Innovation in the API economy

Building winning experiences and new capabilities to compete

IBM Institute for Business Value

How IBM can help

In the era of cloud and cognitive computing, companies need to accelerate the introduction of innovative business models to remain competitive. How will they create customer loyalty that exceeds that of their current and emerging competitors? IBM provides the business expertise and technology solutions to help organizations design strategies that put APIs at the core of their businesses. For more information, please visit **ibm.com**/apieconomy.

A new form of product offering

In today's increasingly interconnected world, application programming interfaces (APIs) are becoming the digital reflection of an organization. To differentiate themselves in a highly competitive market, companies need to create digital capabilities for end users as well as API experiences that set themselves apart in the minds of developers and the organizations they support. They also need to manage their APIs as they do other products and services. This requires a commitment to addressing the external API "look and feel" as well as developing an infrastructure that supports the API lifecycle from inception to retirement. This executive report, the second in a two-part series, explores the API experience and the use of APIs as a new, dynamic form of product offering.

Executive summary

APIs represent more than technical conduits for sharing data. Well-designed APIs provide organizations with a critical link to data and services that enable rapid innovation, open up markets for new goods and services, and serve as the basis for future partnerships. APIs have become a vital external representation of an organization; the digital "face" upon which companies base their brand impressions. Our research shows that, given the increasing importance of APIs, organizations need to focus on:

- Designing engaging API experiences that appeal to developers and organizational strategists. To do this, an organization must brand its APIs to differentiate itself in an increasingly complex marketplace. At the same time, an organization's APIs must reflect the organization's core messages and values. An API producer must be able to effectively promote its APIs to key audiences and ease the overall API adoption journey.
- Managing an API as a product to address elements of the entire API lifecycle, from inception to retirement, in much the same way a company oversees development and ongoing support for any physical good or digital service.

This executive report – based on interviews with over 30 individuals representing companies across industries (see "How we conducted our research" on page 17) – highlights key challenges and effective practices for creating the external experiences and building internal capabilities needed to compete successfully in the API-driven economy.

An engaging API experience brings together branding, design-thinking principles and a community of champions

A clear API promotion strategy integrates digital presence, event participation and influencer engagement

A successful pattern for API branding incorporates consistency, clarity and constancy

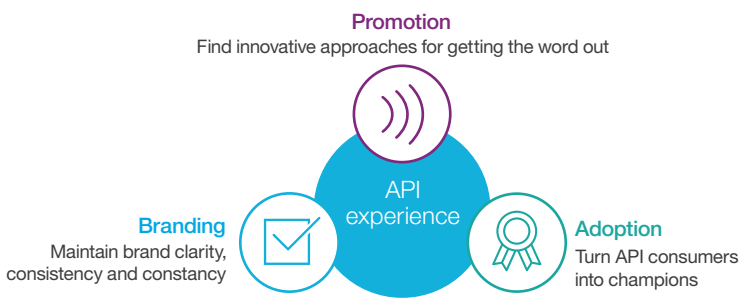
Designing the API experience

APIs, like other products, need to provide an experience that delights customers at all levels. Our study reveals three important facets that bring together an enriching experience for the developers who use APIs and the consumers of the offerings those APIs enable (see Figure 1).

- Organizations must consider the branding and positioning implications of APIs. Not only should organizations address the technical needs and experiences of developers, they should also consider how end users experience API-enabled offerings.
- A robust API promotions strategy that facilitates awareness of the APIs is required. It is critical to sustain developers' interest in considering API usage in an ever-growing ecosystem and pool of competitors.
- Organizations should nurture API adoption throughout the API lifecycle, with an emphasis on turning the API consumer into an API champion. The API lifecycle transcends the initial adoption for development; it is a cumulative experience that includes the use of testing environments, version upgrades, service level agreements (SLAs) and post-deployment support, among other factors.

Figure 1

Three facets are essential to creating an enriching API experience for developers and consumers



Source: IBM Institute for Business Value analysis

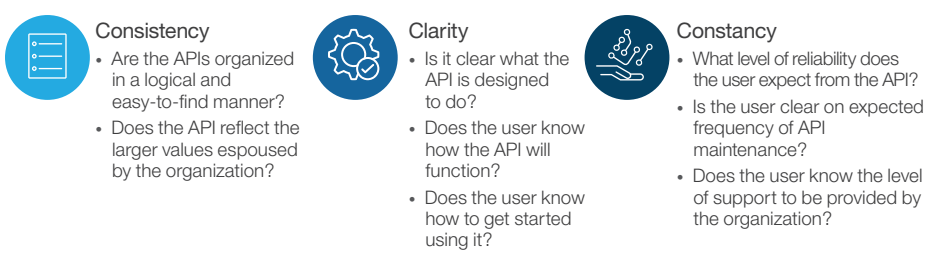
API branding

As with any branding, the API brand communicates its business value and reflects the larger values of the organization. A successful pattern for branding incorporates consistency, clarity and constancy with two user communities in mind: developers and end consumers (see Figure 2).

Consistency: Organizations that are mature in their API journey place great importance on brand consistency. They stress that their APIs retain the original look, feel and functionality across other organizations' products and services. Walgreens, one of the largest drugstore chains in the United States, provides precise guidance on acceptable and unacceptable phrases for describing its services, and how the Walgreens logo should be used on web pages or mobile applications that leverage the Walgreens prescription APIs.[1]

Figure 2

The API brand needs to communicate its business value and reflect the larger values of the organization



Source: IBM Institute for Business Value analysis

Clarity: Many API consumers get the majority of their information about a company's API via communities. As such, API producers must be clear in communicating API features and functions, while making it easy to find them among today's competitive API choices. Some of the issues API producers should address include: the functionality provided by the API, its technical requirements and the necessary steps to get started.

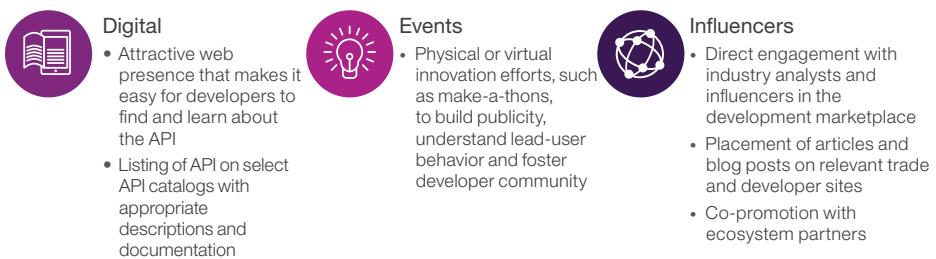
Constancy: The need to set realistic expectations about API capabilities and planned lifecycle are central to influencing API-developer perceptions. It is vital to ensure API-consumer assumptions about API functionality and support are aligned with those of API producers. Brand constancy takes on even more importance with APIs due to risks of brand dilution or worse, erosion by API consumers that build upon the APIs. Easy-to-understand, precise terms and conditions regarding expected levels of service, acceptable forms of usage and maintenance are key to sustaining brand constancy.

API promotion

To overcome the noise of thousands of competing APIs, API producers need to develop clear promotional strategies. An attractive, user-friendly web presence that makes it easy for developers to find and learn about APIs, and API listings on select public or internal catalogs are essential for creating awareness. Physical- or virtual-innovation promotional events, such as "make-a-thons," generate publicity and foster developer communities that promote knowledge dissemination of APIs. Direct engagement with industry analysts and influencers in the developer marketplace, placement of articles and blog posts on relevant trade and developer sites, and co-promotion with ecosystem partners are important aspects of API promotion as well (see Figure 3).

Figure 3

To overcome the noise of thousands of APIs, API producers need to develop a clear promotion strategy



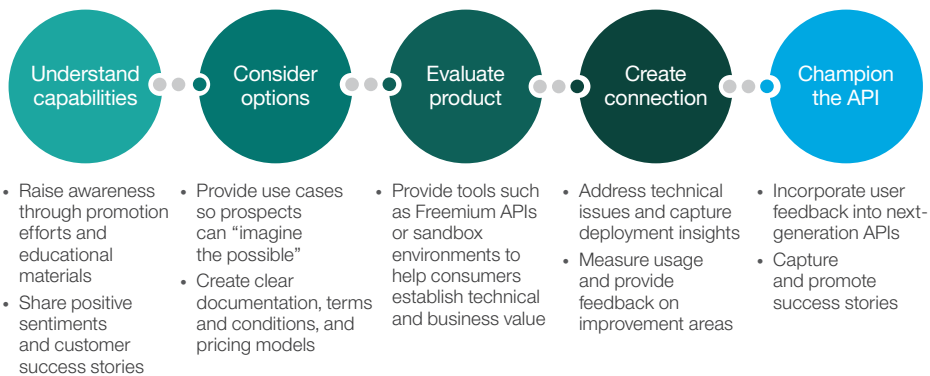
Source: IBM Institute for Business Value analysis

API adoption

Social media makes it easy for API consumers to communicate successes and failures to broad audiences, with "word of mouth" traveling across API forums and communities. For prospective consumers, the recommendations of existing API consumers on established forums and communities are invaluably influential. The degree of "stickiness" and the number of API consumers who become API champions can be key measures of the success of the adoption (see Figure 4).

Figure 4

Organizations should develop a staged journey to transform potential API consumers into champions

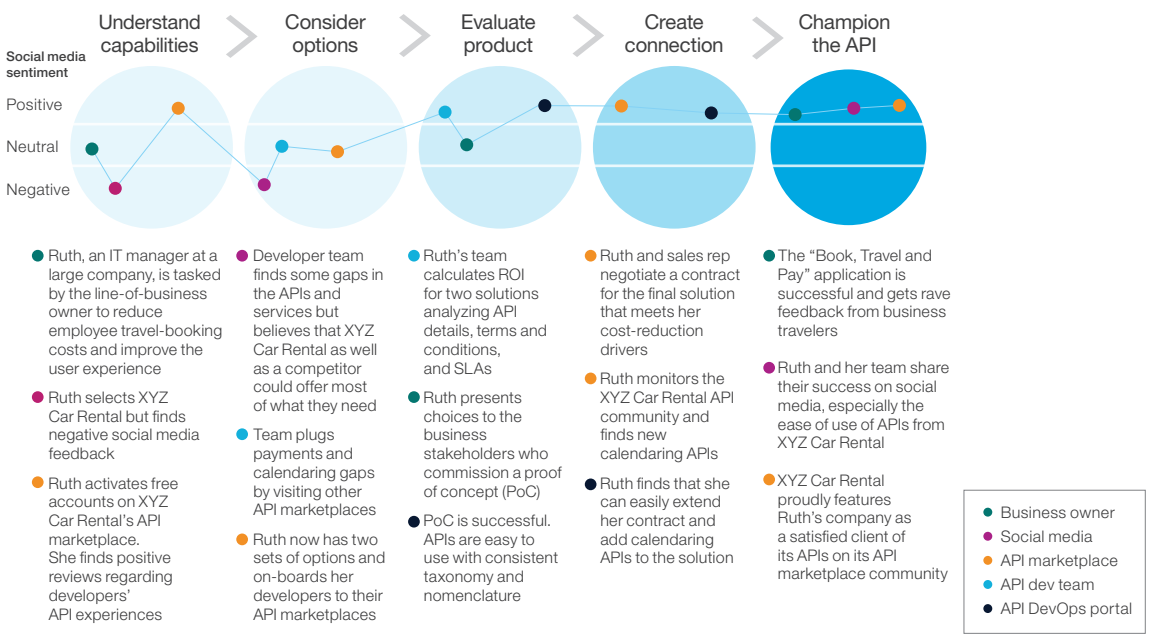


Source: IBM Institute for Business Value analysis

Organizations should develop a staged journey for transforming potential API consumers into champions. A journey map highlights the stages of adoption and potential positive and negative experiences a developer might encounter at various touchpoints, as in this example of the adoption journey of Ruth, an API consumer (see Figure 5).

Figure 5

For an API provider, a successful adoption journey turns Ruth, an API consumer, into an API champion



Source: IBM Institute for Business Value analysis

Take action: Creating an API experience

Organizations striving for a successful API experience should consider the following:

1. Focus on the API brand.
Understand how API-related performance promotes or inhibits overall corporate perception in the marketplace. Ensure that API-related materials – for example, developer websites, documentation and training programs – are consistent with your corporate standards and practices. Monitor customer perceptions in the marketplace and address any issues.

2. Use design-thinking principles to craft the API experience.
Help users "understand the possible" regarding API usage and value. Capture the customer journey to understand users' thoughts, actions and feelings during the API adoption journey. Start small and create incremental experiences, adding functionality over time.

3. Create your API community and grow champions with superior experiences.
Develop an appealing "home base" that provides users with a place to go for new innovations, technical updates and other experiences that create stickiness. Cultivate advocates who are willing to share insights and enable others on the adoption journey. Engage in a dialogue with the community to capture innovations and address concerns.

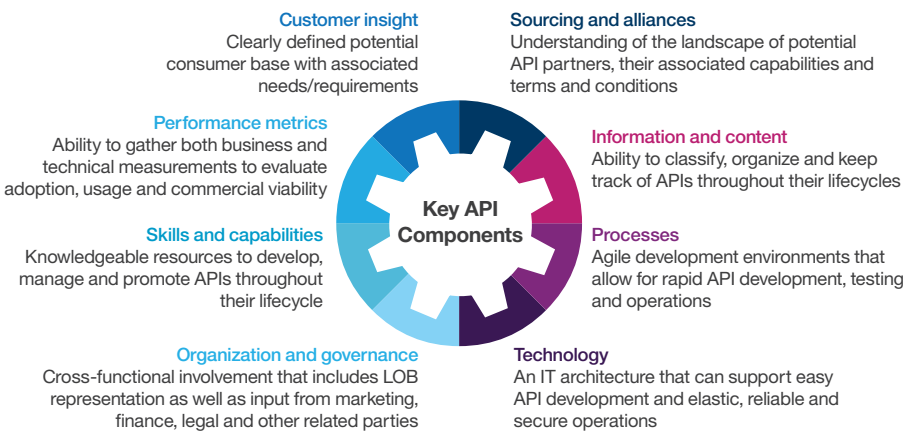
Managing an API as a product

From our research, it is clear that APIs represent more than development tools; they are, in fact, digital products that require similar levels of development rigor to those of other products. As one industry analyst noted, "Organizations fail to think of an API as a real product; rather, they consider it an adjunct of something or a technical issue. They don't frame the issue at the executive level as a product to staff to plan and measure like another product with requirements and stakeholders."[2]

To provide the desired ongoing experience needed to delight developers and end users, the organization must address a number of technical issues and organizational challenges (see Figure 6).

Figure 6

Managing the API product lifecycle involves a multifaceted approach



Source: IBM Institute for Business Value analysis

Customer insight

A recurring theme that emerged from our research was the importance of a timely understanding of how and why consumers prefer your APIs over others. Often, an API originates from a desire to provide a technical capability (for example, access to a piece of data or a service), rather than with a clear external – or even internal – customer in mind. The best way to gain this understanding is through direct interaction with developers and end users.

As the number of APIs grows, understanding how APIs differentiate themselves in the marketplace is likely to become increasingly important. Relevant differentiators influencing customer purchasing decisions include: the quality of the data or service delivered through the API, the ease of use of the API and the reliability of the API service delivery.

Close monitoring of API traffic helps companies understand customer behavior and the context for the API use. For example, one API manager from a financial services company described how his organization shared API usage statistics directly with internal developers.

The intent was to help the developers better understand the types of data – such as exchange rates and location data – consumers were actually using. Developers could then apply that information to enabling consumers with more useful, timely data, such as search capabilities for nearby ATMs or special offers on exchange rates. Providing mechanisms for developer feedback via an API marketplace helps promote positive sentiments, address security and other technical issues, and highlight potential areas for innovation.

Sourcing and alliances

The number of public and private services delivered through APIs continues to grow exponentially, increasing both the available options and the cost associated with locating them. The maturity level and ability of a sourced provider to offer sustained SLAs for its APIs can have a material impact on the API brand. Understanding the landscape of potential API partners, their capabilities, and their terms and conditions, in addition to leveraging internal catalogs of trusted API providers, reduces search costs and risks.

Successful organizations – especially those operating within existing API ecosystems – turn their current suppliers into trusted API providers. They do this by defining API specifications and communicating upgrades and changes on an ongoing basis.

Information and content

Because APIs are strategic assets, the information that flows through them needs to be carefully curated and managed to prevent misuse. From the start, organizations need to be aware of the range of implications associated with sharing data that previously resided within organizational boundaries.

Not only does the information exposure via APIs have significant ramifications on security and privacy, its unintended uses by third parties creates significant competitive threats. For example, the mining – or "scraping" – of inventory levels or the tracking of historical price trends by a competitor turns an API into a weapon against the company.

Organizations need to be very clear in their terms and conditions about the appropriate use of data, including data-retention policies and access limitations. They must be vigilant about using API infrastructures that detect and limit patterns of API misuse. For instance, we interviewed an individual from an organization that is monitoring its API usage patterns and is able to proactively detect patterns of abuse. The company has come up with a penalty-box approach to address aberrant API consumers when it finds them.[3]

Processes

Organizations need agile processes for developing and maintaining their API connections. Given the increasing speed of change in the market, companies need well-connected processes for API creation, production and maintenance. When multiple groups within an organization create an API, they often find it difficult to track usage and maintain consistency. Related challenges include the constant updates APIs must undergo to take advantage of new functionalities.

Organizations that develop clear, internal guidelines for managing API taxonomy, version control, documentation, and common platforms and processes improve development speed and reduce maintenance costs. Other effective factors include DevOps environments that enable rapid API creation, testing and production; and lightweight, yet structured processes for creating global SLA terms and conditions, and compliance and legal requirements.

Technology

Innovative APIs require secure, flexible and reliable technology platforms. Once adopted, an API can place significant strain on the existing technology platform, which must be able to support a high volume of calls. Also, the public nature of many APIs increases the potential for security breaches – as witnessed by many recent public attacks targeted at API vulnerabilities. If API producers don't maintain levels of reliability, security and functionality, API consumers can easily become disillusioned.

Agile API development affects a range of technology areas, including architecture, infrastructure, security, scalability and virtualization, and reliability. To maintain a stable technology environment, many organizations are using cloud-based platforms. These platforms provide rapid scalability as API usage changes over time; enable developer tools that enhance consistency and reduce learning curves; and incorporate authentication tools and monitor API usage to ensure appropriate levels of security.

Organization and governance

Successful API development requires cross-functional decision-making and oversight. Traditionally, IT departments have developed APIs with little or no input from other functions within the organization. Proactive API-centric organizations generally engage individuals from the relevant lines of business in the API development cycle to provide needed guidance around the right level of desired functionality and customer experience.

These organizations also involve their procurement and legal departments in monitoring intellectual property, developing SLAs and contracting. Marketing professionals play an important role in addressing the branding and promotion of APIs, and focusing on the attraction and recruitment of partners and external developers. Risk managers evaluate potential impacts of security breaches as well as unintended use of the APIs by legitimate parties.

Skills and capabilities

The API economy has implications for both an organization's skills and cultural mindset. An API-centric business requires new capabilities, including product management, data science and intellectual property management, as well as a culture that stresses innovation and resource reuse. For example, the product management skills needed to oversee the entire lifecycle of API management are often different from the technical capabilities needed to architect and code the actual APIs themselves.

One way organizations have set out to address these issues is the use of innovation teams centered on creating an API-centric transformation. These businesses create physical and virtual spaces that bring together architects, developers, product managers and business leaders to rapidly exchange ideas and interact with one another. They provide education on API development, develop use-case opportunities, and leverage internal and external collaborative events to promote API value and usage.

APIs drive digital transformation[4]

International Airlines Group (IAG), one of the world's largest airline groups, needed to transform itself into an agile, digital organization. The company was facing competitive investments in innovation and digital technologies, as well as fear of disruption from a potential "uberization" of the airline industry. IAG set up a digital business team to oversee a digital transformation and connectivity program, with APIs as the underlying driver.

This resulted in closer collaboration between the business and IT functions, connecting operations from the front- to the back-office via APIs and reducing much of the complexity caused by disjointed silos. The airline began a "Connectivity Program" to extend the digital mindset across the company, with a focus on timesaving techniques and tools to help airline crews do their jobs.

Bank creates API product manager role[5]

Executives at one of the world's largest banking institutions noticed that the company's internal partners and developers were having difficulty discovering and accessing key financial services. In addition, the company lacked a standard ecosystem to manage external partners, including credit card companies and merchants. To address these issues, the company developed the API product manager role. The individual in this role was responsible for working with leadership to define requirements, ensure APIs were aligned with clients, manage the API lifecycle and drive product innovation.

Performance metrics

The absence of feedback mechanisms to capture customer usage or investment makes the allocation of costs associated with API development and operation difficult. On the other hand, monitoring technical metrics related to API calls, error rates, code defects, quality of service and availability can provide support for the allocation of costs. Furthermore, measuring adoption rates across different customer segments, and obtaining feedback from customers on functionality and ease of use can help fortify the reasoning behind and financial support of the initiative.

Overall, combining these various data streams can help create a better business case for further API development and maintenance. To facilitate this, organizations can build performance dashboards that make it easier to visualize and monitor vendor contracts for API-based services as well as overall API performance.

RBL Bank, one of the fastest growing banks in India, launched an initiative to open up its services to ecosystem partners with multiple APIs. The bank used API management to monitor technical aspects of transactions, client onboarding processes and error rates. Furthermore, the bank tracked the increase of online partnerships, transaction amounts and ROI for the open APIs to gain support for additional resources and funding.[6]

Take action: Building API product management capabilities

Organizations that view their APIs as products, rather than just as technology, can leverage successful patterns and mechanisms of product management. They can realize the full potential of APIs and establish themselves in the larger API marketplace by capturing consumer insights, implementing scalable and flexible technologies, establishing best governance practices, using appropriate skill sets, and capturing relevant business and technical metrics.

For companies looking to quickly ramp up their API product management capabilities, consider the following actions:

1. Apply API standards to act quickly and reduce complexity.
Develop internal catalogs to make it easy to find APIs and supporting documentation. Use common platforms and processes to improve development speed and reduce maintenance costs. Engineer APIs that address reliability, scalability and security from the beginning of the development process.

2. Build an API coalition within the organization.
Incorporate product development skills into your API developer organizations. Build API awareness and competency into supporting disciplines to reduce legal and compliance risks. Provide education to internal and external developer communities on API development and use.

3. Articulate and measure API benefits.
Develop a clear framework that outlines expected API benefits. Closely monitor API usage to understand customer behavior as well as potential technical and security issues. Incorporate usage into future business case discussions.

Are you ready to support the API lifecycle and client experience?

Organizations that are examining their internal capabilities in preparation for competing in the API economy should consider the following questions:

- How effective is the overall process for API lifecycle development in my organization?
- To what extent does my organization have the skills and technical capabilities to create and sustain innovative APIs for use by external consumers?
- How are my organization's APIs viewed from an external brand perspective?
- What is the experience of the API developer when using our APIs?
- What is my organization doing to foster the promotion and adoption of our APIs?

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How we conducted our research

Our research included interviews with more than 30 individuals with API experience across a variety of industries – from financial services to retail. Some represented companies that produced APIs for use by other organizations, others focused on consuming APIs in their internal- and external-facing processes, while still others used APIs to build entirely new products and services. We also spoke with industry analysts and members of academia who have watched the API economy – the commercial exchange of business functions and capabilities using APIs – evolve over the last several years from a series of technical standards into an arsenal of disruptive innovations.

For more information

To learn more about this IBM Institute for Business Value study, please contact us at iibv@us.ibm.com. Follow @IBMIBV on Twitter, and for a full catalog of our research or to subscribe to our monthly newsletter, visit: **ibm.com**/iibv.

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Acknowledgments

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Notes and sources

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