

Identifying API use cases: Retail industry



Executive summary

Many retail enterprises institutions are planning their journey and participation in the API economy. One of the most common questions from companies starting the journey is about the potential use cases within their industry. This paper focuses on several objectives:

- Identifying the common business drivers for API initiatives
- Describing an API identification methodology
- Supplying retail-specific examples using the methodology
- Discussing the current state of regulatory requirements and industry standards
- Providing recommendations for starting an API initiative

Determining an API economy strategy and planning a roadmap offer significant benefits, including:

- Consolidating and standardizing common APIs—or simply business services—within an organization
- Lowering cost of operations by having a central repository and index of enterprise business services such as “retrieve credit score”
- Accelerating digital projects and improving time to market with safe, quick access to business services by both internal and external parties
- Identifying a partnership ecosystem—especially outside your own industry—for formulating new value-add products and services to be more competitive
- Defining new business models for monetization purposes such as the mobile marketplace; that is, curating your company’s business capabilities aggregated with your partners’ business capabilities to provide a diverse range of related or complementary services

This paper is intended for business and IT leadership in the retail industry interested in jump-starting API initiatives by learning about industry use cases.

What is a business API?



Application programming interface (API) is a very old term that has been used to describe technical interfaces for software programs where one software program calls another through its API. Often, these APIs were extremely complicated and not really meant for wide consumption. A few other software programs inside the enterprise might use the API to invoke the program; a partner outside the company might use it as well, but with great difficulty.

This long-standing definition is not what’s getting businesses excited about an API economy. The excitement is instead around what is referred to as a *business API* or *web API* (although sometimes the additional qualifier is left off). These business or web APIs are easy-to-understand interfaces for a recognizable business asset—for example, a customer record, an account, a product catalog, a price, an order and so on.

A business API is a public persona for an enterprise that exposes defined assets, data or services for consumption by a selected audience of developers, either inside or outside your organization. Business APIs are simple for application developers to use, access, understand and invoke. And because a business API extends an enterprise and opens new markets, application developers can easily leverage, publicize and aggregate a company’s assets for broad-based consumption.

Common business drivers for API initiatives

Companies that are executing successful API initiatives focus on one or more of four key drivers: speed, reach, Internet of Things (IoT) and domains.

- **Speed (also known as two-speed IT, bimodal IT or multispeed IT):**



This driver focuses on allowing the business and IT organizations to run at different speeds. Traditional IT management of core systems of record can be changed at a certain rate. Trying to force rapid changes into core systems in the enterprise can result in outages or security exposures. Yet the business needs to react very quickly to new opportunities and competitive threats. It needs a higher rate of change than can be delivered by the controlled changes required to the systems of record. Using APIs, you can prepackage core system assets for consumption by the business to create new and innovative systems of engagement. This driver often tends to be the first one that promotes API use in the enterprise.

- **Reach:**



To reach new markets and obtain new customers, you can make APIs available to other enterprises, such as partners who through their interaction with clients can generate additional revenue and new customers for your enterprise. For example, a clothing retailer might partner with a travel company to provide destination-appropriate attire for a trip.

- **Internet of Things or devices:** In many industries, devices are used in conjunction with APIs to provide new and innovative solutions. This tends to happen in one of three ways:



1. A device sends data via API call, such as a shopping cart that identifies items placed inside for rapid checkout or product cross-selling opportunities.
2. A device is sent a command via API call, such as sending a targeted advertisement to a screen attached to a shopping cart.
3. A device sends data through a non-API call using other technology such as MQTT—a high-volume messaging protocol and transport for telemetry devices—because not all data calls require an action. However, APIs can access the data inside the enterprise and look for or react to particular situations or events. For example, data from shopping carts can be transmitted to the enterprise for analysis. Retailers could use the resulting data patterns to determine common traffic patterns through the store, how long shoppers remain in particular locations, and which products they ultimately purchase. This information can help retailers identify new marketing opportunities or optimize product placement.

- **Domains:** Typically, domains refer to interactions across multiple lines of business. They can largely work independently, but benefit from sharing data. APIs allow the data to be shared in a controlled, secured manner. Domains can also be seen as physical locations. Companies that have multiple locations, which may include cloud and on-premises data centers, sometimes use APIs as a method to secure and control the flow of data between locations. Considerations for regulatory and compliance constraints based on geographical and country specifications become evident.



Businesses often start with a focus on the requirement for speed. After initial success in this area, they address the other drivers. It is not uncommon for businesses to benefit from APIs across all four drivers.

API identification methodology

Who should identify the business APIs? Figure 1 identifies several roles in a high-level organizational structure. Note that several people may be in each role, and a single person may be assigned to multiple roles.

A key role in the structure is the API product manager. The person or people in this role own the success of the APIs and the API initiative. Tasks associated with the API product manager role include:

- Working with the domain owners to identify desired business APIs to bring to market
- Working with the API developer to drive the creation of the API
- Reporting to executives on metrics
- Defining the product characteristics of the API (monetization, rate limits, audience and so on)
- Communication

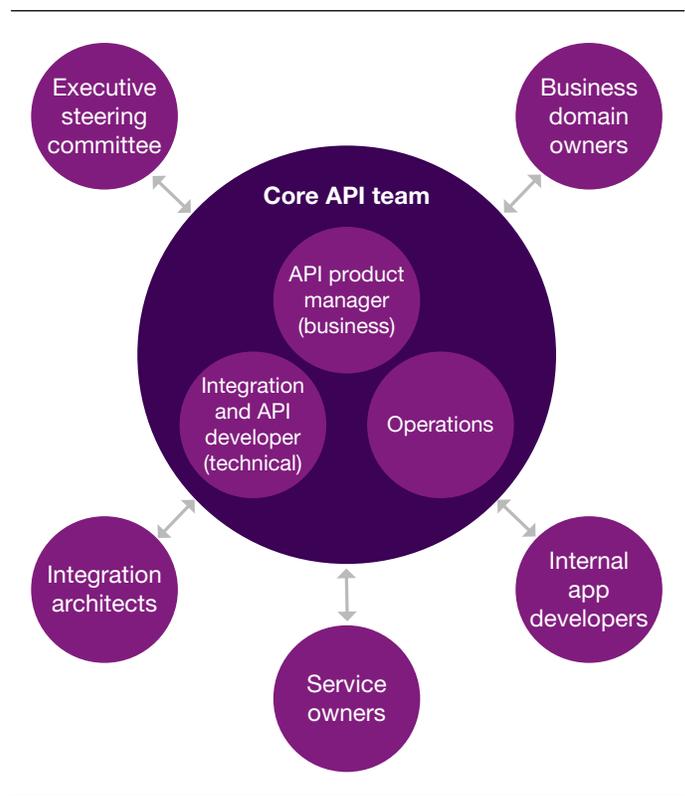


Figure 1. High-level organizational structure for an API development team.

Identifying good APIs is one of the most critical factors in achieving API initiative (and associated business) success. APIs must focus on the needs of the consumer and should be simple. Three questions lead to a good API:

- Who is the audience?
- What do they want?
- Under what terms and conditions are you willing to make the asset available?

Notice that none of these questions ask or refer to the systems of record that will ultimately deliver the response to the API request. Many companies incorrectly define their APIs by looking at what the systems of record do and adding an API in front of them. This approach may simplify the process for the API provider, but it does not meet the needs of the consumer.

When identifying a candidate API, the API product manager needs to understand the API user being targeted (question one). The second question is probably the most important of the three. Understanding what the audience is trying to accomplish can result in the best API. If the definition is focused on consumer need, then the interface is more likely to be useful to that audience and also more likely to stand up to change (versioning). The third question is related to the policies you want to have around the API. What security measures are required to allow the API to be used correctly? Are there rate limits that must be enforced?



“The business of APIs: Best practices” white paper provides additional information on organizational structure and several other important topics. [Download it here.](#)

Once you have answered these three questions, the API product manager and API developer must work together and potentially iterate to define the API. The API developer needs to map the proposed consumer interface for the API to the back-end system of record interfaces—and possibly to many other systems—to provide only the desired result back to the consumer. New business logic may need to be added at a microservice layer in front of the existing systems of record. If the existing systems do not completely address the requirement, the API developer may have to write additional code to add business logic to the existing environment.

Next, consider six categories in which APIs are often used, along with these top questions that can help identify potentially useful APIs in each area.

- **Internal developers (mobile)**

- What data and transactions would your own mobile apps need?
- Does generic data exist that is the same for all app users, such as business locations, open hours, product catalogs and so on?
- Is there data specific to existing customers that should be accessible through your app, such as order status?
- What features of the mobile device—for example, the GPS or the camera—might be useful in conjunction with your APIs?

- **Partners**

- What data and transactions do you share among your current partners?
- Is partner onboarding a long, difficult process?
- Would self-registration of partners be of value—increasing the number of partners and broadening geographic coverage, for example?

- **Public**
 - What apps might others write that could use your data and transactions?
 - What information are you currently making available on your website?
 - If there was a comparison app for you versus your competitors, would you want to be listed as an option? What data would the app need?
 - What other industries or processes might also use your products? One example might be party planning agencies that need the supplies and food sold by your store.
 - Think mashups: What other APIs might make sense with yours? Mapping? Social?
- **Social**
 - How do your systems interact with social media? Can you spot trends in social media and raise alerts or take action?
 - Can you gain insight on your brand and your competition through social media?
 - Can you do real-time analytics combining current customer status, behavior and history with social interactions?
- **Devices**
 - Does your company handle devices such as appliances, sensors or meters?
 - What scenarios can apply to the device? For example, needing repair/supplies, needing to send status information, controlling device behavior or enabling interaction between the device and enterprise systems.
 - How are you positioned to integrate the next UI technology, such as wearables like smart clothing or augmented reality glasses?

- **Data and analytics**

- What data do you collect about your clients? Would this data be of value to a larger audience inside the enterprise?
- Can your data identify market segments that would be of interest to a non-related industry?

Identifying API use cases in the retail industry



Now we will take a look at some examples that apply the API identification methodology to the retail industry.

Internal developer (mobile app development)

General information

General information is information that is not tailored to the specific customer using the app. It may include information about the retailer and its offerings such as store locations; product catalog and descriptions; in-store ads; product pricing, availability and in-store location; and ratings and reviews.

Custom information and transactions

Custom information and transactions are tailored to the customer using the app. Obviously, these APIs require additional security to help ensure appropriate access. APIs that fit this category may include order, order status and tracking, frequent-buyer data, profile management, shopping history and wish lists. Personal discounts could also apply.

Mobile advantages

Customers using the app on a mobile device can benefit from using phone or tablet functions in conjunction with APIs provided by the retailer. Users can take advantage of device functions such as the camera, GPS services, near-field communication (NFC) and digital wallet. One basic example involves using the store location list with a mapping API and GPS to get directions to the store. A more advanced case might involve using NFC to identify potential items of interest based on shopping history, cart contents and social networking posts as a customer enters a particular section of the store.

Adding intelligence with IBM Watson APIs

As online and offline experiences continue to blend, technology plays a vital role in enhancing in-store purchases. Brick-and-mortar-based companies can transform their businesses by collecting and acting on information about a shopper's in-store behavior. APIs are designed to provide online-style, personalized shopping experiences without the need for a mobile app. For example, in-store screens could recognize a frequent customer, access past purchase records, and use IBM Watson™ APIs to apply cognitive computing and make personalized product recommendations from the store screen. This approach offers customers information they need—such as reviews, product comparisons and so on—prior to a purchase, providing a highly personalized shopping experience.

Store managers have access to customer transaction details such as purchase history, loyalty and purchase patterns. However, incorporating qualitative tools such as personas and empathy maps related to Watson technologies and accessed through Watson APIs can help workers assess a customer's mood at checkout, and suggest offers or discounts that may brighten an unhappy shopper's day.

Partnering



APIs can help make it easy for partners to do business with you as a retailer. If you offer business-to-business (B2B) purchasing relationships, providing APIs that allow other businesses to sign up for the program and place orders from their procurement systems can generate new customers and revenue. You can integrate with your suppliers using APIs that allow them to check inventory levels, for example. You might consume APIs from shipping companies to enable interactions for package pickups, pricing and tracking to integrate with your web or mobile apps.

APIs can also help strengthen integration with business partners. When onboarding business partners, retailers need to manually provide access to product catalogs. Using APIs to expose catalog data to all business partners can shorten the onboarding cycle. These APIs can then be repurposed to enable new partner services to improve go-to-market strategies when necessary.

Public APIs



Retailers can deploy many of the same APIs used internally and with partners as public APIs to drive additional business and help obtain new customers. For example, you may choose to make APIs available for a comparison app, enabling your company to compete for new business. Extending your reach to other industries that can send business to you is a significant incentive for moving to the API economy.

Depending on the type of retailer, partnerships can extend across industries. For example, travel apps might suggest clothing required for the trip, or event-planning apps might suggest gifts for upcoming birthday, wedding or holiday events. By providing APIs to these other industry apps, you have the opportunity to obtain new customers, not just support your existing customer set. Many companies make public APIs available. Here are a few retail industry samples from ProgrammableWeb:¹

- **CityGro**: Provides loyalty marketing software that collects customer data and engages customers. It integrates loyal marketing features into applications.
- **iOpenAt.com API**: This search engine returns the opening hours of retail locations closest to the user. Currently, it includes retail locations of stores only in the UK. It returns opening hours of locations within the set postal code in which it is searched.
- **Pennock Floral**: An API provided by this wholesale supplier of flowers, floral containers and other specialty items that sells exclusively to retail outlets enables vendors to integrate directly with Pennock to maintain updated availabilities.
- **ReviewTrust API**: This API integrates consumers' reviews with the aim to increase trust at purchase time.
- **ScreenLab**: This API uses eye-tracking data to analyze focus points and identify key stimuli including color; contrast; grayscale; heat maps; hue, saturation and value (HSV); motion; metrics; patterns; position; red, green, blue (RGB) color model; and more.
- **ShopStyle**: Client applications can retrieve the underlying data for all the basic elements of the ShopStyle website, including brands, categories, products and retailers.

- **Slurplick**: A recommendations platform that extracts information about product images. This platform features analytics, a cloud infrastructure and machine learning.
- **Taulia**: A supply chain management and vendor service allowing users to integrate supplier data into current workflow solutions, send electronic invoices and business documents, and build discounting capabilities.
- **Veeqo**: A multichannel order processing platform and inventory management system, it supports printing of shipping labels, reporting and accounting integration that allow for automated manipulation of order and inventory data across different e-commerce sites.

Social



You might already act as a consumer of social APIs from companies such as Twitter or Facebook, mashing up this information with your own APIs. Acting on specific mentions of your company and trends in social media enables you to capitalize on opportunities or head off problems. Among other things, you can combine Twitter feeds that reference your company with your own analytics to determine if you must take action to resolve customer satisfaction issues, promote positive comments or offer product discounts. Quickly acting on a customer complaint with an offer can turn negative comments into recommendations to do business with your company.

In addition, analyzing social media information for references to consumer or business needs might allow you to take action by offering your products. For example, searches or comments about lost luggage on a business trip might prompt you to offer a discount on replacement clothes and luggage from your company's nearby location.

Check out IBM Bluemix for your API needs

If you are exploring the API economy and interested in public APIs, IBM offers the [IBM® Bluemix® platform as a service \(PaaS\)](#). IBM handles the security, management, operations, scalability and performance for retailers that place their APIs on its branded mobile marketplace hosted on the IBM Bluemix cloud platform.

Device integration



Smart carts

Combining the shopping cart with in-store location services and shoppers' purchase history can help you promote products of interest.

The shopping cart can host a screen that displays product demonstrations or advertises products in nearby departments. And when shoppers select an item on the screen and place it in their cart, sensors and the screen can total up the prices, giving the shopper the advantages of self-checkout—with no lines.

Shoppers can also use the cart screen to help locate items in the store, request assistance and look up online product reviews. It could also be used to access games or videos for entertaining children sitting in the cart, with the goal of increasing the amount of time their parents can stay in the store to shop.

Smart shelves

With massive growth in the number and variability of SKUs, retailers are finding it difficult to optimize the flow of inventory between the back storeroom and the shelves. The true picture of on-shelf inventory is not always reflected by the number shown in the system inventory. For instance, the inventory management system may show 30 action figures in the store inventory, but it may not precisely reflect how many are on the shelf versus in storage. This lack of visibility can cause a host of associated costs for the retailer including loss of worker productivity, stock mishandling and even empty shelves, resulting in lost sales.

IoT APIs that combine store shelf sensors, smart displays, digital price tags and high-resolution cameras make it possible for retailers to see what is on the shelf and in the back stockroom and link these two sets of data. These APIs can be a boon to retailers that have rapidly moving inventory and massive seasonal inventory swings.

Data and analytics



Retailers gather data on their clients' behavior and often perform analysis to help identify marketing opportunities. Typically, the data and analytics are targeted to a specific internal audience. Through APIs, organizations can make the data and analytics more easily available to other internal audiences, providing added value gleaned from data that has already been collected.

Besides providing retailers with actionable insights to fine-tune their omni-channel strategy, APIs offer the ability to build invaluable shopper profiles, allowing them to implement the in-store analytics they need to identify customers and increase sales. Retailers can obtain these analytics by using facial intelligence to estimate a shopper's age, gender, emotional responses and attentiveness, and then combining that information with mobile location analytics such as shopper loyalty and in-store browsing history gathered with in-store beacons or profile preferences accessed via API. Using this insight, interactive touchscreens can deliver one-on-one marketing to shoppers.

Cognitive computing with the IBM Watson Personality Insights API takes this approach to a new level by identifying specific personality traits that relate to various customer types. Retailers can incorporate those traits into an algorithm that enables the company to refine its messaging to better convince a shopper that its product is the best choice.

APIs can assist brick-and-mortar retailers with timely and relevant promotions. Because they lack the digital intelligence—informed by data including browsing history and purchase patterns—of online retailers, these companies are challenged to quickly home in on demand, identify customers' desires, and cross-sell and up-sell.

Better-timed and relevant offers that create compelling consumer experiences can improve brick-and-mortar response rates tremendously. APIs can capture customer identification details and deliver the best possible offer or interaction at the next point of customer contact. When loyalty-program customers are near retail outlets, the brick-and-mortar company can send alerts about and provide access to in-store promotions. Further, they can be used to push tailored content onto smart displays within the stores or even onto customers' mobile devices, using targeted messaging to increase sales.

In addition, APIs enable retailers to provide third parties with access to data assets in aggregate, for example, to identify rapidly selling products (for a fee of course). For additional value—and with appropriate opt-in support—APIs can supply the ability to target specific retail customers with offers from other industries. For example, you could offer special warranties or financing options to customers making high-priced purchases. Or you could recommend complementary products from other stores that do not offer competing products. Note that access to personal information may be regulated in your geography or industry, so consider this fact before providing access.

Industry standards

Industry standards for APIs are almost certainly in the future for the retail industry. This industry has agreed on standards for many purposes: supply chain, inventory, point of sale and so on. Today, these interfaces are not based on APIs. However, as APIs become more accepted in the industry, the simplicity and speed to consume business APIs can help drive adoption of standards more easily than the more complicated options that were available previously. Retailers will compete on their capabilities, products, price and service to their clients—not on having a different API interface.

Closing thoughts and recommendations

The retail industry is one of the most active industries in the API economy. Product- and price-comparison shopping apps are prevalent, and making available the necessary information to compete for customer business through APIs will become extremely common over the near term. In addition, typical retail API initiatives fall into the primary categories mentioned earlier: speeding new offerings and capabilities to market, reaching new customers and marketplaces, taking advantage of devices combined with analytics and sharing assets across lines of business—that is, domains.

If your company has not started strategizing and planning for business APIs, the time to do so is now. Do not wait until you know all the answers and have everything in place to get started—the market is moving too fast. Plan stages for the rollout, and then build on what you learn.

If you have already begun your API initiative, look to build on your successes and quickly identify false starts. Explore additional business drivers and use cases to obtain more value for the business.

As we move into the API economy, huge opportunities exist for new and innovative solutions. IBM brings significant knowledge of the retail industry and the API economy and would like to partner with you on your API journey, by sharing its expertise and experiences to help maximize the value for your enterprise.

To understand more about the IBM perspective on the API economy, visit the [IBM API Economy and Digital Transformation websites](#). IBM API Connect™ is a comprehensive foundation to create, run, manage and secure APIs. You can find more information about API Connect at the [API Connect website](#), and you can download a [trial version](#) of API Connect.

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Produced in the United States of America
September 2016

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¹ Examples of public APIs came from a keyword search for “retail” on www.programmableweb.com. This information is not intended as a recommendation of these specific APIs, nor a statement about their capability or quality. ProgrammableWeb acts as a repository where any company can promote its public APIs. Consumers must evaluate the functionality and quality of any API and decide if it meets their needs before deploying.



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