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From Mr. and Mrs. Outlier To Central Tendencies: Computational journalism and crime reporting at the Los Angeles Times

Abstract

This study examines the impact of computational journalism on the creation and dissemination of crime news. Computational journalism refers to forms of algorithmic, social scientific, and mathematical processes and systems for the production of news. It is one of a series of technological developments that have shaped journalistic work and builds on techniques of computer-assisted reporting and the use of social science tools in journalism. This paper uses the Los Angeles Times' Homicide Report and its Data Desk as a case study to explore how technological adaptation occurred in this newsroom in the early twenty-first century. Our findings suggest that computational thinking and techniques emerged in a (dis)continuous evolution of organizational norms, practices, content, identities, and technologies that interdependently led to new products. Computational journalism emerges from an earlier and still ongoing turn to digital within broader organizational, technological, and social contexts. We place this finding in the local, situated context of the Homicide Report, one of the first crime news blogs to adopt computational journalism in North America.

KEYWORDS algorithm; computational journalism; crime reporting; data; homicide; journalism; Los Angeles Times

Introduction

Computational journalism tends to be represented as one of a series of digital antidotes to the challenges facing mainstream journalism. Its proponents find possibility in the form's promise, from investigative depth, innovation, and increased audience engagement, to its ability to reinvent journalism for the twenty-first century in a way that empowers journalists for a more complicated information environment (Flew et al. 2012; Gynnild 2013; Karlsen and Stavelin 2013; Powers 2012). While many have examined the potential of computational journalism, a more site-specific and local understanding of how it is developing within specialized news genres is an important and underdeveloped area of study. Boczkowski's (2004) research on the transition of print to online newspapers convincingly focused on daily newspapers in the 1980s and 1990s in order to understand the complexity of how technological change combines with and emerges out of existing norms, routines, relationships, and social and material contexts. By approaching newsroom technological change through an understanding of the adoption

process in specific local contexts, scholars can discern how digital media both constitute and are constituted by practice and innovation.

This paper examines how the Homicide Report, part of the Data Desk at the Los Angeles Times, adapted new technologies and different approaches to computational journalism as one of the first interactive mainstream media database/map of homicides in North America. The Data Desk is a team of reporters and Web developers at the L.A. Times' headquarters in downtown Los Angeles. We argue that the database and map were the result of newsroom practices combined with a new technology that started a relatively (dis)continuous evolution of organizational practices, content, identities, and tools that interdependently led to a new product. Paradoxically, this new product differs materially in its construction of the role of the crime journalist originally envisioned by the Homicide Report's founder. The study offers generalizable tendencies for understanding the technological adoption of computational thinking and techniques in journalism. Computational journalism at the L.A. Times can be understood as part of a much earlier and yet-ongoing turn to digital within journalism, framed within broader organizational, technological, and social contexts.

Literature Review

The emerging computational journalism literature largely frames its contribution within the potential for news production and journalism as a competitive and transformational tool for the industry. This approach is not a surprise, given the tendency of journalism professors and scholars to have originated from and/or be linked to the profession. Zelizer (2004) identified a similar bias towards pro industry-centric analyses of journalism education in her study of how journalism educators approach curriculum development. She suggests that they tend to focus on reinvention of the profession as opposed to critical analysis of the educational and journalism context. Similarly, Anderson (2013, 1007) critiques the technological "rise and fall narrative" emerging from the computational literature as related to its early stage of development, noting what he calls the "internalist" bent of the genre in general. He argues that the computer science literature on computational journalism, too, is focused on prescription, such that it is largely about "building things" through technology as opposed to analysis of larger structural, cultural, and sociological questions (1008).

Anderson's analysis of the literature includes prescriptions for future conceptual frameworks to explore computational journalism. This analysis provides a useful starting place for an assessment of the contribution of computational journalism to news production (see also Lewis and Usher 2013). He isolates six frameworks that could be used to approach technological change in news work. Specifically, Anderson (2013, 1009) draws from Schudson's sociology of news, suggesting that scholars apply "political, economic, organizational and cultural frames" to analyses of computational journalism, adding "technological and institutional or 'field' perspectives" to that list. In this way, analyses will move beyond a quick fix to understanding the interrelated forces underlying news work and technological adaptation.

We take on Anderson's exhortation to examine these new initiatives critically and apply

Schudson's (1989, 2005) organizational approach to news by examining how news practices and organizational routines had an impact on the launch and growth of the Homicide Report from a blog to one of the first mainstream media entrants in computational crime journalism in North America. We also draw from Boczkowski's (2004) comprehensive socio-material approach that promotes the idea of "mutual shaping" to understand the relationship between new technology and news production. For Boczkowski, as referenced in Anderson, "organizational factors, work routines, and representations of users shape adoption processes, which are themselves afforded by technological changes. Only at the end of this far more complex process do distinct editorial products begin to emerge" (Anderson 2013, 1014).

Within this larger conceptual context, we define computational journalism using Diakopoulos (2011, 1, emphasis in original) as "the application of computing and computational thinking to the activities of journalism including information gathering, organization and sensemaking, communication and presentation, and dissemination and public response to news information." Similar to Coddington, we also draw from Wing (2006), who asserts the importance of "abstraction and automation" in understanding the contribution of computational thinking to journalism norms and practices (Coddington 2014).

Algorithm as Journalist

Other concepts relevant to our discussion include the algorithm as journalist. Algorithms are invisible agents that sort and filter online information to shape interactions on social networking sites or highlight what is popular online often through automation. Initial research focused on search technology and the information biases built into the algorithms used to highlight particular online content (Hindman, Tsioutsoulis, and Johnson 2003; Introna and Nissenbaum 2000). As algorithms have played an increasingly important role in society (Mayer-Schonberger and Cukier 2013; Steiner 2012), there has been a growth in literature on how algorithms structure ways of knowing and require interrogation (Anderson 2011; Beer 2009). Gillespie (2014) argues that algorithms have become a communication technology, locating them as the latest response to the processing, management, and delivery of information in a complex society.

Algorithms are already being used in sports and financial journalism to automatically generate and publish thousands of news stories without human intervention and at little or no cost (van Dalen 2012). Machine-written news has led to claims that a robo-story will win a Pulitzer Prize within five years to speculation of an apocalypse for the news industry (Marshall 2013). How far the audience realizes or notices robo-stories is unclear, with one small-scale test finding no significant differences in the perception of human or robo-written copy (Clerwall 2014).

To understand the development and application of algorithms in journalism requires both a technological and sociological lens. Algorithm providers contend the neutrality and objectivity of such systems. Yet algorithms are the product of individual and institutional norms and practices. Gillespie (2014) draws a parallel between the assertion of algorithmic objectivity by technology providers and the journalistic norm of objectivity.

In both cases, objectivity comes through practices and decisions hidden from the public that lend legitimacy to the production of knowledge.

The algorithm as journalist raises questions about how decisions of inclusion and exclusion are made, what styles of reasoning are employed, whose values are embedded into the technology, and how they affect public understanding of complex issues. As with other technologies, they are the result of a mix of professional, technical, economic, and political factors. Unraveling the choices embedded in the code presents challenges when, as Anderson (2011) notes, algorithms promiscuously combine human and nonhuman judgment to a degree where it becomes hard to discern between them. “Datacrunching algorithms and other increasingly invisible information ordering devices are neither entirely material, nor are they entirely human—they are hybrid, composed of both human intentionality and material obduracy,” writes Anderson (2013, 1016).

Much debated is how algorithmic journalism fits in with the normative notion of journalism as vital to democratic life. In their report on a 2009 workshop on computational journalism, Hamilton and Turner (2009) write of the potential for the algorithm to sustain the watchdog function of journalism, identify story leads, or shape how a story is constructed and presented to readers. Flew et al. (2012, 168) cite the example of The Guardian using a combination of crowdsourcing and computational methods to investigate Members of Parliaments’ expenses, concluding that computational journalism can “add real value to journalistic knowledge production.” van Dalen (2012) suggests that there is a degree of recognition in the profession about the potential benefits of using algorithms to produce basic commodity news, allowing journalists to focus on more creative, analytical, and in-depth stories, rather than routine news.

Yet there is also an acknowledgement that technology is neither good nor bad (nor neutral). Anderson (2011, 541) suggests that algorithmic journalism “might represent the most recent, and thus most unsettling, model for both communication and democracy.” He argues that algorithmic journalism contains various normative assumptions: it embraces big data, blurs divisions between humans and non-human data, is inclined towards gathering more information rather than better information, and “contains at least the seeds of an internal bias towards prediction” (542, emphasis in original). Indeed, Rieder (2014) points to the development of algorithms as engines of order that combine data collection, analysis, decision-making, and execution all in one.

The use of algorithms for media production contains an editorial logic based on the socially situated choices of media professionals. The algorithm as journalist can be considered an expression of the ideology of journalism that includes “the general process of the production of meanings and ideas” (Deuze 2005, 445). Studying the practices around the use of algorithms in journalism can help to illuminate how these technologies reproduce, embody, or alter norms of professional ideology.

Online Crime News

As this article is largely focused on the development of the Homicide Report, the final section of the literature review will assess scholarly analyses of crime news content in a

digital media environment. Interest in and research on digital media in this domain has largely been concerned with police communications innovations, not mainstream media technology adoption. Scholars have tended to be interested in questions of how police use social media or other forms of digital media to reach out directly to the public, as opposed to the traditional media–police relationship, which is seen as contested and negotiated (Crump 2011; Heverin and Zach 2010; Mawby 2010).

A final conceptual area that is relevant to this paper is the definition of crime news. In a well-known historical account of crime content, Barnhurst and Mutz (1997) examined news about crime, accidents, and jobs over a 100-year period from 1884 to 1994 in three respected US regional mainstream daily newspapers. They found that crime content shifted from largely event-centered accounts to longer stories with more analysis and context. They noted that crime stories changed from stories about highly specific local places early in the period to encompassing a larger geographic focus. They conclude: “crime remained a local denotative event until becoming identified with social problems after the 1960s. The reporting of crime analyses, interpretations and themes surged by 1974” (Barnhurst and Mutz 1997, 44).

They situate the development of crime news as a “more interpretive form of reporting” in shifts in journalism culture, such as an increase in journalism-school graduates trained in the social sciences and emerging definitions of news that identified the importance of context (Barnhurst and Mutz 1997, 49). In addition, they suggest that an increase in the availability of data and computers facilitated media interest in an area long held to be the domain of academics.

Methods and Context

This study examined the launch of the Homicide Report as part of the growth of the L.A. Times’ Data Desk using qualitative interviews and textual analysis of journalism, industry, and public realm accounts of the Report. Specifically, our research question is how computational journalism thinking and practices emerged in relationship to organizational norms, practices, structures, and technologies at the L.A. Times. We used long-form, semi-structured interviews with seven employees¹ of the L.A. Times Data Desk and Homicide Report to gain insights into their individualistic perceptions (Arksey and Knight 1999; McCracken 1988). The interviews were supplemented with a textual analysis of the material written (11 articles in total) about its deployment in industry and professional publications, including the transcript of a radio interview with Homicide Report founding journalist Jill Leovy. We also attended a news meeting of the Data Desk team in August 2013.

Of the respondent interviews, we talked to five subjects in person. The interview length ranged from 45 to 90 minutes each. We interviewed an additional two respondents by phone for between 40 and 50 minutes. The respondents held a range of key professional positions from reporter to editor, researcher, and data journalist, varying in expertise from early to mid and late-career. Only one journalist had explicitly studied as a data journalist, first at university and later in a non-legacy journalism organization. The questions focused on how the Data Desk and Homicide Report developed historically, how L.A.

Times journalists defined crime journalism and data/computational journalism, the roles identified for these journalists, skills of those hired to work in this area, workflows on the Homicide Report, allocation of resources, journalistic practices, and the impact of computational methods on crime coverage. We completed a textual analysis of the transcripts to identify key themes and ideas related to a set of core issues of interest to the researchers. These included the evolution of computational journalism at the L.A. Times, how it was framed to improve quality and economics of news, and how approaches to and understandings of the role of technology affected adoption in newsroom interactions, rationales for the Homicide Report, and overall perceptions of the role of the Data Desk and computational journalism.

The Homicide Report Launches in 2007

The Homicide Report launched as a blog in January 2007 under the authorship of journalist Jill Leovy, whose goal was to cover each of the almost 1000 homicides in Los Angeles County for a year. At the time, the newspaper typically reported on 10 percent of the annual homicides (Leovy 2008). The format included “uniform information” about each homicide, including “race, gender, location of killing or where the body was found” (Gahrn 2007; Leovy 2008). A map was added some months later as initially the Web team lacked the ability and expertise to create it (Ulken 2008). The blog was described in early media coverage as a “compilation” of postings and “dispatches” (Gahrn 2007). In a radio interview, Leovy said her goal was to respond to racism and structural bias in the news media’s coverage of homicide:

There’s sort of an upside-down logic of press coverage in homicide where the nature of news is to cover the man-bites-dog story, and what you end up doing is you cover the statistical fringe of homicide. You cover the very unlikely cases that don’t represent what’s really happening most days in Los Angeles County. It creates, I think, a false view of who’s safe and who’s not and where homicide is concentrated. And The Times wanted to give an accurate view of what homicide looks like, both from afar and close up. (Leovy, quoted in On the Media 2007)

Leovy managed the blog for approximately a year before she was asked by the L.A. Times to hand it over to a colleague (Leovy 2008). She noted publicly that the blog was not able to cover every homicide because of a variety of technical and data issues, adding that “the relentless demands of this beat have at times exceeded the abilities of this reporter” (Leovy 2007). A number of junior Metro journalists filled in on the blog after Leovy left (Roderick 2013), and in November 2008, readers were told that the Homicide Report was going on hiatus (Los Angeles Times 2008). The break lasted 14 months until it was relaunched in January 2010 to include a searchable database and mapping tool (Garvey and Pesce 2010). The database information largely originated from the coroner’s office in Los Angeles County. At the time of the relaunch, the L.A. Times introduced algorithmic reporting tools to produce short posts for the Homicide blog. The posts are automatically written and published, and later can be expanded by a reporter. The robo-post includes the date, incident location, time, race or ethnicity, age, jurisdiction and neighborhood. Finally, in 2013, the Report was renewed once again when a full-time reporter was hired for the first time to manage what L.A. Times assistant managing editor

Megan Garvey called one of the paper's "marquee online public service projects" (quoted in Roderick 2013).

Findings

We found that the adoption of computational journalism thinking and technologies in the Homicide Report was uneven and (dis)continuous. It emerged out of existing norms and practices, was unrecognized in its genesis, and marked by early failures, ultimately evolving interdependently out of relationships with other journalism technologies and grounded in new journalistic identities. In this mutual shaping of technology and journalism practices we identified "stages of innovative energy" supported by various actors and their networks, and application of existing "know-how" to problems that were both defined through existing norms, practices, and economic contexts, as well as re-interpreted through computational thinking (Bijker, Hughes, and Pinch 1989, 4).

The Homicide Report's first iteration as a blog in which all homicides in Los Angeles County were to be reported for a year used the Web to enable already evolving definitions of crime news content. Leovy's goal of identifying the racialized structure of homicide in Los Angeles through a blog format can be understood as shaped by historical changes in the definition of crime news identified by Barnhurst and Mutz as emerging during the previous century. They include a shift towards journalism as populist social science, with both different and larger interpretative goals, conceptually and geographically. In an email cited by LA Observed, Leovy noted:

This is my way of throwing a stone at the monster, and I hope people at least glance at it. At the very least, seeing all the homicides arrayed in a list like this will give readers a much more real view of who is dying, and how often. And for me, it means no longer having to confront weeping mothers who say their sons' deaths were never covered by the press. (quoted in Roderick 2007)

Leovy's mission rearticulates the role of journalist as gatekeeper in an online environment, in that her overarching goal was to explicitly set the news agenda vis-a-vis representations of homicide, despite legitimate critique about her decision to identify race using signifiers grounded in a racialized social history. Indeed, she clearly advocates for what some scholars have labeled a public health approach to crime news content in that the Homicide Report approaches violence as "epidemic," with certain groups more at risk than others. A public health reporting model for crime news content was launched in 1995 by a group of journalists and journalism scholars as educational outreach to a number of US mainstream daily newspapers, including the L.A. Times (Stevens 1998). Part of its mission was to educate journalists on the biases inherent in traditional crime news content in which: "Readers and viewers are rarely given enough information to put reported violent incidents into context to know what violence is 'usual' and able to be prevented, and what is unusual and thus unlikely to be preventable" (Stevens 1998, 38).

This approach is reflected in Leovy's blog, in which she stressed that "I wanted readers to see all the killings—roughly 1,000 violent deaths each year, mostly of young Latinos and, most disproportionately, of young black men" (Leovy 2008). While the Report's first

iteration was grounded in contemporary definitions of crime news and the role of the crime journalist, Leovy's motivations included the seeds of a more systematic computational thinking as defined by Diakopoulos (2011). She was attempting to make sense of the nature of homicide in Los Angeles through aggregation in a way that previous, more episodic journalism genres were unable to articulate. The Homicide Report was successful in this respect, in that it was singled out by non-journalists and advocates as having a positive impact as "a tool for prevention and public awareness" of "non-killing journalism initiatives" by scholars such as Pim (2013, 25).

Leovy's blog and her contribution to journalism at the L.A. Times were constructed as both innovative and experimental but not in the sense that there was an explicit path to its role in launching computational journalism at the L.A. Times. That sensibility emerged later, resulting in one of its next iterations. Megan Garvey, an editor recognized for her leadership in journalism and technology innovation, recalled:

She was definitely an early innovator. I don't think she even had an editor. So it's almost like, if you look at the very early blog, it's almost like a stream of consciousness ... It's just kind of what she's seeing and thinking. (Garvey, interview, December 6, 2013)

From Blog to Database and Algorithm

The Homicide Report's first phase as a blog ended after Leovy finished her year. The blog was sporadically updated and eventually put on hiatus, reemerging in a new form three years after Leovy had founded the report. Garvey said the project stumbled and was "almost killed several times" after Leovy left, adding that she stepped up to take it over because she "thought it was valuable" and that "we could turn it into a database" (interview, December 6 2013). She said she and a number of others worked to "restore" the Homicide Report, eventually relaunching in January 2010 as an "interactive map and searchable database." "It was sort of like the volunteer army ... people who just felt like it was important and spent time doing it" (interview, December 6, 2013). This "volunteer army" included two individuals specifically hired to work in computational and data journalism: Ben Welsh, who had experience in computer-assisted reporting (CAR) and considers himself a data journalist, and Ken Schwencke, a programmer/journalist. The innovations in this version conform to Diakopoulos' (2011) and Wing's (2006) definitions of computational journalism in that the newspaper used abstraction and automation to extend computational thinking and practices to a number of areas of journalism such as: research and information gathering, sensemaking, presentation, and dissemination.

The 2010 re-launch of the Homicide Report included a structured database with "the atomic pieces of a homicide" (Ken Schwencke, interview, December 17, 2013), including the date, location, time, race or ethnicity, age, gender, and jurisdiction. Blog posts from before the re-launch in January 2010 were downloaded and the relevant information extracted and added to the database. Schwencke, who wrote the algorithm, described it as "embarrassingly simple". He added:

It is a simple sort of innovation, a simple sort of tool that has strong impact. It does a lot with very little. It is not a complicated piece of code, it is not a complicated theory, it is not a complicated algorithm. It is this simple thing that we built that has impact disproportionate to the amount of time that we actually spend on it. (Schwencke, interview, December 17, 2013)

The algorithm writes the first paragraph of a post, which contains facts about the homicide. For Schwencke, the robo-post is “about what a normal reporter would write. When you don’t have a lot of information, you write to the information you have.” A journalist can later add more information to the entry. The basic post, though, for Nicole Santa Cruz, “doesn’t have the human touch to it” (interview, August 16, 2013).

For the initial facts, the algorithm relies on the same sources used by human reporters: law enforcement or related sources. The starting point for the Homicide Report is the coroner’s office. If the coroner lists a death as a homicide, it will automatically be written up as a robo-post. Details about the homicide are based on the information from the Los Angeles County coroner’s office. Given that the information is complex and subject to change, the journalist can also amend the details. Thus, the algorithm and its “development of intelligent systems” to “process meanings in contextually relative ways” (Flew et al. 2012, 158) allowed the Homicide Report to extend beyond its early iteration as a blog of every homicide in Los Angeles. This extension initially supplants “humanistic perspectives” and approaches to thinking about crime such as curiosity as a possible motivation for exploring one homicide in more detail than another with abstract thinking and processing (158; see also Wing 2006; Coddington 2014). Journalists at the L.A. Times understood the algorithm as enhancing the role of crime reporters rather than replacing them.

For example, the L.A. Times also uses algorithms to alert the newsroom to levels of crime that exceed the norm for an area in another neighborhood crime project, not the Homicide Report. “There’s an algorithm we developed that identifies neighborhoods that relative to their own history are having an unusual amount of crime in the last week” (Ben Welsh, interview, August 16, 2013). There is a perception that by enabling the L.A. Times to be able to report every homicide, however rudimentary the initial post, algorithms reduce “the load on reporters and producers and pretty much everybody in getting the information out there as fast as possible” (Schwencke, interview, December 17, 2013). For Welsh, the algorithm also has a potential economic benefit:

If through computer programming and data we’re able to, at a lower cost, sort of scale out, even reporting just the fact that all these minor crimes happened, right, that is something that could be of interest to people who care about what happens near they live. (Welsh, interview, August 16, 2013)

The fact that the computer might be able to systematically report on all basic crimes better than the journalist did not emerge as a concern. Finally, Schwencke believes that the public appreciates the robo-posts and their presentation as a blog as a way of learning about every homicide in Los Angeles County. For example, adoption of computational journalism at the L.A. Times focused on organizing information geographically, and

presenting the map interactively and visually. It provides an immediate overview of the current homicides across the city with circles proportionate to the number of deaths. Readers are able to interact with the data to focus in on neighborhoods, street locations, and individual homicides. Schwencke adds:

They are good and they are useful as they get something into the general post stream that a person can come across ... It gives you a familiar interface for the information. The Homicide Report could have just been a map and an interactive database, but giving it the blog sort of feel gives people a familiar starting place. (Schwencke, interview, December 17, 2013)

The L.A. Times' use of the blog format with an interactive map is broadly consistent with the adoption of digital communication technologies within journalism. Blogs, while initially resisted, have been assimilated by news outlets to offer short updates presented in a chronological manner online. Similarly, interactive maps allow newsrooms to incorporate the interactive capabilities of the Web in the visual presentation of information. Innovation at the Homicide Report comes from the use of computational and algorithmic approaches to the gathering, organization, and sensemaking of the crime data communicated and presented through the blog and interactive map.

“More Evergreen ... More Interactive”

Flew et al. (2012) suggest that three technological areas are pushing the growth of computational journalism: increased amount of accessible data, more and less expensive Web 2.0 applications, and greater online participation. They argue this context is supporting the development of computational journalism practices that may help news organizations balance quality and accuracy with speed and lower costs, while attracting audiences as online participants (Flew et al. 2012). Some of these motivations are more visible than others as the L.A. Times adopted and adapted to computational journalism techniques.

Garvey sees part of the shift to data and computational journalism as technology providing the ability to be transparent about journalistic research practices. According to Garvey, newspaper journalists have not been able to share their research information because of space constraints, thereby limiting the public's access to supporting evidence. On data journalism's contribution, she suggests: “The evolution really is in how the work is used and then it becomes in some cases with the databases more evergreen or more interactive in terms of exposing work that we've done for a long time.” She adds that the new ability to take “unstructured information” and create a database will require journalists with a “more sophisticated” approach to journalism such that they can “compile this information in a way that can be used beyond ... what I can write fairly easily” (Garvey, interview, December 6, 2013).

For Doug Smith, the shift towards data journalism allows journalists to address a long-standing bias in the business toward “unusual events.”

I think that our track record too much has been one of generalizing from events,

even if not explicitly, just sort of by implication ... I try to get in the middle and say, let's just be sure we know how this event fits into everything else. (Smith, interview, August 16, 2013)

Similarly, for Welsh, the Homicide Report's articulation of crime journalism widens the lens of interpretation, moving from journalism's general focus on "Mr. and Mrs. Outlier" to the "central tendency":

Mr. and Mrs. Outlier get covered really well in crime news. And they drive tons of traffic, and we have full-time reporters who do that. But as you know that's an incredibly small fraction of the amount of crime that happens. And they probably reflect certain cultural predispositions ... But what data can bring us ... is to try to give some fuller sense of crime as a phenomenon in the city. (Welsh, interview, August 16, 2013)

The notion of systematic homicide coverage has defined the project since its inception. Welsh frames it in the context of an "idea of completeness" (interview, August 16, 2013). The current journalist assigned to the Homicide Report, Santa Cruz, noted that it defies "the traditional notion of news because news is the extraordinary, the unique" (interview, August 16, 2013). The affordances of an online venue are described as enabling a break from traditional norms of crime reporting by both Leovy (2008) and Santa Cruz.

Thus, similar to van Dalen's research, L.A. Times journalists on the Data Desk saw the incorporation of computational journalism as an opportunity to enhance existing practice and allow journalists to focus on more contextual reporting. In practice, however, the actual news work of the current crime reporter is relatively similar to past practices, focusing on relationships with law enforcement sources, verification, and finding the "human-interest" story, rather than going beyond the immediate context of an event. In this way, the rank-and-file crime reporter becomes part of a new professional hierarchy and labeling system for journalists. For example, Doug Smith referenced the emerging professional identity of the data journalist in relationship to the newsroom hierarchy: "Everybody thinks Ben [Welsh] works for me, which is ridiculous. Ben works for God" (Smith, interview, August 16, 2013). This identity reifies the data/computational journalist vis-a-vis the general reporter. Similarly, in our interview, Schwencke noted that he was offered a permanent position at the L.A. Times after receiving a competitive job offer from another news publication.

Mutating Technologies and New Identities

We found that the Homicide Report's various forms suggested a clear process of mutual adaptation with previous technologies, in this case data journalism projects, online projects, as well as the creation of a new professional identity for journalists. For example, a number of respondents identified the importance of previous projects and their success and subsequent learning as key to the generative process on the Data Desk. This is supported by research from Boczkowski (2004, 11), who suggests, "media innovation unfolds through the interrelated mutations in technology, in communication, and in organization."

For example, Garvey identifies two technological factors that shaped the emergence of the Data Desk and Homicide Report. She cites the role of the paper's CAR tradition and its first database project, California's War Dead. The project is an online record of service members born in or from the state who died during the wars in Iraq and Afghanistan. The War Dead was referenced by almost all interview subjects as a key moment that supported newsroom understanding of the possible role of databases. Welsh described it as one of the first examples of the print and Web coming together behind a project that wasn't seen as a Web baby or a print baby, but was kind of the Web hitching up with print on one of the high editorial priorities. (interview, August 16, 2013)

The project pointed to how data techniques could be applied in the future.

The CAR tradition evolved into what we now call the Data Desk, which is people who can do both internal reporting work and turn around and then expose that work to the public in ways that are engaging. (Garvey, interview, December 6, 2013)

Similarly, the coding for the robo-posts for the Homicide Report was drawn from work done for another L.A. Times project, called Mapping LA. "I figured we could expand that idea into making an actual blog post," said Schwencke (interview, December 17, 2013). In a further indication of the iterative process of technological adaptation, the algorithms behind the homicide robo-posts have since been tailored to write posts about earthquakes in California.

Finally, we found that the Homicide Report was only able to evolve because of a leadership change and its relationship with the "cool kids team" (Ulken 2008) on the Data Desk.

Megan [Garvey], who was a, I think, assistant or deputy editor at the time, decided to come down and join us. And that was a terrific boost for the Data Desk ... Megan had a direct channel into the news operation. So it sort of kept us alive and engaged when we were down in limbo. (Smith, interview, August 16, 2013)

In 2010, Welsh, Schwencke and the CAR team sat side by side on the second floor of the L.A. Times' building, near the graphics department, but reported to different hierarchies – web and metro, respectively – in the newspaper. As a result, the skills and team emerged alongside existing CAR expertise. Further support from senior management followed when Ashley Dunn, a former science editor, became Metro editor in March 2011 (Los Angeles Times 2011). In his previous science role, Dunn got to know Smith. "We're good work friends because we know each other well. We always talk. Because his group in the old days was right across from science," recalled Dunn (interview, August 16, 2013). When he took over Metro, Dunn decided to move the team to the main newsroom in front of his office because he "wanted to make sure people were availing themselves to this" (interview, August 16, 2013). Smith noted: "He not only got me here. At the time there were three of us. But he's expanded." (interview, August 16, 2013). He added: There are now seven positions in two departments.

Discussion

The Homicide Report grew out of existing social, organizational, and material contexts, as well as mutually reinforcing access to new technologies, which exemplifies the importance of understanding specialized news genres in their local environment in examining technological innovation in journalism. The history of computational thinking and practices in the Homicide Report was uneven and (dis)continuous, to the extent that evidence of a systematic computational approach emerged unrecognized in its first iteration. Gynnild (2013) argues that the quality of computational journalism depends on a shift in mindset, with journalists learning to think more like computer scientists. We identify that mindset as existing in the Homicide Report—systematic coverage as a public service and related to the changing definition of crime news more generally—from its outset but not explicitly identified as such among journalists. Our interviews provide some evidence that there is an emerging professional class of data journalists but that the mindset suggested by Gynnild is still in process. As with the adoption of other technological innovations, such as blogging, journalists appropriated and adapted computational and algorithmic methods to suit the purposes of journalism. Similar to Royal's (2010) study of the New York Times' interactive desk, we also found the importance of leadership, self-taught skills, and collaboration in the Homicide Report's trajectory.

The discourse of the Data Desk also underplays the potential influences of algorithmic journalism. For example, data from our interviewees suggest that journalists framed the robo-posts as a tool to facilitate systematic coverage and freeing journalists to add more depth, context, and the human touch, as well as possibly decrease costs. van Dalen (2012) reached a similar conclusion about the downplaying of the impact of algorithmic journalism in his study of coverage of machine-written sports stories. He too found a belief that automated content could give journalists more time for research and in-depth reporting. The perspective of the Data Desk is not necessarily indicative of journalists at the L.A. Times. But it is indicative of the attitudes of early adopters and innovators within the newsroom. Journalists involved in the development of algorithmic journalism might be expected to be more open to the potential benefits of such technologies, seeing how abstraction and automation could enable more complete reporting. The automated content is not perceived as a threat as it is not replacing a human member of the data team but rather assisting the L.A. Times to advance its stated editorial goal of reporting on every homicide.

The robo-posts present a challenge to the emergent role of the crime journalist as envisioned by Leovy in that now homicides are initially reported by a non-human actor, the algorithm, while the rank and file crime journalist supplies the "human touch" (Santa Cruz, interview, August 16, 2013), such as details about the victim's life and family. In this way, a problem, how to generate consistent and comprehensive homicide data in a context of inadequate and inconsistent ability to staff the blog was solved through computational innovation and automation. The result addresses the comprehensiveness and economic problem, and could, potentially, free up journalists from routine newswork to focus on applying expertise, judgment, and insight in the pursuit of wisdom journalism (Mitchell 2010). But our findings indicate that journalists returned to familiar, historic,

and gendered practices associated with sensational crime stories, the “sob sister,” whose role was to supply the emotional and human-interest context to news. In this new workplace context, the programmer and the algorithm assume a priori roles with respect to who gets to define the “real” homicide news. This new professional labeling and power relationship is complicated by the fact that the robo-posts, while they extend professional expertise in journalism to include the identities of the programmer and non-human actor, are themselves an expression of basic norms and practices with respect to reporting homicide, albeit with greater completeness. These entail the production of crime news as a routine task, with a standard format with basic facts as defined by official sources. This finding is also in contrast to the generally lower-status role of journalists who are connected to distinct technologies (Powers 2012). In closing, the evolution of the Homicide Report at the L.A. Times involved the emergence of a new class of computational journalist and non-human journalist, repositioning the “human” crime reporter in a more historic and less powerful job classification

Conclusion

The Homicide Report could be said to illustrate a central tendency in understanding innovation in computational journalism, which has implications for how we assess technology adaptation in legacy media institutions. In taking on Anderson’s suggestion to apply a more critical sociological approach to the emergence of computational journalism, this study’s findings show an uneven process of technology adoption/adaptation that builds on changing crime news norms and practices, and interdependencies with other technologies to somewhat paradoxical ends, focusing on a neutral or positive understanding of computational journalism’s contributions to the industry despite potential evidence of more systematic impacts on the nature and identity of the journalist.

The Homicide Report began using blog technology to support a more systematic approach to crime journalism with a public health agenda. Its first iteration emerged out of contemporary changes in the definition of crime news and contained early traces of computational thinking, which shaped subsequent innovation. A later adaptation was more explicit in its adoption of computational journalism thinking and techniques, as a new class of journalist was hired with specific expertise, extending the professional to both non-human crime journalists. As newsroom resources for the Homicide Report diminished and new technologies emerged, its focus shifted to computational approaches to crime journalism. This iteration built on existing newsroom organizational structures and the L.A. Times’ history with CAR, including two early highprofile data journalism projects. The data team applied and re-interpreted its previous learning, resulting in a new form, the Homicide Report, as an interactive database and map. In the later period, journalists approached the adaptation process with an industry-centric lens, focusing on the competitive possibilities for systemic coverage, transparency, and audience engagement offered by computational journalism. Ultimately, however, it can be argued that the approach masked a paradoxical shift in the professional role of the crime journalist, while, at the same time, nurturing the emergence of new and powerful identities of computational journalist in both its human and non-human forms.

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NOTE

1. List of interviewees: Nicole Santa Cruz, staff writer (Homicide Report); Ashley Dunn, assistant managing editor; Megan Garvey, assistant managing editor; Maloy Moore, data team production coordinator; Ken Schwencke, digital editor; Doug Smith, database editor; Ben Welsh, senior digital editor.

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