

API Economy and the Future of Media: Post-print

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Abstract

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Full Text

Open API and the API Economy

The API economy has emerged as a revolutionary business paradigm. As enterprises develop, they accumulate operational capabilities and valuable data assets. By exposing these resources—provided they do not involve confidential information—through standardized data interfaces, companies can generate new revenue streams and establish entirely new lines of business. This process, known as Open API (Open Application Programming Interface), represents a fundamental shift from traditional ICT definitions. Unlike conventional APIs designed for internal systems, Open APIs are user-centric, leveraging third-party developers to continuously enrich and refine applications. This approach enhances user stickiness, boosts engagement, and gradually constructs a vibrant application ecosystem. Since Google first launched its Maps API in 2005, Open APIs have proliferated across diverse categories, including search (Google Search API, Yahoo Search API), text aggregation (Google Reader, Zhuaxia, Xianguo), multimedia (Flickr, YouTube), geospatial services (Google Earth, Google Maps), social networks (Open Social, Facebook, MySpace), and e-commerce (Amazon, Taobao).

Market forecasts underscore this transformation. IDC's 2018 China ICT Market Predictions noted that by 2021, more than half of Global 2000 companies would derive an average of one-third of their digital service interactions from API open ecosystems—a growth trajectory far exceeding direct customer interactions. This trend holds equally true for China, where open API ecosystems represent the critical foundation for reconstructing enterprise digital platforms. The EU's revised Payment Services Directive (PSD2), enacted on January 13, 2018, mandates that banks must open customer data to third parties via Open APIs with proper authorization. Similar legislation has been enacted in Australia and India to open financial payment infrastructure. Globally, the API economy has become a primary driver of digital transformation across industries. According to digital economy consultancy Chuanglue Technology, API economies enable enterprises to transform their business models, build new ecosystems around existing products, and monetize core assets, services, and products. By 2018, the API economy was projected to become a \$2.2 trillion global market. This momentum reflects an irreversible industry trend that enterprises must prepare to address.

The strategic imperative is clear: in today's ICT landscape, speed determines success. As industry observers note, the era of “big fish eating small fish” has given way to “fast fish eating slow fish.” The API economy model aligns perfectly with this demand for velocity, creating value through highly efficient, effective, and flexible business models. IDG (International Data Group) highlights that the internet has proven APIs can accelerate innovation—developers can prototype ideas in days and rapidly scale or discard them based on market response. Gartner forecasts that 70% of B2B commerce will be conducted through APIs by 2019, establishing APIs as the primary mechanism for presenting and utilizing digital assets including data and software.

[Figure 1: see original paper]

Leading enterprises demonstrate this potential. Expedia, the world's largest online travel booking company, created the Expedia Affiliate Network (EAN) to strengthen partnerships with affiliates. By exposing feature-rich APIs, Expedia enables partners—including airlines and travel agencies—to access hotel availability, photos, search results, and user reviews directly within their own websites and mobile applications. This strategy drives website traffic, improves conversion rates, and delivers higher order values for partners. Today, API-generated revenue accounts for 90% of Expedia's total income while creating additional revenue streams through increased traffic.

The API economy permeates numerous ICT domains, including digital transformation, cloud computing (particularly hybrid cloud), artificial intelligence, blockchain, Internet of Things, and microservices architectures. Governments worldwide increasingly adopt APIs as a standardized method for collaboration and governance innovation. The European Commission's PSD2 directive exemplifies this regulatory trend toward mandated API openness.

Media Industry API Implementations

Media organizations provide compelling case studies in API utilization. National Public Radio (NPR) offers comprehensive access to its digital assets dating back to 1995, including news stories, images, audio content, and a repository of 250,000 articles across 5,000 categories. NPR distributes content through three primary methods: (1) “create once, publish everywhere,” where content is pushed to the API before distribution to other platforms and applications; (2) cross-platform content sharing between NPR websites and apps; and (3) direct service to NPR.org and applications.

NPR’s Story API, developed in partnership with GitHub as an open-source project, serves as the organization’s primary interface. This “workhorse” system delivers NPR programming to mobile devices, connected vehicles, and member stations, acting as a gateway to content published on NPR.org and affiliate sites. The API enables real-time sharing of journalistic work through editorial platforms, allowing reporters to distribute content as they produce it. In 2013, NPR launched a WordPress plugin enabling any blog on the platform to access NPR’s complete dataset through the Story API. Content creators can use the API’s push functionality to retrieve and save article metadata from WordPress publications. WordPress administrators can establish automated, customized API queries that update blogs in real-time—for instance, pulling headline content or creating user-specific queries for NPR and other sites. The plugin seamlessly transfers content and metadata from WordPress, requiring only an API key for developers to configure on staging servers. NPR recommends visualization tools including Google Fusion Tables, Google Spreadsheets, Google Charts, and Scribd for data journalism applications.

The Guardian’s API initiative represents another innovative approach to data journalism. The organization provides developers with free tools to create data-driven stories using Google Fusion Tables, Many Eyes, and Timetric. Through its data blog and data store, The Guardian grants all users access to content data, downloadable via Google Spreadsheets or visualized interactively. Examples include “Election Map and Swingometer” and “Government Spending: What Happened to Our Money.” The Guardian’s Politic API supplies personal information about political candidates in JSON format. Its SDK mechanism, called MicroAppFrame, supports multiple programming languages (Java, Python, PHP) and facilitates easy integration with The Guardian’s platform. Partner applications can deliver content and data services to Guardian users, as demonstrated by examples like “What Could I Cook” and “Zeitgeist.”

ESPN established its Developer Center in 2012, branding itself as “where sports and code live in harmony.” The sports network designed its APIs for simplicity, allowing users to request curated, editable news collections. By December 2014, ESPN had opened multiple APIs including Sports, Headlines, Athletes, Teams, ESPN Now, Standings, Research Notes, Medals, Audio, Video, Scores & Schedule, WatchESPN, Calendar, Photos, Leaders, and Draft APIs.

Netflix's success stems from its universal accessibility across devices—from smartphones to tablets to smart TVs. The Netflix API provides original equipment manufacturers with access rights, rapidly expanding streaming service coverage. As James Parton from The Guardian noted, Netflix reported over 2 billion daily API calls, achieving unprecedented speed-to-market and scale that would have been impossible before the API era.

Over the past four centuries, news organizations have collected data while delivering societal information. Today, this data has become digital information, continuously growing toward big data through storage and correlation. News organizations digitize their content to monetize MGC (Machine-Generated Content), making APIs an effective means and critical technology for creating customized content for appropriate audiences while fostering opportunities and partnerships for every consumer.

Technical Architecture for Open APIs

API gateways serve as the entry point for open APIs, providing essential functions including authorization, monitoring, load balancing, caching, request modification and management, and static response handling. The gateway handles request routing, composition, and protocol conversion. All user requests pass through the API gateway before being routed to appropriate microservices. When internet-based models influence traditional enterprises, many systems rely on external partners for traffic and content, requiring API gateways to unify authentication, multi-tenant authorization, and access control for internal services calling external APIs. This extends capabilities from single web applications to diverse usage scenarios.

Key advantages of API gateway implementation include: (1) isolation between internal and external systems, ensuring backend service security; (2) shifting external access control from the network layer to the operations layer, reducing change processes and error costs; (3) decoupling clients from services, allowing independent service development with mapping handled at the gateway layer; and (4) aggregation at the gateway layer to reduce external access frequency and improve efficiency.

[Figure 3: see original paper]

Designing an enterprise-grade API gateway requires careful consideration of multiple factors: (1) security concerns; (2) performance, as the gateway must handle enormous concurrent request volumes—some sites experience tens of millions of requests per minute; (3) high availability, since the API gateway represents a logical single point that could cause catastrophic failure; (4) extensibility for non-functional requirements such as logging, security, load balancing policies, and authentication; (5) efficient API operations, requiring gateway coordination during API deployment and publishing processes, including knowledge of API addresses, interface formats, and message structures, plus backend API encapsulation; and (6) full lifecycle management encompassing service development,

testing, deployment, application and provisioning, categorized management, usage monitoring, and billing.

To capture the open API market, major vendors have launched cloud-based API gateway services. These platforms position themselves as enterprise-grade integration and capability opening platforms on public cloud, helping small and medium enterprises build and manage APIs at any scale with simplicity, speed, low cost, and low risk. Huawei's APIG service, for example, supports Huawei Cloud's entire API integration and opening across lifecycle management, authentication, and traffic control.

Common API gateway solutions include Nginx+Lua, SpringCloudZuul, and MashapeKong. A well-designed enterprise API gateway encapsulates application internal structures, enabling clients to interact solely with the gateway rather than individual services. This provides client-specific APIs, reduces interaction frequency, simplifies client code, and shields clients from needing to know module addresses. API gateways frequently process requests by calling multiple microservices and aggregating results, while also converting between web protocols (HTTP, WebSocket) and internal non-web-friendly protocols.

Note: Figure translations are in progress. See original paper for figures.

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