

# Stepping Forward into the API Economy

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## Highlights

The API Economy is changing the way we think about building applications (apps) and how business value is created. Several technology trends and digital economic trends (for example, the App Economy, Sharing Economy, and API Economy) are converging with industry, creating new opportunities for innovation and customer value.

*Industry-specific API ecosystems are growing rapidly.*

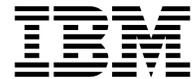
*The API Economy changes how we think about building things.*

*Core technological underpinnings drive enterprise-level adoption.*

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## Rethinking the way business is done

Technological changes continue to evolve quickly, affecting markets, business models, and organizational priorities. Game-changing technology trends, such as mobility, everything as a service, cloud, sharing economy, social commerce, and smart machines, are major market disrupters, fueling the rise of apps and digital products.

The IBM® CEO Study 2012 states “Technology’s impact is obviously broad-based; it is difficult to imagine any aspect of an organization not touched in some way. However, as we looked across the whole of CEOs’ responses, one consistent theme emerged: an overwhelming focus on changes in how people engage with the organization and with each other. The view that technology is primarily a driver of efficiency is outdated; CEOs now see technology as an enabler of collaboration and relationships — those essential connections that fuel creativity and innovation.”<sup>1</sup>

Given that, rapid technology change and the need for innovation are here to stay. How do you and your organization make technology work in your favor without being in a constant state of churn? You can get the latest mobile devices and download the latest apps, but are they allowing your business to pivot to new opportunities or withstand attacks to your value chains from new competitors? And on the flip side, are you making your innovations available to others both for the benefit of your partners or for profit?

The traditional approach of IT might not enable the growth that many companies want. For example, relying solely on the organization’s own IT department might not allow the enterprise to innovate with the speed and scale demanded. Enterprises do not have unlimited resources. They do not have a lock on the best ideas. And, they are learning that they must tap into the larger world of developers. The developer channel is unlimited when IT delivery is viewed beyond the walls of the company’s own IT organization.

An application programming interface (API) is a public persona for a company or a product, where the API exposes business capabilities and services. For example, web APIs can be easily invoked by using a browser, mobile device app, or any Internet-enabled endpoint. Few if any limits exist on what can be offered as a service and exposed as an API. Most limits are self-imposed because of current limitations or constraints, such as security, data transfer speeds, or performance.

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<sup>1</sup> IBM CEO Study 2012, at this website:  
[http://www-935.ibm.com/services/multimedia/anz\\_ceo\\_study\\_2012.pdf](http://www-935.ibm.com/services/multimedia/anz_ceo_study_2012.pdf)

The API Economy is the commercial exchange of business functions, capabilities, or competencies as services by using web APIs. APIs drive the digital economy<sup>2</sup>. Companies that do not embrace the API Economy will likely be left behind.

Embracing the API Economy is a mandate for embarking on digital adoption. If you are interested in rapid customer acquisition, reducing customer churn, seizing new business growth opportunities, and improving business performance, you need to be part of the API Economy.

## The API Economy

The API Economy is key to accelerating value, improving business performance, and extending your business services and goods to the widest possible audience. Ensuring that your company is easy to do business with and creating paths to new business opportunities is key to why the API Economy signals a new business reality.

Companies that seize this opportunity will differentiate themselves and grow in new directions. Consider these five reasons to become part of the API Economy:

- ▶ Grow your customer base by attracting new customers to your products and services.
- ▶ Drive innovation by capitalizing on the composition of both your APIs and third-party APIs.
- ▶ Improve the time-to-value and time-to-market for new products.
- ▶ Improve integration across channels with web APIs.
- ▶ Participate in a new era of computing and prepare for an unpredictable future.

The API-centric, *as-a-service* delivery model, disrupts the consumption of business services in the same way *Cloud Computing* disrupts the IT consumption model. Embracing the API Economy allows companies to both prepare for and take advantage of the next generation platform. Companies are building apps at the edge of the enterprise and positioning themselves to explore new possibilities. This approach enables companies to take advantage of present and future developments in social platforms, wearable computing, mobility, and an ever increasing shared economy.

<sup>2</sup> *Ready for APIs? Three steps to unlock the data economy's most promising channel*, at this website:  
<http://www.forbes.com/sites/mckinsey/2014/01/07/ready-for-apis-three-steps-to-unlock-the-data-economys-most-promising-channel/>

Industry-specific API ecosystems are growing rapidly in several industries, such as retail, financial services, telecommunications, and healthcare. These API ecosystems allow companies to expand into new customer bases and niches that they might not be able to reach on their own.

For example, retailers use public APIs to provide the real-time availability of products. They use partner and private APIs for internal teams, third parties, and partners to build innovative shopping experiences around the business services or the unique data of their companies. This approach enables retailers to take advantage of trends in mobility.

Several banks are exposing various APIs and services, for example, APIs for ATM and branch office locators, foreign exchange rates for travel apps, deposit and lending rates, loan eligibility calculators, bill presentment services, and, of course, access to account data and payments. The Open Bank Project<sup>3</sup> is an open source API and app store for banks. The objective of the project is to accelerate the adoption of digital products by banks in the API Economy.

Open mHealth<sup>4</sup> intends to bring data scientists, developers, and clinicians together to build products that transform the way that we use digital data in healthcare. In this scenario, the API Economy (open API platform) is essential to building the ecosystem and ensuring that data is not trapped in silos.

The API Economy is changing how we think about building applications. The lifecycle of the API consists of the following key actions:

- ▶ Analyze business assets (data, functions, and computing resources) and identify those items that can be represented as digital products.
- ▶ Create web APIs for the business assets, causing digital products to emerge.
- ▶ Generate co-value by incorporating third-party APIs and APIs from developers, hobbyists, and IT teams to compose and produce new APIs and apps.
- ▶ Evolve business models to increase customer value, resulting in more customers, less churn, and more revenue.
- ▶ Establish an ecosystem that consists of platforms, marketplaces, developer portals, and storefronts, making your company essential to your customers.

<sup>3</sup> Open Bank Project, <http://www.openbankproject.com/>

<sup>4</sup> Open mHealth, <http://www.openmhealth.org/about/>

This lifecycle reflects the continuous action that drives the innovation wheel and promotes increased business value.

Technological underpinnings drive the enterprise-level adoption of API-centric models. These underpinnings make it possible to quickly deliver new solutions based on these key enablers:

- ▶ Externalization
- ▶ API management
- ▶ Services fabric

## Externalization of enterprise assets

Externalization is a foundational capability that facilitates creation of a *business-as-a-service* model. It refers to API definition and the integration of right-scaled core function and infrastructure, which includes robust security mechanisms.

- ▶ API definition consists of planning the API specification for reusability and involves careful analysis of the existing back-office applications and data “types” inventory.
- ▶ Technical challenges include deciding when to build a new API from scratch or to use existing back-office and historical services.

Creating APIs often includes deep dives into enterprise applications and data models, coupled with usage and access requirements specifications. It is critical that the APIs are designed with consumability and flexibility in mind to support further composition possibly by a third-party developer.

The discovery of data objects and flows helps determine which systems to tap when mapping an API to a back-end system. From a data perspective, traditional data analysis and design tools uncover the schemas and relationships in the data. When this static approach is insufficient, it might be necessary to analyze the data itself and predict its source and likely mappings that transform the data as it moves through the systems. Similarly, understanding the process flows helps indicate the systems that are involved when transactions flow end to end.

This service-driven composable approach affects business engagement models in development and delivery. At this stage, the focus is on identification of APIs and their composition. At the same time, the requirements for federating the control, security, and privacy of the composite capabilities enabled through iterative development and deployment must be addressed.

Many organizations work with jStart<sup>5</sup>, the IBM Emerging Technology’s client engagement team. jStart’s mission within IBM is to address the real and current business needs of clients by using emerging technologies. jStart’s primary focus is matching the business needs of all industries to IBM emerging technologies in a quick, timely manner that maximizes impact. For example, jStart Beacon<sup>6</sup> is a visual web-based development environment used to create data analytics applications. This solution enables line-of-business users to rapidly build data analytics applications. These new applications consume, parse, and analyze massive amounts of data generated by social media, business applications, internal databases, and even external sources.

IBM Bluemix™<sup>7</sup> enables the rapid building, deploying, and consumption of next generation web applications, services, and APIs. Bluemix is an implementation of the IBM Open Cloud Architecture. It uses Cloud Foundry to enable developers to rapidly build, deploy, and manage their cloud applications, while tapping a growing ecosystem of available services and runtime frameworks. IBM provides services and run times into the ecosystem based on the extensive IBM software portfolio.

## Management of the APIs

An API management layer provides essential services, such as security, governance, and monitoring for APIs defined and developed by your team. For example, API management that provides metering of API invocations enables rate limiting to be applied, API use to be charged, and security provided for business data.

New incoming workloads can be unpredictable. API management throttles access to ensure that peaks of traffic do not affect system stability. A clear understanding of the new workloads can be the basis for new efforts within the enterprise to revamp the back-end systems so that they become more elastic. Migration and consolidation of existing systems and use of private clouds are possible options. API management can provide the underlying technology to support message-format translation, usage, access policy management, and version and change management.

<sup>5</sup> jStart, <http://www.ibm.com/software/ebusiness/jstart/>

<sup>6</sup> jStart Beacon, <http://www.ibm.com/software/ebusiness/jstart/beacon/index.html>

<sup>7</sup> IBM Bluemix, <http://www.ibm.com/software/ebusiness/jstart/bluemix/index.html>

IBM API Management Service<sup>8</sup> provides tools for creating, proxying, assembling, securing, scaling, and socializing web APIs. It includes a customizable developer portal for you to attract and engage with application developers to foster an increased usage of published APIs. IBM API Management has a robust administration portal to easily establish policies for critical API attributes, such as self-registration, quotas, key management, and security. The robust analytics engine that is included provides valuable role-based insight for API owners, solution administrators, and application developers:

- ▶ Application developers can easily find, understand, and use tools to help them consume the API. They can manage their application and understand its consumption.
- ▶ API developers can create, secure, control, deploy, analyze, and manage SOAP and REST APIs.
- ▶ API business owners can advertise, market, socialize, and sell APIs as products.
- ▶ IT operations staff can easily manage and upgrade the API environment to use existing investments.

## A services fabric creates an essential framework

A services fabric enables an API-centric service computing model that facilitates the creation of novel capabilities based on existing APIs to deliver value-added capabilities. A services fabric component provides a framework for composing innovative solutions by using a collection of service patterns, business models, and delivery models:

- ▶ Service patterns define how services are composed and their deployment dependencies, where applicable. They abstract the business logic to create *reusable apps* that when instantiated can replace one or more APIs depending on the performance and legal requirements.
- ▶ Business models can change dramatically with the use of new technology. For example, organizations can apply advanced analytics to new digital data sources, providing customers with innovative products and services.
- ▶ Delivery models are identified and solidified that support the necessary technical skills, process rigor, tools, methodologies, and overall structure and strategies to seamlessly deliver IT-enabled services.

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<sup>8</sup> IBM API Management,  
<http://www.ibm.com/software/products/en/api-management>

For example, the IBM Cloud marketplace brings together a vast portfolio of cloud capabilities and new third-party services. This delivery model delivers a simple and easy experience for key user groups within the enterprise (particularly, developers, IT managers, and business leaders). It enables them to learn, try, and buy software and services from IBM and its global partner ecosystem.

IBM Watson™ participates in the API Economy through the Watson ecosystem. This ecosystem is a community of content providers, developers, and organizations that collaborate and create the next generation cognitive apps.

In conclusion, embracing the API adoption models is a key differentiator for successful enterprises to drive toward business agility and growth in this new era of IT. Using the Watson ecosystem, Bluemix, and other IBM API-related products accelerate your adoption of APIs.

## What's next: How IBM can help

IBM can help enterprises move into the API Economy by providing platforms, tools, and resources to make the transition seamless and natural. IBM is working with developers and third-party providers to advance a marketplace to share web APIs and other essential capabilities.

IBM continues to share its collective knowledge and expertise with its clients and will continue to incorporate lessons learned into IBM products and offerings. Recently, the IBM Watson Group was established to lead the way into this new era of computing.

## Resources for more information

For more information about the concepts highlighted in the paper, see the following resources:

- ▶ *The Power of the API Economy - Stimulate Innovation, Increase Productivity, Develop New Channels and Reach New Markets*, REDP-5096
- ▶ *Exposing and Managing Enterprise Services with API Management*, SG24-8193
- ▶ *The Era of Cognitive Systems: An Inside Look at IBM Watson and How it Works*, REDP-4955
- ▶ IBM Cloud marketplace

<http://www.ibm.com/marketplace/cloud/us/en-us>

- ▶ The IBM Watson Journey  
<http://www.ibm.com/smarterplanet/us/en/ibmwatson/journey/index.html>
- ▶ The Watson Ecosystem  
<http://www.ibm.com/smarterplanet/us/en/ibmwatson/ecosystem.html>
- ▶ IBM Bluemix  
<http://www.ibm.com/software/bluemix/>



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