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Assessing the Diffusion of Drones in Local Television News

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Abstract

Emerging technologies are changing how local television (TV) stations gather and disseminate news. One increasingly used technology is drone journalism. The present study sought to determine the extent to which local TV stations across the United States were adopting this technology as part of their news operations. A survey of news managers ($n = 94$) found that half of the stations were using drones for news, but only to a moderate degree.

Keywords

drones, local news, technology

In March 2017, television (TV) stations in Atlanta dispatched helicopters to facilitate live coverage of a fire and collapse of a bridge on a local interstate (Careless, 2017). Although stations used aircraft for initial news reports, they implemented the use of drones to cover activities the next day and for several weeks after that to track repairs to the bridge. Rather than a rare occurrence, drones are but one recent technology that is changing the face of TV news (Kurz, 2016).

Deploying unmanned aerial vehicles (UAV) for reporting illustrates how the diffusion of communication technologies has dramatically changed the way journalists gather news. The adoption of websites in the mid-1990s now seems relatively

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simplistic when compared to the more recent development of advanced tools that news workers can use to create an "immersive storytelling" experience for their audiences (Nielsen & Sambrook, 2016).

According to the results of a 2016 Radio Television Digital News Association (RTDNA) and Hofstra survey, more than a third of TV stations in the United States owned or anticipated purchasing a drone (Papper, 2017). From an organizational perspective, drones offer a much less expensive alternative to helicopters to gather aerial news footage (Lambert, 2015). Some stations are touting their foray into UAV use, such as San Francisco's ABC affiliate KGO, which was the first station in its area to feature live broadcast from a drone (Miguel, 2015). The Poynter Institute has joined this trend by offering journalists training about Federal Aviation Administration (FAA) regulations, practical experience in operating drones, ethical implications of the devices, and how to incorporate UAVs into news operations (Krueger, 2017).

Increased popularity of drone usage by TV stations is setting the stage for different approaches to news. To date, however, much of the research about drone journalism has focused on topics associated with ethics, privacy, government regulation, and legal matters (see, e.g., Culver, 2014; Holton, Lawson, & Love, 2015). The present study examines the diffusion of drones in TV news from the perspectives of news directors, including motivations for device implementation and reasons why stations might not be venturing into this technology.

Diffusion Theory

Diffusion is how an innovation is communicated over time among members of a social system (Rogers, 1995). In the present study, the innovations are drones and the social system is local TV news departments in the United States. Communication may occur in articles in trade publications and interpersonal conversation among news directors and with station owners.

Rogers (1995) explained five perceived characteristics of an innovation that influence its adoption: (1) relative advantage, (2) compatibility, (3) complexity, (4) observability, and (5) trialability. All characteristics except complexity are positively related to the adoption.

Relative advantage is often associated with a cost/benefit analysis in which individuals or organizations determine whether it is in their best interest to adopt an innovation (Rogers, 1995). An important aspect of this characteristic is audience size, which is usually a crucial issue for broadcasters. For example, Goldberg, Corcoran, and Picard (2013) noted the challenges to stations using drones to gathering news but identified competitive opportunities for stations that cannot afford piloted news helicopters. Adoption of drones might, therefore, largely be a matter of cost, since stations need only special permission from the FAA. The low equipment cost (relative to helicopters) also applies to drones.

Compatibility is related to the extent to which the innovation is similar to existing objects or practices, that is, how well it fits "values, past experiences, and need of

potential adopters" (Rogers, 1995, p. 15). A high degree of compatibility tends to reduce the level of uncertainty toward the innovation. Because stations already have some experience with aerial photography, there is an assumed degree of congruence in delivering content via drones.

Complexity is associated with the level of simplicity or complexity in using the innovation (Rogers, 1995). TV stations interested in implementing innovations will need to understand the technological side of news dissemination and gathering. As noted above, complexity is associated with negatives of adopting an innovation, so that the higher the perceived complexity of the innovation, the lower the tendency to adopt the innovation. For example, a news director who perceives drones as too complex is less likely to implement the technology. News directors might view the entire process as too much trouble. For other news managers, however, the addition of drones might seem a relatively simple process.

Trialability is the ability for a potential adopter to try an innovation before deciding whether or not to adopt it (Rogers, 1995). Additionally, this provides an opportunity to see how the innovation works in the potential adopter's particular situation. However, as Rogers (1995) noted, some innovations are more difficult to try than others. The use of drones is complicated by FAA regulation that protects commercial flights. Coupled with complexity, local TV stations might perceive that implementing drones is too difficult to try because it requires additional technology and permission.

Observability relates to how well potential adopters can see an innovation in use (Rogers, 1995). News directors can observe other stations' use of new technology, but without being able to observe results in relation to TV audiences. The issue is the extent to which adoption of drones by other stations in a market influence other news directors to implement new methods for gathering and dissemination.

In addition to the perceived characteristics of an innovation, organizations adopt innovations based on three types (Rogers, 1995). First, adoption from the optional perspective means the organization does not sense a need to adopt or is not mandated to do so. Second, under collective adoption, the decision to implement an innovation is based on consensus. The third type of innovation adoption in an organization is authority-driven. In that instance, a few people who are in authority positions make the decision to adopt. In the case of drones, stations that are part of a station group might fall under either collective or authority drive, depending on the amount of participation the local news director has in the decision process. For example, Cox Media took advantage of drones for newsgathering in 2015 in anticipation of blanket approval by the FAA in 2016 (Suciu, 2016).

Storytelling Motivations for Drone Adoption

Video-rich storytelling is one tactic used by stations to create an immersive viewing experience (Nielsen & Sambrook, 2016). Drones have become a related development in news-related technologies. These aircraft offer a video-rich audience experience as well as giving TV news operations a much less expensive alternative to helicopters to

gather news footage, along with the ability to cover news in diverse locations (Lambert, 2015).

One major issue for the use of drones is government regulation that, by extension, also relates to station staffing. Starting in August 2016, the FAA (2016) instituted a rule requiring that individuals who fly drones for commercial purposes obtain an operator license for the vehicles. Since newsgathering is part of a commercial operation, an added burden for stations is ensuring that staff who fly drones have a permit.

Although an increasing number of TV stations are using drones for news, there is a dearth of research about this topic from a diffusion standpoint. A survey conducted in 2016 by RTDNA and Hofstra University found that under 20% of TV stations in the United States were using drones for news, although more than 20% indicated they were planning to implement the devices (Papper, 2017). Stations in the largest 50 markets had the highest percentage of drones. A similar study from the previous year showed that stations with more staff tended more to use the aerial vehicles (Papper, 2016).

Journalists have historically used a variety of aerial tools, including helicopters, to capture a bird's-eye perspective of events (Holton et al., 2015). Benefits of using drones are the ability to obtain visuals when it is not possible to physically travel to a location due to terrain. However, there also are a number of concerns associated with the use of UAVs for newsgathering, such as public safety, ethics, privacy, and FAA regulations (see, e.g., Culver, 2014; Holton et al., 2015).

Station characteristics also may serve as antecedents to technology adoption. This includes ownership, market size, and network affiliation. When it came to drone use, one study noted that large market stations were most active in using the vehicles (Papper, 2017). Other factors in drone use include news coverage abilities (Lambert, 2015) and FAA regulations (FAA, 2016), as well as ethics and privacy issues (Holton et al., 2015).

Given prior research about technology and TV news, the following research questions are posed:

Research Question 1: What are differences between drone and nondrone stations when it comes to station characteristics (market size, ownership, news staff size)?

Research Question 2: What is the relationship between motivations to use drones and the importance of drone use for stations?

Research Question 3: What is the relationship between motivations to use drones and importance of drones for stories?

Method

Procedure

This study was conducted through a survey of news directors of English-language U.S. TV station in November 2017. Of 495 invitations, 94 surveys were collected

(19%). Respondents were contacted through an email that invited them to click a link that would take them to the questionnaire. Station websites were accessed through StationIndex.com, which provides a listing of stations in ascending order from market 1 (the largest) to market 210. Within each market, stations are listed according to network affiliation. Only affiliates of ABC, NBC, CBS, and Fox received the survey invitation, since those stations are most likely to feature a regular newscast. After an initial email invitation, two weekly reminders were sent.

News director names and email addresses were located by searching the websites of the stations. For stations that did not indicate the news director's name, a search was conducted through Google in an attempt to locate that information. Some stations did not provide an email address of the news director. However, locating the email address of other station personnel on the website provided a pattern for the email address of the director. Despite these efforts, the researchers were still not able to locate an email address for some individuals. In those instances, the invitation was sent to a general email address such as newstip@stationdomain.

The Sample

The questionnaire first sought information related to the respondent. Since not all emails were directed to an individual, the first item on the questionnaire asked for the respondent's job title. News directors (or higher level news title, e.g., news manager or vice president of News) accounted for 93 of the 94 responses ("Director of Content" was the lone exception). Next were questions related to the station, including market number (responses ranged from Designated Market Area (DMA) 9 to 202), ownership status (group or independent/single owner), network affiliation, and number of full-time news staff, ranging from 3 to 185 people ($M = 46.39$, $SD = 32.29$). Group ownership of affiliates comprised 86.2% of stations. Large market size (1–50) accounted for 19 stations (20%), medium markets (51–100) were 26 stations (27.4%), and small markets had 52.6 affiliates (52.6%). Excluding the numerous duopolies (29 of the 94 affiliates that began the survey), there were 17 stations affiliated solely with ABC (25.4%), 22 with CBS (32.8%), 14 with NBC (20.9%), and 14 with Fox (20.9%).

Results

Respondents were presented with a filter question asking whether or not the station used drones for newsgathering. If answered in the affirmative ($n = 47$, 50%), each respondent was asked to indicate on a scale (0 = *not at all*, 5 = *daily*) the frequency with which the station featured drone-shot videos in newscasts ($M = 2.28$, $SD = 1.23$).

The next two sets of questions were adapted from previous research related to the adoption of technologies by local TV stations (Ferguson & Greer, 2013). First, respondents were asked to indicate the extent on a scale of 1 (*not at all involved*) to 5 (*highly involved*) that each person or entity on the given list contributed to adopting drones

Table 1. Potential Benefits of Using Drones.

Benefit	*N*	Mean	*SD*
To improve the station's image with its community	39	3.54	1.25
To be one of the first television stations in my market	38	3.63	1.44
To provide better viewpoints when covering stories	40	4.88	0.33
To be on the cutting edge of television news technology in general	39	4.36	0.90
To provide enhanced news programming	40	4.65	0.53
To help my station achieve higher ratings in our market	38	4.05	1.04
To distinguish my station from other stations in this market	38	4.18	1.09
Because other stations in my market are using drones	38	2.50	1.50

for news: news manager (self; $M = 4.43$, $SD = 1.04$), other news staff ($M = 3.73$, $SD = 1.36$), station/group owner ($M = 3.79$, $SD = 1.59$), viewers ($M = 1.34$, $SD = 0.80$), advice from friends ($M = 1.45$, $SD = 1.11$), and news managers at other stations in the market ($M = 1.42$, $SD = 1.13$). Next, respondents were presented a series of potential benefits of using drones and indicated on a scale the importance of each (1 = *not at all important*, 5 = *very important*) in determining whether the station implemented or might implement the use of drones for newsgathering (see Table 1).

A subsequent group of 3 items, adapted from prior research (Adornato, 2016), asked respondents, using the previous 1–5 scale, to indicate the importance of a story that features drone shots: place the story high in the newscast ($M = 2.68$, $SD = 1.21$), give more time to the story ($M = 2.55$, $SD = 1.20$), and show drone-shot video of the story to tease a newscast or the story itself ($M = 3.53$, $SD = 1.18$).

Respondents who earlier indicated in the filter question they did not use drones were shown a set of questions that listed possible reasons why the station has not implemented the technology for newsgathering. Individuals were asked to indicate their level of agreement on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*) for each item in a list that included potential issues that media face when using drones (see, e.g., Culver, 2014; Holton et al., 2015; Tompkins, 2017): concerns about privacy ($M = 2.38$, $SD = 1.11$), cost of equipment and maintenance ($M = 3.24$, $SD = 1.35$), FAA regulations ($M = 3.61$, $SD = 1.42$), need for specialized staff ($M = 3.26$, $SD = 1.34$), need for additional news personnel ($M = 2.29$, $SD = 1.35$), and station management does not see value in drone use ($M = 1.87$, $SD = 1.10$). Regarding the latter reason, a news director contacted the researchers to add that his station's ownership (Nexstar) forbade the staff of its 171 stations from using drone video of their own making, in order to avoid lawsuits.

The first research question (Research Question 1) was answered by comparing drone and nondrone stations on market size and size of news staff. DMA rank for drone stations ($M = 89.98$, $SD = 53.09$) differed from nondrone stations market rank ($M = 124.76$, $SD = 53.00$) significantly, $t(90) = 3.15$, $p = .002$. For staff size, drone stations ($M = 57.09$, $SD = 32.61$) differed from nondrone stations ($M = 36.06$,

$SD = 29.04$) significantly, $t(91) = -3.29$, $p = .001$. Using a crosstab comparison of drone use to group ownership, no association was found, $\chi^2(1, 91) = 0.59$, $p = .44$. A similar comparison to network affiliation also showed no association, $\chi^2(3, 64) = 1.24$, $p = .74$.

Research Question 2 considered the relationship between station motivations to use drones and drone use. Of the nine motivations, four had significant correlations with drone use (listed in descending order): increased number of viewers, $r(36) = .43$ ($p = .01$); being first in the DMA, $r(36) = .38$ ($p = .02$); distinguishing newscast from competition, $r(36) = .36$ ($p = .03$); and enhancing the news program, $r(38) = .32$ ($p = .048$). A stepwise regression also showed the significance of increasing audience size, $\beta = .43$, $F(1, 37) = 7.95$, $p = .008$, adjusted $R^2 = .16$.

Research Question 3 examined drone use with respect to the importance to news stories. Two of the three motivations showed correlations in the 20s, but the statistical power was too low for any significant finding (listed in descending order): Showing drone-shot video of the story to tease a newscast or the story itself, $r(40) = .24$, $p = .15$; giving more time to the story, $r(40) = .22$, $p = .17$; and placing the story high in the newscast, $r(40) = .12$, $p = .46$.

Discussion

The present study polled TV station news managers across the United States to provide an early benchmark for the use of drones. One key element in this study was the extent to which drone journalism is diffusing among TV stations. Slightly more than half of the respondents indicated their station had implemented this technology for news. However, the amount of use was moderate, with an average degree of use, on a scale of 1–5, of 2.28.

This study also found that larger markets tended more to use UAVs, which was not unexpected given the amount of financial and personnel resources that are typically available to larger stations. The finding coincides with a RTDNA/Hofstra study, which showed that large market stations represented the highest percentage of drones used for news (Papper, 2017). The present study also found that drone stations had more news staff, which was similar to stations polled in an earlier RTDNA/Hofstra study (Papper, 2016).

The results of this study point to lower influence of a few structural characteristics in the first research question. This study found that ownership was not a factor in the adoption of drones for news. Stations that were either group owned or under independent ownership were equally likely to implement the devices. Also, this study showed there was no relationship between network affiliation and drone news adoption. Drone adoption itself, regardless of how often it is used, is becoming less linked to market size.

Another concern in the present study was whether there was a relationship between the use of drones for news and the use of drones from a station perspective. A pertinent issue is the impetus for adopting the technology. The news manager was perceived to

be the most influential person, followed by the station or group owner, and then the news staff, all of which averaged at least 3.73 on a 5-point scale. From an organizational diffusion perspective, adoption of the technology is somewhere between consensus and authority-driven (Rogers, 1995). In contrast, low influence was comprised of viewers, advice from friends, and news managers at other stations. This suggests that the most important factors in adopting these vehicles are internal rather than external. For news operations, this finding means that reasons for drone adoption transcend the usual organization considerations for other technology.

Drone implementation stands in stark contrast with earlier research regarding the adoption of Mobile Digitial Television (DTV) (Ferguson & Greer, 2013). In that study, the station or group owner was rated as having the most influence, followed by the station manager. Station staff was only moderately a part of the adoption decision. The differences in influence between the two studies might be an artifact of cost and complexity, since Mobile DTV requires specialized equipment and associated expenses. Additionally, that technology affects station operations rather than just one aspect of the station (i.e., news). At the same time, the fact that the decision to use drones was in the control of the news manager indicates autonomy of news departments when it comes to reporting.

Several of the goal-oriented reasons to adopt drones for news coverage were significant. These motivations included increased viewership, being first in the DMA to use a drone, distinguishing the station's newscast from competition, and enhancing the news program. These reasons for adoption represent differences in content for the station versus simply using drones compared with the competition. When all motivations were regressed, increasing audience size explained the highest variance, which suggests that news managers perceive drone news use is a way to attract additional viewers. The underlying meaning is that stations want to win the local ratings race and use compelling video to accomplish immersive storytelling for increased numbers of viewers. It was interesting to note that improving relationships with the community, providing better viewpoints for stories, being on the cutting edge of technology, higher ratings, and the use of drones by other stations in the DMA were not significant motivations when related to the extent of drone use.

Although more than half of the stations used drones for news, around 49% of the stations were not using the technology. The highest mean score of reasons given for not using drones were FAA regulations, cost of equipment, and the need for specialized staff. Those findings were similar to several concerns noted by communication scholars (e.g., Culver, 2014; Holton, Lawson, & Love, 2016). Among possible concerns that were rated low was if station management was not seeing value in drone use. As noted earlier in this article, one news director indicated the group owner did not allow drone use (at a large number of stations) due to concerns about lawsuits.

An examination of the relationship between motivations to use drones and the importance of drones for news stories produced no significant results. Perhaps this means getting the story told is more important than how the story is told. This coincides with the extent of drone use for news in that, while half of stations were using the

technology, they were only moderately active in doing so. These results might be similar to what Moon and Hadley (2014) observed about journalists using Twitter, while still relying on traditional newsgathering techniques. In the case of drones, perhaps TV stations are still focusing on standard story sourcing versus placing drone newsgathering high in importance. As noted earlier, providing better viewpoints for stories was not a significant concern in relation to drone usage motivations. The highest score for importance of drone shots in stories was teasing the newscast or story, which contrasts with media studies showing that promoting newscasts was not the most important feature in social media (Ferguson & Greer, 2015).

The present study provides a current perspective about the user of drones in TV station newsrooms. Due to its exploratory nature, there are a number of limitations that should be noted. One is the number of respondents. More than 90 news managers completed the section associated with drone journalism, but that represented less than a fifth of the number of managers who were sent the link to the questionnaire. Another limitation is the time frame for the study. Adoption of drones is still relatively new, so the results of this research only report one point in time. Future research should track the diffusion of these devices for TV news over time, especially as these vehicles become more commonplace. Also, this study considered only news managers' perception of drones. Additional research should examine perceptions and attitudes of TV news audiences regarding whether immersive reporting techniques are enhancing viewers' experiences with stories. Longitudinal studies also will ascertain whether the public's concerns about issues associated with drones (e.g., privacy and safety) decrease over time.

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