



Informing Science: the International Journal of an Emerging Transdiscipline

*An Official Publication
of the Informing Science Institute
InformingScience.org*

Inform.nu

Volume 23, 2020

MEDIATING REALITIES: A CASE OF THE BOEING 737 MAX

Bob Travica

University of Manitoba, Winnipeg,
Manitoba, Canada

btravica@ms.umanitoba.ca

ABSTRACT

Aim/Purpose	The research problem of this study refers to the manner in which old and new mass media represented the significant social development surrounding two crashes of the Boeing 737 MAX airplane.
Methodology	The study follows a qualitative case study methodology based on a sample of newspaper articles, TV programming, specialized technical publications, Twitter posts, and Facebook content.
Contribution	The study contributes to understanding specifics and differences in representing extraordinary socio-economic events by different types of media.
Findings	Key findings are that these media have constructed different realities surrounding the tragic events and exhibited informing distortions to different degrees.
Implications for Practitioners	Practical implications of this study are relevant for the institutional and individual clients of informing with regard to selecting appropriate media for use. There are also implications for informers with regard to reducing distortions in informing.
Implications for Researchers	Social media could be a channel for alternative learning rather than manipulation. Mainstream media were confirmed to be a loudspeaker for authorities as postulated in critical media research, and analytical media provided influential, deeper technical analysis.
Future Research	As the Boeing case unfolds, it would be interesting to investigate any evolution in mediated realities.
Keywords	informing distortion, fake news, fact, truth, Boeing 737 MAX, mainstream media, social media, explanatory journalism, media relations, informing power

Accepting Editor Eli Cohen | Received: January 28, 2020 | Revised: March 27, 2020 | Accepted: March 28, 2020.

Cite as: Travica, B. (2020). Mediating realities: A case of the Boeing 737 MAX. *Informing Science: The International Journal of an Emerging Transdiscipline*, 23, 25-46. <https://doi.org/10.28945/4530>

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INTRODUCTION

Distortions in informing have become a public concern in recent years. The term “fake news” joined the vocabulary to accompany similar older terms that signify deviations from truthfulness. Researchers are responding to this public concern. This study posits that imperfect informing is inherent to any mass medium, and it uses the author’s media framework to investigate the coverage of the developments ensuing recent fatal accidents of the Boeing MAX 737 aircraft in three types of media—mainstream media, social media, and analytical media.

RESEARCH PROBLEM

The research problem this study has to do with the manner in which media cover a significant social development. The development of interest here is the recent fatal crashes of the Boeing 737 MAX aircraft and socio-economic consequences these events have triggered. The Boeing 737 MAX 8 crashed in October 2018 in Indonesia (Lion Air) and in March 2019 in Ethiopia (Ethiopian Airlines). All 346 people aboard these planes died. These tragic events are technologically unprecedented in the civil commercial aviation since the 737 MAX is a new aircraft, launched just in 2017. A day after the 2019 crash, Ethiopia grounded the aircraft, then China did it, and other countries soon followed the suit, with the U.S. being the last in the cue.

A shock and disbelief of both the authorities and the mass public were commonly shared after the accidents because the planes were quite new and crashed just minutes after the take-off. While the official investigations are still not complete at the point of writing this article, preliminary results have identified several technical problems with the plane that were implicated in both crashes. For a while, the mass public attention was focused on a piece of the aircraft automation called Maneuvering Characteristics Augmentation System (MCAS), which controlled the up/down movement of the plane. It was allegedly fed by erroneous measurements by a sensor of the plane’s vertical angle (pitch), registering a higher pitch than it actually was. If a plane climbs too steeply, it can lose the lift under wings (a stall situation) and fall out of the sky. MCAS responded to these measurements by nosing down the plane. One plunged into the ocean and broke into pieces, and the other crashed into a field speeding at over 1,000 kmh (700 mph).

The story of these technical problems and assumed pilot errors reigned for months, backed by press releases from Boeing. But some dissenting voices sounded, broadening the technical analysis. Questions were also raised with regard to the plane’s certification process executed by the Federal Aviation Administration (FAA). Still, Boeing kept the focus on MCAS and persisted in ascertaining that software fixes for MCAS were underway and that the 737 MAX was going to fly soon again. Airlines owning the grounded 737 MAX kept rescheduling its return to service to follow the expected approval of fixes by the FAA. Boeing’s management structure remained intact after a shareholders’ meeting. The company appointed a specialist lawyer to deal with legal claims. Mainstream media kept reporting regularly on the price of Boeing’s stock.

In the late summer, management changes at FAA were introduced. In the fall, Boeing’s CEO (who was also the President and Chairman of the Board) was summoned for hearings in the U.S. Congress. Around the end of 2019, the CEO was forced to retire, and Boeing announced a halt in production of the 737 MAX. At the moment of writing, these events made the last point in the history of the aircraft that originated from a ground-breaking design in the 1960s, went through four technological transformations concluding with the MAX version, and saw record-breaking 5,000 orders since 2017 – a half of Boeing 737 jetliners currently in service. The expected bestseller of all time ended up in being examined under double lenses, grounded indefinitely, and it keeps generating huge financial losses for airliners, insurance, Boeing, and its many suppliers. The credibility of the FAA that certified the plane has been undermined internationally. The magnitude of human tragedy and these economic problems qualify this whole development as socially significant.

OLD AND NEW MEDIA: BAD GUYS, GOOD GUYS

Due to recency of the 737 MAX-related developments, no corresponding academic literature on the media's coverage is available. This compels looking into the literature on old and new media's coverage of other significant social developments in order to formulate research questions. Social media were appraised as a contributor to significant political developments in the Middle East during the 2010s. These media were qualified as the means of voicing people's criticism, a vehicle for mobilizing and organizing social activism, and an informing channel to the world (see for an example Tudoroiu, 2014, and his references). Furthermore, Kumar and Sarangi (2017) investigated, on a sample of 170 countries, whether Facebook's penetration correlated with smaller assessments of corruption. Such a relationship was previously discovered for the Internet at large (Andersen et al., 2011; Bhatnagar, 2003; Elbahnasawy, 2014). The authors' hypothesis was confirmed irrespective of the presence or absence of free press.

The 2016 American presidential election, however, opened up the door for manipulative uses of social media in political campaigning. Hindman and Barash (2018) focused on Twitter and found that most of the election-related "fake news" was linked to a few established "conspiracy and propaganda sites." Coordinated campaigns were performed by social bots that "made up the majority of the accounts in the supercluster" the authors identified. Fake news was linked to both political parties, albeit unequally. Fake news outlets received significantly fewer links than mainstream media sources.

Alcott and Gentzkow (2017) also studied the 2016 election focusing on the role of Facebook in disseminating fake news ("news articles that are intentionally and verifiably false, and could mislead readers," p. 211). Tracking fake stories favoring either candidate (D. Trump or H. Clinton), they found that pro-Trump articles were three times greater in number and more shared on Facebook than the counterpart. Other actors instrumentalized social media in election politics as well. Alcott and Gentzkow suggested that the informer's motives were commercial and ideological. The clients' motives were cognitive: people prefer to read and share news aligned with their ideology and deny "evidence about the true state of the world that would counter an ideologically aligned but false story" (p. 221). Moreover, the French presidential election in 2017 also involved social media for corruptive purposes. A MacronLeaks "disinformation campaign" on Twitter involved "rumors" (unverified content) planted on an Internet message board and spread by automated Twitter accounts. The campaign originated outside France and used some of the technology deployed in the 2016 U.S. presidential election (Ferrara (2017).

The involvement of social media in significant political events in the U.S. has been confirmed by the Pew Research Center. Its last survey established that more than half of U.S. adults "get news" from social media often or sometimes (Shaerer & Greico, 2019). This is consistent with a previous survey (Gottfried & Shaerer, 2016). The most used are Facebook (a half of the sample), YouTube, Twitter, Instagram, and LinkedIn. Social media have sourced news from various old media. Moreover, six-in-ten respondents in the 2019 survey indicated that "social media companies have too much control over the mix of news that people see on their sites;" about 50% of respondents thought that "one-sided and inaccurate news" made problems (Shaerer & Greico, 2019).

In spite of the attention focused on social media's role in recent significant political events and the public doubt they have aroused, the mainstream media bear their share in the public loss of trust in media. In surveys from 2002-2007, the Pew Research Center found that more than half of respondents deemed mainstream media "politically biased" and publishing "often inaccurate stories" (Pew Research Center, 2007). These attitudes have persisted. In 2017, Pew found just a quarter of the audience sampled deemed the mainstream media's content trustworthy (Barthel & Mitchell, 2017). Academic assessments comply with these figures (e.g., Schudson, 2019).

The history of distortions of the media content is long (Gill, 2019). Before the Internet era, the term "fake news" was used in the context of satirical, entertainment print (Hindman and Barash, 2018).

“Yellow press” was born over a century ago upon overblown, sensationalistic news aiming at increasing the press circulation. Politics was one context, among others. All along the historical trajectory of mass media globally, political party-allegiances have been a constant. Ideologies and propaganda have steadily painted the American media universe, argued Herman and Chomsky (1988). Overall, it appears that mass media have always mediated significant events in a manner that could not be taken at the face value.

The economic domain has had its own forces for spinning the media content. Activities of public relations (PR) specialists are prominent in this context (Ewen, 1998). Tasked to build bridges between a corporation and its environment, PR also strives to mitigate a perceived damage from exposed corporate malpractices. Mainstream media have been used to this end. Already deployed as a channel for corporate press releases, social media are a convenient and cheaper instrument for the same purpose. The phenomenon of trolling (intentionally manipulating discussion) that is known from the political domain, may cross into the economic domain. As a corporate troll impersonates grassroots participants in order to manipulate public opinion (“Internet troll,” 2019), it can be a potent PR weapon.

As in the case of contrasting roles of social media in politics, the same applies to economy. Research has established that social media breed new life to social activism which challenges corporate powers in the ways hardly imaginable in the world of old media. Bennett (2013) discussed a number of international actions conducted via social media, where blogs’ content has become “viral” across social media and sometimes made it into the old mainstream media. Some of the effective actions are the fair-trade coffee campaign that exerted pressure on Starbucks, a sweatshop criticism directed toward Nike, and ridiculing of Monsanto’s genetically-modified, sterile seeds. The dissemination power of social media, captured in the term “virility”, lies in limitless and chaotic spreading of witty, brief messages Bennet calls “meme”; e.g., social media activists called for branding a new Nike model with “sweatshop” and called Monsanto’s seeds “Terminator”.

Veil and colleagues (2015) investigated a social media campaign by advocates of healthy baby food against potentially hazardous ingredients in Kraft Foods’ products. One leader used Facebook, Twitter, and blogs (in addition to her appearances in old media) to criticize unhealthy ingredients in a Kraft’s baby food product as well as the corporation’s irresponsiveness to public concerns. One method the activist used was “hijacking” Kraft’s Facebook page. They changed the self-praising tone of the corporation’s PR in Facebook posts into a sarcastic and generally critical pitch, and then boosted the number of “likes” for such comments. Another method was a hoax video. Veil and colleagues defined hoax as “deceptive alerts designed to undermine the public’s confidence in an organization, product, service, or person” (p. 2), and assumed that the credibility of such an alert is less important than whether the public thinks the claim is possible. The authors suggested that the hoax video undermined public trust in Kraft Foods.

Barkemeyer and colleagues (2020) turned to corporate scandals and the coverage of these in old and new media. They defined corporate scandal as “a rare, significant, and public situation that creates highly undesirable outcomes for the firm and its stakeholders, where the situation is widely perceived as a breaching of norms by the company and/or its officers and the affected party is not fully complicit in the effect” (p. 386). The authors assumed that both traditional mass media and social media could influence public perceptions of large, highly visible companies. Social media could also foster social consensus in general public’s evaluations of a crisis and the implicated company. A key finding of this study was a change in mass media behavior between the periods 1990-2007 vs. 2008-2016. In the later period, the media coverage became more intense in the immediate aftermath of a corporate scandal, and it cooled down much more quickly. This change is attributable to the fast-paced news production in social media, which influenced old media. This evolving media universe challenge old assumptions about a homogeneous and static character of organizational reputation, concluded the authors.

In summary, the review of a sampled literature indicates that both old and new media have been implicated in significant political and economic events and played contradictory roles. Social media have been a *vox populi* and organizing vehicle in political protests and anti-corruption campaigns in the international context. These media have also been used for manipulative purposes in political elections. Surveying in the U.S. identified a high use of social media in political informing as well criticism of their content. In their longer history, old media have also covered politics in a manner that is not always trustworthy. In the economic domain, both old and new media are susceptible to spin-doctoring but they are also capable of exposing corporate scandals and malpractices in a factual manner. Social media can also enable anti-corporate social activism by sharing a content that is mobilizing although not always factual (hoax, meme). The evolving media universe challenges corporate reputations.

THEORETICAL BACKGROUND

MEDIA FRAMEWORK

This study deploys a media framework (Travica, 2016, 2020) that is based on the assumption that social media (specialized websites, blogs, microblogs, sharing sites) make an evolutionary step forward from classical mass media that still are the mainstream media (press, radio, TV, film). Both of these belong to a class of socio-technical systems we call “media”, and thus they can be differentiated as old vs. new media. Consequently, old and new media are comparable on common aspects (Table 1).

Table 1. Old and New Mass Media

Aspect	Old Media	New/Social Media
Informer	Professional	Amateur, <i>vox populi</i>
Technology	Pre-Internet	Internet-centric
Communication	Moderate; One-way, top-down	High; Two-way, all-to-all
Connectivity	Moderate; weaker one-way links	High; strong horizontal links
Creative Expression	Moderate-High; Trained professionals	High; Amateurs & professionals
Content Sharing	Very low sharing of audience-created content	High; new capability
Reality Creation	High, longer lasting; Push upon the audience, spinning	High, temporary; Pull, inter-subjective, and special interest spin

(Adapted from Travica, 2016, 2020)

The old media established most of the properties, while new media added one—digital content sharing, such as photos and videos. A note on the property of reality creation follows below, as it is relevant for this discussion. Other characteristics are almost self-explanatory and explained in detail elsewhere (Travica, 2020).

The capability of reality creation draws on mass communication theory. McLuhan (1964) argued convincingly that TV enabled unprecedented mass communication and connected the world into a global village. As well, various theories of mass media have posited that media play an active role toward the content broadcasted rather than just passively reflecting the world. As argued in Travica (2020, p. 141):

On a more critical wing, theorists see the media as the propaganda tool, amplifier of dominant social positions, or shaper of reality in an ideological fashion. Examples of the first two

are government-controlled media (propaganda) versus corporate media (amplifier). The notion of ideological shaping posits that media intervene in mass perception, understanding and preferences, and thereby obtain cultural legitimacy for what is actually partial descriptions of the world. By creating interpretative frames that coincide with ruling values and symbolic order, media establish what is real, true, factual, common interest, and other universal things. (See Milivojević, 2015)

Reality creation is an effect depending on other dimensions. For example, social media feature a scaled-up connectivity, self-initiated mass communication, free creative expression (of intellect and artistic talent), and content sharing. These altogether contribute to constructing reality in an intersubjective fashion by the crowd and for the crowd (Travica, 2020). Although such reality is generated swiftly and temporarily, as by the means of a “viral video,” it is not lacking persuasive power over the crowd. With old media, trained professionals construct reality through predetermined broadcasting channels, leaving their own creative stamp on it, and with a miniscule reliance on the user-shared digital content. Since it is being systematically worked upon, such reality may last longer in the cognition of clients.

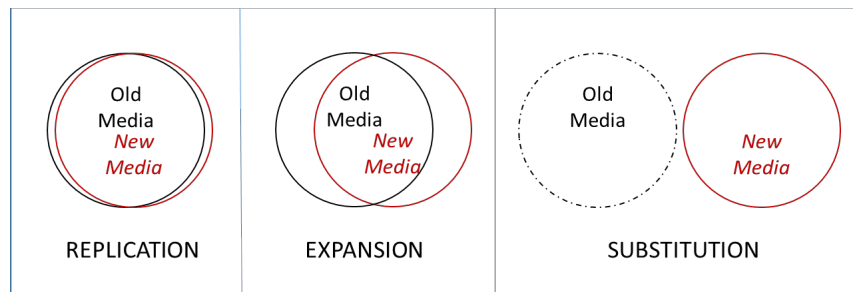


Figure 1. Relationships Between Old and New Media

A model of relationships between old and new media will also be used in the study. As presented in Figure 1, the relationship between old and new media is three-fold: Replication, Expansion, and Substitution (Travica, 2016). *Replication* exists when a new medium mimics Internet-based new media, such as a TV or newspaper website. In addition to this functionality replication, the content can be replicated as well both ways. This is an instance of remediation known in media theory. For example, Facebook users post links to newspaper articles and TV clips; as well, TV and press republish tweets of politicians. Old media deploy replication to bolster their communication capability and connectivity in the Internet-centric, mobile context. New media enrich their communication capability and enable member’s creativity (in selecting the source content and commenting on it) as well as content sharing.

The *expansion* relationship means that capabilities of a new medium are added to an old medium. For example, a newspaper or TV station attaches a blog to the content published in order to enable their clients’ discussion. TV stations encourage the audience to upload digital video and photos, which moves them from a passive client-consumer into a role of journalistic enthusiast (recall recent instances of police brutality in the U.S. when a bystander’s video clip served as the only evidence available). This adds a rudimentary sharing property to old media. Expansion may run the other way as well. For example, Wikipedia, which is created by users, enhanced its creative expression capability by applying professional editorial practices traditionally used in paper publications.

While replication and expansion are cooperative relationships, *substitution* implies a competition and possibly collision between new and old media. New media provide a blend of informing, creative expression, socializing, emotion venting, entertainment, and action mobilizing content that is outside of old media’s capabilities. Consequently, new media can take clients away and starve it from advertising revenues. So far, substitution has been a one-sided relationship driven by new media. But note that all these relationships are evolving, and so one-way relationships could become two-way.

Mass communication and informing involve power relationships. The widely-accepted standard concept of social power and its types (French & Raven, 1957) are relevant for this study. The informer may exert influence over the client based on authority, charisma (respectable traits), connections, rewards, and coercive means. Also relevant is power that emerges in informing processes – infopower (Travica, 2014). The informer can control data/information technology, have expertise the client lacks, and manage meaning by manipulating representations of the subject interesting for the client.

FACT, TRUTH, AND DISTORTIONS

The notion of fact is the last part of the theoretical background relevant for this study. “Fact” here refers to an *accurate* atomic statement about something (a thing or another statement), where “accuracy” means that there is a correspondence between the statement and its referent (cf. Lexico, n.d.; Merriam-Webster, n.d.). An example of the fact is: “Software production for MCAS on the Boeing 737 MAX was outsourced to offshore vendors.” In contrast, the statement “the cause of the Boeing 737 MAX crash is the pilot error” is not fact but a lie, fabrication, hoax; Boeing’s former CEO made this statement with no investigation, that is, no correspondence to material reality, and it turned to be inaccurate. Between these opposites lays a partial fact or “paltering” (Cohen, 2019), for example, “malfunctioning of the AoA sensor caused the 737 MAX crashes.” This sensor was a part of the problem, but a complete fact would cite all technical aspects contributing to the crashes. Note that the angle of attack (AoA) sensor measures the angle of an airplane’s climb and inputs it into MCAS. In turn, MCAS controls the horizontal stabilizer at the airplane’s tail, which directs the airplane’s nose up/down without the pilot’s intervention.

“Fact” is often used interchangeably with “truth.” As “truth” also refers to something real and must be accurate, a fact is always true. However, truth valuing or truthfulness is usually applied to a whole, such as statements making a narrative, chain of evidence, finding, or theory. Thus, fact relates to truth/truthfulness as part to whole. Facts can be accounted for, but the whole still not being true as fiction blends in as in the marketing stunt: “the 737 MAX is your good, old 737, just with more powerful and fuel efficient engines” (the first part is not factual). The whole can even draw entirely on facts but still be false. For example, a chain of evidence on the 737 MAX performance, which must be provided for certification purposes, omits data on its behavior in rare situations.

Truth in media is even a more complicated issue because they often do not report directly on events but report statements on events created by media’s sources. Accordingly, it can happen that mainstream media truthfully report a government’s statement that the certification of the 737 MAX was properly performed, while this statement is false. Therefore, ideological or interest-based media become a loudspeaker of falsehood. Adding fact checking and analysis can help. Still, there are limits to media’s resourcefulness and independence from impacts of the government, owners, advertisers, and ideology. So, the media narrative inevitably deviates from facts and truth and drifts to distortions in informing. The media represent, mediate or construct reality rather than merely reflecting it. A hierarchy of distortions has a narrative devoid of facts on the top (fabrication, fake news, hoax, possibly meme); plot theory and various biases are in the mid-range; and minor partial facts are at the bottom. My last assumption is that distortions can occur in any medium, new and old alike, of a general or specialist character.

The final element in the theoretical background is the fundamental model of informing science, which focuses informing processes between the informer and the client via a delivery system (technology) (Gill & Cohen, 2009). It is assumed that the informer and client can change places, as in the case of social media.

METHODOLOGY

The research problem of this study refers to the manner in which old and new mass media represented the significant social development surrounding two crashes of the Boeing 737 MAX airplane.

The concept of significant social development created for the purposes of this study refers to extraordinary events and consequences that merit research attention. Instances cited in this article are political elections manipulated in new ways, corporate scandals, and unusual air traffic accidents, including social consequences of these. As for the last item that is of interest here, the fact of human life loss combines with several facts: Boeing’s airplanes were brand new, interaction of human and technology factors appears extraordinary, the reputation of Boeing’s and the certifying government agency is seriously undermined, and there may be huge financial losses for airline companies, insurance, Boeing, and its many suppliers. The concept of significant social development captures these aspects.

The study aimed at answering these research questions: 1) How did old and new media cover Boeing 737 MAX accidents and the ensuing events? 2) Are there informing distortions in this coverage?

To answer the questions, I conducted a case study. The key steps in data collection and analysis are depicted in Figure 2. A core segment of study’s data collected is a database that I created. It contains about 500 newspaper articles and TV clips covering the period from October 2018-Januray 2020. Another dataset originated from Twitter and Facebook. I browsed and searched precisely these a number of times by using the media’s search engines. The goal was to identify the relevant content as with the mainstream media, patterns (e.g., confirmations of a particular assertion), deviations (e.g., unusual repetitions of the same post), and distinguished personas (active and vocal contributors). In my database, I catalogued the sources referenced in the posts, and validated them by checking for the full coverage in the sourced mainstream media. I also checked the background of social media personas (frequent contributors, salient posts) as part of the validation process.

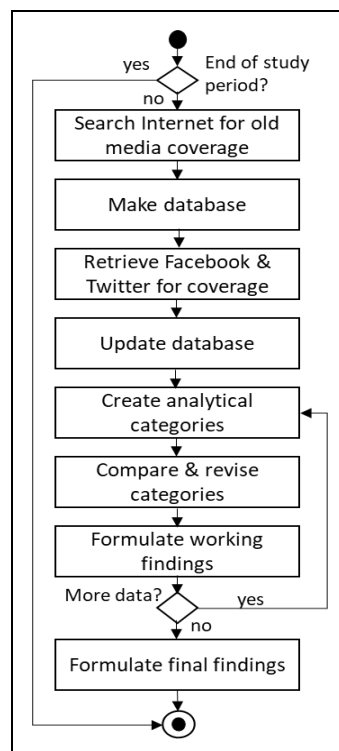


Figure 2. Research Process

My analytical methods included retrieving my full text database of newspaper articles with homemade software in search for key terms that express intellectual and emotional orientations, such as assertion, judgment, opinion, observation, emotion, thesis, and conclusion. These terms were not operationalized beyond standard, widely-accepted definitions. I did not draw any precise statistics from this dataset because statistical analysis was not my goal. The same applies to the social media dataset;

I took just the count of relevant posts browsed and reviewed, replies and shares on Facebook, and retweets on Twitter. Moreover, the articles in the technically specialized media I read carefully and iteratively. I supplemented this by tapping into an auxiliary technical literature in order to validate my understanding of the mechanical and computing technologies used in aviation.

The study process followed the typical qualitative inquiry of continuous learning, with iterative construction of analytical categories and working findings, which drove further data collection. My final analysis toward formulating study's findings was conducted in an interpretive fashion.

FINDINGS ON MEDIA COVERAGE OF BOEING MAX 737 AIRPLANE

Massive publicity erupted with the 737 MAX crashes. Everyone participated: the old mainstream media, social media, and media specializing in technology which I will call “analytical media.” This multi-channel coverage was international in part because human interest was broadly aroused as the passengers killed in the second crash were from 35 countries. Social media for texting and chatting were the fastest in reaction, serving as a channel for public outcry over the tragic events. The traditional mainstream media also reacted promptly, reporting official statements from governments and aviation authorities. Media specializing in technology were the next in line, focusing on deeper technology aspects.

MAINSTREAM MASS MEDIA

Following the old media, one could learn about concerns and criticism of Indonesian and Ethiopian air traffic and the involved airlines. Technology issues were addressed at the level of a particular part of the flight management system, which was in line with Boeing's statements. Statements of Boeing's CEO (who was also the Chairman of the Board of Directors, and President) were regularly relayed. This was accompanied by press releases of the Boeing's crisis management team, once it was set up. However, in the fall media began reporting more on dissenting events. Nevertheless, the part of the media narrative sourced at Boeing has been so extensive that it reads as a survey of Boeing's PR efforts as these evolved. Postings in the Boeing online media room confirm the phases outlined below. However, the Boeing's online media room itself appeared chaotic, unsorted on calendar time, and containing a number of undated or unsigned documents.

Table 2 outlines phases in the timeline of mainstream media's coverage of developments surrounding the 737 MAX. The timeline shows that Boeing has been defensive (Phases 1-3), and then overtly offensive (Phases 4-6). Phases 2-4 are iterative, as once introduced PR method (e.g., an announcement of new sales) would be reused even after introducing another method (e.g., an insinuation on the return to service date). The offensive came across through media as rhetorically loud but factually weak. The alleged deals were either small or under veil of secrecy, except in the case of British Airways. In the fall, a client (follower) of mainstream media could learn about troubling signs for Boeing. In Phase 7, the media began decoupling from Boeing's sources and reporting on the FAA's moves, on a Boeing's whistleblower who warned about problems with the 737 MAX during its development, on Boeing CEO's hearings in the Congress, and on aviation professionals' revolt. The three-in-one Boeing's boss lost the Chairmanship of the Board of Directors. Finally, in phase 8, the Boeing source disappeared from news stories and media focused on actors in the company's environment. Here is an example of this epilogue.

After the crashes, but before the plane was grounded, Mr. Muilenburg [CEO, Chairman, President] called President Trump and expressed confidence in the safety of the MAX. He has repeatedly made overly optimistic projections on the plane's return to service, pushing for speedy approval from regulators. The constantly shifting timeline has created chaos for airlines, which had to cancel thousands of flights and sacrifice billions of dollars in sales. (Kitroeff & Gelles, 2019)

Overall, for 10 months during the 14-month the crisis period, the mainstream media served primarily as a Boeing’s loudspeaker. Critical tones were rare. An example is a piece of investigative journalism in the Wall Street Journal online (Pasztor et al., 2019), which had an added discussion space (an example of media expansion) and received over 600 reactions. Occasional stories about the victims’ families were framed in a manner of reporting on “a collateral damage” in media’s war stories. The media’s client (the mass audience) was tuned to seeing Boeing’s side of the story narrowly focused on two allegedly smaller technical problems. The story covered Boeing’s management as being stable, the stock price fluctuation not disturbing shareholders, the company working hard on technical fixes, and the airlines expecting a quick return to service of the 737 MAX. Reality of “all is under control” was mediated overwhelmingly. The pitch changed only in Phase 8, as this example of a CNBC’s journalists (a show host and co-anchor) shows. He said that he suddenly felt “like a clown for *defending* [emphasis added] Boeing in the early days of 737 MAX scandal”, when he laid trust in excellence of Boeing’s culture that actually was not there (Belvedere, 2020).

Table 2. Coverage of the 737 MAX in Mainstream Media

2018	
1.	After the first crash in October 2018, Boeing directs responsibility to pilot errors.
2019	
<i>Spring</i>	
2.	After the second crash in March 2019, Boeing admits similarities between the first and second crash, while calling for delaying judgement until investigations finish.
3.	Boeing cites MCAS and the AoA sensor as possible causes and focuses attention exclusively on these as the sole problem. In parallel, Boeing emphasizes a focus on safety, and expresses sympathy with victims’ families. Stories about the victims’ families occasionally appear.
<i>Summer</i>	
4.	Boeing announces new sales deals for the 737 MAX.
5.	Boeing keeps persuading on the progress of MCAS fixing and suggesting the calendar of return to service.
6.	Boeing keeps suggesting the calendar of FAA’s recertification. The FAA leadership changes.
<i>Fall</i>	
7.	Troubling events for Boeing.
<i>Winter</i>	
8.	Boeing announces the replacement of its CEO and of temporary halting the 737 MAX’s production.

The media’s client could only wonder, how was it possible that such minor technical problems brought down new airplanes? The frequently reported calendar changes (recertification, return to service) were also confusing. The confusion on the client side climaxed with Phase 7, when media diverged from Boeing’s influence. The client of mainstream media’s informing was left to wonder, what happened with all the reported fixing of the MCAS and the expected plane’s recertification? In the end, the mainstream media’s narrative, staked on narrowly framed problems and solutions, produced another victim – the media’s confused client. Curiously enough, even a U.S. senator appeared confused with the recertification delays, although Phase 8 was well underway (CNBC, 2020).

SOCIAL MEDIA

Social media have displayed a less coherent picture than the mainstream counterpart. An obvious reason for this is in differences between the content and social structuring of social media. Most apparently, social media were an outlet for venting grief and anger over the tragic events and Boeing's aloofness. This motivation brought in the posts linked to different sources than those used by mainstream media. There were critiques, accusations, and calls for legal responsibility of Boeing and the U.S. Federal Aviation Administration (FAA). But the complementary part of social media's coverage just linked back to mainstream media's coverage. Social media analyzed in the study were Facebook and Twitter.

Facebook

Searching for the term "Boeing 737 MAX" on Facebook returned hundreds of posts. These were typically links to various media, old and new. Some echoed the mainstream media's pitch that had been protective of Boeing; others had critical overtones. An example of confirmatory posts is the Seattle-based K5 News TV station. It posted frequently, and each post was associated with one million likes. The posts reveal a bias toward Boeing's side and have often stirred up a discussion. In a December 2019 post, when the Boeing crisis peaked, K5 News cited a Boeing's global survey according to which over a half of respondents allegedly showed readiness to fly on the 737 MAX. Responses to this post were sharply divided into a pro and a contra camp.

An example of critical posts are the public statements of consumer advocate Ralph Nader, who lost a young relative in the crash of the 737 MAX in Ethiopia. In an April post, Nader urged forbidding the 737 MAX to fly ever again because of its "inherent aerodynamic design defect," and he called for investigating criminal responsibility of Boeing's top management and its removal. A link to Nader's Website, at which he advocates a public campaign for banning the 737 MAX, was posted on Facebook (the search term I used was "Axe the MAX Nader"). It was posted in May 2019 by Nader and received 9 shares. (See more about this campaign in the section on Twitter below.)

Facebook has also hosted groups dedicated to the 737 MAX. One is the group called "Boeing 737 Max," which received over 7,000 likes by the end of 2019. Also, there has been an open group gathered around boycotting the 737 MAX, numbering about two dozen members. It features scarce, sketchy postings. There has also been a closed group of the MAX fans. It was formed in 2017 and reached about nine times more members than the boycotting group when this article was written. Most of the posts were references to publications in the mainstream and some other media as well as Boeing's press releases, which are placed by the group owner (declared as self-employed and residing in France). The crashes in Indonesia and in Ethiopia were just announced and no discussion was associated with them. Just a small discussion and fewer "likes" accompanied some postings. However, opinions differed. At the end of 2019, the group's owner felt that a warning was in order:

I'm really tired to block several people who put a comments which is really not objective or put a denigrating comments regarding this plane. If anyone don't like this aircraft please leave the group. I just want to recall that is a Boeing 737 Max "FAN" club and nothing else!!



Figure 3. Abnormally Replicated Post on Facebook

A regular Facebook news feed on the MAX developments has been of a lower frequency. The feed was distributed in June 2019, when over 60 identical posts were placed in one day by various outlets of iHeartMedia (the search term I used was “iheart boeing 737 max software fix”). A piece of the output appears in Figure 3. This company was established in 2008, and it casts primarily by streaming and podcasting. The redundant post references a report announcing that a new software fix requested by the FAA was going to be released in September. If the assertion communicated is set aside, the article cannot be characterized as biased, but rather as confusing: instead of explaining the required fix, the author provided just the already known description of the MCAS problem. In addition, by searching for iHeart posts, I discovered other instances of redundancy irrespective of the Boeing topic.

Summary findings are that Facebook has been deployed to replicate a moderate coverage of the 737 MAX events, which originated in mainstream and other, divergent sources. Facebook members opted between supporting and criticizing Boeing and its product. The reality Facebook mediated was contentious and split. Filtering out the criticism has been identified in one user group that was likely to be run by a foreign national. The news feed was mostly regular and lower in frequency, but for one discovered instance of replicating the same post in one day. No indications of orchestrated campaigns pro or contra Boeing could be found on Facebook.

Twitter

The first crash of the 737 MAX in Indonesia was initially twitted about in a neutral manner by citing mainstream media. Retweets and replies were minimal. The left side of Figure 4 shows one example. Then, some dedicated handles were created. One was “#Indonesia crash” that generated about five dozen posts. These were mostly about new details of the crash and the ensuing investigation, and some were emotional in content. However, after the second crash in Ethiopia, Twitter became a

place for a massive public outcry. An extensive, international tweeting flow ensued, carrying expressions of grief and condolences to families of the victims (“World unites in grief,” 2019). Top politicians in the victims’ home countries were among the tweeters. An example is on the right side of Figure 4.

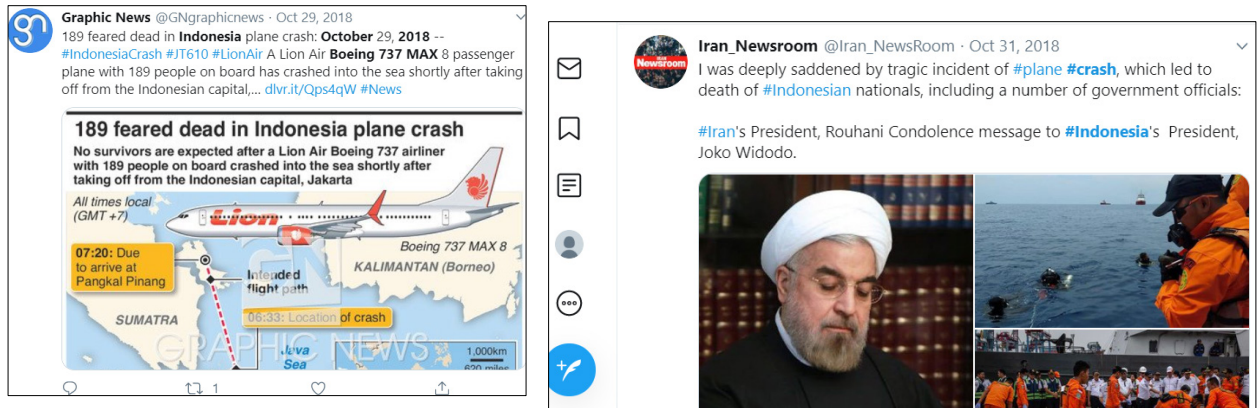


Figure 4. Twitter Coverage of the 737 MAX Crash in 2018

The most remarkable characteristic of Twitter feeds is a rift between critics of the MAX plane/Boeing and supporters. The first group has been more vocal. For example, a number of tweets referenced Travis’ (2019) article that went deeply into analyzing automation of the 737 MAX and aerodynamic shortcomings of the plane (more discussion in the next section). Twitter also carried a considerable number of comments by consumer advocate Ralph Nader. A number of the tweets came from Nader’s organization nader.org, while many came from various media, some of which again used the same source. Nader was also cited by other tweeters without hypertext linking to his comments. His call for banning the 737 MAX also occurred in his tweets. It references his Website storing the original post – the announcement and a logo printed on a button that could be purchased via PayPal in support of the campaign (Figure 5). The announcement reads:

Before and after the fatal crashes of Lion Air 610 and Ethiopian Airlines 302, Boeing did not reveal, did not warn, did not train, and did not address the basic defective aerodynamic design of their plane. Boeing’s bosses gagged everyone that they could. Boeing still insists that the 737 Max is safe while pushing to end the grounding. Purchase ten (10) “Axe the MAX” buttons for \$10 today and join the movement to let Boeing know that the 737 MAX must never be allowed to fly again. (“The dangerously designed...”, 2019)

Searching Twitter on the campaign name (“Axe the MAX”) returned” about two dozen tweets stretching throughout 2019. Most of the tweets are supportive but not all. Some users made assertions that the plane was going to be very safe once it is fixed. This sort of supportive blank assertion appears across Twitter. Sometimes, it also cites savings for airlines allegedly attributable to the 737 MAX.

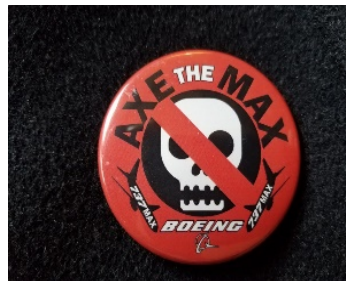


Figure 5. The “Axe the MAX” Button

Twitter also has carried the handle “Boycott Boeing” with around 590 followers. Its owner is a Canadian Green Party politician Daniel Giavedoni. His tweets have featured a clear anti-corporate stance. For example, in July 2019 he tweeted about a BBC news regarding the legal action taken by relatives of the 737 MAX passengers killed in Indonesia by citing the comment of one lawyer:

The families who signed the release & discharge [documents] have been cheated out of compensation, they've been preyed upon by insurance companies and by the counsel for those insurance companies, and ultimately, to the benefit of Boeing. (Giavedoni, 2019)

Among high-profile tweeters is captain Sully Sullenberger, who is famous for successfully landing a passenger jet in Hudson River to avoid crashing in the housing area of New York. Another is pilot W. Brown, who runs a YouTube channel “blancolirio” focused on aviation and having 123,000 followers. Brown’s updates on the developments surrounding 737 MAX have been filled with news from various sources and his pointed comments. These updates have been regularly referenced in tweets within the Twitter network “Boycott Boeing” mentioned above.

Apart from frequent tweets by distinguished personas, Twitter usually went alive after major events. For example, more discussion developed over the leaving of Boeing’s CEO; most comments criticized the size of CEO’s severance pay that was close to the compensation Boeing allocated to families of the crashes’ victims. A release of Boeing’s internal communications in January 2020 caused another surge in tweets. The posts ridiculed the aircraft design, Boeing’s management, and the FAA. A 2017 communication by one Boeing employee read: “This airplane is designed by clowns who in turn are supervised by monkeys” (Belvedere, 2020). This posting received about 590 retweets and over 130 replies. The replies included video clips and drawings of monkeys and clowns in airplanes and management offices.

Summary findings are that Twitter has worked extensively in the replication mode, and appeared quite active, more so than Facebook, and also emotional in the coverage of the 737 MAX events. Although both pro and contra sides regarding Boeing and its problematic aircraft were present, the contra side was more vocal. It was marked by distinguished public and media personas, such as the U.S consumer advocate, a Canadian politician, and piloting experts. Overall, the reality Twitter mediated was highly contentious and divided between poles of “axe the MAX” and an opposite that could be called “max the MAX.” Apart from the strong individual voices, which did not receive many retweets, no indications of orchestrated campaigns in favor or against Boeing could be found on Twitter.

Analytical Media

The smallest part of the text database used in this study, covered the media specializing in technology and management, which I call “analytical media.” These media are typically newer companies or those that evolved from mainstream media toward specialization and Internet outlets (Burg, 2014). Indeed, this media type can be considered the study’s discovery since I did not have them in mind at the outset of the study. They resemble old media, except that they are Internet-borne and the content creator is an expert (possibly temporarily contracted).

Analytical media went deeper than the mainstream media in covering the 737 MAX technology. A studious approach rather than straight reporting stands out. A key point made in these publications is that the airplane’s technological problems have not been just with MCAS and AoA sensors, but rather with faulty aerodynamic properties of the airframe. The media have claimed that Boeing built in oversized engines on a location that violated the airworthiness of the unchanged airframe; Boeing’s engineers then tried to compensate for the loss in stability with automated controls which, inexcusably, were concealed from pilots and the FAA (Blum, 2019; Campbell, 2019; Travis, 2019; Wise, 2019).

This broader technological angle was ignored by the mainstream media for months. When they cited it, it was typically attributed to social media. Indeed, my investigation established that this was correct

just in the case of strong individual voices I discussed above in the context of Twitter. Indeed, the primary source was the analytical media, such as IEEE Spectrum (a publication of the well-known professional association IEEE), *Intelligencer* (news site that is part of *New York Magazine*), and *The Verge* (part of Vox media). Even though these made the smallest segment of informers in the public discourse on Boeing 737 MAX, their impact seems significant.

The IEEE Spectrum article by Travis (2019) has been highly cited. After its publication in mid-April 2019, the article's title was cited 3,300 times in various publications, including trade press, academic research (e.g., Travica, 2020), discussion forums, and blogs, globally and in a number of languages. This figure came from a Google search that could retrieve exact titles; searches by Bing and Yahoo yielded much higher hit numbers, but these may not be accurate. Travis (2019) used his piloting and software development knowledge to analyze problems with the 737 MAX. He examined faults in aerodynamic aspects and their effect on the plane's stability. Singular sensor readings, quality of MCAS software, omissions in the certification process, and Boeing's neglect of pilots were also the target of the author's criticism.

The key point Travis (2019) made was that the changed aerodynamics and the introduction of MCAS turned the 737 MAX into a new model of airplane that was supposed to undergo a complete certification process. However, it was just recertified as if it were the existing 737 model, just with stronger engines. This implies that FAA made a mistake (the certificatory) when it outsourced parts of the certification process to Boeing. Travis also identified tensions between Boeing's software and aero engineers as well as unjustified cost savings as the causes behind the technical problems. Interestingly, Travis cites no literature but just his communications with aviation and software experts.

Wise (2019) reviewed critical parts of the 737 MAX design and analyzed possible solutions based on interviews with aviation experts. The strongest part of analysis is drawing a parallel to aircraft Piper Cheyenne from the 1960's, which had the same problem as the MAX. Due to placing stronger, heavier engines further forward on the wing, the Cheyenne became unstable, according to the plane's test pilot whom Wise interviewed. The designer tried to fix the problem by adding an automated stability-augmentation system for pushing Cheyenne's nose down if it pitched too high. The test pilot realized that without pilots' training this system could get into a feedback loop with the pilot, who pulls up every time the system pulls down. A roller-coast ride would follow and finally a crash. Wise carefully constructed a parallel with the 737 MAX and its MCAS, and crowned it with a logical conclusion: If Boeing enables an automatic cut out of MCAS, which has been announced as the fix, the MAX would be back in the stall-prone condition for which MCAS was introduced in the first place.

A Vox (2019) video has also drawn great attention. Vox is part of an "explanatory journalism" community (Burg, 2014). This attractive video addressed technical reasons of the 737 MAX crashes. It simplified hard technical concepts, focusing on the new engines that violated the plane's stability and the failed MCAS remedy Boeing had implemented. The video cited 13 sources, mostly mainstream media with regard to ordinary facts of the plane's crashes, but no reference to the critical point on the cause of the plane's instability could be found. This video received about 9.5 million views and over 21,000 comments. The viewers criticized Boeing for bad engineering, negligence, and profit greed, and called for legal persecution of Boeing and FAA executives. Interestingly, Vox has been using a YouTube channel for publishing its videos rather than placing it on its own Website (it contains just a link to YouTube's channel). Therefore, this is an example of expansion of old media through new media.

Frost (2020) conducted a veritable analysis of management problems at Boeing, framing it as a major cause of the MAX's defects. The publishing outlet is Quartz online which was founded in 2012 and publishes also on YouTube and Facebook. Relying on expert sources, including Travis (2019), Frost argued that the 1997 merger between McDonnell Douglas and Boeing brought in the culture of the former corporation. The focus changed from Boeing's engineering excellence to cost savings and

maximizing shareholders' value. Competition team values suppressed Boeing's family-like relationships. Boeing's strategy focused on commercial airliners was fogged by McDonnell's focus on the U.S. military, a very different type of customer. Frost concluded that the MAX rendition of Boeing 737 was born within this changed corporation and inherited its weaknesses.

Summary findings are that analytical media have relied on expertise in piloting, aviation engineering, software, and management in addressing problems with the 737 MAX. They created genuine explanations rather than just reporting authority statements or referencing other media. Their criticism seconds social media, but it is better founded. While being small in volume, this coverage has drawn on technical facts to construct convincing, knowledgeable explanations that later appeared in other media. Although the analytical authors have provided answers to difficult questions, the reality mediated resembles a mystery that requires technical thinking to be grasped. The consistency in the criticism of Boeing and its problematic aircraft does not indicate an orchestrated campaign.

DISCUSSION

The previous discussion supplied findings that allow for answering the study's research questions and thereby creating a big picture of the role of media in the developments surrounding two crashes of the Boeing 737 MAX airplane. Each category of the media investigated in this paper has acted as an informer that had particular goals, developed a different narrative, drew on social and informing power, and portrayed a different reality (Table 3). In answering the first research question (How did old and new media cover Boeing 737 MAX accidents and the ensuing events?), I will turn to the media framework presented above, which frames media as a reality creator (Milivojević, 2015; Travica, 2016, 2020).

THREE REALITIES

Old mainstream media created a reality of "It's all under control." The focus of the narrative inundated the client into believing that Boeing knew the best what was wrong with its product and was able to fix that promptly. A convenience of the client's personal detachment from the tragic loss of life was combined with media's assertions of air traffic safety in order to reduce the problem to a mere hiccup that happens with new technology. These media have used connection power to authority sources; thus, they are a transmitter of authority power onto the client of informing. Media's connections could have supplied ample journalistic data, but the media tailored the narrowly focused narrative to continuously manage the meaning away from a deeper criticism of the 737 MAX and its creator.

Social media constructed a less coherent reality based on contrasting views – "It's axing or maxing the MAX." One view portrays the 737 MAX as a dangerous product to be discontinued. The other view feeds on a conviction that the plane is going to be the best ever budget passenger jet once it is fixed, and so its presence should be maximized. As a member of social media wears two hats – of informer and of client – the split reality mirrors members' division. Twitter or Facebook has been a place for reconfirming personal beliefs regarding the MAX crashes, venting emotion, and punching opponents. This is more in line with psychological modeling of social media users (Alcott & Gentzkow, 2017) than simplistic "getting news from social media" that some surveys investigated (Gottfried & Shaerer, 2016; Shaerer & Greico, 2019). Featuring vocal personas with referent (charismatic) power in the informer role and emotional content, Twitter has been involved in covering the MAX developments more than Facebook.

Table 3. Manners of Covering Fatal Boeing 737 MAX Accidents in Media

Context, Acting, Effect / Informer	Old Media	New (social) Media	Analytical media
Client	Air carriers, regulators, insurance, passengers	Other members	Pilots, students, experts, enthusiasts
Goal	Broadcasting Boeing's story	Air personal beliefs and emotions	Creating a broader picture
Narrative focus	The 737 MAX problems are in MCAS software, AoA sensor, and pilot's acting	All is wrong with the MAX vs. Glorifying the MAX	The key 737 MAX problems are in aerodynamics
Social power	Connection, Authority transmitter	Referent	Referent, connection
Infopower	Management of Meaning	-	Expert
Reality constructed	It's all under control	It's axing or maxing the MAX	It's mystery rationally solvable

Analytical media constructed reality that was as coherent as that of mainstream media albeit with more complex building blocks and a critical intonation. The media's client was presented with a technical-murder mystery to be solved. People were killed, and the killer could be the pilot, computer, mechanical technology, and/or corporation. Resolving the mystery required knowledge of both aviation and computer technologies, and of management. Of course, the client could have just put faith in writers' conclusions, and so get on the receiving end of expert power. But being different than clients to mainstream or social media, this client did not shy away from learning and cognitive dissonance. So, the reality of solvable mystery and its solutions has been created with active participation of the analytical media's client.

Another part of answering the first research question concerns the relations between old and new media (Travica, 2016, 2020). Findings indicate extensive *replication* of old media's content in new media, particularly in Twitter. Also, the landmark Travis article of analytical media was much referenced in social media. Old media, however, did not reciprocate. A notable exception is referring the faulty aerodynamics argument to social media (which was actually inaccurate since it originated in analytical media). Furthermore, new media techniques *extended* the Wall Street online edition with a discussion forum that was very active in one occasion. The analytical medium Vox was extended via a YouTube channel that attracted a remarkable number of viewers.

This cross-pollination via the replication and expansion relations, however, yielded no instances of virility or social activism reported in the literature (Bennett, 2013; Veil et al., 2015). A campaign by the U.S. customer rights advocate's on Facebook, which is labelled "Axe the MAX", can be linked to such ambitions. However, a paltry extent of sharing the campaign calls on Facebook and Twitter topped the ambitions. As for the *substitution* relation between media, the extensive public outcry at Twitter after the second 737 MAX accident comes close. By its mere nature of being a channel for folks' voice (as anyone else's), Twitter occupied mass attention, thus substituting old media. But after the burst of activity, Twitter went silent until another irritating event, and the pattern continued. So, the substitution functioned in a reactive mode bound to social media's short news cycle that surfaced in the context of corporate scandals (Barkemeyer et al., 2020).

THREE LEVELS OF DISTORTION

The second research question inquired about informing distortions in the media coverage. The assumptions on facts and truth in the theoretical assumption section provide a backdrop for this answer. Its first part is that extreme distortions (fabrications, fake news, hoaxes) were not discovered. In other words, none of the media studied bears indications of orchestrated campaigning either in favor or against Boeing/737 MAX. There were no corporate trolls or bots on Facebook or Twitter to corroborate findings on the social media abuse in the political domain (Alcott & Gentzkow, 2017; Ferrara, 2017; Hindman & Barash, 2018). Even the persistent problem-narrowing narrative in mainstream media appears as if the media ran on an automatic editor-pilot (trust the powerful corporation, respect the FAA, learn from the stock market) rather than a premeditated pro-Boeing campaign. As Herman and Chomsky (1988) have argued, media editors could succumb to self-censorship compelled by pressures of securing advertising revenues and access to informers (Boeing and the FAA, in this case). Nevertheless, this uncritical stance qualifies as an ideological bias, which belongs to a mid-range distortion in informing. As for analytical media, their interest in demonstrating a technical competence was clearly devoid of campaigning intentions. If nothing else, the informers laid their authority and personal well-being on the line while going against the mainstream informing.

The second part of the answer is that informing distortions were proportionate to the extent to which the realities mediated were not anchored in facts. As discussed in the theoretical background section, facts in media have two levels: the correspondence between a media statement and the original statement the media cite, and the correspondence between the original statement and reality, where “correspondence” refers to accuracy. In addition, a media narrative has to draw on complete key facts. It can be assumed that the mainstream media reported correctly what Boeing’s officials were stating during the MAX crisis. However, their source was executing an interest-biased agenda of diminishing technological problems and shifting attention away from internal organizational problems. Therefore, mainstream media mediated partial facts and an incomplete narrative, which altogether diminished the truthfulness of their coverage.

Falsehood in old media’s coverage applies to social media to the extent of their replicating mainstream media. Still, social media also mediated additional facts and created an opposing narrative critical of Boeing and its product. This reduces falsehood in social media’s coverage relative to mainstream media, although it burdens its client to put the split narrative together (which those going to Twitter or Facebook to just reconfirm their beliefs may not really do).

The sources used in analytical media drew facts from the expertise of their authors and the experts interviewed. The truthfulness of this whole coherent narrative depended again on the expert-authors. It could be verified by principles of technical reasoning and formal logic. It follows that analytical media outperformed other media on source facts and the narrative’s truthfulness. However, these media did not source opinions of Boeing’s engineers. It is uncertain at the time of this writing whether this was intentional or just impossible to do. Indirect evidence released in the aftermath of the CEO’s firing indicates that Boeing’s engineers were critical of the MAX design, although they still keep silent about the plane’s aerodynamic instability.

To sum up the answer to research question 2, there were distortions in the coverage of the 737 MAX case, but no fabrications (fake news) were discovered. The distortions-based ranking of these media in decreasing order is (1) mainstream media, (2) social media, (3) analytical media. The top ranking starts in the mid-range – bias based on ideology and interest. This distortion resembles a systematic error in measurement; once it is known, it can be accounted for in assessing credibility of a media narrative.

CONCLUSION

This study shares limitations of the literature types used. Due to recency of the case analyzed, the literature was limited to trade and generalist press. In addition, social media studied were limited to

two, and there was no deployment of advanced analytical techniques on the social media content, which could yield more precise statistics and visual findings. Still, implications of the discovered differences in mediating the Boeing 737 MAX developments by the mainstream, social, and analytical media do merit attention.

The study's implications for academic research refer to media roles in significant development and to their relations (Barkemeyer et al., 2020; Bennett, 2013; Travica, 2016, 2020). The study investigated three types – old mainstream media, social media, and analytical media – and compared them with regard to their contributions to illuminating significant events and their pertinent distortions in informing in the case of the extraordinary Boeing airplane accidents. The media created different realities. One implication is that the literature on manipulative political uses of social media (Alcott & Gentzkow, 2017; Ferrara, 2017; Hindman & Barash, 2018) should not be mindlessly extended to domains of economy and technology. In particular, the study demonstrates that social media could be a channel for alternative learning and acting within the media universe. As these media are new and changing, the study's evidence helps in explaining their evolutionary path in the context of extraordinary events.

As for mainstream media, by uncovering the media's routine and authority-seconding mode of informing on extraordinary events the study contributes to critical media research (Gitlin, 1978, 1983; Herman & Chomsky, 1988; see also Milivojević, 2015). These media are institutionally old and possess enormous potentials for both social and informing power. This grounding engenders ample space for misleading and confusing the client, as the case studied suggests. Finally, the study contributes to understanding dynamics of media-created reality by suggesting that a new type of media is emerging in the form of an Internet-centric, expert-employing metamorphosis of old media. These media represented the Boeing case in the light of deeper technological and corporate problems.

The study has recognized three realities created by the media studied: "It's all under control", "It's axing or maxing the MAX", and "It's mystery rationally solvable." Common to these narratives representing the Boeing case is that each emphasizes some facts and omits others and weaves a reality with a particular focus. Distortions are common although of different degrees. These findings confirm doubts regarding media neutrality (Barthel & Mitchell 2017; Gottfried & Shaerer, 2016; Pew Research Center, 2007; Schudson, 2019). It is interesting that cooperative constructing of a corporate scandal through action of old and new media has not occurred as explained in the literature (Barkemeyer et al., 2020).

Practical implications of this study are relevant for the client of informing with regard to selecting appropriate media for use. Note that the client is not just individuals but also institutions (business, government, judicial, consumer advocacy, insurance, investors, etc.). As for the informer side, the mainstream media may draw lessons with regard to balancing straight reporting with fact-checking and analysis as well as multi-sourcing of news. In addition, the analytical media might want to consider simplifying the authors' expression in order to broaden the clientele for its valuable content. Budgeting for multiple expert sources in constructing a narrative is also advised.

Future research should compensate for the limitations of this study and compare results on the same topic which is likely to maintain currency in the foreseeable future. It would be interesting to see whether there will be changes in the coverage of each media type. Will the truth value of respective narratives change, and in what direction? Even though Boeing did not manage a concerted PR campaign, such a possibility is not excluded in the future. Will old mainstream media learn a lesson and drift from the roles of corporate and government loudspeaker? Will they join social media in constructing of a corporate scandal? Will social media be able to overcome the fragmentation of the "It's axing or maxing the MAX" reality? Are the analytical media going to manage more extensive expert commenting and simplifying its technical language? Beyond the Boeing case, the media framework used in this study can be deployed for studying media's informing on other socially significant developments.

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BIOGRAPHY



Dr. Bob Travnica is Associate Professor of information systems. He currently teaches at the I.H. Asper School of Business at The University of Manitoba in Canada. Bob completed Doctoral and Master's studies in the United States. He has worked as an academic, software entrepreneur, or journalist in North America, Latin America, Europe, and Africa.

In his research, Bob has focused on informing view of organization, big data, the international perspective, philosophy of information systems, and informing aspects of significant social developments. His specialty is building frameworks and models from an interdisciplinary perspective.

Bob has published close to fifty academic articles and three books, and he is engaged in the academic editorship. In free time, Bob enjoys reading and writing fiction, dancing, playing guitar, learning Mandarin, and charity work.