

## Computational Journalism and the Emergence of News Platforms

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In June 2014 the Coral Project launched with a \$3.9M grant from the Knight Foundation. An ambitious effort to re-imagine and create an open-source community platform, the goal was to enable publishers both large and small to cultivate and tap into their online communities, to support and empower contributors, and to provide for a productive and civic space for readers. Some might find this a curious endeavor given that analogous community platform software like Disqus or Livefyre already exists and are sold by such vendors to meet market needs. But what is particularly interesting and perhaps even paradigm shifting about the Coral Project is that it represents a collaboration between the *New York Times*, the *Washington Post*, and Knight-Mozilla OpenNews. It is a platform tailor-made for news publishers and the types of community needs that emerge in that context, with their interests and values designed into the core.

This chapter examines this shift in how news organizations are increasingly designing and creating their own tools, products, and even entire platforms through the lens of computational journalism. Current industry darlings like BuzzFeed, Vox Media, and Quartz, as well as incumbents like the *New York Times* are now leveraging technology and computing to create platforms that produce a competitive advantage by enabling scale and reducing marginal costs in the gathering, production, and dissemination of their content. I'll explore how computational journalism and thinking factors into this shift, expound on examples of platforms that are emerging in the industry, and discuss the implications of platforms for media competition, scale, and independence.

### Computational Journalism

In this section, I motivate the emergence of news platforms by looking at antecedent concepts in computational journalism.

Recently I have begun defining computational journalism (CJ) as “Finding and telling news stories, with, by, or about algorithms,” in an attempt to broaden the scope of the term to encompass the idea that journalism ought also to orient towards investigating and reporting about computation (Diakopoulos, 2015). But perhaps the most core, distinctive aspect of computational journalism is its focus on tooling, on designing “practices or services built around computational tools in the service of journalistic ends” (Coddington, 2015: 6). Similar framings of computational journalism as tool oriented derive from Cohen et al. (2011) and from my own early writing in conceiving of the field as the application of computing and computational thinking to enable journalistic tasks such as information gathering, organization and sensemaking, storytelling, and dissemination (Diakopoulos, 2010). Computational journalism largely inherits this focus from one of its parent fields – computer science – whose culture underscores the importance of engineering and the production of novel and inventive computational artifacts. Anderson (2013) points out the early focus on digital tooling in computational journalism research and the concomitant loss of a broader sociological approach to the field.

But it is precisely this focus on computational tools that help to solve real journalistic tasks that make it so appealing to the profession and to industry. New ways of producing quality news at greater speed and at lower cost are some of the fundamental “promises” of computational journalism as articulated by Flew et al. (2012). Yet the speed and cost savings do not always materialize. Karlson and Stavelin (Karlsen & Stavelin, 2014) studied computational journalism in Norwegian newsrooms and found that contrary to the notion that it would be time-saving, it was rather an activity that required a heavy time investment (and thus human resource costs). These two views are not irreconcilable however. Recouping a time investment into a computational journalism endeavor can be accomplished through a process of abstraction that results in re-usable pieces or even a platform around the core idea.

A key concept here, also important to definitions of computational journalism, is *computational thinking*. Jeannette Wing, the progenitor of the idea (2006) defines it as “The thought processes involved in formulating problems and their solutions so that the solutions are represented in a form that can be effectively carried out by an information-processing agent.” (Wing, 2010). Relevant components of computational thinking include *abstraction* such as decomposition of problems, modeling, aggregation, and parameterization, *modularization*, and *automation* via algorithms to enable *scale*. Moving away from individual stories via a process of abstraction, parameterization, and modularization is what makes computational journalism pay as an investment. Importantly, computational thinking is distinctly not about programming per se, though programming is often the operationalization of that thinking into code. Code then becomes reusable and the marginal costs of producing similar but different content from the same code-base are minimal. Creating platforms out of reusable code is the key economic benefit to computational journalism in the long term.

In addition to a general tool-orientation, and an inclination towards computational thinking, other cultural distinctions in computational journalism also factor in to the emergence of news platforms. Coddington (2015) clarified nuances relating to the definitions of Computer-Assisted Reporting (CAR), Data-Driven Journalism (DDJ), and Computational Journalism (CJ) by delineating differences along dimensions including professional orientation, openness, epistemology, and vision of the public. He concluded that CAR reflects a basis in social science methods and a public-affairs orientation, whereas DDJ is marked by a different attitude towards story and to the role of the public, and CJ is rooted in applications of automation to information. The cultural underpinnings of DDJ and CJ are marked by a positive orientation towards open-source programming that privileges the creation of productive artifacts over one-off stories (Lewis & Usher, 2013). And the epistemological differences between CAR and DDJ or CJ are further underscored by Parasie’s (2015) analysis of journalistic revelations in an investigation by the Center for Investigative Reporting which illuminated the tensions between the hypothesis-driven practice of CAR and the open attitude towards making data accessible of DDJ. Here we see a cultural shift that creates new opportunities for *data platforms* and the idea of news apps that can act as data appliances rather than specific story devices. Aitamurto and Lewis (Aitamurto & Lewis, 2013) have explored this more specifically in terms of the role of open APIs (Application Programming Interfaces) in news organizations. Such APIs essentially serve as content platforms on top of which other applications, services, and R&D innovation can take place.

## What are Platforms?

The use of the term “platform” is sometimes vague and equivocal depending on its context. What exactly is the difference between a “product platform” and a “technology platform”, a “brand platform” and a “customer platform”? Gillespie (2010) shrewdly points out that the agnosticism to end-use and the semantic adaptability of the word is what makes it such a powerful appeal for technology companies to simultaneously communicate to different legal, user, and commercial constituencies. The term “platform” connotes that some activity will be facilitated and take place as a result. Despite the semantic flexibility of the term when used by businesses for various audiences, others have sought to pin the term down more precisely. Kristjansson et al. (2004) analyzed a range of definitions from the product development literature to derive that platforms are “a collection of core assets that are reused to achieve a competitive advantage.” Cusumano (2010) later posited that platforms are “a foundation or base of common components around which a company might build a series of related products.” Key to both of these definitions is the idea of *reuse* of components, which is precisely what’s enabled by computational thinking concepts like abstraction, modularization, and parameterization. Computational journalism is thus conceptually primed to create platforms and to contribute reusable core technology assets to news organizations looking for a competitive advantage.

Cusumano (2011) enumerates some of the dimensions along which platforms vary, including the degree of openness of the interfaces to the platform, the degree of modularity, and the ease with which other organizations can leverage features of the platform to innovate. Platforms can be considered either internal product platforms, or external industry platforms (Cusumano, 2010). Internal product platforms are those reusable tools that enable an organization to work more efficiently in their production processes. For news organizations this might include everything from publishing tools, to information gathering and management systems, to analytics dashboards. An example of an internal product platform would be a homegrown Content-Management System (CMS) that’s reconfigurable to produce different branded content sites under the umbrella organization’s banner (e.g. Vox Media, or Huffington Post). On the other hand we have industry-wide platforms that enable third party external organizations to build on top of the platform and create new forms of value. The more complementors there are in the platform ecosystem, the greater the value of the platform. An example of an industry content platform would be the early days of Twitter, when their APIs provided ample data and access for a burgeoning 3<sup>rd</sup> party apps ecosystem. Open APIs and plugin architectures are typical methods for creating industry platforms.

A third type of platform that is perhaps peculiar to the media industry is what I would call a *content platform*. Although still used internally to an organization, unlike internal product platforms, content platforms are not about component reuse but rather about streamlining the production of content through modularization, standardization, and parameterization of content in various ways. While a story is a single unitary output (or perhaps a series of related outputs), a platform for stories systematizes things like format, structure, style, and interaction. In essence flexibility is traded off for efficiency in producing sets of content that are structurally similar yet perceptually and semantically distinct. In this sense, the product here *is* the content, the output of the use of a tool by a knowledgeable operator, rather than the tool itself. The distinction between a tool and a platform blur somewhat here, but if you subscribe to the idea that content is the

product, then authoring tools can certainly be considered the platform for the creation of that content. Just like other platforms, content platforms can be operated internally to an organization, or be built as industry platforms.

## **Platform Developments**

Let's examine several specific examples of various types of platforms that are currently emerging in journalism to address tasks as wide ranging as collecting, organizing and making sense of, presenting, and disseminating news information.

The Content Management System (CMS) is perhaps the quintessential example of a content platform, and is often the locus for struggle as newsrooms evolve into pure digital organizations (Rodgers, 2015). Vox Media often touts its CMS, dubbed "Chorus", as one of its key assets. As Trei Brundrett writes on the Vox Product blog, "Unlike many media companies that delegated the web publishing problem to the IT department, we built a platform from the ground up by iterating with bloggers who knew how to tell stories and build communities on the web." (Brundrett, 2014). The Chorus CMS is used to organize and systematize the content production process and is used as the backend not only for Vox.com, but also for Vox Media's other outlets, including SB Nation, The Verge, and Polygon. The repurposability of the platform allows the organization to create different branded experiences rapidly for niche audiences. In a bid to generalize its use further, in addition to the internal use of the platform, Vox is also experimenting with making Chorus available to external actors – advertisers – interested in creating native advertising content (Barr, 2015). Other extensions to Chorus are designed to meet specific news publisher needs. For instance, the Syllabus platform was inspired by a lack of products in the marketplace that could effectively be used for live blogging of events with large traffic (Reeder, 2012).

In addition to its CMS systems, which are proprietary platforms, Vox Media has periodically also open-sourced content platforms, including everything from choropleth mapping tools, to meme generating interfaces, and quiz generators (Victor, 2014; MacWilliam, 2015; Lai, 2014). Quartz launched an open-source tool for creating simple graphics called Chartbuilder (Yanofsky, 2013), which has been taken up by other outlets like NPR, the Wall Street Journal, and the New Yorker. The New York Times has its own chart creation platform that is used internally to the organization called Mr. Chartmaker (Aisch, 2015). Such content platforms are about efficiency in content production. They take easily articulable templates of content: the map, the chart, the image meme, the quiz, and factor out design commonalities so that the authoring process can be systematized and potentially even carried out by less tech-savvy journalists. Tricky decisions like how to make the output content amenable to mobile devices or social media are handled by designers and developers that think through the abstract problem, solve it once, and bake that solution into code. The efficiency boost increases the amount of content that can be produced, speeds-up such output in a deadline situation, and enables less digitally skilled content creators to be productive.

Another area where content platforms have grown substantially is in what is often termed "robot" journalism—the use of automation in the production of written news content. Automated Insights is a company that has been successful in selling the use of their platform to news

organizations like the Associated Press, which in 2015 is set to produce and publish 3000 earnings report articles per quarter written automatically using structured financial data (Kotecki, 2015). At the *LA Times*, the Homicide report used algorithmic reporting tools to produce short posts for the homicide blog as early as 2010 (Young & Hermida, 2015). This code was drawn from an even earlier project called Mapping LA and has since also been repurposed to write tailored posts about earthquakes in California. Essentially, internal code has been generalized and used in various different editorial products and domains.

Journalistic sensemaking of data and documents is also benefitting from new platforms being built that systematize analytic processes. If the result of this standardization is more content creation these systems can also be considered content platforms. An example of this is the Story Discovery Engine (Broussard 2014) which is a reporting tool that generates data visualizations of education data in Philadelphia, PA as a mechanism to tip investigative journalists to areas where there are juicy stories to be reported. While it's designed to solve a problem on a specific beat and in a specific locality, the underlying model and visualization could be applied to other beats or jurisdictions given the availability of appropriate data. As Broussard writes, "Any newsroom can take the software, analyze local data, and generate dozens of original investigative stories that matter to the newsroom's specific audience." (Broussard, 2014: 11). Another effort along these lines, but oriented towards large investigative document analyses is the Overview project (Brehmer et al. 2014). As a tool Overview offers the ability to cluster documents and visualize those clusters. But as a platform, Overview allows for others to build their *own* visualizations that plug into the underlying document storage and analytics, thus providing for a lot more flexibility and adaptability to the needs of different kinds of investigations. Another example of a sensemaking platform is the DocumentCloud project, which serves as a repository for collecting and annotating documents. The documents become a substrate for investigative journalism work that can be built upon using the API.

News organizations are also building sensemaking tools to facilitate journalism that is less directly tied to content creation. The BBC has developed a platform called Datastringer that can be set up by ostensibly non-coding journalists to monitor a dynamic dataset over time (e.g. campaign contributions, or crime statistics). Calculations can be configured on the monitored dataset and triggers then send alert emails to journalists when interesting patterns are observed by the algorithms (Shearer et al. 2014). In data journalism there is much interest in crowdsourcing as a technique to help journalists make sense of large amounts of documents or data (Appelgren & Nygren, 2014). Hive, a journalistic platform built by the *New York Times* has been built to facilitate such crowdsourcing projects (Ellis, 2014). Both Datastringer and Hive are platforms insofar as they are both open-source projects and can be built upon by others, yet there is little evidence that anyone has done so. This raises an interesting challenge for platform creation by news organizations: it's not enough to simply make a project open source. These platforms need to be cultivated as such, with ongoing resources and community development to maintain interest and momentum.

How content is disseminated—that is, the ways in which content finds its audience—is another area of platform development. Social media networking platforms like Facebook and Twitter now drive substantial amounts of traffic to content of all sorts, including news content. As a result, news organizations are developing their own data-driven content optimization platforms

that seek to enhance the reach of their content. For instance, BuzzFeed is developing a tool they call Pound (Nguyen et al. 2015) which is helping them to study how their content diffuses across social networks. They want to use it to drive traffic as much as to study and understand the content they are creating so that they can iterate on and tailor their content to make it maximally appealing (and shareable) to their audiences. Velocity is another platform in this category produced by Mashable. It ingests large amounts of data about how content is spreading on social media and then attempts to predict when something is about to go viral. Recognizing the value of content virality prediction, the company began opening up the platform to advertising and marketing agencies in mid 2014 (Anon, 2014). So in one case, Pound, we see an internal platform, but in the other case, Velocity, we see the inklings of what might shift from its beginning as an internal platform to something that is generalizable and valuable in other content production contexts.

## Discussion

In this chapter I have suggested that certain conceptual antecedents in computational journalism are undergirding shifts in the news industry towards the development of platforms. While not a systematic sampling of platforms that have been created by news organization, the examples I describe above suggest that much of this development is squarely targeted at content. The business of media is media, whether produced by people or with new technologically enhanced tools. But we also see little development of true industry platforms that are used broadly across multiple organizations. While there are initial stirrings of platforms like Velocity being used (and sold) outside of their initial design-context, and there is the promise of the Coral project which may eventually materialize, most news industry platforms are still only used internally. Because of a focus on content and content differentiation, platforms and tools that enable more efficient and scalable creation of content are a key competitive advantage when competing in the news industry. Take a tool like Mr. Chartmaker, which the *New York Times* uses as a content platform for quickly creating charts to use on The Upshot. If this was made open source, or even if it was sold, it might erode the distinctiveness of the Times' chart content. Tools and platforms are thus mechanisms to enable product / content differentiation.

The news industry needs to develop better mechanisms and models to leverage the internal tools it is creating into broader externally-oriented platforms that third parties will build on. I can think of at least three strategies they might pursue: community development, cross-industry non-content products, and cultural re-orientation.

Firstly, to build but also to launch a successful platform involves cultivating communities around the open source tools and platforms that are proffered to the market. Without leadership and ongoing resources to tend to those projects, others may not sense that they are sustainable or worthwhile enough to also invest in. There ought to be a palpable feeling that a platform is stable and supported by the originating organization.

Secondly, the industry should more seriously consider how to take tools that it uses for content production internally and find other information and knowledge domains where such tools also have value (e.g. education, legal services, corporate communications). Companies like Automated Insights sell their automated writing software into the news industry. But a

homegrown automated content production platform, benefitting from the knowledge and experiences of professional content creators, could just as well be developed internally to a news organization and sold into other markets like business analytics, or government and sales reports. Robot journalism, including things like news bots that seek to disseminate information on social networks is an area ripe for a content focused industry to leverage deep knowledge of effective communication into more broadly applicable automation platforms.

A third strategy would involve more of a cultural shift and adoption of an alternative mindset, from the CMS mentality of “this is the platform that helps *us* publish” to the idea of “this is a platform that helps *you* publish.” We see this cultural shift already emerging in DDJ and CJ projects that are more open to user contribution and see the role of the public in a different light. Facebook and Twitter can be seen essentially as CMS platforms that enable the public to publish everything from status updates to photos and videos. I opened this chapter by introducing the Coral project, which is taking an initial step in this direction, by re-thinking how to help the “audience” to publish their content in a way that integrates with publishers’ sites. If news organizations can see themselves as facilitators for the publication of content by the broader public in a way that is still in line with professional quality expectations, they stand a chance of becoming, essentially, the *platform for democracy*.

The potential economic advantages and new revenue streams afforded by successful platforms would of course be helpful to news organizations’ financial viability. But what’s really at stake here is the capacity to create platforms that are deeply interwoven with journalistic values. The liminal press that has proliferated as a result of the popularity of news apps and recommendation systems is sometimes crafted in a vacuum without any explicit journalistic values or understanding of public or civic media (Ananny & Crawford, 2015). Philip Napoli points out that social media platforms like Twitter and Facebook do not come from institutional origins in which providing for the news and information needs of communities were foundational (2015).

Yet such platforms have become absolutely essential to the dissemination of content, accounting for substantial traffic flows to news sites. As a result, corporate editorial decisions, algorithmic or otherwise, dictate the legitimacy of speech, the application of selective censorship, and the relevance of copyright and fair use laws (Ball, 2014; Ragusea, 2015). Topics like medical marijuana (Flamm, 2015) or sex education (Madison 2015), may trigger algorithmic censors that increase the friction in making such important issues more widely visible. Emily Bell has argued that such platforms have commercial interests that are in conflict with those of journalism and, as a result, news organizations ought to work towards creating its own platforms (Bell, 2015). Platforms are power and the owner of the platform sets the ground rules for whatever the platform does, including not only dissemination, but also collection, making sense of, and presenting content. If the goal is to maintain a media environment with public interest motives like transparency, diversity, and an approach to free speech that doesn’t unduly privilege corporatism, then news organizations might be well-served in the long run if they became more cognizant of their ability to embed their own organizational and institutional values into technological developments that become widely used platforms.

## Further Reading

David Weinberger's *The Rise, Fall, and Possible Rise of Open News Platforms* provides a closer look particularly at the role of APIs within news organizations, and includes interviews with industry insiders at NPR, The Guardian, and the New York Times. Jonathan Stray has also written thoughtfully about the functions of journalism that are still waiting to be productized and platformized in *Take two steps back from journalism: What are the editorial products we're not building?* Some of my own earlier writing also attempts to connect approaches to journalism with computational thinking and what that means for innovation in the Tow-Knight report *Cultivating the Landscape of Innovation in Computational Journalism*.

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