

## **Open APIs and News Organizations: A Study of Open Innovation in Online Journalism**

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### **Citation information**

Aitamurto, Tanja, & Lewis, Seth C. (2011). Open APIs and news organizations: A study of open innovation in online journalism. Paper presented at the International Symposium on Online Journalism, Austin, TX, April 1, 2011.

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## **Abstract**

This paper examines how and why news organizations are deploying open Application Programming Interfaces (so-called “open APIs”) as part of their online strategy, connecting this phenomenon with the “open innovation” paradigm (Chesbrough, 2003) popular in the business management and technology literature. Up to now, the news industry has both under-funded R&D efforts and underappreciated the wisdom of external ideas. But this is beginning to change, as some major news organizations—including four studied here: the *Guardian*, *The New York Times*, *USA Today*, and National Public Radio—have deployed publicly available APIs, which can be seen as the first manifestation of open innovation in the news industry. Through qualitative interviews with key developers, we examine the nature of this phenomenon: the relative motivations, benefits, and challenges associated with using open APIs in the context of online news. Our findings offer a fresh perspective on the business strategy and the process of innovation, both for news organizations and the profession broadly.

## Introduction

The news industry is facing a new challenge as the work of online journalism, once focused on serving up websites to be viewed on personal computers, must now contend with the emergence of several digital platforms—computers, mobiles, and tablet devices. Compounding this challenge is the increasing number of operating systems to manage on a single platform; on mobile alone, for example, there are several major varieties: iOS, Android, Symbian, and BlackBerry OS, to say nothing of others coming. Media convergence has created more competition, and, simultaneously, new platforms are emerging as product lifecycles become shorter. At the same time, journalism's traditional advertising-based model is struggling, putting pressure on news organizations with increasingly diminished resources. This creates a conundrum for the industry: how to keep up with the modern demands for research and development (R&D), while at the same time *not* increasing costs but, in fact, finding new revenue opportunities to offset declines in legacy operations?

This kind of R&D challenge is hardly unique to the news industry, as firms in a number of fields struggle with the same tension. In his seminal work on this question, Henry Chesbrough (2003) argues that firms, operating under the right conditions, can more efficiently innovate by drawing on external ideas as well as internal ones—in effect, moving past the “not invented here” syndrome traditionally associated with closed R&D. This paradigm of open innovation (Chesbrough, 2003, 2006) has since become a standard in the literature on technology management and corporate R&D (e.g., see the special issue edited by Enkel, Gassmann, and Chesbrough, 2009). In most cases, this involves an *outside-in* process whereby firms enhance their knowledge base by tapping the wisdom of their suppliers, customers, and other related actors. Open innovation also engages an *inside-out* process of externalizing innovation processes to more quickly bring ideas to market (Enkel et al., 2009).

For much of the 20th century, the news industry—in particular, the newspaper industry in developed countries such as the United States—was a highly stable and successful enterprise (Franklin, 2008; Picard, 2008), one in which monopolistic control in local markets gave many news organizations little need to invest in major R&D or to hunt for creative business solutions from beyond their industry domain (c.f., Meyer, 2009; Nordqvist, Picard, & Pesämaa, 2010). In short, the industry both under-funded R&D and underappreciated the wisdom of external ideas. But this has begun to change, and news organizations have a growing interest in refining R&D processes. In very recent times, some major news organizations—including the *Guardian*, *New York Times*, *USA Today*, and National Public Radio—have deployed publicly available application programming interfaces (otherwise known as “open APIs”), which accelerate the pace at which these organizations can exchange information within their firms and with external computer developers at large—thus accelerating R&D as a whole.

In this paper, we argue that open APIs can be seen as an early manifestation of open innovation in the news industry, and thus it's important to understand the implications of this phenomenon. Simply put, APIs are well-defined computing interfaces programmed to allow software programs to more readily “talk” to each other (c.f., de Souza and Redmiles, 2009). In

web development today, APIs frequently allow programmers to build applications and data “mashups” around information provided by public entities such as the U.S. federal government and private companies such as Twitter and Facebook. For example, with the popular Twitter API, web developers can build applications that take content from Twitter’s streams and reconfigure it for new purposes and in new contexts.

These APIs are “open” in the sense that they are publicly available. In the case of news organizations studied here, such open APIs are designed to invite developers to use some or all of the organizations’ content in web applications. For example, with its content API the *Guardian* gives access to more than a million articles from the past decade and beyond. The content can be used on external web or mobile applications with three tiered layers and three revenue models. The result is that outside software developers can build applications around this data, and the *Guardian*, in turn, can both learn from this external development and take advantage of new revenue opportunities in the process.

The open API phenomenon points to the potential for open innovation in the news industry, but the academic literature has yet to address the practical and theoretical implications of this development: i.e., how this is working in practice, and how it might contribute to the understanding of open innovation in theory. This study seeks to address this through a qualitative analysis of four major news organizations’ efforts to deploy open APIs, exploring several questions of particular concern: What are the anticipated and realized benefits of open APIs for news organizations? What are the relative challenges of open APIs for news organizations? And, what are the future opportunities for open APIs in news organizations?

## **THEORETICAL BACKGROUND AND KEY CONCEPTS**

### *Open innovation as a business strategy*

There are two key factors changing the economics of innovation: the increasing costs of research and development (R&D) for companies, and the shortening product lifecycle (Chesbrough, 2006a). To thrive in this shifting innovation landscape, companies increasingly are turning to “open innovation” strategies as a part of their overall approach to R&D. As defined by Henry Chesbrough (2006b), *open innovation* is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively.

With a business strategy based on the open innovation paradigm, a firm can extract value from both internal and external ideas, as in the case of Procter & Gamble (Huston and Sakkab, 2006). As part of its “connect and develop” strategy, Procter & Gamble more purposefully looked for innovation instead of investing in internal R&D alone. The core of this approach was to find external connections to produce highly profitable innovations, through proprietary networks as well as open networks such as the innovation platforms NineSigma and Innocentive. As a result, more than a third of Procter & Gamble's new products originated from outside the

company, 45% of product development initiatives had key elements that were discovered externally, and R&D productivity overall significantly increased (Huston and Sakkab, 2006).

In the process of open innovation, the organization embraces the flow of ideas both inbound to the organization and outbound from the organization. This means moving beyond the traditional closed innovation system, where the innovation processes that are conducted internally are assumed to be superior to ideas that originate externally—again, the “not invented here” posture of defensiveness noted earlier. By increasing the flow of knowledge to and from the organization, open innovation establishes new paths to commercialize the innovations done within the company, taking advantage of informal and formal ties to outside partners (Chesbrough 2003; Simard and West, 2006).

Chesbrough argues that most innovations occur outside companies’ internal R&D apparatus, and therefore, under the right conditions, firms can more readily innovate by applying the principles of open innovation. In the literature on innovation management (c.f., Van de Vrande and Gassmann, 2010), other terms—such as co-creation (Prahalad and Ramaswamy, 2000) and user innovation (von Hippel and Katz, 2002)—have been deployed to describe similar processes of breaking down boundaries to external input. All of these related concepts emphasize the role of collaboration between the firm and the end-user, customer, or external collaborator, and the role that such collaboration has in creating value to the company.

Open innovation strategy can be applied in constant, everyday R&D work, but open innovation is also often harnessed to achieve specific initiatives: e.g., deliberate innovation challenges by companies, as in the Netflix Prize (Bell and Koren, 2007); “prize philanthropy” contests hosted by nonprofit foundations, as in the Knight Foundation’s Knight News Challenge (Lewis, 2010); and methods of continuous interaction with the end-users, as in the case of Dell’s IdeaStorm (Di Gangi and Wasko, 2009).

In the open business model, companies save resources by leveraging external R&D experiments. By licensing its own intellectual property (IP), the company increases the variety of its revenue streams, reaching new markets through spin-offs, partnerships, and licensing, and thus increasing overall revenue (Chesbrough, 2006a). By applying the open innovation strategy, the company can move towards a platform business model in which the value, and revenue, is co-created with collaborators (Chesbrough, 2011).

### *Open APIs and news organizations*

One manifestation of the open innovation paradigm is the emergence of open Application Programming Interface (API) initiatives, which are being rapidly adopted in the technology industries. APIs enable two computer applications to more readily “talk” to each other in a language they both understand. Open APIs enable websites to interact with each other and exchange and share data, in a manner that is far more rich and complex than mere RSS feeds but still straightforward to use.

APIs serve as an interface between software programs. With public APIs, anyone with the technical capacity can build a third-party service—e.g., a web application based on the API

server's content, such as that provided by Twitter or Facebook. The online video service Netflix has been at the forefront of providing freely accessible APIs for commercial use by external developers—allowing access to data on Netflix titles, for example. Overall, by providing open APIs, companies invite and encourage the wider computer programming and web development communities to experiment with and build upon their content. As a result, a number of such firms have seen ideas and innovations spring up externally, beyond the organization's boundaries—as in the vast array of applications developed around the Twitter platform.

Open APIs are a relatively new phenomenon for news organizations, and to date are deployed mainly only by some of the leading national and international news outlets. In the United States, National Public Radio was one of the first major news organizations to launch an open API when it did so in 2008. At that time, Darren Mauro, Director of User Experience Delivery for NPR Digital Media, described the significance of this step: “An Open API lets NPR offer our content to the public in infinite ways. The public has always been an essential part of what we do—we have ‘Public’ in our name—and the API concept will advance that relationship in a transformative way.”<sup>1</sup>

Soon after NPR, the *New York Times* followed with an open API for its campaign finance data in late 2008, and later a launch of an open API for its news articles in February 2009. In Europe, the *Guardian*, headquartered in the United Kingdom, launched its open API for content in March 2009. The open API is a part of the *Guardian*'s “open content” strategy, in which the newspaper encourages the external developer community to build applications around the *Guardian*'s news content and data. The *Guardian* open API allows access to more than 1 million news articles, dating back to 1999. *USA Today*, the second-largest newspaper in the United States, launched two open APIs in the fall of 2010. What's important to note in these developments is that the emergence of open APIs in the context of journalism mostly has been exclusive to the largest national and international news organizations—ones with the human resources and technical capacity to invest more fully in R&D and deploy these application interfaces. To date, open APIs have not been used broadly, if at all, among smaller, locally focused news organizations (Sullivan, 2010).

The news organizations' open API initiatives come at a time when news organizations in the developed world face a host of new challenges brought on by the digitization of information (for an overview, see Downie and Schudson, 2009; for additional examples, see Lewis, Kaufhold, and Lasorsa, 2010; McChesney and Pickard, 2011; Phillips et al., 2009; Singer, 2008, 2010; Singer et al., 2011). Historically, news organizations' R&D work was focused on the print product, or in the case of broadcast media, on improvements to audio-and-video delivery. In recent times, and with the fast pace of change associated with digital media, the focus of news organizations' R&D has shifted to online publishing (Boczkowski, 2004, 2011). Beyond merely dealing with the website, however, there are multiple platforms that news organizations now must consider: computers, mobiles, and tablet devices, in addition to emerging opportunities to

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<sup>1</sup> See “NPR launches open API: New programming tool enables digital media users to integrate and share NPR news content,” accessible via <http://www.npr.org/about/press/2008/071708.API.html>.

expand their reach across media—e.g., newspapers expanding into the realm of audio and video. As noted at the outset, even within a particular platform like mobile, there may be a number of operating systems to support. Thus, news organizations, which historically have under-invested in research and development because of their strong position in the market (see Picard and Brody, 1997), face a perilous situation: their survival in a shifting environment seems increasingly tied up in their ability to manage multiple platforms, devices, and channels of delivery—in effect, to invest in innovation—and yet their weakening market condition makes it that much harder to commit internal resources to innovation. What are they to do?

### *Research questions*

We argue that the emergence of open APIs at leading news organizations represents a shift toward an open innovation paradigm that may help address the R&D crisis facing the news industry. The purpose of this study is to examine four leading cases of this deployment: National Public Radio, the *New York Times*, the *Guardian*, and *USA Today*. These four were chosen because, as noted above, they are considered among the first and most prominent open API efforts to be undertaken by news organizations. While many other news organizations undoubtedly use closed APIs internally, these four organizations have made a clear step toward *open* APIs that facilitate the kind of interactions necessary for open innovation to occur. This study, exploratory and descriptive in nature, takes up three research questions as a way of developing an empirical baseline from which to begin theorizing about the impact of open innovation in the context of journalism:

- RQ1. What are the anticipated and realized benefits of open APIs for news organizations?
- RQ2. What are the relative challenges of open APIs for news organizations?
- RQ3. What are the future opportunities of open APIs in news organization?

## **METHOD**

To answer these research questions, we conducted qualitative interviews with at least one developer who led or continues to lead the deployment of open APIs at the respective four news organizations: National Public Radio, the *New York Times*, the *Guardian*, and *USA Today*. These interviews were conducted over a six-month period in 2010 and 2011. Some interviews were done in person and others via phone, typically for a duration of 45 minutes; they were recorded for transcription later. The resulting texts were analyzed by both authors in an open-coding fashion, allowing for key words and motifs to emerge organically, as is customary in qualitative textual analysis (Lindlof and Taylor, 2002). To answer the research questions, we watched for four themes in particular: (1) evidence of concepts of open innovation embedded in these open API initiatives; (2) discussion of news organizations' rationales for adopting open APIs; (3) the results of these efforts, for better or worse; and (4) indications about the future potential of open APIs in news organizations broadly.

## RESULTS

### *Sample profile*

Before detailing the findings from these interviews, we proceed first with a basic profile of open API use at these four news organizations. Although each has incorporated open APIs into their workflow, there are differences in the number of open APIs deployed and the overall time since open API development has begun at each news outlet.

- *National Public Radio*: NPR's open API includes audio from most NPR programs dating back to 1995 as well as text, images and other web-only content from NPR and NPR member stations. The archive consists of more than 250,000 stories.<sup>2</sup>

- *New York Times*: The *Times*, which began open API development in 2008, offers more than a dozen open APIs, ranging from news content to entertainment information (e.g., movie reviews) to data on politics and Congress. These APIs, unlike those offered by the *Guardian*, are designed for noncommercial use only, and do not include full-text articles, instead including links back to the *Times*' website.<sup>3</sup>

- *Guardian*: The *Guardian*'s content API gives access to more than a million articles from the past decade and beyond. The content can be used on external web or mobile applications with three tiered layers and three revenue models. The *Guardian* provides also specialized APIs such as the Politics API, specialized in content covering politics and elections in the UK.<sup>4</sup>

- *USA Today*: The latest of these organizations to join the open API domain—with its first offerings appearing in late 2010—*USA Today* now offers seven APIs: articles, bestselling books, book reviews, music reviews, movie reviews, snapshots (statistical graphics), and sports salaries. The articles API includes news stories back to 2004 but does not offer full-text access.<sup>5</sup>

### **Benefits of open APIs for news organizations**

This section examines the benefits of open APIs for news organizations. First, we will elaborate the impact of APIs on internal and external product development. Second, we will introduce the business strategies behind the open API initiatives and new ways to commercialize content through APIs. Third, we will provide insight into how news organizations benefit from open APIs by gaining traffic and leveraging their brand. Fourth, we will elaborate the impact of open APIs in building a community of developers, and the more sophisticated ways to track audience behavior through APIs.

### *Acceleration of internal and external product development*

The use of the open innovation paradigm in the form of open API initiatives has benefited both external and internal research development work in news organizations. With the open

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<sup>2</sup> See <http://www.npr.org/api/>.

<sup>3</sup> See <http://developer.nytimes.com/>.

<sup>4</sup> See <http://www.guardian.co.uk/open-platform>.

<sup>5</sup> See <http://developer.usatoday.com/>.

APIs, external developers—virtually anyone with the technical know-how—can experiment with the news organizations’ content and, for example, build web or tablet applications. This benefits the news organizations because they no longer have to experiment with everything themselves, instead allowing for the results of the external developers to find what does and does not work. This enables the development process to accelerate, as the news organizations draw on existing experiments as frameworks for their own exploration. Thus, the open APIs function like an external R&D lab for the organization. A key developer describes this development:

*So, there have been some partners who have built versions of apps and then our own technology team is just able to build stuff quickly because that framework is there. You don't have to know anything about databases. If you're a front-end developer, you don't have to work with the database guys or the Java developers. You can just start—if you're a Flash expert, you can just start getting to work. Then the collaborators and the partners have done some experimental work that's helped us see what's possible.*

Within the four news organizations examined for this study, the open APIs have led to experiments in which the external developers manage to build a new product by using the content and information in a fashion that the news organization wouldn't have thought of doing.

*In our sense, it's essentially free product development, right? I mean we've only got so many resources here. Why not leverage the crowd and see how they envision our content and how they mash it up? I think that's extremely interesting and a wonderful opportunity that an API gives you, to see what kind of product development occurs sort of organically.*

To cite one example, an external collaborator drew up the *Guardian's* Politics API, which covers information about politics and elections in the UK, and information in the *Guardian* Data Store to create a “voter power index.” The index assessed the importance of a single vote in a given region, and thus indicated whether voting there would make a difference in altering the political power structure. Open APIs thus hold potential for new products that may lend fresh perspective on the democratic purposes that are central to journalism's function.

Moreover, by tapping into the wisdom of the crowd in this fashion, news organizations can gauge the relative demand for existing content that could be recycled or repurposed—as in the case of USA Today's ongoing list of bestselling books:

*Is there a demand out there for our bestselling books beyond sort of the website where it's always lived? I mean, we're basically giving new life to this content, and we want to see if people out there bite and are interested in it.*

Open APIs also enable developers to build products for niche audiences—or something that can initially appear as a niche audience but later evolve into a bigger audience. This is an advantage for news organizations that have to focus on bringing products to mass markets rather than targeting marginal audiences. For example, a Google engineer developed an NPR application for the Android platform with his 20% time, which Google gives to all its employees for developing products according to their own interests. Also for NPR, an external collaborator built an audio player for the Unix platform, a marginal platform in terms of user volume. But there is demand within that niche group for the audio player on Unix, and a collaborator just needed the NPR open API to be able to build the product and satisfy that demand.

These examples indicate that open APIs foster product differentiation in news organizations' product portfolios—whether the products are owned by them or external collaborators. This is crucial given the fast pace of digitalization that news organizations are facing. With the help of open APIs, the external developers (aka collaborators) can customize the content within a framework that is useful to them. This is important because news consumers are growing accustomed to increasingly customized ways of gathering their news.

Furthermore, the external development initiatives can even show the way in internal development, as has happened for NPR. The first iPhone application for NPR content was launched by an external developer who was using NPR's API. The application was called NPR Addict, and it quickly became popular, with hundreds of thousands of users. Within NPR, the externally created application opened the eyes of the internal development, and accelerated NPR's own product development, leading NPR to build its own iPhone application. "But, in addition to that, it really captured our imagination that, 'Wow, if we don't do it, someone else is gonna do it. We'd better do it.'"

The news organizations embrace these experiments, and would like to see more of them. They feel that by releasing their content on open APIs, they are giving their content a new life. This leads to experiments, which, in best cases, result in innovation.

The use of open APIs also benefits the news organizations internally. The launch of an open API initiative is often tied to larger structural changes within the organization, such as retooling the content management system (CMS) and creating a systematic, organization-wide use of APIs. The API gives a formulaic and structured way to do product development; therefore, the API lets the development team focus on the user experience, so they don't need to spend their time on learning about different technological aspects or technological twists such as connecting databases to one another. This results in less need for in-house developer work, accelerates the development work, and ultimately saves money. For example, the *Guardian* was able to build an iPad app with its internal API for a fraction of the normal cost for an iPad app.

Inside news organizations, product development with APIs has increased collaboration across departmental boundaries. The API initiatives and the open platform approach overall leads to collaboration between the technology teams and editorial teams, which (in the best cases) has inspired further collaboration and cooperative development. For example, when the

UK Treasury released its COINS (Combined Online Information Systems) data<sup>6</sup>, providing details on UK government expenditures, the *Guardian* editorial team and the technology team together built a service to search the COINS database. At the *Guardian*, such API usage has accelerated the analysis of data, and helped the teams work more closely. A developer at the *Guardian* described this progress:

*So, for example, when the UK Treasury released the COINS data, we were able to work really, really quickly to—across the technology and the editorial teams. They came together to try and find out what was in there, what mattered, what needed to be surfaced, what user experience did we need to create so other people could access it. In the space of about four days, we had a really nice working model of something that you could use to search COINS database. That was because the technology and editorial teams came together.*

In NPR, the API has benefited operations at national headquarters, but it also has helped member stations that are using the station-level key of the NPR API. The station-level key gives member stations a broader access to the NPR content than the public API. The API is a better method for the member stations to work on the content, because it facilitates better transfer of content to the member station from NPR's main CMS. Member stations use the NPR API to publish content on their websites, and some of the stations are using the NPR API as a distribution channel for themselves.

At NPR, most of the API requests come internally, and therefore, most of the traffic that the API-driven applications draw comes from the NPR-built applications. This means that NPR is the biggest consumer of NPR-produced, API-facilitated content—a process that one developer described as “eating our own dog food.”

*Open business strategies: New ways to commercialize news as a product*

Business strategy is one of the main motivations for the news organizations to launch their open API initiatives. “We’re trying, especially these days,” said one developer, “to think about how to monetize our content.” Other developers were similarly direct:

*This is of commercial interest to us. We’re not doing it just because it was fun. We’re not doing it because it came out of some R&D project. We’re doing it because it’s for the benefit of the future of the business.*

The news organizations have identified strategies for gaining revenue from open APIs. There are basically two direct ways to gain direct revenue: First, by letting collaborators use their content for free, but expecting them to take the news organization’s advertising key with them. In the case of the *Guardian*, this means that when an external developer builds a mobile app on

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<sup>6</sup> See <http://www.guardian.co.uk/politics/coins-combined-online-information-system>.

the *Guardian* content through its API, the application presents advertising from the *Guardian* ad network, but the *Guardian* also allows developers to present their own ads. This is one option at the *Guardian*'s three-tiered model at the *Guardian* open API. The second method for revenue via open API-built products is to charge a licensing fee for the content. *USA Today* applies this method as one revenue opportunity, and also the *Guardian* provides the method in its three-tiered access model for API.

Apart from direct revenue streams in the form of advertising and licensing fees, the news organizations can find other, more indirect ways to strengthen the value of their product through an open business strategy. One of them is to drive traffic to their website through their open APIs. At the *New York Times*, the open API strategy is built around driving traffic to the *Times* website. When using the content delivered through the company's API, there are links back to *Times* content baked into the API, and the *Times* requires that the link be displayed. As a developer described this approach: "The *Times* has a great brand and great content, and the best way to get it to people and to get people coming back to our site is to get that content everywhere and to have eyeballs on it all the time." The *Guardian* uses a similar approach in its three-tiered business strategy: the news organization allows the collaborator to access the *Guardian* headlines, data, tags, and metadata, but not the body copy of the article. At this level, the developer can publish the *Guardian* headlines and metadata for free, and keep the advertising revenue.

At NPR, the (direct) business strategy behind the open APIs is to generate more traffic to the NPR content. The traffic can be monetized, as NPR can tack on a sponsorship at every request. The NPR page impressions are growing, and because most of the consumption comes from NPR and its affiliates, the content piped through APIs gets impressions on the NPR-driven platform; these page impressions, in turn, can drive banner-ad revenue from sponsorships.

Overall, these news organizations are generally open to customized partnerships with republishers. One tier in the *Guardian* strategy is to form customized partnerships, which allows for using *Guardian* content without the *Guardian* ads under certain conditions. In this tier, the revenue share is negotiated.

### *Leveraging the brand and generating traffic*

One example of an indirect business strategy is brand leveraging. The news organizations with open API initiatives have a strong view about how the unrestricted, boundless Web changes the nature of the news business. In this view, it is not enough to provide the best content only on your website; that content also needs to be spread across the Web, as audiences spend less and less time on any one destination site as they "snack" on content across many domains. Thus, the developers at these news organizations recognize the internet, rather than a single site, as their publishing platform, and want to see their content leveraged all across the Web. For these developers and their organizations, the introduction of open APIs is an important step in the process of circulating that content and thus making their brand more salient around the network.

*You start thinking, “Well, how can our brand become meaningful in the experiences that people are having wherever those experiences are at whatever time of day, in whatever application, on whatever device?” So, that’s where we came up with this kind of big, broad statement about weaving the Guardian into the fabric of the Internet. It was because it was a realization that we needed to be a part of the Internet and not just on the Internet.*

This is a radical shift for news organizations, as they are used to controlling their content on their own platforms, even setting up paywalls and related means of guarding its use. However, in the digital era, news organizations have less, if any, control over the infrastructure, the Internet. Letting go of control creates a new role for the news organization: rather than being passive information providers, they claim a stronger, more active role in enabling users to reuse, interact with and experiment with their content—the very intellectual property of the news organization.

*The whole [open API initiative] is really about trying to turn us from a news and information site into a news and information platform. So we want to be more than just a website where you come and get your news. We have all this great news and information, and we really want to treat those as building blocks for other things across the web and really ... help The Times become a part of the web and not just a discrete site where you go to get your news.*

These news organizations see their open API initiatives as central to this process of embedding their content across the Web and within the framework of how the Web works. The purpose is to build the brand and drive exposure. For example, the *Guardian*’s “Powered by the Guardian” logo, attached to content shared via the API, can be found across a number of domains; not only does this enhance branding and traffic, but because that API comes with Guardian-driven advertising, there are built-in opportunities for direct revenue. Altogether, this shift in thinking has begun to change the way these news organizations see their (potential) audience: from being simply visitors to the news organization’s domain, to a wider group of users spread beyond those boundaries.

The news organizations see open API initiatives as an inevitable path in publishing. However contradictory it may sound, they understand this process of opening up as a way of helping them to wield *greater* control over the content. As one developer described it:

*We don’t want [our content] to necessarily be free. We want people to use it and attribute it and do all the good stuff with it. You treat it respectably. The API actually gives you an opportunity to control that in some ways that the web site doesn’t, and in fact the people who use the API have more respect for it anyways. I mean, they’re authorizing that they are gonna abide by the terms of use, they’re developers, they*

*understand the world in which that kind of content sharing is. But people who just go to [our website], for example, copy and paste, they don't necessarily have the same respect, and no one can track it in the same way, and no one can shut 'em down in the same way.*

As the audience footprint spreads across the Web through the use of open APIs, the news organizations see APIs as benefiting their knowledge of consumer habits. The use of open APIs give news organizations useful metrics, identifying *who* is using the content, *how* they are using it, and *how often* they are using it. With API-based interfaces, news organizations can use this better tracking of user behavior to create correlations across multiple platforms about what the user is doing based on impressions via particular platforms. This information can lead to a more efficient ways of delivering content to end-users.

*Ecosystem effect: Creating a community of developers*

The open API initiatives have attracted a community of developers around the news organizations. The community often begins with a handful of developers interested in the news organization's content, and grows to include a larger group of developers. The *Guardian* has 3,000 developers around its Open Platform, which includes its open API initiatives and its Data Store. As they learn to communicate and collaborate with developers, news organizations are finding opportunities for partnerships and business opportunities amid this development ecosystem.

*And we've gotten a lot of people reach out to us and say, "We want to do business with you because we know you have an API, we know that an integration would be very easy because an API makes that integration easy, and we know that NPR content is awesome, so let's do a deal." If we didn't have the API, some of these people would still approach us because they love NPR's content, but they might not know how it's gonna happen. So, if you know there's an API and you like the content, let's talk. So there have been a lot of business-development opportunities as a result of it.*

The open APIs give developers an opportunity to see what kind of content is available, and imagine the ways they might use that content, without having to first approach the news organization to find out more information. In this way, the open API initiatives become a "good conversation starter" and a baseline for further collaboration. The open API initiatives have also made collaboration with more established companies smoother, because the news organizations can point them to the API rather than going through a complicated and time-consuming content-sharing process, one request at a time.

*[Having an open API has] allowed us to really have more interesting discussions with other tech companies that maybe we wouldn't have if we didn't have these APIs.*

*So, we're in constant contact with the Yahoo developer network, and with the people at Google, and a lot of startups in the city. And so, you know, in a way it's given us access to their mindshare and to talk a lot about like, "What are they doing and what's coming with them?" So, I think it really helps keep us on the cutting edge of stuff so that we know what's going on and how we can pull some of the interesting things that they're doing onto our site. That's been very helpful also just to open the lines of communication. It's good street cred.*

Overall, the interest from the developer community and other companies has slightly surprised the news organizations. The interviewees said that, amid the surplus of user-generated content online, there is considerable demand among web developers for high-quality, professional content of the kind produced by leading news outlets.

*The Guardian is a particularly strong brand in terms of its journalism. So, I think a lot of the uptake is because ... a lot of developers have wanted to actually use high-quality content in their apps, and that is just a different thing that very few organizations that have an open strategy have to offer. It is usually a specific technology service. Amazon offers hosting, and that is just so different from what we are doing, that it puts us in a unique position and desirable to be able to publish Guardian content directly in your app and in your website.*

Some of the news organizations, particularly the *Guardian* and *New York Times*, have nourished their network of developers by organizing events—e.g., so-called “hack days”<sup>7</sup>—to bring together developers and journalists, in a single physical space, to work together on projects.

The aggregate result of such efforts is greater awareness running in both directions: the news organizations' developers are better in touch with external trends and are more fully networked with the wider development community; and the web development community, in turn, has become more attuned to the benefits of partnering with news organizations and their content. This creates a virtuous circle of mutually reinforcing benefits flowing between and among the news and technology organizations alike.

### **Navigating the challenges of open APIs**

The developers were emphatic that, on balance, the introduction of open APIs at news organizations has been a positive step—indeed, one that in many cases has exceeded their expectations. Nevertheless, just as there are internal and external benefits associated with open APIs, the news organizations have also experienced internal and external challenges through this

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As one example, see <http://www.nytimes.com/marketing/timesopen/hackday.html>.

process—e.g., from internal struggles to secure buy-in from corporate managers to the external difficulties of ceding a degree of control over content and its use by outsiders.

Internally, the technological challenges of developing and developing open APIs were relatively minimal. In most cases, APIs in some form had been used previously, and therefore transitioning from closed to open APIs was the basic technical undertaking. By contrast, it was the cultural mind-set of traditional news organizations that proved a more significant hurdle, and which generally took more time and creativity for the developers to overcome. While it's true that some top-level managers were more open to the API initiatives than others, the trend we found was that these developers and others from the information technology (IT) wing of the news organizations had to make a strong pitch for internal acceptance. This required reaching up vertically to gain the buy-in of corporate leaders, and, to a lesser extent, reaching across horizontally to convince journalists in the newsroom. Not surprisingly, given the ongoing debates about whether news content should be freely available online, internal stakeholders were skeptical about the nature of making anything “open.”

*We made the push. We sold it internally. There was some apprehension, some wonder what you're talking about, “Why are we gonna give away the farm for free? This is our baby. We're giving away the content.” Our argument was, “The content is on the website. Anyone can come and scrape it. Anyone can capture a stream. The content is out there. It's free anyways.” (emphasis added)*

In a similar vein, another developer described how his team “sort of de-emphasized the open side of things” in their discussions with executives, explaining to them that the “open part” was simply a “byproduct,” an unavoidable factor of having a public API for purposes of better R&D—“speed-to-market around product development”—and, therefore, a better bottom line in the future.

*And, frankly, although I was very excited about the open side of things, as were many of us down in IT, we didn't want to go into these meetings talking too much about going open, because [it's a sensitive topic] ... particularly for some of our more traditional executives that are at high levels, talking about paid content models and now charging for content. ... We didn't want to confuse them into thinking that just because you have an open API means that you are giving away your content.*

Ultimately, developers found that they could gain acceptance among internal stakeholders by framing “open” initiatives in two ways: in one sense, as “Business Development 2.0,” as one developer put it; and, in ironic twist, as a means of maintaining control over content. The first pitch appealed to journalism-as-a-business, with its desire for monetization; the second appealed to journalism-as-a-profession, with its desire for control as a natural instinct of professionalism.

*That was basically our sales pitch, that, “This content is wide open anyways. Let’s control it, and let’s be able to track it and shut people down if they’re doing evil things, and whatever else,” and eventually people came around and we opened it.*

Another internal difficulty, and one that also has superseded technological concerns, was the question of intellectual property rights. In most cases, the licensing rights that news organizations have negotiated—e.g., for the use of freelance photography—have been done with print or web publishing in mind; those rights are not optimized for the database-driven, multi-use nature of APIs and the variety of applications that emerge from them. These considerations have factored into determining whether news organizations can (and should) charge licensing fees, or whether content should support commercial applications created by external developers.

*There are certain things where it’s very fuzzy, like images is one where there are lots of different rules depending on what agency we get it from, whether it’s internal and a staff writer or a staff photographer, or if it’s internal and a freelancer. And so for those things where we aren’t completely sure, we just leave it out. We don’t want to, I don’t know, step over any lines.*

At one organization, the navigation of legal rights created a back-and-forth ping-pong of meetings that hampered the deployment of the open API initiative far more than any technical problems. “[W]e had a long series of meetings about what we’re capable of legally, technically, and what business drivers there were to withhold or to present all this material publicly. So the challenge became learning about all of those impediments, trying to wash away as many as we can, and, for those that remained, building technology into the system ... to support those things.” The particular challenge, as this developer noted, was that “the legal team doesn’t know anything about APIs, so it’s an education process.”

While the technological issues have generally been easier than cultural and legal ones, these developers nevertheless have found difficulty in synchronizing the structure of APIs (variable-driven databases) with the atomic unit of journalism (narrative accounts). Whereas the latter are intended for linear (human) consumption, the former are designed for nonlinear (machine-driven) engagement. For example, in one case a developer found that to develop a database of his newspaper’s movie reviews, it would require “de-normalizing” the data to pull apart archived stories that would include several reviews within a single published article. Having those review “briefs” couched in a single article made sense at the time of publication, but that logic gets pulled apart in a longitudinal database. A related challenge was that while much of journalism implies one-off coverage of events as they arise, databases require continual updating over time—and so the very rhythm of newswork seems out of sync with APIs.

*We have to be careful about opening an API if there’s no commitment to maintaining that data and massaging that data and enriching it. ... [Before releasing an API,] one*

*of the questions there is making sure that we don't go through the IT effort of writing a web service around that **if there's not that editorial commitment to maintain that data.***" (emphasis added)

Looking externally, perhaps the primary challenge is preparing for the inevitable uses of the API that will not be to the liking of the news organization—and yet must be negotiated carefully, so as to maintain a consistent and close connection with the development community.

*We do worry about what people could do, and I think we're just not at the scale where people are going to abuse us yet. That day will come. ... It will be hard to deal with. There will be someone who's going to be very noisy, who's going to do something with our content that makes us very, very uncomfortable and we're going to have to decide, "Do we turn off their [API] key or do we let it go and let it be?" Our default is to let it go at the moment. We haven't seen anyone do anything that we felt was damaging to our brand.*

Overall, the looming challenge for news organizations is figuring out which is the most successful strategy in a complex and fast-changing environment. Much of this involves negotiating a line between openness and control, between free and paid licensing, between what's permissible under copyright law and what's not. At the moment, there are no tidy answers.

## DISCUSSION AND CONCLUSION

The basic principle of open innovation, the flow of ideas and knowledge outbound from the organization and inbound to the company, is manifest in the news organizations' open API initiatives in the following ways: the news organizations make their core product—news or (more broadly) content—available for anyone to use. This is the outbound flow. As a result, they get to see their content take on a "new life," as it were, in various applications created by external developers, through innovations in presenting and publishing that content. This process of observing and learning from the external community comes back to benefit the internal research and development (R&D) work being conducted internally within the news organization—thus providing the inbound flow.

The news organizations have benefited from applying the open innovation paradigm in the form of open APIs in a variety of ways. The open APIs have taken a role of an external R&D lab, in which the external collaborators use the content made available by the news organization and develop applications based on the content. This leads to experiments and forms of exploration that wouldn't (and couldn't) be done by the news organizations alone. The result is a three-way boon for the news organizations: First, they don't have to experiment with everything

with their own R&D initiatives in order to find out the best way to publish and present their content—and this saves resources. Second, the external collaborators can build products that better reach audiences, thus leveraging the journalistic content to “more eyeballs” (as developers put it) and resulting in increased traffic and revenue for the news organization. Third, the external collaborators can use the open API to serve niche audiences by building products that the news organization would otherwise have overlooked because the niche is too small to justify internal R&D resources.

Open APIs have also brought new revenue opportunities to news organizations. The strongest revenue source is increased advertising revenue, as the content is spread on the Web through numerous applications based on open APIs deliving the news organization’s advertising network, or through increased traffic via hyperlinks from the applications. Some news organizations charge licensing fees for their APIs, and some of them form partnerships with their open API collaborators to share the advertising revenue. The news organizations envision a number of nascent business opportunities in their open API initiatives. Open APIs also allow improved behavioral tracking of the consumers, which can benefit news organizations in creating more customized products.

The news organizations examined here see their open API initiatives as a part of their wider strategy, in which they want to shift from being a passive news site to a more active platform, one that people can interact with more fully. They want to be, as one developer put it, “woven into the fabric of the Web.” They want to learn (as another developer described it) to “act open.” Thus, by using open APIs, the news organizations transition from simply being *on* the Web to being *of* the Web. They gain greater brand leverage, as their branded content is spread more widely across the Web. Additionally, they are creating communities of developers around their content and open platforms, paving the way for mutually beneficial partnership opportunities.

While the benefits are many, there are clear challenges as well, beginning with the internal difficulties of getting buy-in from top management, which generally is nervous about “giving away” content in any fashion, and sorting out the fuzzy legal implications associated with rights management in database-driven applications. There are also structural and technical challenges baked into the nature of traditional news gathering and storytelling, but clearly it’s the cultural reticence of news organizations that will be the greatest impediment to implementing open APIs.

Ultimately, for all the benefits they may offer, open APIs have not yet been transformational to news organizations, and to date have not been widely deployed outside of a cluster of major national and international news outlets. Nevertheless, the findings in this study point toward a platform business model described by Chesbrough (2011), one in which value and revenue are co-created with collaborators in a variety of ways. As the news industry struggles to find value and revenue in the digital environment, the open innovation paradigm may well offer a way forward.

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