

BETTING ON TECHNOLOGY:
THE DIFFUSION OF MOBILE LIVE-STREAMING APPS
WITHIN NEWS STARTUP ACTOR-NETWORKS

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REUBEN J. STERN
Professor Mike McKean, Thesis Supervisor

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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

BETTING ON TECHNOLOGY:
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presented by Reuben J. Stern,

a candidate for the degree of master of arts,

and hereby certify that, in their opinion, it is worthy of acceptance.

Professor Fritz Cropp

Professor Amanda Hinnant

Professor Mike McKean

Professor Dale Musser

This thesis is dedicated ...

To the memory of my parents, Lori and Bob Stern, who insisted on sending their Brainy Smurf off to college.

To the memory of my brothers Robert Stern and Aaron Stern, who did not get the same opportunities and privileges I did, but deserved to.

To my remaining siblings, Paula Stern and David Stern, who continue to treat me like a shining star.

To other first-generation college students everywhere. You can do it.

And to all the professionals and academics working hard to keep quality journalism alive amid relentless technological and social transformation.

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ABSTRACT

This research combines the diffusion of innovations and actor-network theoretical models to present a detailed explanation of how the live-streaming mobile apps Meerkat and Periscope were adopted at two digital news startups, Mashable and The Huffington Post; and it identifies the complex confluence of factors that influenced that process.

The findings from a series of in-depth semi-structured interviews with staff members in both newsrooms offer support and clarification of the diffusion of innovations theoretical model. Adoption of the apps spread through the organizations mostly as theorized but through a less rational progression than the theory suggests. Actor-network analysis further suggests the organizations had less autonomy than might be expected when it came to how and whether they decided to adopt and implement this new technological innovation. Consistent with actor-network theory, the adoption decision was shaped by a network of actants that in this case included newsroom personnel; the technology companies that created the apps; the South by Southwest Interactive conference; publicists; competing news organizations; the apps themselves; and, above all else, the audience.

Along with benefiting our scholarly understanding, this research has the potential to help news professionals in legacy operations and within news startups as they continue to navigate today's constant stream of new ideas and technologies.

Introduction

Continual updates to the capabilities of individual computing devices, especially smartphones, are forcing media companies into a cycle of constant change and innovation. The continual rise of new platforms has even forced news organizations to restructure their job roles (Moses, 2015). Indeed, ability to *adapt* and *innovate* involves buzzwords that are believed to separate the media companies that will succeed from those that may fail in this rapidly shifting landscape (Pavlik, 2013). So-called *legacy newsrooms*—i.e., news organizations originally created and structured to deliver news on a platform that preceded the Internet—have had a more difficult time infusing innovation across their operations. Much academic research has attempted to pinpoint the various reasons for that challenge of media innovation and transformation. Less studied, however, have been the practices related to innovation inside the newer breed of digital-native journalistic operations, which Carlson and Usher (2015) call *news startups*.

As newer entrants into the field, these startups had the opportunity to structure themselves and operate from the beginning in a way that was optimized for online news delivery and free from historical constraints that have been shown to hinder changes to traditional news production process. For example, BuzzFeed, Mashable, The Huffington Post, and Vox.com all incorporated programmers and/or product managers as part of their newsrooms specifically to ensure that new capabilities would be continually added to the technological tools being used to report and deliver their content (Stern, 2013; Stern & Wise, 2014a, 2014b, 2015). Furthermore, in hiring their entire newsroom teams from scratch to produce material exclusively for digital platforms, organizations like NowThis

were able to sidestep some of the normative attitudes and beliefs that often hinder evolution of traditional news gathering and delivery processes. The result is that NowThis can better tailor its journalistic product to a younger audience more accustomed to receiving news in forms consistent with the latest technologies being used by the public (Stern, 2014; Stern & Wise, 2015b). Thus a complex mix of human, technological and operational factors make the internal workings of these new media companies different from traditional journalistic outlets. As a result, these newer organizations tend to be more adept at incorporating change and more accepting of new methods and ideas than legacy media operations, as evidenced by their early adoption of various innovative modes of storytelling (e.g., BuzzFeed quizzes, Vox.com card stacks) and of new third-party mobile technologies (e.g., Mashable's pioneering work on the video platform Vine; and the early adoption of the messaging platforms Snapchat and Viber by BuzzFeed and The Huffington Post).

In light of this unique character and the gap in our academic understanding of their approach to innovation, this study investigates how new technologies get adopted inside digital news startups. While the structural factors that set them apart are interesting in their own right, it may be more fruitful to understand how the innovation-oriented cultures inside these organizations respond to a specific challenge shared by all news organizations: how to handle the introduction of a single ground-breaking, media-related, consumer-grade technology developed outside any specific news organization and available to everyone.

To that end, the recently introduced live-streaming mobile video platforms Meerkat and Periscope provide a fitting focus of study. The adoption of these particular apps

provides a lens through which it is possible to understand how innovations are identified, integrated and expanded upon within cutting-edge organizations.

This research is useful for both theoretical and practical purposes. From a theoretical standpoint, it adds to the body of knowledge surrounding the application of the diffusion of innovations theoretical framework, which has informed much of the existing knowledge about innovation in general. Specifically, this research provides evidence to support a nuanced diffusion of innovations-based explanation of how innovations connect with needs as they are adopted. Outlined in more detail below, diffusion of innovations theory posits that innovations are generally evaluated on their ability to satisfy a need. However, the text at the heart of diffusion of innovations theory (Rogers, 2003) concedes that some innovations — such as fashion items and consumer electronics products — get adopted after discovery regardless of whether the adopters had previously thought or knew they needed them. In other words, “We become aware of a consumer product, are attracted by it, and then decide that we must have it” (Rogers, 2003, p. 172). As to the question of which comes first, i.e., the need or the innovation, the answer for Rogers was: “Research does not provide a clear answer to this question” (p. 172). In the case of Meerkat and Periscope, the technological capability to offer live streaming video from a remote location already existed, but many news organizations had not identified this form of news as a problem in need of a solution. But when suddenly many people became aware that a pair of mobile apps made it possible to stream video between smartphones, news organizations that had not previously felt a need to live-stream from a scene started doing it because they could (and because average citizens were also using the app to view and stream footage of various events). Studying this

situation in depth illustrates some of the reasons certain innovations get adopted seemingly by whim rather than being put through a more rational decision process.

Another theoretical goal addressed by this study involves moving forward a stream of research that looks at media innovation through the lens of actor-network theory. The basic premise of this theory, explained in more detail below, is that a news organization is really a network of actors with different motivations and levels of power and influence; and that this combination of *actants*, their actions, and the handling of internal disagreement shapes what the organization does. Importantly, the theory envisions that nonhuman actants, such as specific technologies, exist within the network and have the power to shape outcomes through interactions with others in similar ways to how human actors influence things. This research provides further insight into the appropriateness of this actor-network approach for analyzing the adoption of technological innovations in news-making. Much of the previous actor-network research in journalism applied the model to the innovation of media convergence and was carried out in legacy media organizations that were attempting to reshape entire work practices and cultural norms across the studied newsrooms. The research here investigates the adoption of a much more finite and modest innovation, enabling a more precise spotlight without having the baggage of so many other cultural and organizational change factors that blur the picture. Secondly, as Primo and Zago (2015) point out, most of the actor-network research in journalism has analyzed the attitudes, motivations and actions of human actors while ignoring the corresponding elements related to nonhuman actants. Those researchers specifically put out the call for more research that attempts to capture the ways in which nonhuman actants in the networks exert their influence upon the outcomes. Picking up

the challenge, this study shows how the live streaming mobile apps, with their unique characteristics, shaped the editorial offerings of the news organizations in question. The findings provide a better understanding of how a singular piece of technology developed by outsiders and not necessarily built for journalistic use is able to make its way into a news organization and shape the content and/or form of the information presented to the public. Further, analyzing the adoption of this single technology in two similar but different newsrooms helps separate out which aspects of the outcome resulted from characteristics of the technology itself rather than from the dynamics of the actor network into which it entered.

On the practical side, a deeper understanding of how digital news startups approach and make decisions about innovation has the potential to guide news operations of any kind. Specifically, the results of this research could provide news professionals in legacy operations, or anyone attempting to start a journalistic outlet from scratch, a model for how their organizations might more effectively handle the constant stream of new ideas and technologies.

Literature Review And Theoretical Framework

Most of the previous research into media innovation corresponded with the adoption of online technologies, as news organizations moved to take advantage of—or keep up with—new opportunities afforded by the Internet. Nearly all these studies looked primarily at newspapers (Usher, 2012). This inquiry has mostly been carried out by looking at the innovation process as a whole within a specific organization (e.g., Boyles, 2015; Ryfe, 2009); by looking at wider industry response to innovations (e.g., Powers, 2012; Schmitz Weiss & Domingo, 2010); or by looking at the journalists themselves, namely what they do along with how and why they do it (e.g., Agarwal & Barthel, 2013; Spyridou et al., 2013).

Meanwhile, the sociological study of newsroom work in general has shifted from focusing on organizational constraints within prominent news organizations in the 1970s and 1980s to a recent focus on individual agency and the interconnections within networks (Stonbely, 2015). This shift is mirrored in newsroom innovation research. A key example of the structural approach that nevertheless had widespread influence on later studies is research done by Boczkowski (2004a, 2004b) that looked at innovation inside online newsrooms. That research identified three factors, all structural, that shaped the ways multimedia and interactivity were adopted: the relationship between online and print newsrooms, the degree to which the online side maintained the gatekeeper function of its print counterpart, and the way users were represented. Widely cited research by Steensen (2009) provides an example of the shift in focus toward studying the journalists themselves. Using an ethnographic approach to observe the launch of an online section of

a Norwegian newspaper, the author specifically sought to find new ways to study innovation that moved away from structural factors and also allowed a wider vision of online journalism that could include feature content and not just breaking news. The results pointed to five factors that influence innovation inside a media organization: newsroom autonomy, newsroom work culture, the role of management, the relevance of new technology and innovative individuals.

Looking more broadly, Powers (2012) found by analyzing the content of professional publications that across the journalism industry the responses toward technological change over the past several decades grouped into three distinct ways of seeing things. First, there was a “discourse of continuity” that views change as constant and therefore attempts to integrate new technologies in service to existing practices. Second, he identified a “discourse of subordination” that views new technologies as a threat to journalistic authority and therefore seeks to resist or suppress them. The third response was a “reinvention discourse” that views the emergence of each new technology as an opportunity to rethink existing definitions and norms. With regard to news startups, Carlson and Usher (2015), in analyzing the organizations’ founding manifestos, found them to be clearly driven by the third of these mindsets, i.e. a desire to use new technologies to reshape the way journalism is done. However, the news startups also appeared to be driven in part by the first paradigm in that they also seek to use the new technologies to replicate some of the traditional modes of journalism.

It is worth noting that the adoption of a specific innovation is not the same as having an ongoing organizational process of innovation that continually churns out new ideas and products. However, much of the research in this field tends to blur that

distinction. Perhaps this is because, with legacy organizations still struggling to adopt new technologies and with the study of news startups still nascent, researchers have not yet encountered many news organizations designed primarily to reinvent journalism and therefore always engaged in the process of doing so.

There are two other strains of innovation inquiry to be discussed here. First, the diffusion of innovations theoretical framework has been successfully applied as a way to understand the spread of new technologies and practices in news organizations. Second, and more recently, actor-network theory and a related focus on the *objects of journalism* have been proposed as a helpful approach to understanding more thoroughly what goes on inside and among the organizations from which journalism emerges, especially when it comes to understanding how innovation occurs.

Diffusion of Innovations

The diffusion of innovations theory has been applied to the study of communications for the past 50 years since the first edition of the book in which Rogers laid out the theory in detail (Eckdale, Singer, Tully & Harmsen, 2015). The concept was originally developed to explain why farmers didn't adopt a specific innovation that might have benefited them financially; but the theory was presented from the start as a model that could explain the spread of new ideas or technologies as a general process, regardless of the specific type of innovation at hand (Rogers, 2003). According to this theory, diffusion is conceived as a form of social change that includes "both the planned and the spontaneous spread of new ideas" (Rogers, p. 6). An individual decision whether to adopt an innovation results from a combination of information seeking and information processing that is motivated by the person's desire to understand the advantages and

disadvantages of the innovation. In other words, when people learn a new innovation might satisfy a need they have, they will voluntarily seek out information and then think about it in order to make a decision. When this happens repeatedly across a population and lots of people decide to adopt, the innovation spreads. The theory holds that a single innovation spreads slowly at first, then picks up speed, and then tapers off.

Four main components play a role in the process. First, there's the innovation itself, defined as "an idea, practice or object that is perceived as new" to the adopter, even if it is not actually new (Rogers, p. 12). Five distinct attributes of any innovation were originally identified as steering adoption: perceived *relative advantage* over previously known alternatives; degree of *compatibility* with "existing values, past experiences and needs of potential adopters" (Rogers, p.15); the level of *complexity* involved in using the innovation; *trialability*, meaning whether a user can test the innovation before fully committing to it; and *observability*, or whether it is possible to see others using the innovation. A sixth attribute was identified in later diffusion research: the capacity for *re-invention*, or customization, by the user. These characteristics also affect the rate of adoption across a population.

The second component of the diffusion model is communication. In short, information about an innovation has to pass from someone who knows about it to others who don't. The quality and range of those information exchanges has an impact on how the innovation spreads.

Third, different people take different amounts of time to work their way through the steps of making a decision. Things become more complicated when a decision is being made by an organization, so in that case the process likely takes more time.

The final component of diffusion is the presence of a social system, which sets the boundaries for the spread of the adoption and has norms and social structures that affect how ideas spread within it. A social system includes different types of actors including opinion leaders and change agents that help move an innovation forward; and each system has multiple ways in which decisions get made.

Although the popularity of the diffusion model for communications research peaked in the 1980s (Srivastava & Moreland 2012), the model has informed much of the academic study of media innovation, particularly related to digital news. For example, Singer (2004) applied the theory to study how positive notions of media convergence spread among journalists in four U.S. newsrooms. The model also provided a basis for Westlund (2008, 2011) to investigate how the public was embracing mobile phones as a way to get multimedia news and information.

One important criticism of the diffusion model is that it paints an overly rational and orderly process within organizations (Eckdale et al., 2015). The theory also doesn't adequately address a new entrepreneurial and experimental startup ethos -- imported from the tech sector and currently being championed in news industry discourse -- that embraces a try-anything or fail-early-and-often iterative mentality.

Actor-Network Theory

Over the past decade a stream of research has applied actor-network theory (ANT) to the study of media innovation. The theory was first articulated in detail by Latour (2005) to explain social dynamics in the scientific community. It was linked to the study of journalism that same year by Turner (2005), who recognized ANT's potential to help explain changes in the news industry. The central idea is that news happens through a

complex network of actors whose actions and interactions bring about what is called “journalism.” The end result reflects the series of negotiations between actors with varying motivations who wield different levels of power in the network. Furthermore, those dynamics and relationships are continually subject to change. A somewhat radical component of this model is that it calls for non-human technologies to be analyzed as actors in the network because their presence and capabilities exert power to affect the outcomes similar to the effects of the human actors in the network. Thus the word *actant* is suggested as a way to diminish the differentiation between humans and nonhumans. To apply the theoretical approach calls for identifying the actors in the network and how they fall into different groups, and then looking for the sources of conflict or division among those actants/groups in order to understand how their actions shape the end result. Under this framework, journalism and innovation both can be conceptualized as active constructs constantly being defined by this ongoing interaction of actors and networks. Given this dynamic, the proper way to study journalism as an actor-network, according to Primo and Zago (2015), is to “follow all the actors” (p. 43). The goal is to tell a complete story that does not relegate the technology to second-class (or lower) status in the explanation. Lewis and Westlund (2015) argue that ANT offers a fitting model for studying news organizations because it opens up the possibility of considering not just the journalists but also the technologists and business people who play an increasing role in determining the way news is produced and presented, along with the complex interactions with audiences and technology. The approach also “acknowledges the extent to which contemporary journalism is becoming interconnected with technological tools, processes, and ways of thinking” (Lewis & Westlund, p. 21).

Domingo, Masip and Meijerc (2015) point out that so far ANT has been applied to journalism primarily as a way to examine adoption by legacy media operations of online news delivery mechanisms and the associated technology and practices. For example, Schmitz Weiss and Domingo (2010) found the dynamics of newsroom actor networks slowed or impeded the adoption of innovations inside the online operations of a public TV broadcaster and three newspapers. The findings showed progress was impeded by culture clashes between online and print reporters and between journalists and programmers. A complicated relationship between journalists and a digital content management system also got in the way. Similarly, Spyridou et al. (2013) found that change was happening slowly among journalists in Greece partly due to the complicated relationship the journalists had with the various technologies and innovations being introduced.

Over the past year the theory has received a flurry of attention from media scholars, with academic publications *Journalism* and *Digital Journalism* both devoting considerable space at the start of 2015 to aspects of this discussion. Those articles include several pieces already cited here that discuss the theory's strengths and that attempt to clarify how to best apply ANT to the study of media organizations (Boczkowski, 2015), how best to integrate technology and other nonhuman entities and objects into the research (Schudson, 2015), and how researchers could expand the theory beyond individual organizations. To that last point, Domingo et al. (2015) call for expanding the use of ANT beyond the walls of individual newsrooms to apply the framework as a way to examine the larger set of processes that constitute modern journalism, since today's complex news landscape blurs previous distinctions between journalist and audience.

Picking up the phrase *news network* from Hemingway (2008), they argue that ANT concepts provide a more accurate way to conceptualize the whole idea of journalism:

News network is a notion that attempts to embrace the practices and discourses that people (journalists, managers, activists, public relations practitioners, citizens) perform to produce, circulate and use news (collections of ideas, facts and points of reference about matters of common concern in society such as reportages, articles, comments, pictures etc.), considering professional ideals (autonomy, quality, transparency, democracy, public sphere, etc.), symbolic constructions (newsworthiness, shares, ratings, etc.) and material artefacts (technologies, tweets, newspapers, newsrooms, etc.) as elements that are all important in the process. (Domingo et al., 2015, p. 56)

It is argued that this approach also could improve accuracy by shifting away from normative definitions of journalism into theoretical frameworks that allow empirically driven characterizations based on what actually occurs inside newsrooms (Domingo et al. 2015). In other words, rather than attempting to uncover whether practitioners live up to a preconceived notion of what journalism should be, the ANT approach enables researchers to capture an evolving definition of journalism that is informed by what journalists actually do and/or produce without judgment from the researcher.

One criticism of ANT is that it risks focusing too heavily on the technology and thereby might inadvertently cause journalists to surrender their own responsibility for shaping journalistic outcomes and cede control to technological change they view as inevitable (Domingo, 2015). Researchers thus have a “moral commitment” to “show how contingent any configuration is” (Domingo, p. 71) so that journalists can see from the research that they still have power to resist or alter the technology and thereby affect how journalism is done.

More common criticisms of ANT say it is merely descriptive and that it “lacks an adequate theory of power” (Anderson & De Maeyer, 2015, p. 7), meaning that although the approach calls for researchers to look at imbalances in power dynamics, “it is strangely silent when it comes to assessing whether, and why, they matter” (Couldry, 2008, p. 7). Another criticism is that ANT so far has failed to identify cause-and-effect relationships that explain system-wide variance of outcomes beyond the individual organizations being studied, and that the explanations given fail to capture the full complexity of innovation processes (Boczkowski, 2015).

A connection has already been made between diffusion of innovations and actor-network theories by Micó, Masip and Domingo (2013), who argue that the two theories together offer a more nuanced way to understand the complex processes in question. Specifically, integrating ANT into the study of innovations “helps open the black boxes of decisions and power struggles... that the model of diffusion of innovations has tended to simplify” (Micó et al., p. 123). Meanwhile, diffusion of innovations can help strengthen the ANT approach by providing a more theoretical explanation of the complex steps being danced as the dynamics of the actor-network whirl around. The findings from Micó et al. demonstrate this *pas de deux*: By studying change inside a European public broadcaster over the course of five years, the researchers found some evidence that the interplay of the actor-network influenced aspects of the diffusion of innovation process. Specifically, the results suggest that an individual’s position within a newsroom actor-network might shape his or her perceptions of the relative advantage of an innovation.

Meerkat and Periscope

In Spring 2015, two mobile live-streaming apps launched within about a month of

each other: Meerkat on February 27, followed by Twitter-owned Periscope on March 26. Both apps enable anyone with a smartphone to broadcast a live video feed from the device's camera to anyone else who has installed the app and chooses to watch. They both enable users to announce the presence of a video stream inside Twitter's real-time news feeds; and like other social media platforms, both apps enable users to follow other users, with the number of followers for a given user interpreted to indicate reach and popularity. Additionally, the apps enable viewers to post comments and ask questions in real time directly to the person streaming the video.

Many news practitioners immediately saw the potential of these apps for journalism, thanks in no small part to the heavy amount of hype Meerkat received from tech bloggers (Kuittinen, 2015) and from strong word of mouth and heavy experimental use of the app during the South by Southwest (SXSW) Interactive conference held March 14-18 in Austin, Texas (Newton, 2015). Adding to the hype, a week later on the day Periscope launched it was used by a prominent video journalist from the online news operation Fusion and also by citizen bystanders to stream footage from a dramatic news situation involving a gas explosion and subsequent building collapse in New York City (Popper, 2015; Walker, 2015). News organizations quickly found other ways to use the apps. For example, by early April, i.e. two weeks after Periscope debuted, Mashable had already launched a weekly business show using the app (Moore, 2015). By mid-July, BuzzFeed had amassed 93,000 followers on the platform (Patel, 2015). Legacy news operations also quickly found ways to experiment with Periscope, including USA Today (Sichynsky, 2015), The Washington Post (WashPost PR, 2015), the Guardian (McMillen, 2015a), the BBC (McMillen, 2015b), and The New York Times (Gonzalez, 2015). However, it's

interesting to note that the online-only publications seemed slightly ahead on this, especially in the case of Mashable, where the experimental use of the apps went beyond just a single person broadcasting material from the field. This clearly begs the question: Why?

RQ1: How is a new technological innovation (in this case, mobile streaming video apps) adopted within digital news startups?

RQ2: How does the technology function as an actor in the network and thereby influence what happens with it and the organization (i.e., the innovation processes and the resulting journalistic outcomes)?

Methodology

Domingo et al. (2015) propose a list of possible research methodologies for ANT studies related to journalism that includes computerized data analysis, network analysis, discourse analysis, offline ethnographies, media diaries, and action research. Their list also includes the method of reconstruction interviews, of which they cite as an example Reich (2009). In that study, the researcher conducted interviews with Israeli journalists in which the subjects verbally reconstructed the process they went through in reporting specific previously published stories identified by the researcher.

Several ANT studies have used more traditional means of qualitative interviewing as an effective route to understanding individual actions and motivations inside a newsroom workplace. For example, Micó et al. (2013) used structured interviews to reveal how the interactions and relationships among various newsroom actors affected the adoption of convergence processes within a European public broadcaster. Similarly, Agarwal and Barthel (2013) used in-depth interviews with online journalists to explain how the shift to online news was reshaping the cultural norms and values driving the actions of newsroom workers. As demonstrated in these cases, interviewing enables the researcher “to obtain information such as feelings, opinions, intentions, or perceptions that would be difficult to gather through other methods” (Micó et al., p. 126).

Lewis and Westlund (2015) recommend long-term ethnographic observation as the desired method of study related to actor-network theory because spending time inside an organization enables a researcher to observe both actors and actions in progress during their daily routines. However, they also acknowledge the considerable burden this

suggestion places on researchers, who are likely to struggle to get adequate time or access (or both) to carry out such ambitious work. The nature of innovation itself further complicates the prospect of capturing it through observational ethnography. Although the soil in which innovation may sprout could be considered a constant, the exact moment when a seed might begin to germinate—i.e., when a specific idea becomes apparent or a new technology is introduced—is unpredictable. Therefore it is uncertain a researcher embedded during a specific span of time, even a long time, will actually witness firsthand the actions that contribute to innovation adoption actually occurring.

Another reason ethnography is problematic in this case is that actions and influence of a technology upon the actor-network in which it operates are not readily observable. A more realistic way to elicit that kind of information would involve other means, such as targeted discussion with the human actors who felt or were otherwise affected by the influence (i.e., “actions”) of the technology.

Given that the initial adoption of Periscope and Meerkat happened prior to the start of this research, it was too late to observe and probe their adoption firsthand or even in real time; however, the whole process was still an appropriate thing to study because the timing was recent enough that subjects could still remember many details of what happened. Thus, a form of interviewing similar to Reich’s reconstruction method was used. Interview subjects were asked to walk through the process by which Meerkat and Periscope were identified, considered, and adopted for newsroom use. The interviewer was careful to elicit information about both the actions themselves and other dynamics involved. Questioning included how decisions were made related to use of the apps, where any points of disagreement arose, and how those disagreements were negotiated.

While that attempted to shed light on R1, trying to answer R2, i.e. the influence exerted by the technology in the innovation process, required different questions. For example, a question asking why people felt compelled to try these new apps helped uncover the force of the technology itself in creating impetus to adopt it. It was also possible to spot the influence of the apps by asking interviewees to describe coverage that came from the apps along with how their news outlet would have handled the situation without the ability to live stream it from a phone. Differences were identified between the actual outcomes that resulted in these newsrooms and what was described as the likely outcome had the technology not existed, and that helps inform the explanation that follows of the influence of the technology itself. Additional questions elicited further insight into the technology as an actant: In what ways did using the apps make newsroom practitioners want to use them more and more (or less and less)? And to what extent were ideas inspired and subsequently tried as a result of using the apps in the first place?

Selection of research participants began with the researcher's existing contacts at the news startups Mashable and The Huffington Post. The researcher attempted to use snowball sampling to capture a sufficient number and range of involved stakeholders to paint a representative picture of how the streaming apps were identified and integrated into each organization. This is similar to the sampling method used by Boyles (2015) to uncover how innovations developed by in-house innovation labs make their way into the regular work of the rest of a news organization. This method of identifying participants played out according to plan at The Huffington Post, where a contact within the organization was able to help secure permission from the organization's legal department for the research to be conducted and arrange the first interview. The rest of the

interviewees were identified and recruited from that initial starting point. In the end a total of five Huffington Post staff members were interviewed, at which point a clear picture had emerged regarding how things occurred in that newsroom. At Mashable a public relations professional within the organization assisted in arranging individual interviews but imposed a limit on access to interviewees. In the end a total of three Mashable staff members participated in interviews for this research. Although the number was less than hoped, these interviewees had extensive firsthand knowledge of the situation, and the material uncovered during the interviews provided the necessary breadth and corroboration of basic facts to supply a sufficiently detailed account of what happened with the apps.

Consistent with general ethical considerations that respect an individual's right to privacy and protection from harm (Fontana & Frey, 1994), identities of individual interview subjects within the organizations are being kept anonymous. Because these organizations have only a single person in certain job roles, it is necessary in this report to withhold practically all details about the people who were interviewed so as to avoid inadvertently revealing any of their identities. For this reason, interviewees are identified somewhat nebulously throughout the findings and discussion sections. Although interviewees' workplace affiliation are generally made clear, their role within the company is mentioned only when it is directly relevant to the information provided and in cases where the descriptive information could refer to more than one person and thus does not immediately point to a single possible source. As a further protection, the researcher has attempted to omit any specific details that a reader of this report could trace back only to a single human source or that might enable a reader to extrapolate a

single person's identity. While this strict adherence to anonymity is necessary, it does make it difficult to convey the full nuance and detail of everything that was said. To address that, significant effort was made to rephrase statements in ways that capture ideas and recollections precisely without unmasking any specific person.

Interviews with Mashable staff members were conducted on January 14, 2016, in person inside the Mashable offices and were recorded with a digital audio recorder. The staff members interviewed all witnessed first-hand the adoption of the streaming apps and had roles within the company that extended beyond one specific department. At The Huffington Post, the first interview similarly was conducted in person inside the company's offices on January 15, 2016, and was also recorded as digital audio. The remaining Huffington Post interviews took place and were recorded over telephone or video conferencing software (i.e., Skype) on January 19, January 20, February 19, and February 22. All interviewees from The Huffington Post were involved to varying degree in the adoption of the streaming apps within the newsroom. Three of them had jobs specifically focused on social media; the other two had newsroom jobs focused on a more traditional editorial role. Their positions within the company hierarchy ranged from entry-level to middle-management.

Interview recordings were transcribed by the researcher and yielded about 70 pages of single-spaced 12-point text. The full transcripts are not included with this research because in each case the level of detail and personal recollection clearly points to the specific person interviewed and thus the person would no longer remain anonymous. To make up for that, the researcher attempted to include within the findings section every relevant detail or insight that came up during the interviews, except as noted above. The

transcripts were analyzed by the researcher following a process similar to that used by Micó et al. (2013), namely a qualitative textual analysis that looks for key themes related to the research questions and provides interpretation through the lens of both diffusion of innovations and actor-network theory. First, in the Findings section, material from the collection of transcripts is assembled into a cohesive narrative of how the technology adoption played out in each newsroom, followed by a synthesis of findings that explains how staff members in both newsrooms reacted to the technology. For the Discussion section, material from the interviews first is mapped to the components of the diffusion of innovations model, with an eye toward deciphering the degree to which the innovation adoption followed the theorized path. This part of the discussion also attempts to explain things that occurred outside the diffusion model. Next, the discussion moves on to looking at actor-network interactions, specifically attempting to more precisely explain the streaming apps' adoption through the lens of how actants involved asserted themselves in the adoption process and/or helped shape the journalistic outcomes. The discussion then moves to offering additional explanation and insight.

Findings

Adoption at Mashable

Meerkat showed up early on the radar at Mashable, and that's not surprising given the organization's origin as a tech blog and its continuing focus on covering subjects relevant to heavy users of the Internet. According to one interviewee, Mashable regularly writes about new technologies, especially those that are "flash in the pan Internet hits," even though it often is unclear whether a technology will become successful over the long term. When a technology does succeed, Mashable continues to report on it. Meerkat certainly fit that normal pattern of coverage. The app was first spotted by one of the newsroom's technology beat reporters, who promptly wrote about it in a story entitled "Meerkat app shows the potential for live streaming on Twitter" (Fiegerman, 2015a). The article was published on March 2, 2015 — three days after the product launched and 11 days before technology and media professionals started arriving in Austin, Texas for the annual South by Southwest Interactive conference. During those 11 days there was little, if any, official internal discussion about adopting the technology and no official attempt to use it for Mashable-related purposes. However, one interviewee recalled that Meerkat, or maybe Periscope, was used by newsroom personnel "probably right away" for "fun in the office" and "to really understand how to use the technology."

At least some newsroom staff members at Mashable were "very familiar" that streaming live video from the scene of news was technically possible well before the arrival of the streaming apps. One interviewee pointed out that the Occupy Wall Street protests of 2011 were live streamed at the time. However, that awareness wasn't enough

to motivate the Mashable editorial team to attempt live video before the arrival of Meerkat given the challenges and staffing limitations involved. As of early 2015 Mashable had a lean video team. As a result:

It was up to the one or two people that would be going out to these big major news stories. . . . It was you and your phone and whatever notes you're taking and whatever interviews you're doing. So adding in another element I think would have been a lot for one person.

Still, at least some newsroom staffers saw the potential of live video, especially given the importance that immediacy had taken on in the increasingly 24-hour news cycle, where “you're expected to be putting out your news in that speedy fashion and consuming your news in that speedy fashion.” This awareness helped spark interest among people in the newsroom when they first heard about the mobile streaming apps, particularly the apps' potential to enable reporters to easily live stream in a breaking news setting without needing bulky equipment.

The closest thing to live-streaming that Mashable had done before the arrival of Meerkat was using Google Hangouts to host in-office discussions with invited guests. Google Hangouts is a Web-based technology that enables multiple people with their own individual webcams to appear on a single webpage in adjacent video streams with a combined audio channel and text messaging integration. One example of Mashable's use of the technology is the MashableReads book club hangouts, where a big-name author such as Margaret Atwood, David Mitchell or Malcom Gladwell came in for a live Q&A, and audience members could submit questions. MashableReads hangouts occurred about every other month. Audience numbers for the hangouts were reportedly less than desirable. It's not clear whether the limited success of the hangouts was the reason, but

Mashable staffers were not really placing a priority on doing more of this sort of thing even though they had this type of live-streaming technology at their disposal and already in use. (The book club hangouts were eventually switched over to Periscope, where they continue to follow the same concept.)

The South by Southwest Interactive conference became the major catalyst for Mashable's early adoption of Meerkat, and the person primarily responsible was Mashable founder and CEO Pete Cashmore, according to multiple people interviewed. The annual event brings together tens of thousands of digital professionals from a wide range of industries and from across the globe for several days of keynote addresses, seminars, workshops and parties that run throughout the day and late into the night. The festivities completely overtake large portions of downtown Austin, with road closings around the main area and additional venues spread across a wide geography. The event has served as a major launching pad for various technology startups. The most notable example is Twitter, which over the course of the conference in 2007 leapt from obscurity into a tech world darling that bloggers were immediately predicting "could make a Facebook-sized blowup among the general public" (Douglas, 2007). In 2015, Meerkat quickly and clearly rose to become a similar darling of the conference, and the team at Mashable simultaneously rode and fueled that ascent.

As they had done in preceding years, the Mashable staff set up a physical space at the conference called the Mashable House. The venue plays host to ongoing parties as well as promotional activities for Mashable and affiliated sponsors. The activities inside the Mashable House also provide fodder for coverage that goes onto the organization's website and social media channels. At least a dozen regular Mashable staff members

were on hand, either covering the conference or promoting Mashable to conference attendees, whose tech savvy make them a key target audience. The staff contingent included all or most of the organization's top executives along with members of the marketing, social media and reporting teams. Mashable is one of only a few news organizations that had a presence this large at the conference. (Fast Company magazine is the other notable example.)

Thanks to clever marketing, Meerkat gained considerable traction with conference attendees just as everyone was arriving in Austin, and Mashable's leader took note. According to multiple interviewees, Cashmore began the conference very bullish about the technology and quite excited about the potential of mobile live streaming. They stressed that Mashable's quick dive into Meerkat during the conference was a unique situation compared with adoption of other technologies. Normally the staff would be more cautious upon the launch of something new. They might just claim a Mashable account on the new platform and perhaps say hello to that audience but not really develop an entire strategy around it the first week since it's not viewed as worth the time and effort if the platform doesn't take off. However, in this case making a big splash on the platform was, to use one interviewee's words, "pretty much a directive from Pete... this is something we need to be doing. Do it." Cashmore's background likely contributed to his immediate zeal for adopting the technology. As one interviewee explained, "He started as a blogger, so he, in and of himself, has journalistic instincts; and I think his gut was that this is going to be big, which turned out was correct." Staffers also suggested their CEO's enthusiasm was motivated in part by Mashable's late adoption of online video relative to competitors:

In some ways we were late to the game. We're really diving really deep in the last year and a half; whereas there's a lot of other media organizations that have been working on video for a lot longer or are video media organizations. So, you know, live-streaming was definitely a place where . . . we can jump on this early and really make a name for ourselves and get a lot of expertise and do this best, which might give us an edge in the video space. . . . So I think that was definitely part of the motivation.

Most of the initial Meerkat use consisted of Cashmore simply streaming live on his own — walking around, telling people about the Mashable House, going around and interviewing people that he was meeting, just asking people questions and taking questions from the audience. At one point, interviewees recalled, Cashmore came up with the idea of inviting people to meet at the Mashable House the next day to do more Meerkat streaming together. The ensuing conversation to plan the logistics included the top managers in charge of marketing, social media and creative development, all of whom were on hand at the conference. It was primarily the two people in charge of creative development and social media who worked out the strategy and details. They used Twitter to spread the word about the specific place and time for the Meerkat meet-up. They also “printed out big meerkats and put them on sticks and walked around with them.” The result was an entourage of people wandering around together through downtown Austin like a tour group, led by the top brass from Mashable, streaming a live video feed of the journey through Meerkat. Meanwhile, over the course of those same several days multiple individual Mashable reporters at the conference randomly streamed things from their own personal Meerkat accounts, occasionally “blowing up” with lots of viewers watching their video feeds. At least one of these instances occurred at a conference-related party.

By the time Mashable staffers returned to New York after the conference, many people within the company were familiar with the technology because they had been using it at the conference or, for some, in their own personal lives. In that sense, one interviewee likened Meerkat to Twitter: “It’s that blur of personal and professional, especially in the journalism realm, where your tweeting is not only a professional thing but it’s also a personal thing.” Word about the apps also spread informally through the newsroom, as some staff members were “playing around with it in the really early days.” One interviewee remembered hearing about Meerkat simultaneously through colleagues and through social media when the app was first gaining traction.

The decision was made quickly for Mashable to keep using Meerkat. Again, it was Cashmore the CEO leading the charge, insisting that Mashable should have a physical space in the office for live streaming and should continue actively experimenting. So staff members from the marketing creative team converted an office into a live-streaming studio, decorated it a bit, and blocked out set times for regular broadcasts twice a day. The programming included things like a news update on certain days, a tech update on certain days, a fashion-related show on other days, product reviews, etc. All of the topics were based on areas Mashable generally covered already. The live-stream effort continued to be overseen by managers from the marketing creative side, rather than being handed off to a newsroom editor. Arranging the schedule was assigned to a member of the communications team whose regular duties typically involved public relations-related work. This person was chosen to do the Meerkat scheduling because she already had responsibility for scheduling newsroom personnel for outside appearances on other media outlets like CNN. The Meerkat scheduling began with reaching out to people

within the newsroom who organizers of the live stream thought would be best on camera to represent the topics in question. According to one interviewee: “People were hyped about it, so it wasn’t that hard of a sell.” Interviewees also said it was probable that one or more reporters from the newsroom initiated their own involvement by expressing interest to the people organizing the effort, but they could not recall a specific example of that. The schedule for the live stream was maintained online using a shared-access Google calendar. It was also important to keep track of things to ensure the live streaming did not impede response to breaking news or interfere with other newsroom responsibilities. The overall commitment of resources was considerable:

You have to have someone manage that schedule. You have to hear the pitches for what they are going to talk about and talk to them about them. You then have to have someone in there working with them to film and moderate comments; and, so, it’s a lot of energy and a lot of expended resources.

Another example of Mashable’s early experimentation with the streaming apps happened in the middle of the night. A few weeks after SXSW, Apple was set to begin allowing people to pre-order Apple Watches online starting at 3 a.m. Eastern time. According to interviewees, Cashmore again was the one to suggest live streaming the moment. The resulting video feed, emanating from inside the Mashable offices, featured the organization’s creative director sporting pajamas and a silk robe. Cashmore also was there for it, interviewees said.

Periscope launched about 10 days after everyone returned home from South by Southwest. At that time the staff was already getting its sustained Meerkat effort off the ground. With the launch of Periscope, staff members saw a bigger trend happening, namely that mobile live streaming wasn’t just a single app; there were going to be serious

competitors in this space. As one interviewee explained, that indicated that the whole idea of live streaming was entering a second phase. Previously it had been focused on traditional equipment streaming to desktop computers, but this looked like a whole new paradigm. (That initial inkling did indeed play out over the following year, as evidenced by the subsequent integration of similar capabilities into other social platforms like Facebook and YouTube, as well as the wider adoption of other mobile live-streaming platforms such as YouNow.) The Mashable team immediately started using Periscope in the exact same way Meerkat was being used. To do this, they “jury-rigged” a “dual selfie stick” that had two cell phones on it, one for Meerkat and one for Periscope. Multiple interviewees used the word “contraption” to describe the thing, and it enabled the team to send basically the same video stream to both apps simultaneously. They built four of these set-ups, keeping one in New York and sending the other three to Mashable offices in Los Angeles, San Francisco and London. It was the first time they had done something like that. They continued using both apps together in this way until “it just became, like, the interaction and the numbers were so much better on Periscope so it made sense for us to just focus.... Also, the experience on Periscope is just much better.” Members of the Mashable team still had a soft spot for Meerkat, though, because “the founders of Meerkat Meerkatted with Pete at our party at South by Southwest.”

As things progressed, it became more clear to the creative team that the material being streamed from the office was primarily an editorial product. Said one interviewee: “It just makes more sense if you’re going to have a tech hour that you have your tech journalists doing it, not just your social managers.” However, there was still a shared involvement in the process between newsroom personnel who were on camera and the

creative team, which pioneered the use of the app, arranged the logistics, and continued to help with certain other aspects such as managing the phone itself, monitoring comments, etc. That same interviewee characterized the whole thing as a good example of how the creative team might typically jump into a new technology, figure out what it's about, and then identify the best way to use it and the best people in the organization to continue managing it. The fact that Meerkat got adopted during a live event like South By Southwest is also important because it's expected that Mashable staffers would work together, even across disciplines, when out in the same place. The adoption of Meerkat took that further than usual, however:

The volume of people in this case was a little extreme. Normally it's not like the whole organization is involved. But this was kind of like that — was literally, like, everyone was talking about Meerkat. So, I think it was very unique in that way; but collaboration between departments and questions of, you know, when and how we're going to use these things are very collaborative here.

Around the same time Mashable started streaming regularly from the office, a handful of reporters began using the apps out on assignment in the field. For example, in late March a reporter on the scene in Ferguson, Missouri, did a live stream showing viewers the general scene outside the police department where protests were taking place. Streaming via an app enabled a “very democratic view” of what was happening compared with the more traditional video coverage from other news organizations that had their reporters onscreen talking to the audience. Other examples of live-streamed news reports include a stream from the scene of protests in Baltimore the following month and another later in the fall from Paris in the aftermath of simultaneous terrorist attacks around the city.

Regarding which Mashable journalists were most likely to use the apps at first:

Obviously we're a company that has its roots in technology, but especially on the editorial side a lot of our staff are writers first, so they wouldn't be as familiar with it. But I think most people are pretty eager; like I'd say maybe there was a core of, like, five or six people that really liked to use it, and then maybe other people that would be a bit more hesitant to use it.

There was never a top-down mandate within the newsroom that required reporters to use the streaming apps. Instead, reporters familiar with the technology sometimes just decided it fit the situation, with some encouragement. Like many newsrooms, Mashable has reporters assigned to specific beats (technology, lifestyle, science, travel, entertainment, etc.), but there's also a three-person real-time news team responsible for managing editorial content around things happening in the moment. This includes pushing news out via social media channels, occasional news reporting in the field by members of the real-time team, and other non-traditional forms of content production such as compiling materials from social media related to topics gaining heavy interest online. So a reporter going out to cover a breaking story might have received encouragement to use the app — or in-person assistance — from a colleague on the real-time news team. Even in these cases, though, the decision of whether to use the apps ultimately was left up to the person or people in the field. According to one interviewee, a factor that influenced whether journalists embraced the live-streaming apps was the degree to which their work already involved a lot of social media. For example, a member of the real-time news team might be much more inclined to use the app regularly since that role within the company already required a lot of social media interaction.

To fully grasp the dynamics that would enable something like Meerkat and Periscope to quickly integrate into Mashable's overall operation, it helps to understand

the Mashable Collective. The Collective is a group of production staff and artists who produce content from within the marketing department. The primary purpose is to promote Mashable's own editorial material as well as promote the advertisers that Mashable works with, and "sometimes just some stuff for fun." The collective is made up of six separate crews: animation (four people), motion graphic design (three people), video (three people), video editing (one person), brand services (two people) and a new media team (three people) that does a little bit of everything. Each of these crews has a leader (included in the staff numbers) who reports up to the director of creative development. The director of creative development reports up to the chief marketing officer. In addition to creating a lot of short-form video and graphic animations, much of the Collective's effort relates specifically to figuring out how new technologies might be integrated into Mashable's work. As one interviewee explained, part of the Collective's mission is to embrace "somewhat aggressively" new technologies and "to experiment and see if this is a place for Mashable." This also includes figuring out how Mashable might leverage a given technology or platform. The experimentation has included successful social content platforms like Vine, Instagram and Snapchat as well as others that have disappeared (e.g., Pop and GoPop) or that still exist but simply have not taken off (e.g., Foto and Stellar). The interviewee went on:

You know, I really wouldn't trust us as a source for information about these things if we didn't really get in the weeds and sort of do it ourselves. So it's also kinda part of our mission as a company as a whole.... Reporting on what's happening is one thing, but actually being experts on it and being able to provide utility to our audience is just as important in many ways.

The Collective is seen as the primary place where internal expertise with new

technologies gets developed and then shared with others across the organization. Although it is housed within the marketing department, the multidisciplinary Collective contributes regularly to both marketing and editorial projects. For example, Collective team members might contribute their expertise to a regular journalistic story project, creating elements such as an animated motion graphics segment needed to explain something within a long-form video story being produced by the newsroom. The Collective also produces some its own pieces of content, such as short-form Vine videos, that go out directly to the audience under Mashable's banner. This arrangement by its very nature fosters collaboration across departments and creates a sort of cross-pollination of expertise. Interviewees pointed to the example of Snapchat Discover, which involved an editorial product tailored specifically to exist within the confines of an emerging social platform. The end result for Mashable was developed by two people working together: a newsroom editor who would "know the best content" and a member of the Collective team with extensive Snapchat expertise who would "know the best content that's going to fit into that platform."

Interviewees at Mashable were reluctant to pinpoint any specific norm when it comes to the process by which new technologies are adopted. However, they said for something like a new social platform it would generally be expected that the heads of the creative team and the social media team would have the responsibility for jumping on it and working together to figure things out, which is what interviewees said happened in response to the debut of another social media platform called Peach that launched the week before these research interviews were conducted. For high-profile new technologies — i.e., "something as big as Meerkat, or something that's, like, everyone in media is

talking about it” — a directive is more likely to move down the chain from a higher-level executive like Cashmore or the chief marketing officer. That directive wouldn’t necessarily dictate what the organization should be doing, though. Instead it would be more of an inquiry about what the plan ought to be, and then it would be up to the other managers to plot a strategy. There are variations in the process, however. For example, the adoption of the social messaging platform Snapchat back in 2014 was the result of Mashable hiring someone who already had extensive experience with that platform, which Mashable had not yet really adopted. The person soon afterward expressed to colleagues a belief that the platform would take off and was empowered to develop a strategy and implement it.

Knowledge related to new technologies makes its way around the overall Mashable operation in both formal and informal ways. For the editorial team, an ongoing series called Mashable University offers a regular outlet for peer-to-peer training. The sessions are coordinated by two editors, but anyone can suggest a topic and lead the instruction. Beyond that, staff members tend to “know who to go to on the team” to get expertise with specific tools. So a more traditional reporter might seek out a tech reporter colleague to gain a better understanding of how to use a particular technology, or the reporter might go to the real-time news team to get advice about social media. Individual journalists also seek guidance regularly outside the newsroom, for example from the social marketing team or from colleagues in the Mashable Collective.

Over time the use of the streaming apps for scheduled programming became more normalized into the regular workflow. The live stream offerings also incorporated additional types of material such as product unboxings, in which a tech journalist would

open a newly released product for the first time in front of the streaming smartphone camera. By late 2015 editorial staffers streaming from within the office were “mainly self-sustaining” with the apps: They would simply notify the creative team that they were going to stream, or possibly get help if needed. Late in the year another group within the organization, Mashable Studios, had begun to integrate the apps into their work, too. Mashable Studios is the branded content arm of the organization, a “third-party content development studio” that works in partnership with outside entities to develop editorial-type content that gets distributed to Mashable’s audience. One example of how streaming apps have been integrated into this work corresponds to a weekly Web video series *Cooking with One Hand*. As part of an ongoing partnership, staff from Mashable work together with America’s Test Kitchen to produce the online show. Then, on the weekends they have a live Periscope stream through which viewers can watch them actually cook a recipe live. The initial pitch for the show came from the advertiser, but it was the team at Mashable that suggested adding the live streaming component as a way to “make it Mashable.”

By January 2016 Mashable was also using additional tools for mobile live streaming, including the app YouNow and the newly launched Facebook Live, which enables live video streams directly into Facebook’s social platform. They used the tools extensively during their coverage of the Consumer Electronics Show in Las Vegas that month. As before, the work was a collaboration between the social media team and the reporters, who were featured on the video feed reviewing new products directly from the floor of the conference center. According to one interviewee, the material garnered something like 750,000 views. (The apps do not maintain a record of viewership beyond

the life of the video stream.) Precise norms surrounding use of the apps for news purposes were still up in the air, particularly around the question of what would be appropriate for Periscope versus other platforms like Snapchat and the question of whether there are certain situations in which Mashable would or would not live stream something. In January 2016 Mashable's use of the technology was still seen by interviewees as "experimental"; and interviewees hinted that this state of flux would likely continue for some time as the apps continued to evolve and other new technologies emerged. However, according to one interviewee, everyone in the newsroom knew by then how to use the streaming apps:

If they're not familiar with it they've probably been asleep since last year because we had it so closely intertwined into our day-to-day... If they weren't out in the field using it, because not all of our journalists go out in the field, I'd be surprised if they didn't at least get in on one of the live streams they were doing here.

As for how many people have continued using the technology, the interviewee estimated that half the newsroom staff uses a streaming app regularly, meaning once a month or more, and certain members of the tech team probably use it three or four times a week.

Somewhere along the way at least one of the regularly scheduled live streaming shows was discontinued. A weekly news recap streamed from the office basically fizzled out. One interviewee explained that as the news operation has grown the reporters have started covering a wider range of stories and don't necessarily have the time to sit down for a half-hour each week for the live stream. But there wasn't exactly a high-level strategic decision to stop doing that program. Instead, people just moved on:

I think it was more like some of us are small children with shiny objects and, you know, this was a very exciting thing to be doing, we were doing it all the time,

and now we're playing around with different things. So we've kind of started doing a lot of Snapchat stories and things like that.

That pattern fits with Mashable's overall culture of experimentation, according to another interviewee. Instead of formal structures and meetings, decisions about when to stop doing something experimental are more likely to happen through "a feeling-out process" with "a lot of guess and check." Again, Mashable's origin story was mentioned as part of the explanation — a sign that even though Mashable has grown into a global operation with about 300 total employees, the organization's internal sense of identity still clings to the lingering spirit of the one-man tech blog. In this instance that meant trusting staff members' intuition to determine what works and what doesn't. When it came to the streaming apps, "we knew it worked with events and the breaking news stuff" so that was continued. As for the weekly news recaps, "we can get the same information out via Twitter or Facebook, and we're getting better engagement and it's just a better format."

Although Mashable's overall use of the streaming apps may have decreased in certain ways over time, one interviewee explained that experimenting heavily with the apps when they first launched has led to smarter use of them because journalists now have a better grasp of what stories can best be communicated with a live stream versus other means. Another result is that the technology is now more integrated as a familiar part of the available toolkit, so journalists are ready to use a streaming option when they encounter a situation ideally suited to it.

Having the technology in use also has inspired at least a few editorial team members to start thinking more about how they could present their journalism live in the moment and whether the material they are reporting is something that should be delivered that way. Many times reporters getting ready to go out on assignment have taken the

initiative to suggest they live stream from the field. In this case they can get a “one-sheet of best practices” from the creative team if they need guidance on how to use the apps. Various leaders within the organization are encouraging and supporting this, too. The people managing the overall Mashable social media accounts might pick up things a reporter is streaming through his or her own account and share it with the wider Mashable audience. In other cases it could be a more direct recommendation, where the top editor might specifically ask a reporter going out on assignment to think about live streaming if the reporter feels comfortable doing so. Interviewees said the staff overall were willing to embrace a new technology like the streaming apps because staff members are young, tech savvy and unencumbered by traditional notions of journalism. As one interviewee explained it:

I think most of us are digital native, so I think that our understanding of how we’re doing journalism is different than somebody that might be a little bit older... we’re very comfortable with the idea that when we’re here and we’re reporting we’re not just writing a story that goes on a website. We’re creating immersive ways for our audience to experience that story.

Another Mashable interviewee said staffing decisions are made specifically to foster that ethos:

We hire people who understand these platforms and can utilize them because we’re telling stories in ways that are native to the audience that we cater to and that we want to reach.

The result is that “pretty much everyone that’s going out and doing stuff” is accustomed to doing multiple things at once while out reporting, including pushing things out to multiple social platforms. Additionally, certain freelancers are reportedly drawn specifically to Mashable because they have that same mindset.

Despite that openness, as of early 2016 live streaming by reporters still had not risen to the level of job requirement, however. Outside of news coverage, at least one interviewee expressed interest in pursuing additional creative possibilities, such as exploiting the audience feedback function to offer new kinds of shared experiences among the viewers and the people in the video. Some of these ideas sprang from a visit by Periscope employees to the Mashable offices late in 2015. During that visit, the Periscope staffers suggested various ways Mashable could expand its use of the platform, including more behind-the-scenes footage. Ongoing use of the apps at Mashable has inspired other big-picture thoughts among staffers as well. As one interviewee explained:

It definitely affects the way people think about what their own responsibilities are, what skills they might want to develop, how their careers want to develop. It opens up new opportunities, I think, and different personalities and different people will grab onto those different opportunities as it makes sense for them.

Adoption at The Huffington Post

Compared with Mashable's experience, the initial embrace of the live streaming apps at The Huffington Post seemed modest and, perhaps, more typical: Various members of the staff heard the initial buzz surrounding the apps and decided to give mobile streaming a try. One interviewee from the newsroom recalled first hearing about it on Twitter. Another newsroom employee reported hearing about the apps from the Huffington Post's social media team. A social media team member remembered first hearing about Meerkat "probably with all of the press that surrounded it" near the time of South by Southwest or maybe a little before, seeing information "bubble up on my circles." These circles include following what competing news organizations are doing, active use of social media, and keeping up with technology news via blogs and via

websites like TechCrunch, Nieman Lab, and Poynter, which were specifically mentioned. Also, it was mentioned that sometimes a staff member at The Huffington Post might learn of a new technology because “someone from one of our peers” might ask what The Huffington Post is doing with the technology.

Individual staff members independently tried Meerkat for a few things early on in the weeks following the app’s launch. One example involved a behind-the-scenes stream before a scheduled sit-down interview with U.S. President Barack Obama on March 20, 2015. In that case the idea came from the staff members arranging the interview. They had heard of the streaming app but not yet tried it out, and they suggested the idea to the publicists in the White House press office as the interview was being arranged because “the White House quite likes new technology, and so this was pretty new.” The White House press team embraced the idea, and the resulting stream basically showed some of the preparations inside the room where the interview was going to take place and “wasn’t anything very advanced or sophisticated.” Interviewees suggested there were other examples of early Meerkat use but were not able to recall specifics.

Most of what interviewees recalled involved Periscope, which makes sense since adoption of the apps at The Huffington Post revolved around Periscope almost entirely. Part of the reason for that choice, according to one interviewee, was that Periscope was owned by Twitter, which The Huffington Post had “a long-established relationship with.” Important, too, was the perception that Periscope “stole Meerkat’s thunder very fast” and that users would migrate toward Periscope. A specific attribute of Periscope also was cited as a factor: The app was able to use Twitter’s social graph and Meerkat couldn’t. Access to the social graph meant users who logged into the app would automatically have

their network of connections from Twitter ported over into the other app. (Meerkat initially did have access to Twitter's social graph but then Twitter shut off Meerkat's access on the eve of the South By Southwest conference, presumably in anticipation of Twitter's own impending launch of Periscope; Honan 2015).

On the day Periscope launched, an intern from the social media team was sent to try using the app at the scene of a building explosion a few blocks from The Huffington Post's office. At the time The Huffington Post had about 5 million Twitter followers, and a tweet announcing the organization's Periscope live stream would have appeared in all of their Twitter feeds. According to one of the intern's colleagues on the social media team, the result was positive: "It was popular; there was a lot of engagement... it was pretty cool to see the high of watching this on CNN but your feed is better." After that initial trial, "it felt like we needed to do more with it." Another early example of using Periscope for news that surfaced in interviews involved live streaming Hillary Clinton's entire launch rally on Roosevelt Island in New York City in June 2015. The event was streamed via a staff member's personal cell phone, and the extended streaming drained the phone's battery entirely.

The scale of operations at the Huffington Post is notably bigger than at Mashable; the staff is about three times the size. The main social media team alone at The Huffington Post consists of six full-time employees under the direction of a global social media editor, who reports up to the director of growth and analytics. Members of this social team manage the main Huffington Post accounts on various social media platforms, including Twitter, Facebook, Instagram, Vine, etc. Because the team is immersed in the different platforms, it maintains an overall sense of what's going on in the world, what

kinds of things work best on each platform and what the different audiences are like. Typically a major social platform would have a single point person on the team assigned to oversee it primarily, but team members help each other out across the platforms. Multiple members of the social team said they stay on the lookout for new technologies, but they also said the global social media editor usually is first to spot the newest stuff and is the one who immediately claims an account with the Huffington Post name, even if it is unclear whether the platform will take off.

In addition to the main social team, there are social media editors working within the dozens of different newsroom content sections, referred to as *verticals*, which include entertainment, business, impact and innovation, voices, politics, etc. Those social media editors manage the social media accounts specific to the vertical. That could include accounts on Twitter, Facebook, Instagram, etc. (There were “hundreds” of social media accounts being managed all across the operation at the time; The Huffington Post, 2015). While this corps of social media editors report to the content editor for their specific verticals, each operates with a high degree of autonomy. For guidance they typically look to members of the main social media team, and it is rare that the social editors on the verticals become aware of a new technology before members of the main social team. In particular, the social editors on the verticals generally follow suggestions or direction given by the global social media editor even though this person does not have any direct authority over them. While there is a lot of individual freedom regarding how to use a social technology as it’s being adopted at The Huffington Post, the decisions about how much energy gets devoted to a specific technology and when/whether to abandon it altogether generally rest with the global social media editor. Interviewees indicated that

higher level managers are kept in the loop, but they do not typically issue direct mandates regarding individual platforms.

Some of the guidance from the main social team spreads across the newsroom via individual word of mouth. The global social media editor also sends information about new technologies via email to a list of people across the organization who opt in to receive it. Members of the social media team are among the recipients, but the list also includes others who are interested in receiving that sort of information. It was estimated that maybe 30 or 40 people total might receive these emails. Also, a meeting held every other week brings together all the social media editors from the main team and the various verticals. The relationship between the social editors also includes helping promote each other's content. For example, when one of the verticals was close to reaching a million likes on its Facebook page the social media editor from that vertical enlisted help in hitting the threshold from the overall social media team, asking them to share a video on the more heavily trafficked main Huffington Post Facebook page with a note suggesting that followers of the main page like the vertical's page, too. The interaction might be more involved when something newsworthy happens. In that case a member of the main social media team might coordinate with the social media editor on the vertical so that the main team shares on the main account a post about the news from the vertical's social account.

Although The Huffington Post created an overall account for Meerkat, not all of the verticals had accounts. For example, the entertainment vertical did not use Meerkat at all but did launch a Periscope account. That decision did not require input from anyone besides the social media editor for the vertical, so it was basically up to that person which

app to use. At first the social media editors did most of the streaming from outside locations that went through official accounts, but before long Periscope was installed on Huffington Post-owned phones to make it easier for other staff members to stream content from an official account while out in the field. They would just be handed the phone to take along. There was no formal Periscope training provided to these newsroom staffers because, as one interviewee explained, “if you play around with it for five minutes you can figure it out.” However, the staffer emphasized that individual staff members would generally seek guidance as needed from one of the social media editors.

As far as whose job it was specifically to experiment with new social media tools and get the Huffington Post into that space, the responsibility has typically fallen on the main social media team, although people across the newsroom might have experimented with certain things individually on their own. One interviewee said individual assignment of responsibility for a given technology or platform is based on who has the bandwidth and whose background the specific technology might align with; and as explained below, that in fact did play out with the streaming apps. It was anticipated during the interviews for this research that in the coming months reporters would be expected to spend more of their time experimenting with new technologies along with more traditional duties.

According to interviewees, news-related live streaming on the main account has been somewhat limited. Two examples interviewees could recall of how The Huffington Post used Periscope to cover news were coverage from the scene related to church shootings in South Carolina and live-streaming a press conference that introduced Misty Copeland as the first African-American principal ballerina at American Ballet Theater. One explanation given for the limited use for news was fear of accidentally reporting

incorrect information that has not been verified. Another reason given was that it's more important to focus on delivering news coverage via Facebook and Twitter because those are the platforms where the newsroom has built its biggest following. A third deterrent to using Periscope for serious news that one interviewee mentioned is that it would be difficult to find an appropriate tone that would fit with the "general vibe" of the platform, which is "more fun and upbeat." However, it was pointed out that matching the light-hearted tone of a specific platform might be less of a consideration if the staff member can give the audience an exclusive behind-the-scenes window into something worthwhile. The specific example given for that was in the aftermath of terrorist bombings in Paris, when a member of The Huffington Post staff provide visual reports from vigils for the victims via the organization's Snapchat account, which usually features content that is "fun and silly." Periscope was also used out in the field for some entertainment-related coverage, such as the opening of a museum exhibit in July 2015.

Like Mashable, The Huffington Post also developed scheduled programming from within the main newsroom via the streaming apps. The overall idea came from the social media team, in consultation with the editor in charge of the lifestyles sections. Given both the timing involved and the regular pattern of exposure to new ideas described above, it is likely at least one person involved at The Huffington Post was aware of the live-stream programming being done by Mashable, but interviewees at The Huffington Post did not acknowledge that awareness. Ideas for regular programming were identified through several internal brainstorming meetings during which the goal was to develop a strategy to "leverage this platform to really engage our readers." Ultimately, responsibility for creating and managing the Periscope account's content was

put in the hands of a lower-level associate on the main social media team together with a fashion editor who already had a significant personal presence on other social media platforms and a background in video media. The fashion editor had previously volunteered to help out with newsroom social media efforts and was thought to have the right kind of personality to be an ambassador for the organization and to fit the platform.

Sometime around May 2015 the pair launched a recurring feature called “Scoop on the Scope,” where the fashion editor would walk around the newsroom on camera several times a week and strike up conversations with various people on the staff about the work they were doing. According to interviewees, the idea to focus the Periscope content on behind-the-scenes newsroom material arose from a combination of imagining what might interest viewers and of asking them directly via the app. As one interviewee put it, “Periscope is so interactive that it’s really nice that you can get instant feedback like that.” The viewers responded favorably to the “voyeurism stuff” that enabled them to meet the people who wrote stories they read online, so that kind of material continued to drive the programming. Another recurring feature that arose was “Bag of Beauty,” which features a beauty editor on the Periscope video stream opening bags of sample cosmetic products she receives while talking about the contents. The editor reportedly receives about 15 such packages a day. This show has become one of the most viewed pieces of The Huffington Post’s Periscope programming. Other feature-related uses of the app mentioned in interviews included things like a food editor doing taste tests of new food products, an impromptu interview with a celebrity visiting the newsroom to meet with a reporter, and a lifestyle editor bringing in alcohol brand representatives to demonstrate the mixing of various cocktails. As one interviewee described it, “things just kinda pop

up and it's very lighthearted and there's not a lot of hard-hitting news stuff; but it's fun and I feel like the Periscope viewers like to see that." Having someone specifically assigned to use Periscope in a behind-the-scenes way played a pivotal role in bringing these specific forms of programming into the mix. At least one interviewee said it was unlikely these other situations would have ended up on the live stream without that central fashion editor as catalyst approaching others in the newsroom and bringing them on board. At the time of these interviews, the associate social media editor who co-launched the "Scoop on the Scope" effort had left the organization and it was estimated that as much as 80 to 90 percent of the Periscope streaming from The Huffington Post was being done inside the newsroom by the fashion editor. The rest of the live streaming came from one of the other editors or reporters going out to cover a news event and taking along the dedicated Periscope/Snapchat phone.

It's important to note that when Meerkat and Periscope launched The Huffington Post was already streaming an all-day live video feed called HuffPost Live from an elaborate broadcast-style facility elsewhere in the building separate from the main newsroom. The show was hosted by on-air anchors and relied primarily on traditional studio interviews, with little or no on-the-scene news event coverage. In cases where HuffPost Live did provide coverage from a scene, it was usually a pre-scheduled convention-type setting where they set up a temporary studio. The studio feed was filmed with traditional broadcast equipment and could be viewed online via any standard Web browser. The webpage containing the video stream also included a commenting function where users could post their own thoughts and reactions, similar to the features built into the live streaming apps. However, there are a few reasons why the newsroom was not

live-streaming in conjunction with this. First, HuffPost live was operating as an independent unit. It occasionally contributed segments of video into the newsroom's editorial offerings to be published on the main website after the initial broadcast, but it did not work the other way around. Also, newsroom staff members didn't feel compelled to live stream from news events because, as one interviewee put it, people were in the mindset that it required bringing a lot of bulky equipment rather than just being able to use a smartphone.

One interviewee said it's likely that if something like the streaming apps appeared now the team would do even more with it than they did at the time. For one thing, in the months since the arrival of the streaming apps the newsroom as a whole has been encouraged even more than previously to be experimental and to spend time and resources on these emerging platforms. As one interviewee described it:

We used to have a mentality of just the beast needs to be fed constantly, and now we just want to be more strategic. So I think playing with an app and being an early adopter of an app is really something important.

Perhaps a reflection of this more strategic thinking is that in January 2016 The Huffington Post announced a major consolidation of its video efforts that would effectively eliminate the all-day format of HuffPost Live and integrate it with other video efforts across the newsroom (Weprin, Pompeo and Sterne, 2016). Although HuffPost Live is being scaled back, the importance of video overall is expected to keep growing and the form of the video being produced is expected to keep changing. One interviewee predicted successful video will look less and less like TV, which is one reason HuffPost Live might not have succeeded as hoped. Video also is expected to look a lot quicker; to be a lot heavier on graphics; to be a lot more real-time and a lot less dressed up. As the

interviewee described it:

Who cares... if a talent has makeup on or not for stuff; I mean, obviously if you are doing HD or something, then yeah, that's a consideration. But if you are standing there with your phone on selfie mode on Periscope just go live and be fast and bring the news.

So, how much of that shift in expectations is happening because people's expectations are changing versus the technology changing? According the interviewee: "Both. I think it's the technology has changed user behavior."

Finally, an idea that surfaced in more than one interview at The Huffington Post — which did not come up in conversations at Mashable — is a sense of responsibility among those managing the Periscope account to spend time watching other people's Periscope streams. This was perceived as important not only because it projects a sense of authenticity for The Huffington Post but also because it would flatter the person who has attracted the attention of a major news outlet like The Huffington Post and likely inspire that person to want to go see what The Huffington Post is streaming.

Reasons for Adopting the Technology

To understand the range of factors that contributed to Meerkat's rapid adoption, it helps to consider the trajectory of a similar technology. One social media team member at The Huffington Post recalled hearing about the mobile video streaming platform YouNow back in the summer of 2014 (i.e., at least seven months before Meerkat launched) and indicated that the Huffington Post likely claimed an account on the platform around that time. YouNow offers basically the same core functionality as Meerkat and Periscope and actually launched all the way back in 2011. YouNow eventually enjoyed a spike in popularity in mid-2014 (Hess, 2015), which corresponds to

when The Huffington Post became aware of the app. At that time, however, The Huffington Post staff did not see value in adopting the platform for newsroom use. As the social media team member explained, “There was no push for us to live stream because nobody was using it; people weren’t using it enough, at least. So we weren’t going to jump on that at all.” (YouNow eventually was adopted by The Huffington Post starting in June 2015, when a member of the main social media team began doing a weekly program. The format of the stream adhered to the YouNow platform’s general aesthetic, i.e. the person streaming appears seated in front of the camera talking directly to the audience in a confessional style, responding to comments from viewers along the way. The show continues to air regularly, and the archive of videos is viewable online at <https://www.younow.com/HuffingtonPost>).

Staff members at Mashable also reported having been aware that various live-streaming technology existed before Meerkat appeared but that they did not use that technology to do any live streaming. So why did they jump in with Meerkat? According to one interviewee, the exact combination of attributes, situation and buzz played a big role:

This new technology, which is very consumer focused and very accessible, at this time because of the hardware and network capabilities that literally were just around in the last year or two, it felt like a Mashable thing. I don’t know how to describe that. I guess it was innovative; it was social; it was tied to Twitter, which is huge for us; and it was a new technology; and it debuted at a place where we are extremely tied to, South By [Southwest]. So it was just a lot of factors that lined up specifically to make it feel like this is something finally for us.

One thing interviews in both newsrooms made clear was that when it comes to new social platforms in particular, if something is getting a lot of buzz or picking up quickly there is

not much time spent weighing out these pros and cons at the start. Instead both Mashable and The Huffington Post just dive right in. Regardless of what eventually might be done with a new platform, at least jumping into each new technology to claim an account was cited by a staff member at The Huffington Post as an important form of brand protection to make sure that someone else doesn't start posting content in that place under the publication's name.

A second, perhaps obvious, motivation for this immediate adoption is that the organizations are placing bets in hopes of future payoff, and they don't want to miss out. Interviewees at both The Huffington Post and Mashable pointed to the example of the social messaging platform Peach, which had just launched the week before the start of the interviews for this research and immediately attracted a flurry of attention. As one Huffington Post staffer explained, the initial launch onto that platform "was very much act first, think later, but just because it was totally out-of-control success that first day, like everyone's on this, it might be something." That interviewee later made a distinction between the adoption of internally focused technologies that make an organization more productive, such as the collaboration tool Slack, versus external-facing technologies like Periscope and Peach, which bring the possibility to add a new audience-pleasing capacity. For internal technologies, the interviewee said, the decision is often based on a problem that needs solving and thus a technology is sought to help solve the problem. With something like Periscope, "I would replace problem with opportunity... there are opportunities that present themselves and there are solutions to make those opportunities a reality." Another Huffington Post staff member explained the motivation to adopt new social technologies as something akin to peer pressure:

We try to jump on things and use things that other people are using because we want to stay relevant; and if people think that this app is cool, we're like, All right let's find a way to make this app work for us.

The fact that the streaming technology involved a social media platform also contributed to the team's willingness to try it out in a public way. As the staff member explained it, "when it comes to social media it's all about experimentation and just kind of getting it out there and, you know, just having fun with it." Any risk involved — such as audience dissatisfaction or loss to reputation — are not seen as a problem since "there's so much forgiveness in this sort of realm of experimentation." Similar explanations surfaced at Mashable, where the rapid adoption of the live streaming apps also seemed to involve a heavy strain of opportunism. As one interviewee put it:

From my understanding of it, it's always been pretty experimental. I don't think it's been like, Oh my god, this technology finally came and filled this long-standing need that we had. It was more of a case of Wow, this is here and this is cool and let's try and tell a story in a new way.

Another Mashable interviewee said internal goals might have been a contributing factor to the excitement about Meerkat. Not long before the streaming apps hit the market, Mashable's leaders had raised a second round of venture capital funding and announced at an all-hands meeting that video was going to be a major organizational strategic priority for the coming year. But the above-quoted Mashable interviewee said that even without that management imperative, it's likely the newsroom would have dipped into the streaming technology because that's where the audience was going. As that interviewee described it:

I think most of us are realists and understand that when you're working on a digital platform you're not just writing for the website, you're also trying to push

out on all these different places that our audience is; and as we saw our audience becoming interested in Periscope and becoming interested in Meerkat, it's a place that we wanted to have a presence.... For me it wasn't so much about this push for video, it was a push for us to reach our audience on all these different platforms, and this was the one that everyone was talking about, so why wouldn't we want to be on it?

Given the strong emphasis on reaching or growing the audience, one challenge that surfaced was that it had been difficult to gauge success. For one thing, Periscope and Meerkat do not offer the kind of detailed audience analytics provided by other digital delivery avenues like websites. With the streaming apps, the number of people watching a stream is displayed inside the app as it is happening, but those metrics are not recorded for later reference. Even knowing the number did not necessarily help as there was no established way to know how many people constituted a success. For example, one interviewee recalled a series of news-related live streams at Mashable in April 2015 attracting “a couple thousand views on each of the live streams, which was pretty big at the time.”

Even if the newsrooms could track data about when and how many people watched different streams (which is becoming possible in newer iterations of streaming technology like Facebook Live and YouNow), that still leaves another concern that was expressed related to whether Periscope actually helps with a key newsroom goal. Only one person brought this up, and it's not clear how far into using the apps the insight arrived, but when it comes to the goal of attracting *new* audiences, technologies that rely on existing platforms, such as Periscope's connection to Twitter, present a problem: Content discovery in the apps is limited because people seem to be jumping into Periscope to view specific pieces of content they saw mentioned on Twitter rather than

actually spending a lot of time inside the video smorgasbord of Periscope itself searching for things to watch. In other words, as this interviewee explained, the likelihood seems low that someone not already following the news organization on Twitter would stumble upon a piece of content posted inside one of these other apps. So the streaming video really presents little more than a way to further engage audiences they've already attracted via Twitter (and similarly within Facebook, too, via Facebook Live). In other words, because Periscope taps into the huge audience the news organization already has on Twitter, adoption of the apps might not be all that useful in the end if the apps themselves aren't a place people go to discover content. This perhaps help explain why by the time of the interviews staff members at The Huffington Post seemed slightly more bullish about pushing content via Snapchat, which is a universe unto itself.

The other problem this interviewee mentioned with Periscope and its connection to Twitter is that these platforms are flooded environments in which individual bits of content can get lost in the deluge. This is particularly problematic in Twitter because it relies on a time sync with the user. In other words, if the user isn't looking at his or her Twitter feed when the news organization first starts streaming, it's quite likely that user will miss it entirely rather than stumble upon it mid-stream, unless, of course, the initial tweet sets off a storm of retweets. But even then, by the time users catch word of the stream, the moment to watch may have passed. However, it was mentioned in another interview that there is value to the apps whether or not people actually watch the video. In the immediacy-driven swarm dynamics of the social-media news landscape, an important goal is not just delivering the news online eventually but also letting people know immediately that the news outlet is on the case right when things start happening.

In this regard, a newsroom's entire social media efforts help bring the audience into an overall arc of coverage. As one interviewee at Mashable explained it:

People were really interested to see that, Wow, Mashable is actually there and they're doing this in real time. And then (we) had huge pick-up again when we had more analytical stories to come later on. So... our audience does follow through the whole thread.

It's difficult to separate out how much the streaming video itself contributes relative to all the other material Mashable pushes out on social platforms in a breaking news situation. But if the goal is to hook people into a story and get them coming back to a particular news outlet for more information, then live video footage was thought to help in that regard especially given Periscope's close integration with Twitter, but there was no way to know for certain.

Allure of the Apps

When it came to actually using Meerkat or Periscope, interviewees from both publications said they liked the fact that these streaming apps work on a mobile phone because it makes the capabilities "more seamless," "much easier" or "more efficient" than other streaming technology. They also said the apps enable live streaming to integrate better into a journalist's workflow. One interviewee from the Huffington Post praised the "fluidity" of the apps, highlighting the flexibility to "just pick up my phone and be, like, Oh, I want to Periscope this." As an interviewee from Mashable described it, the user-friendly nature of the apps' design and feature set meant that anyone who tried to use them could figure it out, so that the technology itself facilitated its own use: "There was nothing fussy or complicated about it. I was literally just taking out the phone and pointing it in the correct direction." Thus, the interviewee said, the decision of whether to

use one of the apps depended more on the degree to which live-streaming itself fit into a reporter's work rather than whether the reporter could master the technology. The interviewee contrasted that with Snapchat, which can be a bit more confusing because that app offers separate options for sending a single-image snap versus building a story with multiple elements: "It's just like one step too many sometimes, so I think that some people shy away from using it." Snapchat's early reputation as a "sexting app" and its ongoing reputation as "the messaging app that my little brother uses" were also brought up as a reasons individual staff members might not be inclined to use it. Meerkat and Periscope did not have these kinds of negative associations, although the perception of Meerkat did turn increasingly negative as the size of its user base was eclipsed by that of Periscope.

Another important feature that contributed to the appeal of Periscope and Meerkat is that the person doing the live stream can see questions and comments from the viewers right there in the app in real time. Nearly all the interviewees cited this ability for back-and-forth with the audience as a central reason for the apps' adoption. Interviewees from both newsrooms used the word "huge" to describe this feature's importance. As one interviewee explained, with previous traditional technologies a newsroom would need a second person monitoring and fielding the questions to the journalist who might be telling the story at the same time, but with Periscope and Meerkat "you're having immediate interaction with your audience and you can follow threads of the story that they want you to follow as well." As one interviewee recalled from a breaking news instance:

We were fielding questions from people asking them what they wanted to know about the situation or what they didn't understand or, you know, if they were

confused about who the key players were in this or needed some background on the story; and people would jump in with their different questions or things that maybe we hadn't explained.

The social feedback nature of the apps “sparks new questions for you to be asking yourself about the story.” In one case described by an interviewee at Mashable, audience members expressed confusion about things the reporter streaming the footage had taken for granted as obvious. The viewer comments led the reporter to start adding background information via narration to explain why people in the footage were reacting in a certain way. In other words, the instant comments from people watching the stream changed what was getting reported:

I do think that back and forth gives you a very different dynamic than someone that's live on CNN. You're not able to tell that guy, Oh, turn a little bit to the left. What's going on over there? And we actually were doing that.

In that particular case, as in others, there were actually two Mashable staffers on the scene, one from the real-time news team and another who has a more traditional reporting role. The pair worked together on the coverage, one fielding questions from the viewers via the app and the other one doing most of the explaining to the audience. The material shown in the video feed responded to concrete directions from viewers via questions like “What's going on to your left?” or “I hear something in the background. Can you turn this way?” The result is that it became possible to “give people a real 360-degree view of what's going on.” As the interviewee who provided that anecdote explained:

It does make you pick up things that you wouldn't have picked up otherwise because you have the brain power of these thousands — I mean at some points we had thousands of people watching the streams — and we have the brain power of all those people, and the questions they would ask as well.... It was a real back

and forth, and it did have an impact on the way we told the story because we could home in on what our audience really wanted to know and understand.... I think it's a very democratic way of telling the news.

Another reason a staff member at The Huffington Post gave to explain why the interaction via video apps is appealing is that it gives the journalist a new level of ease and speed with which they can feel they are informing an audience. For example, the person explained, it was already technically possible for audience members influence coverage: They could tweet or email requests to the organization or directly to individual reporters. However, the interaction via video speeds up the process and eliminates most of the work involved. As the interviewee explained it:

If somebody tweeted me and said, 'I've always wanted to know...', then I have to go and sit there and do research and write an article and it's going to take me a lot longer; but if somebody on Periscope comments and says, 'Can you tell me everything you know about J.Lo?' Sure, I can tell you that right now and it's going to take me 10 seconds. ... It's, like, way more instant gratification.

As that scenario illustrates, it seems the person benefitting from the exchange was just as likely to be the journalist using the technology as it was to be the audience member who asked the question. This idea that journalists were motivated to use the apps because they personally enjoyed the experience surfaced repeatedly in interviews from both newsrooms. The staff member above from The Huffington Post recalled jumping on the app initially because there were opportunities "that I thought would be, like, fun"; and this person repeatedly used the word "fun" to describe both the experience of using the app and the kind of content that was disseminated through it. Another Huffington Post interviewee recalled being "super excited" to try out the apps because of a general interest in things that are new and, again, *fun*: "I wanna know how it works, I wanna

know what's going on, I wanna know what everyone's using; so I was really excited.”

When an interviewee at Mashable mentioned the enjoyment factor it wasn't necessarily focused on fun directly but instead on the enjoyment of reporting a story in concert with the audience: “I love that. I love being able to tell stories in that way.”

Somewhat related, multiple interviewees said their initial use of the apps made them want to use the apps even more. One interviewee cited the audience feedback as a primary reason: “It's super validating as an editor to know that you're saying things or showing them things that they want to see, or entertaining them in some way.” Another interviewee, who overall was quite positive about the apps, described having a more gradual initial warming to the technology. At first from a personal standpoint the interviewee didn't see the appeal of Periscope because “I didn't know who'd want to watch me; and then it creeped me out in a way.” However, thinking about the app “from a business standpoint” made sense because it enabled the interviewee to share an insider's view of backstage situations the general public would not be able to witness themselves, and “I like to show people that.” Once the interviewee dived in and used Periscope when it seemed appropriate, the interviewee was soon won over: “I think once I started doing it, I started liking it.” Several months of live streaming regularly since then has made the interviewee's overall attitude much more enthusiastic, fueled again by a sense of validation:

I love being on camera.... It's fun to have people interested in what you do every day, and it kind of reminds you... this is cool and people do care about what you're doing. And it's fun to see what they say and their opinions, and just talking to people that you don't know and kinda having them get to know you is exciting.

It became apparent from the interviews that people who use social media as part of their

jobs tended to be more social generally inside the organization and more inclined to embrace this particular technology. Several of them mentioned their tendency to mingle with colleagues across editorial sections or to locate themselves purposefully in public work spaces where they might cross paths with others, rather than being seated at their own desk all day long. This informal communication contributes to their exposure to new ideas and new technologies, and is facilitated by the office layout of both newsrooms, which includes couches, work tables, etc., throughout wide open public spaces.

Conversely, not everyone who tried the apps wanted to continue using them. Resistance surfaced around the idea of reporters and editors out covering news also being expected to live stream. As one editor from The Huffington Post explained it:

If you are one person with two hands, using one of those hands to live stream something is a pretty low priority because you need to be [audio] recording, you need to be out there interviewing people, maybe you need to be shooting video, maybe you need to be taking pictures, you need to be writing. There's just a lot of other stuff you need to do, and live streaming is probably not at the top of that list.

Some people in The Huffington Post newsroom were also reluctant to participate in the behind-the-scenes video streaming such as the Scoop on the Scope video streams. One staff member joked about using lunch breaks as an excuse to avoid appearing in the video, but it seemed the person was actually somewhat serious: "I always hated going on there. I was talking to somebody walking in the hall, and they totally ambushed me to get on this thing. It was kinda funny." Another interviewee said there was a distinction between openness to the live streaming and to new technologies in general: "It's not about the technology and not wanting to adapt, it's like some people don't want to be on camera.... It depends on what the technology does and whether or not they want to personally put

themselves out there.” To make the point, the interviewee brought up the internal communications tool Slack, which had been introduced into the newsroom by fiat from top management around the same time the streaming apps were taking off. According to this account, at first staff members complained and wondered why they needed to use yet another thing when they already had other tools. But ultimately, the interviewee explained, people accepted that management wouldn’t force everyone to use something if it didn’t have benefit, and so the resistance waned. “Now we love Slack,” the interviewee said. The point was that although staff members at The Huffington Post might sometimes hesitate to integrate something new, that isn’t the norm. The interviewee continued:

It’s mostly young people here who are used to technology constantly changing; and also it’s, like, we work for an online newspaper so we are not, you know, unfamiliar with Internet territory.... So most of the time people are fine and interested and engaged; but even if they’re not, I think overall they realize that it’s part of the job so there’s only so much complaining that somebody can do.

Another problem that was mentioned by one interviewee related to the apps was the fact that Periscope was designed as a consumer app for individually owned phones and without enterprise functionality. Specifically, at The Huffington Post there’s a desire to get reporters in the bureaus, such as Washington, to contribute more content into the apps. But Periscope, assuming the user is an independent individual, requires authentication via a corresponding Twitter account. As the interviewee explained, that presents a huge organizational liability because it requires giving anyone who streams on behalf of The Huffington Post the log-in credentials to a Twitter account that has millions of followers and, with one wrong tweet, could send the entire Huffington Post operation into a public relations nightmare. The interviewee said The Huffington Post has put in a request with

Twitter asking them to create a better solution for user authentication, but that was still unaddressed at the time of the interviews. Other things that were mentioned as downsides of Periscope: Streaming time is limited by available battery life, and there is potential to unwittingly wrack up costly data charges if a user goes over a pre-set monthly cellular data limit.

How the apps Influenced Coverage

At the beginning, live streaming a news event was more likely an add-on to what the news organizations might do anyway. Pete Cashmore's initial Meerkat streams from South by Southwest did not displace any of the organization's regular coverage and, to the contrary, gave them more to write about. And when The Huffington Post sent an intern to the scene of breaking news on the day Periscope launched, a reporter and photographer also were dispatched to produce a traditional news report.

Other situations emerged later in which Periscoping an event became a replacement for regular means of coverage, particularly related to entertainment. One example of this was The Huffington Post's coverage of Jingle Ball, a live concert tour with A-list stars that stops in Madison Square Garden and is promoted by Z100, one of the biggest radio stations in New York. In 2014, before the arrival of the streaming apps, The Huffington Post covered the event by producing a list-based article with photos that highlighted five standout moments from the event. In December 2015 — nine months after the arrival of the streaming apps — there was no immediate Web story; instead the team offered a Periscope live stream from the red carpet, along with some material delivered via Snapchat. One interviewee explained the choice as being more fun and also said it helped The Huffington Post work around the fact that publicists were not granting

access to celebrities. According to the interviewee, the stream became a viable alternative to traditional coverage because a social media audience would be happy enough just to get to watch someone like pop singer Selena Gomez walk down a red carpet. Using the streaming apps also inspired some of the journalists at Mashable to reconsider the ways they might approach coverage more generally, including with hard news. As one of the interviewees from that newsroom explained:

We've learned through using the apps that there are better ways to tell certain stories. So, you know, we now say, Well, I have access to this live-streaming app, I don't necessarily need to write a 500-word scene-setter on this event that we're going to be covering later on in the day because I can physically stand there with a phone and show people what it is.

One example of this rethinking of coverage was a presidential candidate rally late in the summer, where a pair of Mashable staffers on the scene decided to use a streaming app while waiting for the event to start. Previously they might have written up a quick summary of the scene upon arrival, but this time they went around interviewing people in the crowd on a live stream instead. The result “resonated much better” with the audience because it gave viewers “a much more interactive sense of what was going on.” Some material from the live stream was later repurposed into other stories. In this case it was a conscious choice to use a live stream in place of writing a text story as a way to give the audience a sense of the scene at the event. The interviewee who recounted this anecdote indicated that it's possible this kind of live reporting could happen via Twitter or other social platforms, so the streaming apps might not be solely responsible for reshaping the reporters' approach. However, which specific technology was involved, the ability to push material from the scene takes away the need for someone in the field to post a story

immediately. The interviewee elaborated:

I mean we do get it up as quickly as possible, but I think that our focus now is really pushing things on social and letting our audience know we're there, we're taking account of what's going on — I'd say especially for events coverage and breaking news coverage — and then moving on to like a more in-depth story later on.

The apps also provided reporters in the field access to material that might not have been available to journalists using traditional live video equipment. For example, one of the interviewees had been on the scene using Periscope while covering a major national news story. Although some bystanders were reluctant to appear in a video at all, the interviewee said, others were willing to be interviewed because the reporter was just using a cell phone:

It's a much less intimidating situation than having a news crew come up to you with a camera; and, you know, the interviews we were getting were just so much more candid.

During that coverage the streaming apps were not used during press conferences because the journalists on the scene had to take notes as well. So they simply tweeted bits of information from the press conferences.

In some cases the Huffington Post team covered events via Periscope that otherwise would not have merited any newsroom attention at all. An example of this brought up by one interviewee was the opening of a Hunger Games exhibit at the beginning of July 2015 at the Discovery Times Square museum. This was one of the first things covered via Periscope within the entertainment vertical. Normally The Huffington Post would not cover something like this because “we never want to do blatant advertising for a specific place”; however, in this case “we thought it was, like, a good

opportunity for social.” It’s worth noting that it was a regular content editor and not a social media editor who received the press release and thought it would be a good idea to cover it via Periscope, showing that awareness of the apps had spread beyond social media staff members by early summer and that use of the apps was not driven solely by social media staffers. The interviewee who brought up this example said it was impossible to say how the newsroom would have covered the exhibit without the streaming apps “because we wouldn’t.”

At a more macro level, multiple interviewees said that in the months since the live streaming apps debuted the overall news landscape has been shifting toward being in the moment. As a result, according to a member of The Huffington Post’s social media team, when it comes to reporters covering news “we want people to focus more on the real-time aspect of it; I mean, that’s how news is being consumed now. It’s hard to get people to read a story.” Another influence at the macro level is that the ways in which people consume editorial content are changing, and staff members acknowledged being driven by that. As one interviewee put it, “We have to take things to the audience now. We can’t expect the audience to come to us.” As a result, The Huffington Post now feels compelled to use the apps because the apps are “where the audience is, and we can’t ignore the audience on those apps. I mean, that’s a big part of our audience.”

The apps have also brought about a shift toward the personal. Before the streaming apps, the Huffington Post did not offer — and likely would not have initiated — the kind of behind-the-scenes content that introduced specific editors and how they go about doing their jobs. As one interviewee explained, the staff was busy writing content all the time, so turning the focus onto themselves wasn’t something they had time for or

thought was interesting for readers. However, the interviewee said, “I think Periscope and Snapchat are great ways for us to now be faces of the brand.” When asked to explain what changed, the interviewee again pointed to the technology as the reason it now made sense to open up personally:

I think there’s just more transparency now with technology... you have so much connection and a vehicle to connect with writers and people that you admire. Celebrities are tweeting back people, and I think this is just another iteration of that, to be able to then see them on camera is awesome.

Interviewees at Mashable said whether or not the live streaming apps had emerged, the form of their reporting would have matched whatever technology was prevalent since that’s what Mashable strives to accomplish. As one interviewee put it, “At the time it was live streaming, but if it wouldn't have been we would've been going hard on something else. I don't know what that thing would've been, but we're always trying to do that.” As for the extent to which technology in general drives decisions at Mashable, another interviewee described it thusly:

Huge. Humongous amount. I mean, changes lives. That amount. We wouldn't have hired the people that we have. We wouldn't have teams that are made up of motion graphics designers and animators if we didn't follow this technology. So, humongous amount.

Asked about the recently launched platform Peach as an example, the interviewee said that a person likely would be hired at some point specifically to manage Mashable’s activity on that platform “if it really did take off, where it was essential to the information economy.” But then after a slight pause the interviewee added, “I mean, depending if we have money.”

Negotiating Adoption of the Apps

This last comment regarding Peach points to something that surfaced during interviews at The Huffington Post, namely the question of how to balance adoption of new things with the need to manage an ever-increasing array of emerging technologies simultaneously calling for attention. When Meerkat first hit the scene in 2015 the total number of social media accounts across all Huffington Post verticals already numbered in the hundreds (The Huffington Post, 2015). By the time of the interviews in January 2016 The Huffington Post's main social media team was actively managing accounts on Facebook, Twitter, Periscope, Snapchat, Viber, YouNow, Instagram and others, while bracing for the possible need to engage on additional platforms like Kik, Line, Slack, and now Peach. One interviewee described the dilemma:

I think every publisher is sort of just trying to figure this all out right now. . . .
What's the best utilization of our time? Do we focus on these emerging apps that have an unclear future that aren't exactly monetizable for us right now, or do we... put more emphasis on Facebook and Twitter, which send traffic which are traditionally more monetizable for us?

Again, interviewees indicated that the decision of where to expend effort depended on how well the technology appeared to be taking off with users and whether the technology enabled something "fun." The specific functionality of a social technology was of lesser concern, especially in the case of competing technologies that do similar things, such as Meerkat and Periscope. As one interviewee put it, "The technology, it usually speaks for itself. If more people are on it, odds are that it works better." Ultimately, though, the decision of which technologies to invest in long-term is driven by audience behavior. Said the interviewee, "That's the whole thing; we want the audience to be watching or

otherwise it's not worth our time.”

Interviewees from both newsrooms said there wasn't really conflict involved in the adoption Meerkat and Periscope, just concern about resources. However, leaders of both newsrooms were said to generally expect that trying new technologies should be a regular part of what the organization spends time doing. As one staff member from Mashable put it:

Experimentation is encouraged and the pressure is a little off. It's not like someone is going to come to me and be like, We misspent these resources and now you know you're not going to have what you need moving forward if you want to experiment next time. It's a little more open, thankfully, of a culture here. So a lot of those anxieties you can put to rest.

An interviewee from The Huffington Post described a similar dynamic there, saying there was “pretty much unilateral agreement that this is stuff we need to be doing or experimenting with.” The interviewee continued:

I can't think of a time I've disagreed with someone on just the need to be working with something. Maybe it's gonna happen, but generally it's just little things about who's going to do it, or what the workload is.

At Mashable the resource question is partly solved by interns, who often are assigned to emerging social network platforms that might seem unlikely to take off just to see what can be done. The intern would be expected to make a Mashable account, experiment with the technology, and figure out how to grow the Mashable presence on it. As one interviewee described it...

There's not a lot of pressure. If it doesn't go anywhere it's no big deal; but we get to learn, they get to learn, and a lot of times other things will come out of that. A lot of times, with smaller applications, [the app's creators] will get really excited

that Mashable is a part of it and now the intern is practicing networking with outside social networks and things like that, and that's another impetus for doing it. And sometimes those things can turn out to be huge.

This low-level experimentation can also pay off in other ways. For example, an intern did such a good job figuring out Mashable's use of the social visual creation app GoPop that the founder of the company visited the Mashable office three times and established professional relationships with members of the Mashable team. GoPop was soon afterward acquired by BuzzFeed and its product promptly taken off the market, but the humans involved are still in contact with each other, and the intern was hired on as a permanent staff member at Mashable.

A similar dynamic operates inside the Huffington Post, where it was an intern who first used Periscope on behalf of the newsroom. But a permanent staff member still has to oversee and assign that. According to interviewees, mid-level managers at The Huffington Post and even individual social media editors are empowered to jump into a new technology without needing permission from higher up, particularly when the technology does not require significant financial commitment. But higher-level managers ultimately decide how many or which staff members might be assigned to handle an adopted technology. For example, the decision to assign a fashion editor to work on the daily Periscope programming was not the result of mid-level negotiation but instead was made by higher-level management. Meanwhile, individual coverage decisions are negotiated by the hands-on editors/reporters within the verticals. There was mention of some disagreement over whether it made sense to use the apps to cover things that were already being live-streamed via more traditional means from elsewhere in the Huffington Post's offices, i.e. via HuffPost Live or via the website of AOL, which owns and shares

space with The Huffington Post. Interviewees said there was no suggestion of the newsroom having to get these existing external live streams into to the apps. Instead the example that surfaced in the interview was of a story editor suggesting that a social media editor go Periscope a celebrity being interviewed on HuffPost Live. The social media editor didn't think it was a good idea, so it didn't end up on Periscope. As the interviewee explained, the editor could have escalated the matter to a higher-level manager, but in this case the final decision would probably be left to the social media editor because "the social person knows what people want to see most... more than... somebody who's writing and maybe doesn't know that platform as well." Another consideration that was cited in this scenario is whether the streaming was a wise use of the social media editor's limited time. To address that, it was pointed out that the editor who thought the streaming would be a good idea did have access to the streaming phone and could have just done it.

Whether reporters at The Huffington Post are likely to stream something they are out covering depends on who the reporter is and what their direct manager thinks. According to a member of the social media team, if a reporter is there to write a story, they are likely to focus on that; but if it's something where the reporter could hold the live-streaming phone in one hand and a recorder in the other hand, then "by all means that's encouraged." In practice, however, that can be a tougher sell than the social media team might hope. For example, one editor interviewed for this research laughed at the notion that reporters would be expected to live stream events they cover. Although the editor had used one of the streaming apps in relation to news coverage, the editor said it was mainly the video team that would be doing it and that "if I am going to an event, I am reporting on it and taking notes, and I don't really have the capacity to be doing that

and also holding up my phone and recording an event the whole time.”

A related frustration expressed by a social media team member was that some members of the editorial staff simply were not comfortable using the various social media apps, and that this limited the degree to which those editors or reporters could even be asked to produce materials for the platforms while out on assignment. “That’s annoying,” the interviewee said, “but for every editor who is like that there’s another editor who’s like, ‘Can I do this?’ And so it really balances out.” This sort of exchange is negotiated informally, and when an editor declines to report something via social media while out on assignment, the response is fairly low key depending on the situation. In some circumstances a publicist might grant access to a reporter on the condition that the event be covered via a specific social media platform, in which case there isn’t much choice for the reporter. However, when it’s a social media team member who suggests using the platform and the editor refuses, the social media person would likely back down, and it would rarely escalate beyond that.

Discussion

Diffusion of Innovations

As explained in the literature review section above, the diffusion of innovations model supposes that adoption of a new innovation results from a combination of information seeking and information processing that is motivated by a desire to understand the advantages and disadvantages of an innovation. It supposes that people or organizations take some amount of time to make thoughtful, rational decisions before investing in something new. Specific attributes of the technology might help or hinder its adoption, but overall it is expected that most adopters work through a set of considerations before deciding to adopt something. An S-shaped adoption curve is thought to represent a normal pattern of adoption across a population, with only a few fast-movers jumping on at the early stage, followed by a period of gradual uptake that turns fast as word spreads about the innovation, and eventually a tapering off as most of the people who are going to adopt the innovation have done so.

At an organizational level, according to this model, the digital news startups might rightfully be classified as early adopters among the overall population of news and information companies, although further research would be needed to gauge whether that is in fact how things played out across the industry. Either way, the theorized process by which an individual adopter makes a reasoned adoption decision only partly aligns with what happened here. Mashable and The Huffington Post appear to have jumped into the fray of a public frenzy, acting first and then thinking later. Nevertheless, the diffusion of innovations model does help explain a lot of what happened, as several attributes of the

technology contributed to its adoption as theorized.

First, Meerkat and Periscope offered a *relative advantage* over previous alternatives. The fact that they were smartphone apps made it possible for journalists to live stream from anywhere without needing any additional equipment beyond the pocket-sized devices they already had, making the apps superior to other live-streaming technologies. The ability for audience members to submit questions in real time to the person operating the live stream also presented an important new development. And although there was another app, i.e., YouNow, that offered both these capabilities, Meerkat and Periscope offered integration with Twitter, meaning notice of a live stream would go out automatically at the start to millions of existing audience members. A final advantage was that audiences were flocking to Meerkat and Periscope, which was not yet happening with YouNow.

Secondly, the apps offered some degree of *compatibility* with existing values, past experiences and needs. The technology-conference frenzy surrounding Meerkat played directly into Mashable's self-image as a hip and creative purveyor of Internet culture that remains ahead of the curve. For The Huffington Post, the apps were compatible with an overarching ethos of letting individual voices attract readers to the organization's site. After all, the site originally grew by assembling a large constellation of individual bloggers. More importantly, for both organizations the technology offered some potential — as yet unproven — to satisfy a constant need, i.e., attracting and maintaining an audience. However, neither organization appears to have spent much time actually thinking about any of this. Instead, as a Mashable interviewee expressed it, they just had a “gut feeling.”

Thirdly, adoption is said to be influenced by the level of *complexity* involved in using the innovation. In this case complexity was not an impediment, as both Meerkat and Periscope were generally easy to master. In fact, nearly everyone interviewed expressed disbelief that anyone would require actual training to use them. However, at the organizational level there is another dimension. For a newsroom that is already attuned to chasing the audience from platform to platform and thus already has the structure and personnel in place to wrap itself around a new platform like Periscope, the initial investment is small and easy: Simply install the app and have whoever is already doing this type of work add it to the mix, then gradually expand as the platform takes off. On the other hand, for a newsroom that is not appropriately staffed or experienced in delivering content for social media audiences, implementation likely would pose considerably more challenge.

A fourth attribute in the DOI model is *observability*, or whether those considering an innovation can see others using it. In the case of a newsroom adopting a social media platform, this could involve two dimensions: other *people* using the app, and other *news organizations* using it. These technologies are built specifically to incorporate this attribute in their basic operation, quite likely based on DOI theory which says this is important for an innovation to get adopted. In the case of Meerkat, however, Mashable's use of the platform at the SXSW conference was simultaneously reacting to and creating the pool of other users. For The Huffington Post it was a little different since in addition to seeing the public adopt the technology they also probably could see Mashable using it. With the social platform Peach, however, it's important to note that both Mashable and The Huffington Post jumped in to create accounts not because a lot of people were using

the platform yet but because there was a lot of buzz around the idea that users *might* flock to it. A similar thing holds true for the not-yet-popular social platforms to which Mashable assigns interns.

A fifth DOI innovation attribute is *re-invention*, or the ability for the user to customize the innovation. While the apps did allow the news organizations to tailor the streaming to fit existing breaking news coverage patterns, the opposite also held true in that the apps actually customized the news organizations around themselves to yield live programming that fit the ethos of the individual platforms. This idea is elaborated further in the actor-network analysis that follows.

Finally, the remaining attribute in the DOI model is *trialability*, or the ability to test an innovation before committing to adopting it. With social platform technologies, the only way to test out the technology is to create an account and start using it. For innovations that cost a lot of money to implement, this would be a problem and should have impeded the adoption of the platforms. However, this aspect of the theory has less applicability when use of the innovation, in this case an app, is given away for free. This conflation of trialability with actual use is no doubt by clever design, because in order for a social platform to become viable it needs as many people as possible doing something with the real version of the platform and not just walking through a separate demo. A news organization could create a test account to see how the platform operates or have staff members test it out using personal accounts, as happened at Mashable before the SXSW conference. But the only way to get an accurate picture of how the technology would help the news organization is to create and start using an account with the news organization's branding. This immediate adoption without trial is further motivated by

the fear that someone else might claim the single username that represents a brand.

The rest of the diffusion model deals with adoption across a population. It is interesting to examine how that played out inside the studied news startups. The spread of a new innovation is believed to be fueled by the *communications, time* and *social systems* within which the innovation lands, with overall adoption following the aforementioned S-shaped curve. That, more or less, is how the adoption of the streaming apps played out at The Huffington Post. The global social media editor and a small number of others around the newsroom became aware of the frenzy around Meerkat and decided to investigate; word spread through an established network of communication within the newsroom; the live streaming gradually became more widespread, in this case over a relatively short amount of time; and the newsroom's social system, which promotes individual autonomy, enabled various individuals to adopt the innovation across the operation. It should be noted that if the innovation is described as mobile live streaming in general, then the diffusion process is still playing out and probably has not yet reached the top portion of the S in the curve.

What happened inside Mashable presents a much different path to adoption. The top-down edict to make a big splash with the technology obviously influenced the speed and degree to which the technology was adopted. If any deliberation or negotiation about whether to adopt the technology did occur, it took place quickly inside the head of a single person rather than being slowed down by any kind of organizational dynamics. The fact that all of the senior management of the company were together at conference seems to have contributed to the sense of urgency and collaboration that marked the impromptu deliberations about how the apps would be integrated into Mashable's efforts.

Having a top leader become an early adopter and insist the organization do so as well both incentivized the adoption of the technology and provided a model for staff members of how to go about doing it. And, importantly, the collaborative cross-departmental organizational culture provided a social system uniquely geared toward helping the new innovation get integrated in so many different ways. Individual characteristics of newsroom employees likely also played a role since a high percentage of the Mashable newsroom was said to exhibit the characteristics of first-movers rather than followers when it comes to embracing something new. As interviewees from Mashable portrayed it, the organization specifically seeks these characteristics when hiring its employees. All of this together made the path to adoption inside Mashable more of a blitz, with very fast and heavy spread of the technology at the outset followed by a tapering off of additional adopters over time. This result would yield an adoption curve with a more convex shape rather than the theorized S-shape. The convex-shaped curve suggested by Mashable's adoption of Meerkat is consistent with a refinement to the diffusion theory explained in detail by Danakowski, Gluesing and Riopelle (2011). That research presents the results of an ambitious quantitative study that used computerized textual analysis of thousands of individual emails to detect and plot patterns of innovation across the various divisions of a global automobile manufacturer. The resulting curves, especially those showing the spread of adoption across different divisions of the company, hewed to a convex shape rather than the theorized S-shape. The explanation for this was that the use of computerized communications technology, i.e., email instead of analog person-to-person communication, changes the nature of how innovation spreads across a population, with many more people likely to jump on board at the beginning if communication channels

are digital. The relevance here is two-fold. Firstly, what happened inside Mashable offers additional anecdotal support to the idea that the expected path by which innovations get adopted may indeed be shifting toward a more swarm-like phenomenon, at least under certain circumstances. Secondly, the pack mentality exhibited in response to the initial launch of both Meerkat/Periscope and later Peach demonstrates that this convex-shaped adoption pattern may be even more prevalent when it comes to new technologies spreading across the organizations that comprise the overall journalism landscape.

Actor-Network Theory

Actor-network theory calls for analyzing the ways in which various human and non-human actants within a social system exert power to affect the outcomes. Attempting to identify the full range of actants in the adoption of the live-streaming apps yielded many of the most salient details contained in the findings section above. The results of that inquiry illuminate a much more complex range of influences on newsroom innovation decisions than what is accounted for by the diffusion of innovation theoretical model. The full set of actants in this case included newsroom personnel; the technology companies that created the apps; the South by Southwest conference; publicists; competing news organizations; the apps themselves; and, above all else, the audience. Untangling this complex network suggests that news organizations have less autonomy with their own news products than one might expect.

Newsroom personnel. Obviously individual and collective decisions by newsroom personnel were a primary driver of what transpired. Internal networks of newsroom personnel shaped things on a macro level. At Mashable, the strong overall internal network connects staff members across disciplines, thanks in large part to the

existence of the Mashable Collective which spans traditional news organization boundaries separating advertising/marketing and editorial. The real-time news team also offers a similar web of connection that loops together reporters and editors across the newsroom. A strong top-down directive in this case activated these internal connections and motivated staff members from across the organization to work together quickly to brainstorm possibilities and integrate the new technology. Informal channels of information exchange such as impromptu advice-seeking, Mashable University, etc., also helped spread the technology out to individuals not initially involved in the first use of the apps. The Huffington Post generally operates as a looser network of independent actors, at least as far as the relationships between different verticals and the centralized teams are concerned. Still, semi-formalized information channels like the email blast disseminated by the global social media editor helped the technology spread, albeit less quickly, across a newsroom that employs several hundred people. However, members of the main social media team did provide some momentum. Also important, having a features editor regularly walk around the newsroom with the app running while recruiting others to appear in the live stream simultaneously spread the technology among staff while integrating it into the operation's regular work flow. At the individual level, staff members' skills, preferences and attempts to balance competing work priorities influenced the adoption of the apps in several ways. Employees who already were active on social media or who felt comfortable being captured on video embraced the technology, led the effort to get others to use it, and made the resulting content engaging for viewers. Individual staff members also became the subject of the streaming content, offering themselves up for scrutiny by audience members viewing the stream. This

willingness to be the subject of the live-streams went beyond what staff members had previously done, and the individual personalities and expertise of the staff members who appeared in the streams shaped the audience experience directly.

Technology companies. When a technology company creates a new social platform the goal usually does not involve facilitating the flow of material from news organizations; instead, the point is to entice a mass array of users to exchange information with each other via the platform. However, as demonstrated by what happened with Meerkat and Periscope, the choices made by the creators of the technology can impact both the type and form of the content produced in a few ways. First, by initiating wide public adoption of a technical capability that previously didn't exist, the tech companies unwittingly force news organizations to take note and possibly react. In this case that happened by enabling person-to-person mobile live streaming whereby viewers could talk back in real time to the person streaming the video. Just putting this on the market and making it a common thing would force any smart news organization to at least consider using the specific platform or incorporating the functionality into its own live video efforts in some way. In this case, the creators of the live streaming technology actively encouraged news organizations like Mashable and The Huffington Post to use their platforms both indirectly and directly. Founders of Meerkat created the frenzy that sparked its use by Mashable and then appeared in one of the first streams from Mashable's CEO, thus endearing themselves to the staff and leading Mashable to keep using Meerkat longer than they might have otherwise. Later on, representatives from Periscope actively courted Mashable, visiting their offices and suggesting additional types of content Mashable could produce for the platform. And part

of why The Huffington Post chose Periscope over Meerkat was because The Huffington Post already had a relationship with Periscope's parent company, Twitter. The companies also helped determine which technology would get adopted by surpassing or falling behind competing technologies. Twitter's decision to cut off Meerkat's access to its social graph significantly lowered the relative appeal of Meerkat, which became another reason The Huffington Post migrated toward Periscope. Finally, the technology companies retain significant influence over whether or how news organizations might be able to generate revenue off the content they disseminate via social media platforms, a source of much news industry frustration.

South by Southwest Interactive. It might seem odd to include an event as an actor in the process of technology adoption, but the South by Southwest Interactive conference contributed significantly to everything that happened related to the streaming apps. First of all, the conference prompted Mashable to send its executive team and a cadre of reporters to Austin, Texas, all at once on the hunt for both things to cover and engagement with audience members. The ensuing frenzy over Meerkat at the event provided both impetus and opportunity for Mashable to dive right in. The fact that Mashable's executives were right there to plot and execute a strategy put significant energy behind the rest of Mashable's adoption process, as well as the adoption of mobile streaming technologies by other news organizations that were paying attention, including The Huffington Post.

Publicists. As more than one staff member from The Huffington Post revealed, when granting access to a celebrity or even a high-level public official, some publicists and press agents are now negotiating which specific social media platforms might be

used to disseminate the resulting material. Thus news organizations are effectively ceding some control over where they publish something in order to get the goods. While publicists did not specifically fuel the overall adoption of live streaming apps, at least one early instance of Meerkat streaming by one of the news startups was prompted by a desire to offer the White House press team something new and innovative to accompany an interview with the president. On the flip side, the inability to convince publicists to grant an interview with A-list celebrities performing in Jingle Ball prompted a staff member from The Huffington Post to use a streaming app to give its audience at least something interesting from the event.

Other news organizations. Media coverage of Meerkat's success during the South by Southwest Interactive conference was cited as a contributing factor to The Huffington Post's interest in adopting Meerkat and later Periscope. Although it was not specifically mentioned, based on the information consumption habits described by one Huffington Post staff member it is quite likely Mashable's early use of Meerkat contributed to the adoption of the technology by other news organizations. Also important, the interviewee suggested that casual social conversations between staff members from different publications might include questions about what each other's newsroom is doing with a particular technology. It was suggested that this kind of interaction might have contributed to awareness and interest in use of the streaming apps by at least one of the studied organizations.

The apps themselves. The novel combination of features and functionality — live peer-to-peer video plus group chat plus integration with Twitter, all in a user-friendly interface — provided an optimum level of utility and ease that was almost impossible to

ignore. Plus, interviewees said, using the apps was fun, not just for the viewers but also for the journalists who were streaming something. With that allure, Meerkat and Periscope were able to attract early adopters naturally prone to experimenting with new toys within both newsrooms. After that happened, the apps eventually altered the way journalists reported on various events, motivated journalists to expose themselves in ways they wouldn't have before, and steered them toward covering things they previously would have skipped. The fact that both newsrooms quickly answered the call of the apps in similar ways — particularly by arranging regularly scheduled programming — attests to the power of the apps to subtly exert their will on the newsrooms and force the creation of editorial content that fits the design and ethos of the apps themselves.

The audience. By design, the apps empower individual viewers to get involved in the video being produced. But more important than audience input during live streams was the fact that audience members were watching at all. By simply spending time with the platform en masse, audience members attracted the attention of organizations constantly seeking to position their content in front of the public's gaze. The primary editorial goal mentioned over and over again by interviewees in relation to the streaming apps was to follow the audience. One interviewee stated it clearly: "We noticed that so many people in our audience were talking about Periscope and were talking about Meerkat... so we were trying our best to be a part of that." To be fair, a more journalistic rationale did get mentioned, namely that the apps enabled journalists to give the audience a truer sense of what was happening during a big, complicated story. However, the few times that interviewees did bring up that rationale it was almost always after first mentioning the need to be doing something the public was excited about. In the case of

Meerkat versus Periscope, it also was the audience that ultimately determined what technology would prevail.

The decisions made by news organizations might also have affected the outcomes for other actants within this network. For example, a news organization can fuel the growth of a social platform simply by putting their content there. It appears this happened with Mashable and Meerkat during the SXSW conference. When people heard about the platform and saw that Mashable was using it, that no doubt contributed legitimacy to the app and probably helped convince some people to try it. This symbiosis was recognized by the technology creators, who visited with the news organizations and encouraged them to build their content presence on the platforms. Not only is it important to startups like Meerkat and Periscope but also to the established platforms like Facebook, Twitter, Snapchat, etc., all of which have put notable effort into managing relationships with major publishers to ensure quality content continues to populate their platforms. This leads to the kind of relationship The Huffington Post has with Twitter by which a newsroom staff member felt perfectly at ease requesting that the tech company incorporate a new feature into Periscope and thinking the request might someday get addressed.

What if a news organization wanted to lessen the influence of some of these other actants when deciding which journalistic technological innovations it might adopt? Could the news organization act more autonomously? Perhaps not. One interviewee made the argument that a single media company alone does not have enough power to fundamentally alter the form in which news and information is presented. That kind of change requires a technology company to do it. The example used to illustrate the point

was the form of six-second video popularized by the social platform Vine. The interviewee said news organizations might have experimented with that format before Vine existed but it would have gone nowhere. According to this reasoning, newsrooms might have a desire to experiment with radical media forms but the investment of time and energy would be futile without there being some kind of paradigm in which the audience was conditioned to getting that kind of content presented in that way. It's up to the audience to go there first, the interviewee said, and then smart media content companies will follow along. If it is true a media company cannot succeed with experimental information formats until the right third-party technology gains traction with a significant user base of potential audience members, that certainly attests to the power of technology and audience as actants that influence the way media will be presented in the future. For this reason, it is likely that news organizations will continue to be forced to adjust the form and content of their journalism to fit the constraints of the latest technologies while having minimal ability to influence what those technologies can do. This points to a future in which technologists hold more sway than journalists in determining what journalism will or will not entail, an idea explored more thoroughly by Jarvis (2014) as he offers advice for news organizations facing this situation.

Additional Discussion

There is another related angle that might help explain the urgency with which the streaming apps were adopted in both places. To understand this point, it is important to remember that the technology being studied here differs from other innovations in that the live-streaming functionality of the apps was entirely embedded within one or more social media platforms. Because of this, organizations treated Meerkat and Periscope not

just as an innovation related to video production but as a potential new avenue for reaching audiences, an ongoing organizational goal. As such, the platform may have been viewed not just as a technology but as an entirely new medium (Chernova, 2015). Thus, the reaction was more complex than might have been the case with an innovation that simply added efficiency or offered an incremental improvement to something already being produced such as a faster printing press or a more reliable strain of soybean seed.

Through this prism, much of what happened with Meerkat and Periscope might be easier to understand, especially given the upheaval brought about by the introduction of the Internet. In the century before the Internet, entirely new information dissemination mechanisms arrived only a few times: the development and proliferation of radio in the early 1900s and the advent of television half a century later. In each of those cases, established news companies were largely able to maintain their status quo. But the Internet unleashed a fast-moving, nonstop mass of uncertainty and forced evolution that news organizations of every type lagged in fully grasping. Digital news startups like Mashable and The Huffington Post, on the other hand, were born in this Internet age and thus seem to expect that they will need to evolve along with every new technological innovation that affects media consumption and distribution. Importantly, the rate of technological advancement has also soared so that another disruptive technology could be born at any moment. So if a technological innovation contains even the smallest hint of bringing about new information consumption patterns, these digital news organizations feel compelled to pay attention and place their bets. At the extreme, and especially given the stated goal of meeting a fickle audience wherever it is, the rush to adopt a new thing like live-streaming apps could be seen as something more existential: Each new social

technology brings the threat — or perhaps promise — that it could eventually become an important mechanism upon which the news organization depends for its very existence. This notion would certainly explain any willingness to wager heavily on a new technology with uncertain outcomes, and would make it a no-brainer when the initial ante is quite small and involves little more than dispatching an intern to the task. As one interviewee from The Huffington Post summarized, “It’s not a high-risk gamble.” If the organization spends time adopting someone else’s technology and it takes off, the news organization turns a small investment into the eventually payoff of a bigger audience or additional value for the audience it already has. But the bet is also a hedge against future disruption. If the news organization has adopted a game-changing technology from the beginning, that lessens the chance of losing the audience should people migrate their attention over to that new digital space. And if the experiment fails, the interviewee said, it’s probably because the platform itself couldn’t find an audience, not because the newsroom itself failed. In that case, “it’s not like we’re going down with them.”

Of course a news organization could build its own native app or entire social delivery platform; but that would require much more expertise, time and resources, and it might not be as likely to attract a sufficient audience. It also would require news companies to think of themselves as a different kind of entity entirely, one that creates technology rather than simply using it to disseminate information to an audience. Some digital news startups — Vox Media and BuzzFeed, for example — have begun going down this road of melding journalistic and technological ambitions, but they are nowhere close to creating a widely adopted consumer-grade technology along the lines of Periscope, Meerkat, Twitter, Vine, Facebook, etc.

Regardless of origin, it is clear the mere emergence of certain technologies — and, perhaps more importantly, the audience behavior related to those technologies — influences the adoption of the technology within digital newsrooms and has the power to reshape the overall editorial output in both form and content. This might not be entirely new, but what is likely a recent phenomenon is the high degree to which these digital news operations seem ready to chase both the technology and the audience wherever they may go and the significant newsroom resources necessary for that endeavor. To use another game-related metaphor, the live-streaming apps demonstrate how the rapid introduction of new technologies challenges today's media companies to a kind of nonstop whack-a-mole, where newsrooms remain on constant alert hoping to smack each new unpredictable thing that pops up before it's too late. Adding to the difficulty is the fickle nature of an equally unpredictable audience that likewise cannot be relied upon to remain for long in any given place.

This constant pressure to follow, and perhaps lead, a yet-to-be-captured audience into new technological territory has implications for many aspects of news beyond simply the adoption of individual technology platforms. For example, Mashable generates much of its online traffic by reporting on things that are already gaining traction online, or things that are likely to gain traction as predicted by a proprietary technology called Mashable Velocity. The newsroom also has a dedicated team, called Water Cooler, whose mission is specifically to find things people are talking about and create content related to that to lure the audience to Mashable's site. (Stern & Wise, 2015a). There is plenty more research to be done here, but it opens up the possibility that existing theories of media fail to adequately account for the extent to which the behavior and appetite of

the audience — both attained and potential — related to specific technologies shapes the type and amount of content newsrooms produce now and in the future. It appears the actor-network approach can, indeed, be helpful in this regard, especially given the degree to which these findings suggest current patterns of technology adoption might diminish the role of journalists as gatekeepers or agenda-setters. Furthermore, considering the diffusion of new technologies across the news industry as a whole, the findings of this research suggest it might be useful to look at adoption through the prism of game theory to help explain how the anticipation of decisions by competing organizations shapes what happens within any given newsroom. Theoretical elements of intermedia agenda setting might also help explain how the technology adoption choices made by one or more specific news organizations affects what happens across the industry overall.

Another thing worth noting is that a digital startup's entire organizational direction — and hence its embrace or rejection of specific technologies — may be subject to forces that were only hinted at in this exploration of the live-streaming apps. As mentioned in the Findings above, when trying to pinpoint why there was such early enthusiasm at Mashable for Meerkat one interviewee mentioned a fresh round of venture capital funding that corresponded to an overall emphasis on ramping up video production at Mashable. That emphasis on video grew significantly stronger since Mashable employees first roamed the streets of Austin with Meerkat in March 2015. A year later — coincidentally at the South by Southwest Interactive conference, held about eight weeks after the interviews were conducted for this research — Mashable CEO Pete Cashmore announced a video content partnership with NBCUniversal's cable network Bravo whereby Mashable would start creating entertainment video programming for the

network (Shaw, 2016). A few weeks later, on April 7, 2016, Cashmore announced via an internal memo that the company was refocusing its entire operation toward video entertainment programming and would thus eliminate its hard-news-gathering effort altogether. The announcement came a week after Mashable secured a \$15 million investment round led by Turner Broadcasting. The changes called for the addition of video-focused personnel and resulted in the firing of an estimated 30 newsroom employees, including the editor in chief, the managing editor, the politics editor and the business editor, but not the real-time news team (Sterne, 2016). It's quite possible that Mashable's success in creating live video programs specifically for the mobile streaming apps contributed at least a little to the belief that Mashable could pull off a successful pivot toward video entertainment and away from hard news. Further research would be required to understand the degree to which that may have been the case, but if the adoption of the apps played any role at all in Mashable's trajectory, then the power of the apps as an actant in the network certainly would have been even stronger than described so far. More importantly, even if the apps played no role at all, these latest developments bring to the fore another category of actors that influence what happens particularly within a digital news startup: outside investors. This situation obviously merits all manner of further investigation by academic researchers.

Finally, it is important to note that all of the people interviewed for this research were involved in some capacity at the early stages of adoption of the streaming apps. That makes them naturally more likely to have positive views on the technology and its usefulness in the newsroom, as well as making them less equipped to point to downsides, resistance, etc. This bias should not severely diminish the validity of this research, which

seeks to explain the process by which the technology was quickly adopted. However, it does mean that the current study provide a less-than-complete range of viewpoints related to these specific technologies at hand, and the findings might also leave uncovered one or more obstacles to technology adoption that exist within these newsrooms. Further research focused on late- or non-adopters might help illuminate barriers to innovation adoption and might better explain points of differentiation between early and late adopters within a specific news organization.

Conclusion

This research shows in detail how the streaming apps Meerkat and Periscope were adopted at two digital news startups, Mashable and The Huffington Post; and it identifies the complex confluence of factors that influenced that process. Both organizations adopted the technology quickly, although the adoption appears to have been more rapid and far-reaching at Mashable thanks to a combination of collaborative, boundary-spanning internal social structures and enthusiasm for the technology from the top leader of the company. The findings offer both support and clarification of the diffusion of innovation theoretical model. The research also highlights how the news organizations had less autonomy than might be expected when it came to how and whether they decided to adopt and implement a new technological innovation. As actor-network theory suggests, the adoption decision was shaped by a network of actants that in this case included newsroom personnel; the technology companies that created the apps; the South by Southwest Interactive conference; publicists; competing news organizations; the apps themselves; and, above all else, the audience. Combining diffusion of innovation and actor-network theoretical approaches succeeded in making it possible not only to

understand the path to adoption of the live streaming apps but also to gain a more complete understanding of the dynamics, motivations and interactions that shaped the outcome.

The design of this study presented a few limitations. As noted in the methodology section, studying the adoption of a technology months after its introduction via backward-looking interviews meant the researcher was not able to observe firsthand the nuanced interactions that could fully elucidate the process and dynamics in question. The research might thus fail to capture certain details that either no one noticed at the time or that had since slipped out of memory. Thankfully, the launch of the social messaging platform Peach the week before the research interviews began helped fill in some gaps. Another limitation is that the findings showcase only the news organizations being studied rather than offering a generalizable picture of all news startups. Choosing more than one news organization to study aided in this regard. Additionally, any instructional value for other news organizations might be tempered by the unique structural elements of the organizations being studied. For example, at Mashable a key factor contributing to speedy adoption of new innovations is the unique collection of staff members who populate the operation; so knowing how Mashable did it may be of only limited use to a news organization that is confined to working with existing staff members who are reluctant to change, or to organizations that might not be able to attract the kind of people who choose to work for news startups. Even so, the insights gathered in this research have the potential to guide organizations that support journalism practitioners in developing appropriate training programs or other mechanisms that might help news organizations become more adept at adopting new innovations should they desire.

Additional research might go further to directly compare and contrast the way journalism innovation happens inside digital news startups against similar processes inside one or more types of legacy news operations. Similarly, as implied by other articles mentioned above, researchers might devote more attention to the larger network of news organizations, journalism-related foundations and institutes, audience members, sources, and academia to understand how new technologies spread across the industry. This idea directly corresponds to what Turner (2005) suggested when he first proposed ANT as a means for studying journalism. It also would be interesting to look more closely at the full range of actor-networks at play inside modern news organizations and the relative extent or complexity of those networks. Specifically, legacy news organizations traditionally have very separate operations when it comes to producing journalism and bringing in revenue. However, changes in distribution platforms and audience behaviors are forcing a more product-centered approach in many organizations that necessitates new kinds of interaction among the various players within a media enterprise. The discussion of the Mashable Collective presents a window into that world. Investigating more fully how those actors from within and outside the newsroom intersect and collaborate around innovation — especially around efforts to connect new content ideas with new streams of revenue — could help us better understand what it really means to operate a journalistic operation in these times of constant digital transition.

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Vita

Reuben Stern is the Futures Lab Deputy Director at the Donald W. Reynolds Journalism Institute. In addition to overseeing other projects, he hosts and co-produces the weekly Futures Lab video update. His areas of expertise include innovation, management, content strategy, product development, marketing, multimedia reporting and editing, cross-platform content delivery, audience research and engagement, user experience, design and infographics.

In 2009, Stern helped create the cross-platform public affairs program Intersection, a collaboration of RJI and NPR-affiliate station KBIA/91.3 FM, and he hosted the program from its launch through 2013. He also has taught classes at the Missouri School of Journalism since 2002. Before joining RJI, Stern was the managing editor for the Columbia Missourian, where he directly oversaw the day-to-day operation for the website and daily newspaper and helped launch several innovative initiatives including a revamped website and custom-built content management system.

Previously Stern worked at The Atlanta Journal-Constitution; The Budapest Sun, an English-language newspaper in Hungary; and the Los Angeles Daily News. He also spent several years working as a freelance editor and graphic designer.