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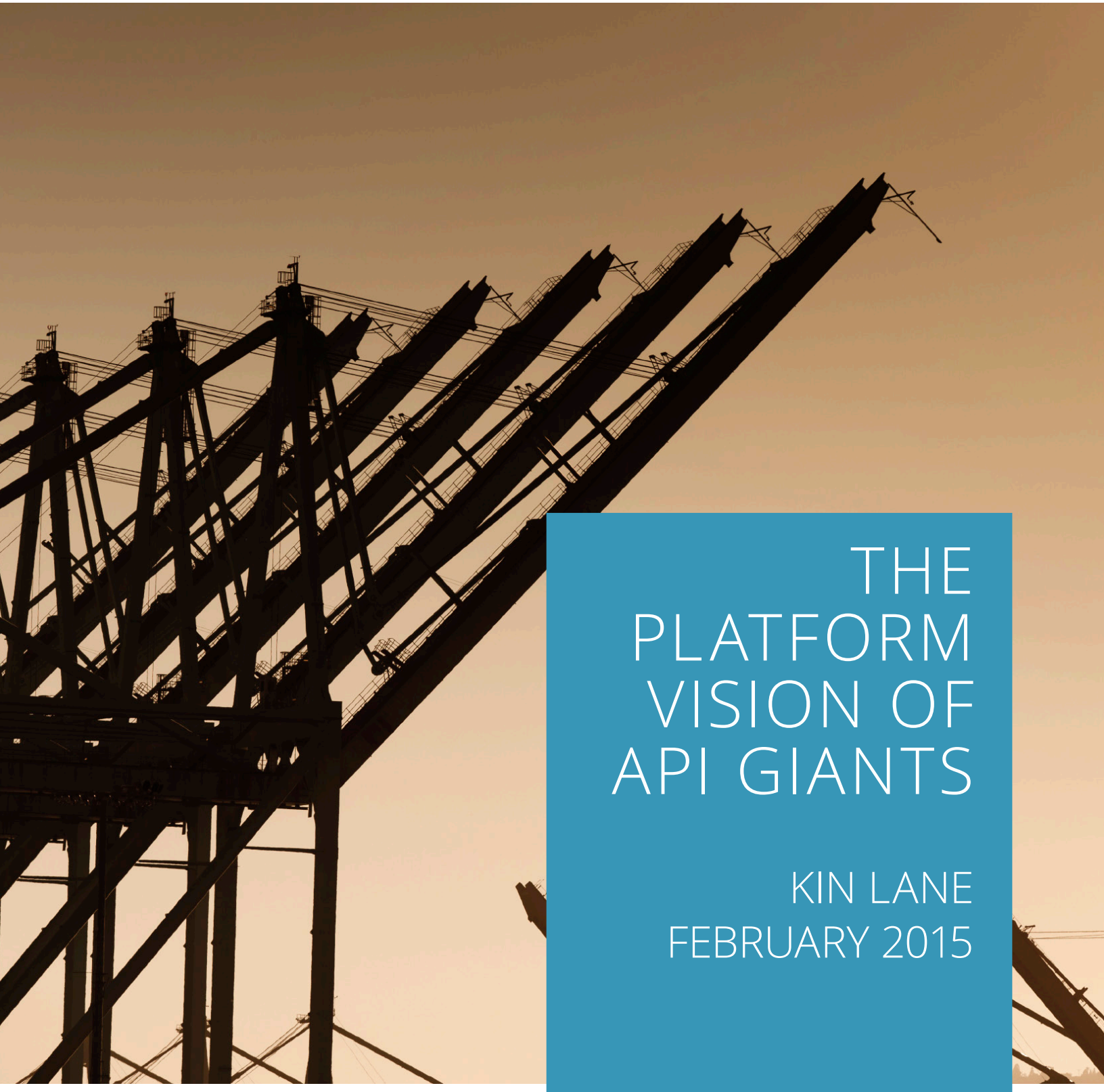

THE PLATFORM VISION OF API GIANTS

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A whitepaper profiling how leading technology companies are employing APIs.

Introduction

The following are a handful of short stories about API providers that have changed how we think about the industries they serve. They have built distributed ecosystems of thousands of trusted partners and developers, and invented entirely new industries and business models. Their data, content, and other digital assets have become part of the fabric of how we do business and govern in 2015.

This isn't a technical story. This is a story of how simple, open technology has the potential to transcend the IT and developer worlds. It can affect all aspects of business operations — including R&D, business and product development, and marketing and customer support.

The Internet is slowly (but surely) changing how we operate as a society.

A major part of this evolution is rooted in how software is developed, which has also been slowly changing over the last fifteen years with the help of Application Programming Interfaces, or APIs.

This new breed of web APIs is providing clear access to valuable data, content, and the other digital assets that are needed to build websites, and web and mobile applications. This whitepaper will shed some light on organizations that are putting APIs to work, such as technology giants like Amazon, and also show how traditional businesses—even government agencies like the US Census Bureau and the White House—are employing APIs to help better achieve their missions.

The modern web API movement is not based on a new software technology from companies like Microsoft, Google, or IBM, it's simply the next step in the evolution of the World Wide Web. We've passed beyond the point of simply surfing the web, and merely consuming HTML documents. Today users navigate the Internet through smart technology, creating, consuming, and interacting with multiple types of content, data, and digital resources, all accessed via web, desktop, or mobile applications used in both our personal and professional lives.

APIs originally provided read and write access to valuable data and content using web URLs, allowing developers to build features into their applications and other systems. However, over the last fifteen years, providers began to realize that there were other unintended benefits of opening up APIs that had more to do with the business, politics, and culture of a company than just the technology. API-driven benefits have emerged that allow companies to do business differently, with partners and the public at large. Even more importantly, they have allowed companies to transform internally in a way that makes them more scalable, agile, and effective, delivering measurable business results.

APIs are already touching all aspects of our personal and business lives. It's important that everyone become aware of APIs—the agility and efficiency they enable, and the opportunities they create for business and relationships to flourish in this new environment. When an entire business or organization is educated on API-centric approaches and are able to participate in platform operations, that platform can ascend from being just a developer area—a footnote on a website—to becoming an API-driven community with hundreds or thousand of users contributing and participating. If the right feedback loops exist, that community then has the potential to evolve into an ecosystem. It can ascend beyond the time and investment of its owners to become a collective vision.

Building an ecosystem of sales professionals with **Salesforce.com**

In early 2000, Salesforce launched its enterprise-class, web-based sales force automation, what they called "Internet as a Service". APIs were part of it from the very beginning. The company identified early on that customers would need to share data across different business systems, and APIs would be how they would achieve it. This would forever change how software is delivered.

After fifteen years of developing its API ecosystem, Salesforce has cultivated a robust community of sales professionals, providing valuable web and mobile applications and supporting services in just about every business sector there is. When Salesforce looks to develop a new line of business, it looks to its ecosystem. It invests in, or acquires, best-of-breed tools that have emerged from within the community in order to deliver what its users demand, such as mobile applications, big data solutions, and the other fast-growing areas of the online digital economy. The Salesforce ecosystem has become so self-sustaining that the company and community together have become a living market or incubation environment, which defines sales and relationship management across almost every business sector

> "Salesforce was the first software provider to take an enterprise class web application, fit it with an API, and deliver what we call today Software-as-a-Service (SaaS)."

Changing how we architect and deliver technology from **Amazon**

In 2002, online retailer Amazon.com launched Amazon Web Services (AWS), allowing developers to incorporate Amazon content and functionality into their own websites. Now any third party site could search for and display products from Amazon.com. From day one, the API was integrated with the Amazon Affiliate Program, which provided developers a way to monetize their websites through traffic that resulted in an Amazon.com purchase.

CEO Jeff Bezos realized the potential of breaking up Amazon's valuable data, content, and resources into APIs. He directed internal staff to adopt the same approach when it came to defining and providing services internally between various groups within the company. This new vision for defining, deploying, and scaling internal business assets would emerge publicly in 2006 as a new concept we now call "cloud computing." It would forever change how we approach our technology architecture and do business in this new online world.

In March 2006, Amazon launched a new API that was completely different from the e-commerce services developers had come to depend on. This API was a simple storage service called Amazon S3. It could be used to store and retrieve any amount of data, at any time, from anywhere on the web. It gave developers access to the same highly scalable, reliable, fast, and inexpensive data storage infrastructure that Amazon uses to run its own business.

Just a few months later, Amazon followed its S3 release with a second cloud computing service called Amazon EC2, or Elastic Compute Cloud. This API provided developers with resizable compute capacity, allowing them to launch different sizes of virtual servers within multiple Amazon data centers. Just like its predecessor, Amazon S3, Amazon EC2 was just an API.

Developers using the Amazon S3 API were charged $0.15 per gigabyte per month for storing files in the cloud. Amazon EC2 users were charged varying rates for each small, large, or extra-large server they launched, paying only for every hour that the server was actually running. Amazon S3 combined with Amazon EC2 has provided a blueprint for the next generation of software engineering and business, where APIs are at the core. With this new type of API-driven business model Amazon ushered in a new age of cloud computing. APIs were no longer just for data or simple functionality. Now web APIs could also be used to deliver critical global infrastructure.

Being more social and open to external ideas at **Twitter**

Twitter introduced its API to the world just two months after its launch in 2006. The API was released in response to the growing prevalence of users scraping the site or creating rogue APIs. So Twitter exposed the Twitter API, which returned machine readable JSON and XML that developers could put to use. In just four short years Twitter's API became the center of countless desktop clients, mobile applications, web apps, and businesses, in addition to Twitter's own mobile apps and public website.

Twitter is one of the most important API platforms operating today. It let an open API ecosystem of almost a million 3rd party developers build out the rest of the platform, establishing an external R&D environment for the fast growing communication platform.

> "Twitter goes to show what is possible when a dead-simple platform does one thing really well, then opens up access via an API. "

Using APIs to set the tone for business operations at **Flickr**

The popular photo-sharing site Flickr launched in February 2004. Six months later, they launched their now infamous API. Six months after that they were acquired by Yahoo.

Originally created as an online game, Flickr quickly evolved into a social photo sharing sensation. The launch of the API helped Flickr to quickly become the image platform of choice for the early blogging and social media movement by allowing users to easily embed their Flickr photos into their blogs and social network streams.

The Flickr API is the driving inspiration behind the concept of BizDev 2.0, a term coined by co-founder Caterina Fake to describe their policy of requiring companies to use the API to develop applications. The company would only contact companies who had successfully attracted users, which increased efficiencies in how Flickr engaged with its partners and allowed it to rapidly build a network of trusted, high value partners.

Listening to what users need with **Google Maps**

Google launched the Google Maps API in 2006, allowing developers to put Google Maps on their own sites using JavaScript. The API was launched about 6 months after the release of Google Maps as an application in direct response to the large number of rogue applications developers that were hacking the application. Google Maps had been so popular that developers had immediately hacked the JavaScript interface and developed applications such as housingmaps.com and chicagocrime.org.

Google Maps API started a trend of API mashups using its valuable location-based services. The API demonstrates the incredible value of geographic data and mapping APIs, as well as the power users can have in influencing the direction an API takes.

> "Lars Rasmussen, the original developer of Google Maps, commented on how much he learned from watching the developer community hack the application in real-time. Google Maps then took what they learned and applied it to the API we know and depend on in our apps today."

Realizing the future is being a distributed platform at **YouTube**

Shortly after launching in 2005—right before its explosive growth in 2006 which led to being acquired by Google—YouTube launched an API for developers to integrate the YouTube video experience into their web applications. YouTube continued to engage with developers and provided embeddable, API-driven tools. This made it possible for any user to place videos on websites across the Internet, expanding the reach of YouTube beyond its central website and platform.

> "YouTube has shown that APIs can rapidly scale the publishing of user-generated content, while also exponentially expanding the reach of a network using API-driven, embeddable video players spread across the web."

Accessing population data from the **US Census Bureau**

The US Census Bureau launched its own API in the summer of 2012, providing access to 2010 Census data as well as results from other community surveys. The agency was looking to expand access to its valuable survey data and allow developers to more easily integrate census data into applications.

Census data was already playing a major role in private sector solutions like Google Flu Trends, location applications like Yelp, and leading newspapers like USA Today. However, these were all made by large companies with the resources necessary to process the large census data dumps. The federal agency has worked hard to provide data explorers, spreadsheet connectors, and other tooling and resources that data scientists, developers, data journalists, and any tech savvy user can use to enrich their own work. This has helped them to develop a robust, long tail of users consuming the valuable data and putting it to work.

Citizen engagement using the petition API from **The White House**

The White House launched the Petition API in late 2013, allowing the nearly 300,000 petitions, signed by 10 million users, to be queried and displayed via any website—expanding the voices of citizens engaging with the federal government on the issues that matter most to them. Within the last couple of months the White House has also added the ability to post signatures to the White House Petition API. This has made petitioning the White House truly a two-way street, distributing the federal government's engagement with citizens online via any website, not just WhiteHouse.gov

The White House Petition API provides a machine-readable way for the government to engage with millions of its citizens. The technology doesn't guarantee the government will listen to every petition submitted, but it does give a significant voice to citizens in a way that was unheard of before the Internet existed.

Giving a loose network of stations a common platform with **NPR**

National Public Radio (NPR) has always been a loosely coupled network of news outlets, spread across the United States, sharing a common mission. With the introduction of the web, and more recently APIs, NPR has been given a new opportunity to strengthen its networks of news and radio outlets. Over the last 10 years, it has been developing its own API network. Over the last two years, it has morphed into an open source, federated, media distribution platform, now called Public Media Platform (PMP). This new API approach is giving NPR, its public media partners like APM and PRI, as well as indie publishers a common platform for publishing and accessing content across its network. Using APIs has allowed them to achieve this in a way that protects the interests of each individual station while also supporting the overall mission, changing how the media works in an online, digital age.

These providers are just a small sampling of what's happening

This API journey represents only a handful of the most significant 10,000+ public web APIs currently available. It doesn't even begin to demonstrate the number of valuable API resources fueling the recent growth in mobile usage, or even more recently, the fast growing world of connected devices—from home thermostats to new cars from manufacturers like Ford and Tesla.

APIs initiatives aren't just coming from IT and developer groups. They are being used to provide access to assets company wide.

> "Jeff Bezos at Amazon showed us how to internalize APIs within a company—not only changing how everyone within a company interacts, but forever changing how software is built and revenue is generated from valuable digital assets: through meaningful engagement with trusted partners and the public over the Internet."

It all begins with solving problems using technology

APIs are not a specific vendor technology. They were born out of the need to solve immediate problems with the tools developers already had, applying the same technology the web already uses to deliver websites in a way that is distributed across the Internet, and also onto the mobile phones that have become ubiquitous in our daily lives.

Salesforce used APIs to allow sales professionals to integrate their software-as-a-service into any existing system, while Amazon empowered an army of affiliates to sell their products across the web. But it wasn't until Flickr introduced the concept of BizDev 2.0 that APIs became a new way of doing business and began to move beyond just a technical audience. This new API-driven business approach was elevated to an entirely new level when Amazon reinvented how we look at providing access to digital resources to a new "pay for what you need" way. It introduced a new economy; one where everything is API driven.

A community way of operating on the open internet

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APIs start with technology, but they are really about doing business in a digital age. If a company is finding success online in 2015, they are employing APIs. APIs have been popularized through some extremely successful public APIs, like the ones listed above. However, over the last five years, APIs have become about more than public access to valuable resources. They're about making those resources accessible to trusted partners and internally, across any company, organization, or government agency.

APIs are defining new ways of doing business, deploying architecture in an age where agility, flexibility, and scalability set the competitive edge. Companies are using APIs to develop armies of professionals and take advantage of open developers who are looking to develop the next big thing in technology, creating real-time incubation and R&D labs adjacent to existing company operations. This is a world in which data and content get generated and refined by the community, while developers work hard to help create the next generation of features, web, and mobile applications.

To truly achieve Internet scale in this age, companies, organizations, institutions, and agencies have to embrace APIs—and allow all resources to be accessed, consumed, and evolve in an online, 24/7, global environment. At first take, it sounds like this story is about exposing everything a company does online. In reality, APIs allow for secure read and write access over the Internet in new ways. They not only better secure digital assets but provide analytics and other insights into how resources are actually being put to use—something many companies don't possess today.

Many of the companies showcased in this paper like Salesforce, Amazon, Twitter, and Google have successfully cultivated ecosystems of developers who extend the reach of resources beyond just a handful of leading partners. They have established robust, productive, long tails of consumers and publishers, which extends the reach of their platforms across almost every industry, stretching around the globe. The Internet itself has become a living ecosystem, and APIs represent the next generation of the Internet, one that is even more programmable and accessible than its predecessor.

Kin Lane is a technology professional with an obsession for Application Programming Interfaces, also affectionately known as APIs. With over 20 years experience as a programmer, database administrator, architect, product developer, manager, and executive, he now spends his days studying the business and politics of APIs and telling those stories. He thrives on monitoring the API industry in real-time and tracking new trends that are emerging, along with looking back at its history. Kin considers himself a full-time API evangelist, not for a single API, but for APIs in general. His focus is not just on developers, but also helping the rest of the world understand the value and potential of APIs. He can be found at kinlane.com, apievangelist.com, and www.linkedin.com/in/kinlane.

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At **3scale** we provide a comprehensive API management platform that lets providers easily package, distribute, manage and monetize APIs through a SaaS infrastructure that is flexible, secure, and Web scalable. The platform enables the distribution of a company's data, content or services to multiple devices or mobile/Web applications, as well as the ability to easily productize APIs. Since 2009 more than 500 APIs have been powered by 3scale. Customers span the Fortune 500, government, academia, and startups. 3scale customers include Coldwell Banker, Johnson Controls, SITA, Transport For London (TFL), UC Berkeley, Wine.com among others. The company also powers APItools for API consumers and APIs.io, the worlds first open source API search engine. For more information, visit www.3scale.net.