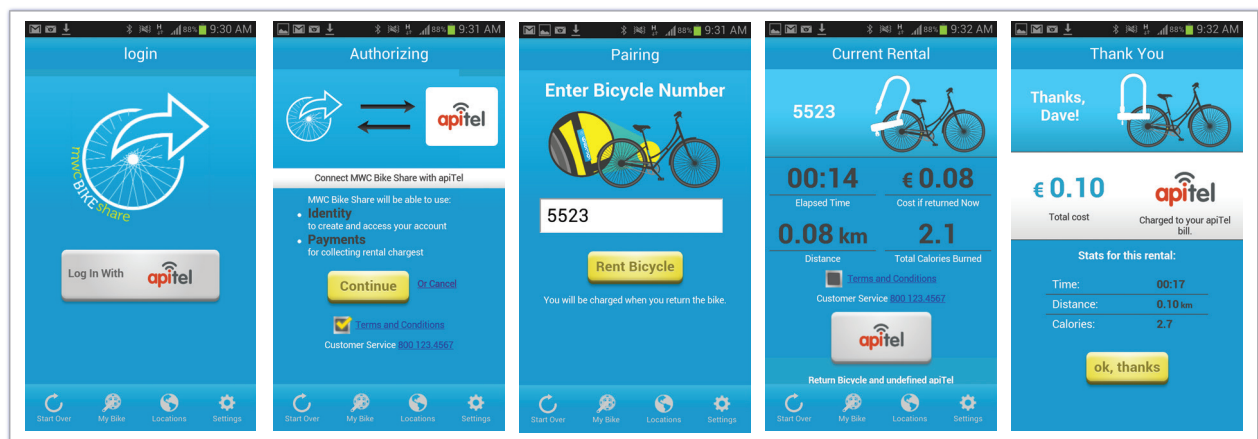
App User Experience

What are the implications of an API Exchange for app users? First and foremost, there is no new behavior expected from app users. They continue to use the apps they like on their favorite devices. Let's see how this works.

Suppose a developer has created an app for renting bicycles that uses an identity system (log in with my phone number) and a payment system (charge it to my phone bill) from any operator connected to the API Exchange.

A subscriber of a fictitious operator, ApiTel, uses an app a developer created using another operator's APIs to power a bicycle rental application. ApiTel participates in an API Exchange and connects their required APIs, which in this case even had a different specification.

The following figure shows the way that the app would appear to an ApiTel subscriber using the app:



As you can see from the figure, the flow of the app involves a user **identifying** himself as an ApiTel **subscriber**, using the app to **rent** a bicycle, and then **paying** for the rental by charging it to his phone bill.

All this worked seamlessly even though the developer didn't create this app using ApiTel APIs. Here's how Apigee API Exchange made this possible:

1. A developer works with an operator of their choice (in this case not ApiTel) to develop the BIKEShare app
2. The BIKEShare app uses two APIs from the operator: OperatorID and Payment
3. Both ApiTel and the other operator have the Operator ID and Payment APIs available and are both connected to the API Exchange
4. A subscriber of ApiTel opens the app and clicks the "login with ApiTel" button
5. Now the user can use the app, in this case, selecting a bicycle to rent. This is where the innovation of the app developer comes to life
6. The app user clicks the "Pay with ApiTel" button (which uses the Payment API and charges the rental to the user's phone bill—no credit card information required!)

Apigee API Exchange: Powering App Ecosystems Across Industries

Companies across all industries, including telco, healthcare, financial services, and more, are striving to innovate and create digital ecosystems. At the same time, market fragmentation slows developer adoption and restricts participation in the app economy.

To accelerate growth, unlock value, and enable innovation, API providers need to interoperate to present the largest possible market opportunity for developers. Today, Apigee API Exchange delivers interoperability, enabling a massive ecosystem of app innovation and new distribution channels.

API Exchange benefits all participants, from those with leading-edge APIs and development communities to those who have no developer community. API Exchange helps effectively overcome fragmentation and enable innovation and competitive differentiation on an unprecedented scale. It is truly a win-win-win for app users, developers, and API providers.

About Apigee

Apigee is the leading provider of API technology and services for enterprises and developers. Hundreds of companies including AT&T, Bechtel, eBay, Korea Telecom, Telefonica and Walgreens, as well as tens of thousands of developers use Apigee to simplify the delivery, management and analysis of APIs and apps. Apigee's global headquarters are in Palo Alto, California, and it also has offices in Bangalore, India; London; and Austin, Texas. To learn more, go to apigee.com.

Find Best Practices to Accelerate your API Strategy

Scale, Control and Secure your Enterprise

Build Cutting-Edge Apps and Intuitive APIs

Get end-to-end visibility into your business with Apigee Insights