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Chua, Sherwin; Westlund, Oscar

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Article

Audience-Centric Engagement, Collaboration Culture and Platform Counterbalancing: A Longitudinal Study of Ongoing Sensemaking of Emerging Technologies

Sherwin Chua ¹ and Oscar Westlund ^{2,*}

¹ Department of Journalism, Media and Communication, University of Gothenburg, 405 30 Gothenburg, Sweden;
E-Mail: sherwin.chua@jmg.gu.se

² Department of Journalism and Media Studies, Oslo Metropolitan University, 0130 Oslo, Norway;
E-Mail: oscar.westlund@oslomet.no

* Corresponding author

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Abstract

Digital journalism studies have done little in terms of studying longitudinally the interrelationships between emerging technology and convergent news practices. This study addresses that void by using a sensemaking approach to examine how emerging technology was appropriated and enacted in the convergent news activities of newswriters, and how they made sense of the emerging technologies over two and a half years. Our study analyzes two newsrooms in Singapore: 1) a digital-first legacy newspaper, and 2) an independent digital-only news startup. This article employs the Infotendencias Group's (2012) analytical framework and its four dimensions of news convergence: i) business, ii) professional, iii) technological, and iv) contents. Additionally, it proposes and employs a fifth dimension: v) audience-centric engagement. The fifth dimension is based on the concept of "measurable journalism" (Carlson, 2018), analyzing how its actors influence the relationship between newsrooms and their audiences. This study builds on two rounds of in-depth interviews conducted from end-2015 to mid-2016, and again in 2018. Our findings show that audience-centric-engagement practices are observed in all four dimensions of convergent news activities of each news organization, and leads to three main conclusions: 1) the growing significance of *audience-centric engagement*, 2) an emergence of a *collaboration culture*, and 3) the salience of *platform counterbalancing*.

Keywords

audience engagement; collaboration; convergence; digital journalism; emerging technology; measurable journalism; sensemaking; social media platforms

Issue

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1. Introduction

Emerging technology possesses the potential to impact the situation for news work and the place journalism has in society. This thematic issue studies how emerging technology has enabled new forms of public engagement, new user interfaces and contents, changing professional practices in news work, and their legal and

economic implications. Digital journalism studies have shown how journalists and the news media are struggling to maintain their professional position and their position in the market, exploring and experimenting with automated journalism, mobile news, citizen journalism, live blogs, big data, crowdsourcing, paywalls, hyperlocal journalism, digital analytics, and audience engagement (e.g., Franklin & Eldridge, 2017; Witschge,

Anderson, Domingo, & Hermida, 2016). Ultimately, both the practice and study of digital journalism are continuously changing. Yet, there are relatively few studies that trace the actions and beliefs of newswriters over time in the salient case of journalism and emerging technology. This article presents data from a two-and-a-half-year longitudinal study that applies a sense-making approach entailing analyses of newswriters' *actions* and *beliefs* in relation to the use of emerging technology over time (Weick, 1995; cf. Westlund, 2011) to examine four previously identified forms of convergence in journalism (Infotendencias Group, 2012), and also a fifth, audience-oriented form (Carlson, 2018). The study empirically examines two types of news publishers: a 'digital-first' legacy news organization (LNM), and a 'digital-only' news startup (DNS), hereafter referred to using the acronyms. Media scholars have been paying attention to emerging technology (and the technologists associated with them) and its relationship with news practices (e.g., Baack, 2018; Westlund, 2011), including tensions and negotiations taking place among diverse social actors in the news organization in relation to emerging technology and innovation (Krumsvik, Milan, Bhroin, & Storsul, 2019; Nielsen, 2012; Westlund, 2012a; Westlund & Krumsvik, 2014) as well as in relation to potentially active participants (Lewis, 2012; Westlund, 2012b). Nonetheless, while journalism studies scholars have a growing interest in researching the role and influence of emerging technology in entrepreneurial journalism and DNSs (e.g., Carlson & Usher, 2016; Witschge & Harbers, 2018), most studies have focused on the digital transformations occurring in LNM. Thus, in terms of relative proportions in sheer amounts of studies, scholars have largely neglected the interplay between emerging technology and small news companies (exceptions include Ali, Schmidt, Radcliffe, & Donald, 2018), including DNSs. Still, in 2018, researchers have successfully argued that DNSs (i.e., digital native news websites) continue to grow in importance, and that researchers must study them (Canter, 2018). In recent years, scholars have studied DNSs such as BuzzFeed (Tandoc & Yuan, 2018) and De Correspondent (Harbers, 2016), finding that they are more willing to experiment with new technology and pay more attention to their audiences. Moreover, scholars have also begun re-examining the methods and ways to study the news values of digital-born news organizations (Canter, 2018).

There are relatively few studies of news organizations taking a longitudinal approach (exceptions include Nel & Westlund, 2013; Nelson & Tandoc, 2018; Westlund, 2011, 2012a). To date and to our best knowledge, digital journalism studies have done little in terms of studying and comparing the interrelationships between emerging technology and convergent news practices in both these types of news organizations, and especially so when it comes to research designs with a longitudinal approach towards change and persistence over time. DNSs differ from LNM: DNSs possess little overheads and a few

staff; have flat organizational hierarchies; have evolved distinct newsroom cultures that thrive on chance-taking and creativity; and receive funding from investors or large companies rather than banks and traditional funding streams (Boyles, 2016; Usher, 2017). Given their differences in structures, practices, and cultures, it is imperative to do so. This article seeks to address this research void. In doing so, this essay adopts a non-technologically deterministic position and acknowledges that emerging technology possesses the potential to influence—but not govern—the transformation of news practices.

This article applies a sensemaking approach to examine one LNM and one DNS, with the aim of understanding how emerging technology has been appropriated and enacted over time in the salient case of news publishers. Both news organizations examined in this article are located in Singapore, which has a domestic market of about 5.6 million people. The island-state has one of the world's most developed information and communication technology (ICT) infrastructures and is ranked among countries with the highest global internet and mobile penetration rates (We Are Social, 2018). Singapore has an idiosyncratic news environment. The country's mediascape is dominated by two LNM companies, Singapore Press Holdings (SPH) and MediaCorp, which the country's elected government maintains a powerful influence over (Duffy, Ling, & Tandoc, 2018). Since the early 2000s, there has been a flourishing of news websites and applications, developed by both local LNM organizations and independent DNSs (Lau, Lin, & Low, 2013; Tan, Tng, & Yeo, 2015). Therefore, Singapore's evolved ICT infrastructure, high degree of digital connectivity, and burgeoning space for digital journalism make it a suitable environment in which to examine the interrelationships between emerging technology and news practices, and the manner in which news professionals make sense of the phenomenon.

This article includes two rounds of semi-structured in-depth interviews conducted with a total of 13 newswriters over two and a half years. This diverse group of social actors in news organizations (cf. Lewis & Westlund, 2015) included senior editors, reporters, digital graphic illustrators, videographers, and newsroom managers. The first round of interviews with the 13 social actors took place from end-2015 to mid-2016. In mid-2018, more interviews were done with four newswriters who had participated in the initial round. All in all, this article contributes to the body of research on emerging technology and news convergence in three distinct ways. First, it provides an in-depth comparison of how emerging technology is being approached by news workers in two distinct types of news organizations. This goes beyond most studies that focus on LNM, and provides vital insights into the interrelationships between emerging technology and news practices of DNSs. Secondly, this article presents a fifth form of convergence—*audience-centric engagement*, which has been developed by drawing on the concept of "measurable journalism" (Carlson, 2018)

that considers the use of digital analytics in quantifying news consumers. Third, by comparing the changes in the sensemaking patterns of newswriters in each news organization over time, we achieve a deeper analysis of their actions and beliefs towards the use of emerging technology.

This article is organized into five main sections. Next follows the second section: an outline of our analytical framework and approach, discussing also applicable literature. Thereafter, we turn to the third section, presenting method and material for our two case studies in Singapore. The fourth section focuses on reporting the findings for each of the two research questions. Conclusions and a discussion of future research close the article.

2. Analytical Framework and Approach

This article adopts a sensemaking approach as developed by Weick (1995). By adopting this approach, we refer to a research design and analysis focusing on personal *actions* and *beliefs* taken *over time*, amongst a selection of key representatives in news media firms (e.g., Westlund 2011, 2012a). In doing so, the article applies and further expands on the Infotendencias Group's (2012) analytical framework on four dimensions of convergence by adding a fifth, audience-centered dimension. In the sub-sections that follow, we outline and discuss each of these, closing with a synthesis.

2.1. The Sensemaking of Emerging Technology in Journalism

Sensemaking is a constructivist approach focusing on how members of organizations engage in diverse kinds of sensemaking patterns as they grapple with what they are doing inside their organizations, and what is going on beyond it. The sensemaking approach is especially applicable to the study of organizational change and emerging technology in media companies as it provides a lens through which we attain an in-depth understanding of how newswriters, through patterns of interpreting, negotiating and acting, make sense of the transformations happening around them. Importantly, in seeing organizations as sensemaking systems, members within these systems are continuously trying to interpret emerging changes in relation to that which is more familiar, and to make them comprehensible and predictable (Weick, 1995). Examples include their experiences and routines for working with emerging technologies, or what Powers (2012) refers to as “the emergence of technologically specific forms of work” (p. 28). The sensemaking approach has been applied to the study of emerging technology in journalism. In a three-year longitudinal study, Westlund (2011, 2012a) showed how diverse social actors from different departments—editorial, business and IT—within a news organization displayed heterogenous sensemaking patterns and drew on their prior experiences from their news work, especially those gained from work-

ing on news websites, when implementing their publication's mobile application. Furthermore, Weick (1995) suggests sensemaking can be used to examine how people retrospectively make sense of changing events through a continuous process of construction, classification, interpretation and conclusion. He argues that organizations may be viewed as “sensemaking systems” (p. 164), and that change management in organizations involve a tension between innovation (new practices) and control (old methods). In analyzing transformations, actors involved seek to assert control of “old” methods, which leads to a continuous reconciliation of these two opposing views (Weick, 1995; cf. Westlund, 2011). Additionally, Weick (1995) highlights that *actions* and *beliefs* underscore organizational sensemaking patterns. In *action-driven* process, actors make meaning to justify the actions they have *committed* to, or to gain a sense of cognitive coherence about their actions they have performed to *manipulate* their environments (Choo, 1996, cf. Westlund, 2011). In *belief-driven* patterns, people *argue* about their beliefs when they find that they are in conflict with current situations, or use beliefs as *expectations* to guide their understanding of evolving events occurring around them through a process of connecting new meaning to old understanding.

Importantly, this article uses the sensemaking approach as an overarching conceptual lens just as much as a way to position our stance on theory of science. It guides how we approach the epistemological nature of knowledge produced through interviews with newswriters as systems of sensemaking (cf. interpretive systems). Thus, we do not here claim to capture an ontological reality, but instead, focus on socially constructed accounts about how newswriters approach, engage and negotiate with emerging technology through *actions* and *beliefs*. The sensemaking approach is used to present a holistic understanding of the interrelationships between emerging technology and news work over time.

2.2. Journalism and Convergence: An Analytical Framework

Defined as the “combination of technology, products, staffs and geography among previously distinct provinces of print, broadcast and online journalism” (Singer, 2004, p. 3), scholarship on journalism convergence may be grouped into three areas. The first area analyzed news convergence as a *product*. In the 1990s, scholars opined that the blurring of the lines between different forms of traditional media represented the catalyst behind the surge of digital multimedia. Pavlik (1996), for instance, viewed convergence as the “coming together of all forms of mediated communications in an electronic, digital form, driven by computers” (p. 132), and Winseck (1998) argued that convergence entailed the gradual combination of ICTs and telecommunications. The second area conceptualized news convergence as a *process* that occurs in multiple phases. Au-

thors such as Boczkowski (2004) stressed that convergence is an accidental process involving multiple paths influenced by technological, local, and environmental factors. Dailey, Demo and Spillman (2005) proposed a five-stage continuum of news convergence that illustrated a gradual process of cooperation and integration between newswriters, and highlighted that all newsrooms would need to gradually experience the various stages before achieving “full convergence” (Dailey et al., 2005, p. 152). The underlying and normative assumptions that total integration was desirable in patterns of news work was, of course, contested.

Partly as an extension to research in the first and second areas, journalism scholarship adopting a *multidimensional* approach to news convergence emerged as a third area. Researchers have argued that a thorough understanding of convergence can only be attained through an all-round approach that examines how every element of the complex, interconnected system—an organization’s technology, products, content, staffs, geography, business strategy, and interaction with their audiences—exerts a reciprocal influence on each other (Domingo et al., 2007; Infotendencias Group, 2012; Singer, 2004). In 2012, a group of Spanish academics formed a research consortium, the Infotendencias Group, and proposed a model that consisted of four main types of news convergence:

1. *Business convergence* analyzes the corporate strategies of a news organization, including newsroom integration and new forms of logistical arrangements designed to increase productivity;
2. *Professional convergence* looks at skills polyvalence, which refers to a journalist’s multimedia and multi-tasking expertise;
3. *Technological convergence* emphasizes “cross-media” and “multiplatform” news production and dissemination—a trend seeing news companies adopting new production patterns, including multimedia content management systems that facilitate news publishing on multiple platforms simultaneously;
4. *Convergence of contents* focuses on the impact of increasing demand for multimedia news on media organizations’ production and dissemination strategies.

In light of the four A’s (see Lewis & Westlund, 2015), this analytical framework allows for a broad analysis of social actors and technological actants in diverse activities related to convergence. While the Infotendencias Group’s (2012) framework represents a multidimensional model for examining news convergence, it omits the dimension of the audience and hence, does not address the different ways social actors approach their audiences. Thus, next we propose a fifth, audience-oriented dimension to the analytical framework.

2.3. Expanding the Analytical Framework : Audience-Centric Engagement

News audience scholarship has stressed that audience participation has become a “key strategic question” (García-Avilés, Kaltenbrunner, & Meier, 2014, p. 582) in understanding newsroom dynamics in LNM and DNSs (Bruno & Nielsen, 2012). A 2018 thematic issue of *Media and Communication* expands our gaze onto how news media have approached participation for proprietary vis-à-vis non-proprietary platforms, including its assumed positive aspects and its often-overlooked dark aspects (see Westlund & Ekström, 2018), which have been elegantly conceptualized as “dark participation” (Quandt, 2018). Much engagement with active audiences nowadays takes place via social media platforms non-proprietary to the news media, and scholars and practitioners alike do well in questioning assumptions about the nature of such participation (Lewis & Molyneux, 2018).

Carlson (2018) argues that as more newsrooms adopt more complex digital methods of quantifying and tracking their online audiences in real-time, greater attention must be paid to how the factors of materiality, practice, culture, and economics shape the relationship between newsrooms and their audiences. To this end, Carlson outlined eight dimensions of measurable journalism: (i) *material*—digital news infrastructures and digital analytics software; (ii) *organizational*—new roles in newsrooms responsible for analyzing and reacting to the metrics, and new types of digital service providers; (iii) *practice*—new audience engagement methods and the use of data in news decisions; (iv) *professional*—concerns over journalistic autonomy that includes the acceptance or resistance towards audience metrics; (v) *economic*—the use of data to monetize content, make resource decisions and facilitate advertising; (vi) *consumption*—introducing content recommendation algorithms to personalize content for audiences; (vii) *cultural*—wider concerns and debates over the use of story performance metrics as the deciding factor in determining newsworthiness (e.g., Carlson, 2017, on meta-journalistic discourse and ultimately also journalistic authority); and (viii) *public policy*—concerns over data security and privacy issues. Carlson (2017) stressed that these eight dimensions are “mutually constitutive” (p. 409) and researchers should approach them holistically rather than avoid over-emphasizing any element.

2.4. Synthesis and Study Rationale

Emerging technology has been considered an important component of the sensemaking approach (Weick & Meader, 1993), and the sensemaking approach is suitable for examining emerging technology, innovation and change management in organizations *over time* (Choo, 1996; Weick, 1995; Weick & Meader, 1993). To date,

there are few studies that longitudinally analyze the interrelationships between emerging technology and convergent news practices concerning shifting *actions* and/or *beliefs*. By longitudinal, we here refer to having at least two consecutive points of data gatherings with the same news publishers and similar sets of representatives, enabling analysis of changes over time (see Nelson & Tandoc, 2018, for a similar research design). In extension of the above, this study synthesizes the sense-making approach with the analytical convergence framework to, firstly, examine how the newswriters in a LNM and a DNS engaged with emerging technology in practices related to the five dimensions of convergence, and secondly, analyze how the newswriters made sense of emerging technology over two and a half years. Correspondingly, this study asks these two research questions:

RQ1: How did the newswriters say emerging technology was *appropriated and enacted* in their convergent journalism practices over time?

RQ2: How did the newswriters *make sense* of key emerging technologies over time?

3. Method and Material

Case study is an optimal method for in-depth examining of contemporary phenomena within their real-life context (Yin, 2018). This study adopted Yin's (2018) case study method that involved two rounds of semi-structured, in-depth interviews over two and a half years. The study applied a longitudinal approach because the sensemaking of developmental trends, such as the interaction between emerging technology and news practices, requires examination of the same group of people over time (cf., Westlund, 2011, 2012a). The first round of interviews with 13 newswriters—editors, reporters, designers, photographers and videographers—was conducted from end-2015 to mid-2016 (hereafter collectively dated as 2016). In mid-2018, four newswriters (three from the LNM, and one from the DNS company) who had been interviewed in 2016 were interviewed again. They were selected for two reasons. Firstly, three of them were senior editors in their respective news organizations who were directly involved in implementing emerging technology, and one was a middle-level manager at the LNM who had experienced using new technology both as a reporter and editor. Secondly, some participants from 2016 were unavailable because they either had resigned, declined to be interviewed, or, in the case of the LNM, been given new roles due to restructuring that were not relevant to this study. While the data collected in 2016 was part of a separate study (Chua, Goh, & Lin, 2018), it was similarly focused on the convergent journalism practices and application of emerging technology in both news organizations, and hence, afforded a retrospective (sensemaking) approach during the interviews in 2018. Each interview lasted between 45

to 60 minutes and in total produced almost 1,000 minutes of data. Interviews with the LNM newswriters in 2016 and 2018 took place in the participants' offices, including their meeting rooms and at their desks, and gave the first author the opportunity to observe the participants' working environments, take notes, and follow-up with questions about the observations. Interviews with the DNS newswriters took place in public places as they did not occupy a permanent office during both instances. To augment the interview data, the first author regularly recorded notes and tracked significant changes in the content and services of the digital news products (websites, mobile apps, electronic newsletters, and social media platforms) for each publisher. In November and December 2018, the DNS (*The Online Citizen*) was forced to temporarily suspend operations as its equipment was seized by the Singapore Police Force, and its editor-in-chief prosecuted for criminal defamation over publishing an editorial that criticized the Singapore government. Public donations (i.e., crowdfunding) enabled the DNS to resume operations a week after the seizure occurred. However, this complicated final follow-up interviews in December 2018.

3.1. Case Selection

Theoretical sampling was used in selecting two cases: *The Straits Times* (ST), a 172-year-old LNM owned by media conglomerate Singapore Press Holdings (SPH), and *The Online Citizen* (TOC), a 12-year-old DNS. They represent unique cases that differ in funding models, business strategies, operations, size, culture, and leadership. Their distinct traits make them suitable cases for comparing sensemaking patterns and convergent news practices vis-à-vis their use of emerging technology.

ST was founded in 1845 and employs about 300 staff. It is Singapore's most-read English newspaper and had, until 2017, a market capitalization that was larger than that of the New York Times Company (Yap, 2017). Since 2013, ST has been transforming itself from a print-focused newspaper to a digital-first news organization (Fernandez, 2015). In comparison, TOC started operations in 2006, has employed no more than 10 full-time staff since its inception, occasionally relied on volunteers to assist in news production, and struggled to remain financially viable (Sim, 2016). For revenue, TOC relies on multiple sources, including digital advertising, reader contributions, online crowd sourcing, and organizing citizen journalism training workshops and seminars for social activists (Hicks, 2015).

3.2. Data Analysis

The interview questions in 2016 and 2018 were designed to focus on how emerging technology was appropriated and enacted in the convergent news practices in both ST and TOC. Furthermore, Weick (1995) argues that sense-making constitutes *enactment*—the ongoing process of

one acting on one's own beliefs to confirm his or her predictions about the future. Hence, to understand how the newswriters made meaning of emerging technology in their work through their *actions* and *beliefs* over time, the 2018 interview questions were left open-ended and explicitly probed interviewees on developments regarding the appropriation and enactment of emerging technology in their newsrooms, and requested them to reflect on their responses in 2016. All interviews were recorded digitally and transcribed verbatim, and then coded according to the five dimensions of journalism convergence to identify how emerging technology was appropriated and enacted in their journalism over time. "Measurable journalism" (Carlson, 2018) was not employed as the fifth dimension of news convergence in the 2016 study. However, the similar focus of both the 2016 and 2018 studies in examining ST's and TOC's approaches towards quantifying and engaging online audiences afforded both sets of data to be similarly coded according to the aspects of "measurable journalism". Thereafter, based on the *action-* and *belief-driven* sensemaking patterns highlighted by Weick (1995), the transcripts were coded again to analyze how the newswriters made sense of the manner in which emerging technology had influenced their journalistic practices over time.

4. Sensemaking of the Appropriation and Enactment of Emerging Technologies

This section responds to both RQs by presenting findings that are organized according to five sub-sections. Within each sub-section, we first identify examples of how emerging technology was appropriated and enacted in the newswriters' practices between 2016 and 2018 (e.g., their actions) in relation to a specific dimension of journalism convergence (RQ1). Then, we present how the newswriters in each news organization made sense of the emerging technology over time with regard to newswriters' *action-driven* (committing and manipulating) and/or *belief-driven* (expecting and arguing) sensemaking patterns (RQ2). When making reference to these patterns, we italicize and include them in parenthesis in the following paragraphs.

4.1. Business Convergence and New Digital Strategies

In 2018, SPH set up a new digital strategy department devoted to exploring the use of emerging technologies in journalism for its publications, including ST. The head of the department (formerly ST's digital editor in 2016) said that since 2016, SPH's management had been considering an integrated, "company-wide" strategy to incorporate the use of emerging technologies across the company's publications. He said in 2016 that the knowledge learnt from the use of emerging technologies was mostly kept within ST. In 2018, however, he stressed the knowledge had been shared across the company's newspapers. For TOC, the editor-in-chief said in 2016 that ex-

perimenting with emerging technology was not a priority as they were understaffed and he expressed TOC was overwhelmed by day-to-day operations. In 2018, he said previous staffing issues had been resolved and he had more time to explore and adopt suitable emerging technologies over the past year.

On *making sense* of digital strategies, ST's newswriters were largely *action-driven* by a *commitment* to the idea that new innovative methods were needed to take the company forward in a digital news environment. The head of ST's digital strategy department in 2018 explained that his department had been set up (*manipulating*) because he and SPH's management wanted to focus "on new [digital] trends and developments", "new digital opportunities that [could] be monetized", and develop "more sophisticated ways to engage with [readers] online". In 2016, he said he was "looking for bigger and better collaborations with other departments because of the synergies they brought". In 2018, he thought his new department had successfully helped break down metaphorical walls within the company by promoting a greater degree of knowledge sharing and collaboration. Other ST newswriters in 2018 also thought the digital strategy department—through its efforts in keeping them abreast of digital trends via weekly email newsletters, and frequent courses and workshops—had created a culture of greater "digital awareness" (deputy political editor, 2018) within the company. Contrary to ST, TOC's newswriters engaged in *belief-driven* sensemaking that first involved a process of debating (*arguing*) the enabling potential of specific emerging technologies, which led to an alteration of their beliefs and a revised understanding (*expecting*). The TOC editor-in-chief gave two reasons for changing his attitude from ambivalence to embracing the use of emerging technology between 2016 and 2018. First, he said he had become more aware of the advantages of using metrics to understand the demographics and preferences of his readers. In 2018, he said he used digital tools to try to observe the best times to publish stories, monitor the geolocation of TOC's readers, and consider trending topics. He claimed that the data improved his publication's service to its readers, which in turn helped increase readership numbers, and "maximize" online advertising revenue for TOC. Second, in 2018, he also thought automated journalism could help TOC better compete with larger news companies by increasing efficiency and news output, and "free up his journalists to devote more time to producing more in-depth, analytical stories".

4.2. Professional Convergence and Emerging Journalistic Skillsets

Here, we focus specifically on mobile journalism skills as an example of how newswriters in both organizations appropriated and enacted emerging technology in relation to professional convergence. Other skills involving online metrics, social media engagement, long-form-

video production and interactive graphics are discussed as examples in the other sub-sections.

In 2016, newswriters from ST and TOC said they were expected to use mobile devices to produce multimedia news and relay information, including videos, sound bites and descriptions of events, to their newsrooms using real-time mobile communication apps (e.g., Telegram, WhatsApp or Facebook messenger). This is in line with being mobile journalists, so-called MoJo's (e.g., Westlund & Quinn, 2018). In 2018, editors from both companies said mobile journalism skills for reporters had become even more important than in 2016. However, both organizations differed in the manner in which mobile journalism was appropriated and enacted since 2016. For ST, its social media editor said in 2018 that mobile journalism skills had "gradually become the norm rather than the exception" and SPH had provided more professional training—mobile journalism hands-on workshops and digital journalism-related seminars—for its newswriters. For TOC, one of its section editors said in 2016 that instead of "forcing staff and volunteers to be expert mobile journalists", TOC relied on "multi-skilled groups" of reporters, where different journalists excelled in different mediums, to produce multimedia articles. In 2018, the editor-in-chief said that TOC still followed this arrangement as it had worked well.

On *making sense* of mobile journalism skills, both ST and TOC reporters engaged in *action-driven sense-making* patterns, but differed in their approaches. ST's newswriter in 2016 expressed that mobile journalism skills were highly important and they were *committed* to the notion that it was the direction the industry was heading towards because "audiences expected to see more multimedia news content in real-time" (ST videographer, 2016). Hence, SPH had begun increasing the frequency of digital journalism training since 2016 (*manipulating*). In 2018, the ST deputy political editor said the new digital innovation department's efforts had contributed to making staff more aware of the importance of learning the latest digital journalism tools and production techniques. Second, they also expressed that a retrenchment exercise in late 2017 had psychologically reinforced the workers' *commitment* to adapt to the digital news environment, which required newswriters to "do more and be more technologically savvy" (ST social media editor, 2018). For TOC, its editor-in-chief acknowledged the importance of mobile journalism skills in both 2016 and 2018. However, in both instances, he said he remained *committed* in his approach in not requiring his staff to be experts in mobile journalism, and instead, adopted a "multi-skilled groups" approach (*manipulating*). In 2018, he gave two reasons his approach: First, he thought it was "unfair to expect a journalist to shoot photos, videos and write a story on his own". Second, he believed TOC's "multi-skilled team" approach had proven to him that it improved communication and collaboration among staff, who were then able to produce better quality, more in-depth stories.

4.3. Technological Convergence and Proprietary versus Non-Proprietary Platforms

We observe two ways in which newswriters from ST and TOC said they had, over time, altered their use of emerging technology in their strategies for multiplatform news distribution across proprietary and non-proprietary platforms. First, in 2016, both ST's and TOC's editors said they wanted to distribute news content on as many social media platforms as possible. The ST's digital editor said in 2016: "We need to keep flooding the different online platforms with our news [so] that ST remains the prominent brand in the digital space." ST also began pushing content on WhatsApp and Telegram in 2016. Likewise, TOC's editor-in-chief said in 2016 that it needed to "keep pushing content on to every social media space to get traction". In 2018, however, they said they were more selective and cautious when publishing content on social media platforms that were non-proprietary to the publisher (cf. Westlund & Ekström, 2018), although they were still willing to work with the non-proprietary platform companies to increase the reach of their content. Second, both ST's and TOC's editors in 2018 said they were also channeling more resources into enhancing their proprietary platforms, such as mobile news applications and websites, to entice more readers to use these channels, and consequently be less reliant on social media. To this end, they have added features such as customizable content, podcasts, greater interactivity, text-to-voice functions (ST), and multi-lingual versions (TOC). In 2016, editors from both news organizations acknowledged that the motivation to enhance their proprietary platforms had not been as great.

On *making sense* of their multiplatform news strategies, newswriters in both news organizations engaged in *belief-driven* patterns that involved *arguing* and *expecting*. In 2016, editors from both ST and TOC said that social media channels were helpful for their publications in garnering more readers for their content. However, in 2018, the editors said they had become more skeptical of social media platforms. That skepticism, in turn, motivated them to focus more resources on improving their proprietary channels and reduce reliance on social media platforms in disseminating news:

Facebook changed its algorithm [in early 2018] and we were badly affected. So, we had to look for alternative sources quickly. But also, we want to grow our readers outside these [social media] platforms. I think we're realizing that as long as we have a critical number of paying subscribers, and we focus on making these loyal subscribers happy by offering them really good products, then it might be a sustainable option...instead of a focus on growing readership numbers. (ST social media editor, 2018)

For TOC, the editor-in-chief in 2018 said he decided to "develop [TOC's] own news app and improve [its] web-

site”, to avoid being subjected to the social media platforms’ “constant changes and harsh policies”. He added: “We would still need social media, but with our own channels, we call the shots, we have access to audience data, and we can better cater to the preferences of our loyal readership base”.

4.4. Content Convergence and Multimedia News Production Capabilities

Mobile journalism aside, the workers from both news publications said in 2018 that they had been making use of emerging technologies to improve their capabilities in multimedia news production since 2016. For ST, their editors in 2016 said their publication had set up a video unit to produce documentary-style videos and an interactive graphics unit to produce interactive multimedia news for ST’s microsites during major news events. In 2018, the editors said the newspapers’ content management systems were gradually being upgraded to better facilitate the processing of multimedia content. For TOC, the editor-in-chief in 2016 said it had invested in developing a microsite to host multimedia news content for major news events, and also new production hardware and software. In 2018, he said besides long-form videos, TOC produced different types of videos to cater to different segments of its audience, including documentary-style videos, three- to five-minute videos clips, and ‘live’ streaming videos on Facebook.

On *making sense* of using emerging technology to enhance their multimedia news content, newswriters from both news organizations engaged in *action-driven* patterns. For ST, its digital editor said in 2016 that the publication had *committed* to investing in producing interactive and multimedia content in order to provide audiences with a better “news consumption experience” than its competitors. In 2018, he said ST would continue to upgrade its multimedia and interactive news capabilities (*manipulating*) because he thought they were still crucial in providing “readers with a consistently good experience” that cannot be “easily copied by [ST’s competitors]”. For TOC, its editors in 2016 displayed a *commitment* towards increasing and improving their multimedia content because they had thought their readers demanded it. In 2018, TOC’s editor-in-chief remained *committed* towards that notion and further expressed that he realized readers not only preferred multimedia content, but different age groups preferred different types of videos. Hence, his publication devoted more resources to producing different types of video news (*manipulating*) because he wanted to cater to each age group’s preference.

4.5. Audience-centric Engagement, Online Metrics, Social Media, and News Automation

This sub-section presents findings for the fifth dimension of convergence, audience-centric engagement, in re-

lation to how the newswriters said they had appropriated and enacted three types of emerging technologies—online metrics, social media, and news automation. Our findings reveal a salient correspondence to six of the eight dimensions of measurable journalism proposed by Carlson (2018): 1) material, 2) organizational, 3) practice, 4) professional 5) economic, and 6) consumption. Next follows a closer discussion of these.

Regarding the *material* and *organizational dimensions*, ST’s head of digital strategy in 2016 said his publication had been using metrics software, Chartbeat, to track story performance. In 2018, on top of creating a new department dedicated to exploring new ways of using digital tools, including metrics, ST’s social media editor said his publication had moved from Chartbeat to a new vendor, AT Internet, and was still considering new software providers that afforded greater data granularity and customizability in tracking story performance. For TOC, although the editor-in-chief in 2016 said he did not rely on metrics, he revealed in 2018 that he had started to use Google Analytics to monitor story performance. He added that although TOC did not create a new position in the company for this purpose, he took on the responsibility of exploring new ways to leverage metrics. Regarding *practice*, ST’s editors in 2016 said they had been developing new audience engagement methods on social media. They expressed in 2016 that as part of ST’s audience engagement strategy, its newswriters were tasked with regularly interacting with readers on its social media channels. The editors said it was not seen as successful as the newswriters felt overburdened. In 2018, the social media editor said ST started closed Facebook groups for its loyal readers, where ST’s stories were shared and discussed. Similarly, in 2018, TOC’s editor-in-chief said he was planning a similar Facebook group for TOC’s readers. However, unlike ST, he said TOC’s newswriters still regularly interacted with their readers on their social media accounts. Regarding the *professional* dimension, in 2016 and 2018, newswriters from both publications said that the use of analytics to guide news decisions was debated in their news organizations, but stressed they did not entirely rely on metrics to determine newsworthiness. ST’s digital editor said his publication had a principle of using “half analytics and half human judgement”, while the TOC editor-in-chief said analytics was “a good to have to help better understand your audience, but it was not a must-have”. Regarding the *economic* dimension, the editors from both newsrooms said in 2016 that they had worked closely with social media platforms to develop content (e.g., Facebook Instant Articles), but were not given sufficient data on the outcome of those projects. In 2018, however, editors from both news organizations decided to enhance their proprietary platforms to improve audience metrics and reduce their dependence on social media platforms. This data were, in turn, used to drive monetization from online advertising. Beyond digital advertising revenue, ST also experimented with different digital subscription models to maximize monetiza-

tion. It had experimented with both freemium and metered paywall models since 2010, before eventually reverting, in 2018, to a modified version of the freemium model first implemented in 2010. TOC's content, on the other hand, is free. Regarding *consumption*, newswriters from both publications in 2018 said they were exploring the use of automation in their news production and distribution, whereas in 2016, there was no indication from either that they would be using such emerging technology. In 2018, ST's editors said they would start to explore the use of content recommendation algorithms to disseminate customized news, and were considering the use of an automated system to replicate the digital news copy into daily print editions. TOC's editor-in-chief said, finances permitting, they were going to explore the use of automated news bots to write and publish articles.

On *making sense* of their approach towards using metrics, newswriters in both organizations in 2016 and 2018 engaged in *action-driven* patterns. Throughout the period of study, they remained *committed* to the idea that analytics should not be prioritized over human judgement, and this reaffirmed their actions to rely more on their news-training when making editorial decisions. For ST, its deputy political editor echoed in 2018 what the digital editor had said in 2016, namely that it took years of journalism training to understand news values and hone editorial instincts, and these could not be replaced by software. In 2016, the TOC editors said they did not "chase numbers", and in 2018, the editor-in-chief said it had not changed. In 2016 as in 2018, TOC would not use it to track the performance of each article (and individual newswriters), but to get a sense of news habits and preferences, trending topics, etc.

On *making sense* of their approach towards monetizing audience metrics data, ST displayed *action-driven* patterns, while TOC displayed *belief-driven* patterns. In 2016, ST's digital editor expressed that audience data were a crucial stream of online advertising revenue. In 2018, as the head of the digital strategy department, he was *committed* to his earlier attitude towards audience metrics: "We now need to better leverage on metrics and look for new digital opportunities that we can monetize". For TOC, its editor-in-chief was indifferent to audience metrics in 2016. However, through *arguing* and *expecting*, he had adopted a different view in 2018 as he had realized it played a critical role in determining the company's advertising revenue and ensuring TOC remained financially viable.

On *making sense* of their approach towards news automation, the workers in both news organizations in 2018 showed *action-driven* patterns and were *committed* to using these emerging technologies to improve their journalism. Compared to 2016, when neither newsroom was experimenting with automation, ST's head of digital strategy in 2018 said: "We can now customize content to form more personal relationships with our readers". Likewise, TOC's editor-in-chief believed that automation could raise TOC's journalism standards by

breaking news faster and allowing its staff more time to focus on in-depth stories.

5. Three Key Conclusions

This longitudinal and interview-based study of sense-making around emerging technology has yielded many important findings and three overarching conclusions: 1) the growing importance of *audience-centric engagement*, 2) an emergence of a *collaboration culture*, and 3) the salience of *platform counterbalancing*.

First, this longitudinal study leads us to conclude that *audience-centric engagement* has become increasingly important, and plays into how emerging technology has been approached. This observation emerged in the 2016 data, and as mentioned, led us to incorporate Carlson's (2018) "measurable journalism" framework in our 2018 data collection to further guide our comparison and analysis. All in all, the findings indicate interrelationships between *audience-centric-engagement*-related practices, which has been conceptualized using 'measurable journalism', and the four types of convergent news practices in the following ways: i) *material* and *organizational*, and *business convergence*—both organizations incorporated metrics into their news platforms, and created new roles (ST) and responsibilities (TOC) dedicated to leveraging on metrics; ii) *practice* and *professional convergence*—both organizations were developing new methods of interacting with audiences on social media platforms (e.g., closed Facebook groups which gave loyal readers a sense of exclusivity); iii) *professional* and *professional convergence*—both organizations were increasingly using metrics to monitor story performance (e.g., they demanded more customizable and granular data), but yet displayed concerns about the extent to which metrics should guide newsworthiness; iv) *consumption*, and *technological* and *content convergence*—both organizations were reliant on metrics to inform their decisions on customizing different forms of multimedia content for varied groups of audiences across their news dissemination platforms; v) *economic* and *business convergence*—both organizations used metric data to drive monetization from online advertising and, for ST, design different digital subscription models. Although both news organizations initially (in 2016) displayed different attitudes and strategies for adopting emerging technology, they eventually (in 2018) developed an approach in which emerging technology enabled their understanding and engagement of their audiences, and thus validated its use. Importantly though, they were unwilling to rely entirely on metrics and relinquish their professional influence and editorial judgement. Also, other research from Singapore has indicated a resistance towards the use of metrics (Duffy, Tandoc, & Ling, 2018). More generally, research has found concerns about metrics getting (too much) influence over editorial judgments (e.g., Zamith, 2018). Renewed audience orientation, in the traditional sense of *recipients* that engage with the news, has become crucially impor-

tant for news media that see how user payments become an increasingly large chunk of their revenues, even the largest chunk. Consequently, approaching audiences as *commodities*, sold to advertisers, may on the other hand, lose significance as platform companies continue to overtake the advertising market and as news publishers focus more on reader revenues. This would mark a paradigmatic shift for many news publishers, one in which recipients also must be seen as customers.

Second, a *collaboration culture* has emerged. The adoption and use of emerging technology in both news organizations over two and a half years has gradually resulted in both news organizations breaking down the “walls” that used to separate editorial and business operations, now instead facilitating cross-departmental collaborations. ST’s newsroom integration and TOC’s “multi-skilled team” approach to multimedia content production are instances of how the use of emerging technology contributed to working practices that fostered greater collaboration and communication between diverse newswriters. Moreover, as digital innovation (e.g. Carlson & Usher, 2016; Westlund & Lewis, 2014) and audience data (e.g. Carlson, 2018, Nelson & Tandoc, 2018; Zamith, 2018) become increasingly important to the economic considerations of both news organizations, their senior editors are increasingly taking on duties—e.g., monitoring audience metrics and scouting monetization opportunities—that once belonged strictly to the commercial departments. This finding is in line with a growing body of studies on integration not only between editorial and commercial operations (Cornia, Sehl, & Nielsen, 2018; Drew & Thomas, 2018), but also technologists (Lewis & Westlund, 2015; Westlund, 2011; Westlund & Krumsvik, 2014).

Third, *platform counterbalancing* sets the focus to how both news organizations have developed a sort of “balanced” position toward the appropriation and enactment of certain emerging technology. In 2016, they were clearly oriented towards boosting their multi-platform news dissemination, pushing their brands across social media platforms. In 2018, *platform counterbalancing* became salient; they started acting more cautiously with regard to giving away their content to non-proprietary social media platforms, while working on improving their proprietary platforms. This approach appears sensible when taking into consideration that Bell, Owen, Brown, Hauka and Rashidian (2017), in a report about the “platform press”, argues that platform companies have gained incredible influence over revenues and citizens’ attention spans to the news. News media have oftentimes felt pressured to develop a presence on social media platforms to offer their news where the publics are (Nielsen & Ganter, 2018). Platformization, and the social media bandwagon, has fueled ongoing and disruptive processes in which the news media become increasingly dependent on platforms non-proprietary to them. In discussing this, Ekström and Westlund (in press) posit there is an overall process called “dislocation of news jour-

nalism” in play, encompassing epistemological consequences for truth claims, “contexts of justification” and audiences acceptance/rejection of knowledge claims. Their concept of dislocation of news journalism mostly stresses news publishers becoming more dependent on platform companies, albeit acknowledging the process can also move in the direction of reducing dependence. In assessing the major trends in journalism for Nieman Journalism Lab, editors have in December 2018 similarly singled out news media’s overreliance on social media platforms, and predict that more publishers will re-focus their efforts in improving their proprietary platforms and products in 2019 (Schwartz, 2018; Smith, 2018). And even as we make our ultimate edits to this article before typesetting, we are encouraged to see supportive findings and arguments in the Reuters Institute Journalism, Media and Technology Trends and Predictions 2019 report (Newman, 2019). It underscores the frustrations that many subscription-based news publishers continue to endure with non-proprietary platforms, as the former increasingly pivot towards innovating their content and payment models—all this while realizing that social media platforms may perform better as marketing tools than reader engagement channels. In concluding on *platform counterbalancing*, we suggest this may well be used as a concept referring to how contemporary news publishers strategically attempt to balance or reduce their dependency on platform companies. In extension of this, the news media are now increasingly shifting focus from driving traffic, digital advertising and social media engagement, to conversion of readers into loyal subscribers. Yet, they are embarking on a difficult journey as people’s willingness to pay is presumably even more limited than their attention spans. We welcome future research into the multitude of ways *platform counterbalancing* is done, and with what effects.

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The authors declare no conflict of interests.

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About the Authors

Sherwin Chua is a PhD candidate at the Department of Journalism, Media and Communication, University of Gothenburg, where his research focuses on the intersection of technological innovation and journalism practice. He holds a Master's Degree in Mass Communication from Nanyang Technological University, Singapore, and a BA from National University of Singapore. Chua is also a freelance journalist who covers digital transformations occurring in journalism. His articles have been published by industry think tanks such as Harvard University's Nieman Journalism Lab, WAN-IFRA (Asia Pacific) and The Splice Newsroom. He had also spent a decade as a journalist in news media and publishing, and taught journalism and mass communication-related courses at a polytechnic in Singapore.

Oscar Westlund (PhD) is Professor at the Department of Journalism and Media Studies at Oslo Metropolitan University, where he leads the *OsloMet Digital Journalism Research Group* and the OsloMet Digital Journalism Research Fellowship program and Focus Seminar series. He holds secondary appointments at Volda University College and University of Gothenburg. Westlund specializes in journalism, media management and news media consumption for proprietary news media platforms such as news sites and mobile applications, as well as with regard to social media platforms non-proprietary to the news media. Westlund is the Editor-in-Chief of *Digital Journalism*, and has also guest edited special issues for a handful other leading international journals. He currently leads a research project called *The Epistemologies of Digital News Production*, funded by the Swedish Foundation for Humanities and Social Sciences.