

# Identifying API Use Cases – Telecommunications Industry

## Executive Summary

Many Telecommunications enterprises 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:

- Identifies the common business drivers for API initiatives
- Describes an API Identification methodology,
- Supplies Telecommunications specific examples using the methodology,
- Discusses the current state of API industry standards, and
- Provides recommendations for starting an API initiative.

The significance behind having an API Economy strategy and planning a roadmap are for the benefits of (but not exclusive to):

- (I) Consolidation and standardization of common APIs (or simply business services) within an organization
- (II) Lowering cost of operations by having a central repository and index of your enterprise business services like e.g., retrieve credit score
- (III) Accelerating digital projects and improving time to market with a safer, quicker access to these business services by both internal and external parties
- (IV) Identification of a partnership ecosystem (especially outside your own industry) formulating new value-add products and services to be more competitive
- (V) Defining a new business model for monetization purposes like a mobile marketplace i.e., a curation of your company's business capabilities aggregated with your partners' business capabilities to provide a diverse range of (related or unrelated) services

The paper is intended for Business and IT leadership in Telecommunications interested in jump starting their API initiative by learning about industry use cases.

## What is a “Business API”?

The acronym “API” stands for Application Programming Interface. This is a very old term that has been used to describe technical interfaces to any software program. 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. Perhaps a partner outside the company might use it as well, but with great difficulty.

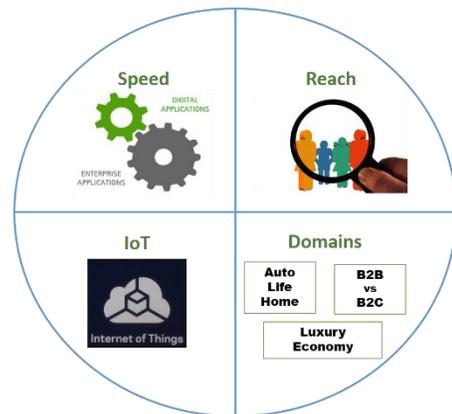


It is not this old definition that is exciting businesses about an API Economy. The excitement is around what is referred to as a “Business API” or “Web API”. Although sometimes the additional qualifier is left off. These Business APIs (or Web APIs) are a simple to understand interface to a recognizable business asset (e.g. a customer record, an account, a product catalog, a price, an order, etc.). A Business API is a public persona for an enterprise; exposing defined assets, data or services for consumption by a selected audience of developers, either inside or outside your company. A Business API is simple for App developers to use, access and understand and can be easily invoked. A Business API extends an enterprise and opens new markets by allowing App developers to easily leverage, publicize and/or aggregate a company’s assets for broad-based consumption.

### Common Business Drivers for API Initiatives

Companies that are executing successful API initiatives have been focused on one or more of four key drivers:

1. **Speed** – aka Two Speed IT, Bi-Modal IT, or multi-speed IT. This driver is focused 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 could result in outages or security exposures. Yet, the business needs to react very quickly to new opportunities and competitive threats. The business needs a higher rate of change than can be delivered by the controlled changes required to the systems of Record. APIs are used to pre-package 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 drives API use in the enterprise.
2. **Reach** – This driver is about obtaining new customers and reaching new markets. APIs are made available to other enterprises (e.g. partners) who through their interaction with clients will generate additional revenue and new customers for your enterprise. For example, a wireless carrier can partner with a major media firm or sports entity to produce a direct-to-customer media production for consumer viewing on their mobile device.
3. **IoT** – Internet of Things or devices. In many industries devices are used in conjunction with APIs to provide new and innovative solutions. Because of the central role of communications in many IoT ecosystems Telcos are increasingly investing in IoT (or Machine to Machine) technology, and target on monetizing additional connections and network traffic, and developing a variety of new services. This tends to work in one of three ways:

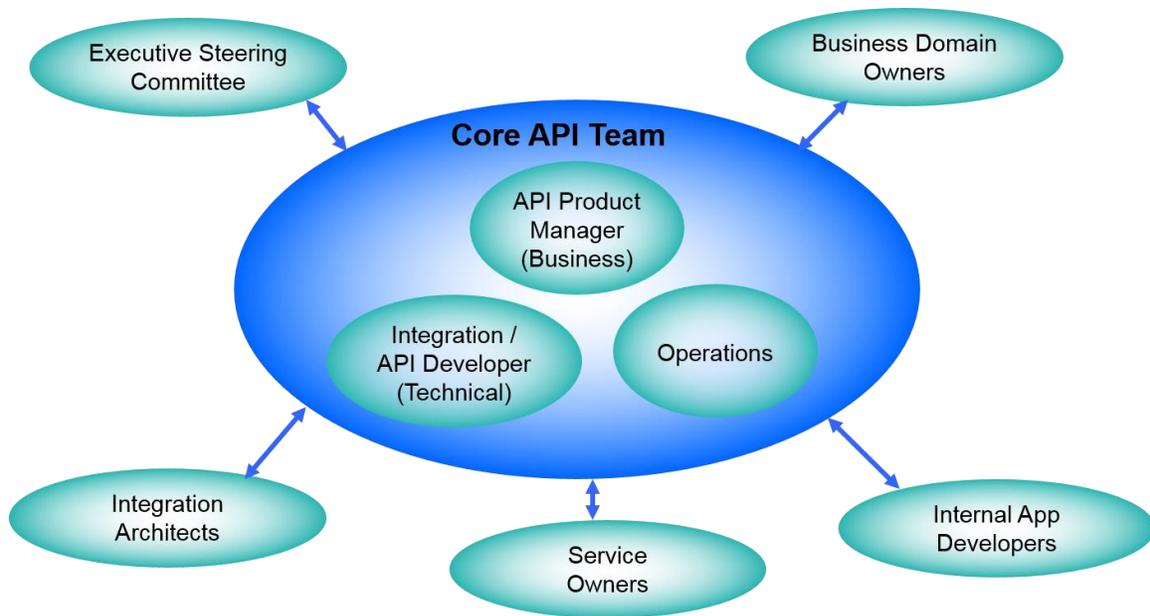


- a. Device sends data via API call (e.g. a plug in device in the car sends teenage driver behavior such as braking and acceleration to the Telco- then the parent to view via mobile app and billed on the phone bill.)
  - b. Device is sent a command via API call (e.g. security office issues command to pan remote security camera to the right)
  - c. Device sends data via non-API call using other technology such as MQTT (a high volume messaging protocol and transport for telemetry devices) because the data does not all require action. However, APIs are used to access the data inside the enterprise and look for or react to particular situations or events. (E.g. medical monitoring devices are constantly sending data, analytics are used on the data to try to spot issues and APIs are used if an issue is found to alert the doctor and patient. Many Telecoms partner with their own business customers who have innovative Machine to Machine devices such as industrial flow monitoring that require connectivity and APIs can be used to create flow threshold alerts)
4. **Domains** – Typically domains refer to interactions across multiple Lines of Business. Domains can largely work independently, but can benefit from sharing data. APIs are a mechanism to allow the data to be shared in a controlled secured manner. We will discuss this further in a later topic. Domains can also be seen as physical locations. Companies who have multiple locations and/or cloud and on premise data centers are sometimes looking at APIs as a method to secure and control the flow of data between the locations. Considerations for regulatory and compliance constraints based on geographical and country specifications will become evident.

Businesses most often tend to start with a focus on the requirement for Speed. After initial success in this area, the other drivers are also addressed and it is not uncommon for businesses to experience benefit from APIs across all four drivers.

### **API Identification Methodology**

So, who should identify the Business APIs?



The figure above shows a high level organizational structure, identifying several roles. Note that there may be several people in each role and/or a single person could possibly be assigned to multiple roles.

A key role in this organization is the API Product Manager. The person/people in this role own the success of the API(s) and the API initiative. Some of the key tasks associated with this 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, etc.)
- Communication

Please see the paper, “The Business of APIs: Best Practices” for more information on organization and several other important topics. [\(NEED URL/HIPERLINK\)](#)

Identifying good APIs is one of the most critical factors to success. APIs need to be focused on the needs of the consumer and should be simple. Three key questions lead to a good API:

1. Who is the audience?
2. What do they want?
3. 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.



When identifying a candidate API, the API Product manager needs to understand who they are targeting to use the API (question 1). The second question is probably the most important one. Understanding what they are trying to accomplish will result in the best API. If the definition is focused on the consumer's 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 wish to have around the API. What security measures are required to allow the API to be used correctly? Are there rate limits that need to be enforced?

Once the answers to these three questions are understood, the API Product Manager and API developer need to 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 potentially to many systems providing only the desired result back to the consumer. It is also possible that new business logic may need to be added at a micro-service layer in front of the existing systems of record. If the existing systems do not completely address the requirement, additional coding may be necessary to add business logic to the existing environment.

Next let's look at six categories where APIs are often used and leading questions that can help identify APIs that could be useful in each category.

✓	Internal Developers
✓	Partners
	Public
	Social
	Devices
✓	Data / Analytics

**1. Internal Developers (Mobile)**

- What data/transactions would your own mobile apps need?
- Is there data that is generic that is the same for all App users (e.g. business locations, rates, etc.)?
- Is there data that is specific to existing customers that should be accessible via your app? (e.g. account balance, order status)
- What features of the mobile device (e.g. GPS, camera) might be useful in conjunction with your APIs?

**2. Partners**

- What data/transactions do you share between yourself and your current partners?
- Is partner on boarding a long difficult process? Would self-registration of partners be of value (e.g. more partners, wider geographic coverage)?

**3. Public**

- What apps might others write that could use your data/transactions?
- What information are you currently making available on your web site?
- If there were a comparison app for you vs. your competitors would you want to be listed as an option? What data would the App need?
- What other industry sales might also use your products (e.g. car purchase needs bank loan)?
- Think Mash-ups – what other APIs might make sense with yours? Mapping? Social?

**4. 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 via social media?
- Can you do real time analytics combining current customer status/behavior and history with social interactions?

#### 5. Devices

- Does your company deal with devices (e.g. security or sports cameras, appliances, sensors/meters)? What scenarios can apply to the device (e.g. needs repair/supplies, needs to send status info, controlling device behavior, interaction between device and xxx)?
- How are you positioned to integrate the next UI technology (e.g., wearables like smart clothing or augmented reality glasses)?

#### 6. Data/Analytics

- What data do you collect on your clients? Would this 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? (E.g. expensive cars are purchased in this neighborhood, lots of child related purchases occurring in this neighborhood).



### Identifying API Use Cases in the Telecommunications Industry

Applying the API identification methodology to the Telecommunications industry, let's look at some Telecom API examples.

#### **Internal Developer (Mobile App Development) –**

- General information – information that is not tailored to the specific customer using the App. This could include general information about the telecommunications company and their offerings – plan options, mobile phone options, accessories available, store locator, ratings, and reviews.
- Custom information and transactions – this is information and transactions that are tailored to the customer using the App. Obviously for these APIs, additional security is required to ensure appropriate access. APIs fitting into this category



- might include – checking usage data, upgrade eligibility, checking your account balance, paying your bill, changing account features, account maintenance (password, address, etc.), ordering new phones/features, and order status/tracking.
- Mobile advantages – Customers using the App on the mobile device can take advantage of functions of the phone or tablet in conjunction with APIs provided by the telecommunications company. Sample device functions that we can take advantage of are the camera, GPS services, near field communication (NFC) and digital wallet. A basic example is to use the store location list with a mapping API and GPS to provide directions to the store and scheduling appointments. The phone could also be used to find family member locations by using the phone's GPS geolocation capability.

**Partnering** – APIs can help make it easy to do business with you. Telecoms can create a platform that other companies can build upon using platform APIs. APIs can access services provided directly by the Telecom or through partnership arrangements. Here are some sample APIs that can be included:

- Content services – streaming media, news, stock information
- Online services – social media, video chat, messaging, search, shopping
- Technology services – hosting (i.e. cloud), caching, payments
- Connectivity services – support for intermittent connectivity
- Device integration – smart phone, wired telephone, tablet, computer, television
- Business services – analytics, billing, accounting, coupons

Other businesses can build on these services with their value additions and rely on the telecom to manage the infrastructure and selected business services. Providing easy on-boarding of partners to supply services and bring on new partners for new capabilities is another API opportunity. Industry vertical partners can also use Telecom APIs to build B2B offerings. Business customers may also want to take advantage of certain capabilities from the Platform options listed – for example billing services or messaging services which could be offered a la carte. Other industries can be attractive partners as well. For example, partnering with travel providers or planners can help customers with their necessary phone needs when they arrive at their destination – and drive plan upgrades to you.

Partners with Telecoms can provide real time pricing for agriculture, commodities, and securities. They can integrate with a software that shows facial recognition of any person on your phone. Car reservations, rentals, Television streaming and movie video, can all be integrated into a mobile, TV, or online offering for a new revenue source and customer benefit. Even 'odd-couple' partnerships can exist between Telecom firms and companies like publishers, photo sharing, and energy smart-city firms. The list is endless if the Telecom wants to explore the possibilities.



**Public APIs** – Many of the same APIs used internally and with partners can be used as public APIs to drive additional business and new customers. For example, you may choose to make APIs available for a comparison App, so that your company has the opportunity to compete for new business.

Making available APIs to access plan offerings, accessories, phone selections, etc. would allow enterprising developers to create shopping Apps that sell / offer the Telecom products.

[TELSTRA APIs](#), [Orange APIs](#), [Verizon APIs](#), and [AT&T APIs](#) are all major telecom global developer platform portals used to assist developers in creating programs that access their global communications infrastructure.

Extending your reach to other industries that can send business to you is one of the large incentives in moving to an API economy. For example, people looking for holiday or birthday gifts could be offered Telecom options along with gift options from other industries. By providing APIs to these other industry Apps the Telecom has the opportunity to obtain new customers, not just support your existing customer set.

Up-time, security, load capacity and scalability are all concerns to be considered when developing and testing APIs within telecom, but when supplying or using public APIs they should be considered to yet an even greater extent. The world depends on telecom; if telecom halts the world halts.

Many companies have made public APIs available. Below are just a few samples offered in the Telecommunications industry:

- [Humbug Analytics API](#) – Connect any application or PBX to their service for in-depth reporting and fraud alerting. Use the API to authenticate phone numbers during call setup, submit PBX events for analysis, submit call detail records for analysis, and more.
- [StreamWIDE Call Screening API](#) – Allows users to filter calls using acceptance and denial lists, time-based filters, behavior-based filters, delays on incoming or outgoing communications, and more.
- [Offline Geolocation](#) – Allows cellphones to derive a location without being connected to the internet or data networks. The service is designed as a failover system when a user has no Internet connection, due to roaming or coverage issues, and GPS has not been turned on, or is not available indoors.
- [Recharge My API](#) – An online mobile recharging, bill payment, and eCommerce platform. Users can pay bills, manage payments, and recharge their mobile phone airtime and data. The Recharge My API allows developers to access and integrate the functionality of Recharge My API with other applications.
- [Personal Cloud Storage API](#) - The Telco's Cloud APIs enables access the personal storage of millions of Telco Cloud users who trust their Telco to automatically back up their important content including photos, videos, documents, and music. Personal content on any device, even on-the-go. What

does it mean? It means additional revenue streams to offset declining ARPU (Average Revenue per User). It means happier customers because good NPS (Net Promoter Score) Scores are key.

- [Lipisha](#) - Based in Kenya, Lipisha offers a payment platform for businesses that enables them to collect, process and integrate payments from customers and clients using mobile money such as M-Pesa or Airtel Money. The Lipisha API allows developers to integrate with the Lipisha payments system. The API carries out a number of activities including creating a new payment account, querying for transactions, Sending mobile money, charge a credit or debit card, transferring funds between different Lipisha accounts, and more.

Note: Most of the above sample public APIs were found by searching [Programmable web](#) for “Telecom”. This is not a recommendation to use these specific APIs, or any statement about their capability or quality. Programmable web acts as a repository where any company can promote their public APIs. It is up to you as a consumer to decide if the functionality and quality of the APIs meets your needs.

For your consideration, IBM offers a PAAS (Platform as a Service) called [Bluemix](#) where IBM can worry about the security, management, operations, scalability and performance behind telecoms wanting to put their APIs on their branded “mobile marketplace” hosted on the IBM Bluemix Cloud platform.

**Social** – The majority of interaction with social networks is via smart phone. Customer interaction on social networks should be one of the first areas explored to determine opportunities for APIs. After all, if this is what the phone is being used for, then this is where there is a business opportunity.



In this area you might act as a consumer of social APIs from companies such as Twitter or Facebook and mash this information with your own APIs. Acting on specific mentions of your company and/or trends in social media can provide business advantages, allowing you to take advantage of opportunities or head off problems. For example, twitter feeds that reference your company combined with your own analytics can help determine if actions need to be taken to rectify customer satisfaction issues or promote positive comments. A customer complaint that is quickly acted upon with an offer can turn negative comments into recommendations to do business with your company.

In addition, references to consumer or business needs might allow you to act to offer your products. An example could be searches or comments about network connectivity problems or broken phones might prompt you to offer phone options if your own customer or to convert the customer to you if they are with a competitor. Or, social comments about planned international travel can be an additional indicator for plan upgrade marketing opportunities in addition to the direct partnering option mentioned previously.

**Device Integration / Wearables** – Telecom is an industry based on devices – the phone itself, cell towers, cable boxes, etc. These devices can provide data as to usage and location or act as a presence in the home to provide services. For example, an unusually large number of devices in an area may indicate crowds which could be avoided if traveling or targeted if marketing. As commuters travel with their cell phones (hopefully using hands free), their path can be tracked for use with analytics (see next section). A Fence API can be used to create a ‘geofence’ to detect if a user is within the location fenced. Detecting if a user walking or driving, is also available as a scenario. A cable box can be a point of presence in the home to allow for home management systems (climate controls, controlling lights, etc.) or home security systems.

Despite being based on devices; the Telecom industry is not tied to the telephone in its current form. As telephones move to wearables to whatever the next user interface will be, the value of APIs will allow the new interface to be supported with limited impact on the existing corporate systems. Wearables are still in their infancy starting with fitness-bands, censored clothing, Google-Glasses and Virtual Reality goggles with tremendous opportunity for growth.

Devices with embedded chips can be connected to the wireless network and billed by the Telco directly, or on behalf of their business customers. Examples are: Back-up routers for business continuity/disaster recovery, sensors & modules within a vending machine, a parking meter, a utility smart-meter. Handheld devices for inventory management & remote signature, ruggedized field tablets & laptops, portable trackers for trailers or construction assets, SCADA monitors, fleet GPS trackers... the list is endless. The growth for Telcos lies in the growth of connected devices in industries such as manufacturing, Energy, and Healthcare and to be ready for the expected growth of connections to be in the billions by 2020- [Gartner Forecast](#).



**Data / Analytics** – Telecoms gather data on their client’s behavior and often perform analysis to help identify marketing opportunities. Typically, the data and analytics are targeted to a specific internal audience. Through APIs the data and analytics can be made more easily available to additional internal audiences providing additional value from the data that has already been collected. APIs can also provide access to the ‘dark

data’ that the brick & mortar Telcos have hidden away in the back rooms, and provide these to developers to create applications to benefit and enhance customer and employee satisfaction.

Telecoms are able to track mobile customers as they commute/travel and move between cell towers. Knowing common customer patterns can help with marketing opportunities and planning for capacity.

According to Brian Partridge of [RCR Wireless News](#), “Subscriber Data Management (SDM) category will witness the fastest growth rate and will eventually account for \$29

Billion in global revenue by the end of 2018. There is opportunity for wireless carriers to leverage their ‘SDM’ systems to mine Big Data, perform analytics, gain business intelligence.” Firms can use that intelligence as a new revenue stream such as selling data to trusted third parties and other B2B firms—even outside the industry.

Network Function Virtualization and Software Defined Networking. (NFV/SDN) are ways to achieve cost efficiencies for established Telcos. Simply integrating these SDN and NFV into existing OSS (*Operational Support Systems*) and BSS (*Business Support Systems*) systems, will not unlock the potential new revenue streams that virtualized networks offer. There is a need to exploit network virtualization and to drive new revenue streams from products and services that don’t exist today. An API initiative to create global applications that utilize Telco’s Network value, will assure competitive advantage.

In addition, it is possible through APIs to provide third parties access to data assets in aggregate, for example the data mentioned earlier that identifies commuting patterns – for a fee of course. For additional value (and with appropriate opt-in support) the ability to target specific customers with offers from other industries could also be supplied. In addition to the commuting example, this could also apply to home services that could be offered through the in home cable connection.

Using internal data sources accessed through APIs in conjunction with APIs to access the recent IBM partnerships with Twitter and The Weather Company APIs can be combined to present a dynamic dashboard on a mobile app, or used to create actionable insights for policy and decision-makers. This can also be used to create marketing offers that can be pushed out in real time to specific users on their mobile apps for new promotions and increased sales.

### **Industry Standards**

The Telecommunications industry is very familiar with standards. It is what lets the world communicate across country boundaries and telecommunication providers. These standards have been in place and will continue to be enhanced as required as new technologies and interaction tools are created. I do not expect that these type of standards for interoperability will be replaced by Business APIs.

However, Business API industry standards are almost certainly in the future for Telecommunications. The industry is very comfortable with standards and using these to provide value across the industry for all companies involved. Telecoms will compete on value-add services integrated with their partner eco-system, heightened digital engagement and personalized offerings to their client, not on having a different API interface.

The [IEEE Standards Association \(IEEE-SA\)](#) agrees that there needs to be more education given to developers on building security into their initial designs, possibly implementing an attack tree or use case security framework from which to build. Because

there are so many types of APIs, there is no standard way to implement this. In Nice, France – Axiata, Bharti Airtel, BT, China Mobile, China Unicom, NTT Group, Orange, Telefonica, and Vodafone – agreed to an operator-centric API alliance, agreeing to adopt 18 open APIs designed to boost operators’ digital capabilities. They adopted an ‘API Manifesto’ which states, “As Service Providers, we recognize that by using, endorsing and requiring a suite of common industry Open APIs, we can unlock a range of growth and efficiency opportunities...”[API Manifesto](#)

This paper outlined many areas where Telecoms can take advantage of Business APIs. Today these interfaces are not based upon Business APIs. However, as APIs become more accepted in the industry, the simplicity and speed to consume Business APIs will help drive adoption of standards more easily than the more complicated options that have gone before.

### **Closing Thoughts and Recommendations**

The Telecommunications industry is becoming active in the API Economy. Typical Telecom 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 (i.e. Domains).

Suffice to say, if your company has not started strategizing and planning for Business APIs, the time 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 roll out that build on what you learn.

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

As we move into the API Economy there are huge opportunities for new and innovative solutions. IBM brings significant knowledge in the Telecommunications industry and the API economy and would like to be your partner on your API journey sharing our expertise and experiences to help maximize the value for your enterprise.

To understand more about IBM’s thoughts on the API Economy visit the IBM [API Economy](#) and [Digital Transformation](#) websites. IBM API Connect is IBM’s complete foundation to Create, Run, Manage, and Secure APIs. You can find more information about IBM API Connect at the [API Connect website](#). And you can also download a [trial version](#) of API Connect.

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