



Reuters Institute
for the Study of Journalism

JOURNALISM, MEDIA, AND TECHNOLOGY TRENDS AND PREDICTIONS 2017

NIC NEWMAN

DIGITAL NEWS PROJECT

2017

JOURNALISM, MEDIA, AND TECHNOLOGY TRENDS AND PREDICTIONS 2017

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About the Author

Nic Newman is a Research Associate at the Reuters Institute for the Study of Journalism and has been lead author of the annual *Digital News Report* since 2012. He is also a consultant on digital media, working actively with news companies on product, audience, and business strategies for digital transition. He has produced a predictions paper for the last ten years. This is the second to be published by the Reuters Institute.

Nic was a founding member of the BBC News Website, leading international coverage as World Editor (1997–2001). As Head of Product Development he led digital teams, developing websites, mobile, and interactive TV applications for all BBC Journalism sites.

Acknowledgments

The author is grateful for the input of 143 digital leaders from 24 countries who responded to a survey around the key challenges and opportunities in the year ahead. Respondents came from some of the world's leading traditional media companies as well as new digital born organisations. Survey input and answers helped guide some of the themes in this report and data has been used throughout. Many quotes do not carry names or organisations, at the request of those contributors.

The author is particularly grateful to a number of other experts who offered ideas and suggestions by email: Kevin Anderson (ex Gannett executive), Paul Bradshaw (Birmingham City University), George Brock and Jane Singer (City University), Damian Radcliffe (University of Oregon), Adam Tinworth (Digital Consultant), Tim Weber (Edelman), Kevin Hinde, Alfred Hermida (University of British Columbia), Douglas McCabe (Enders Analysis), Charlie Beckett (Polis), and Richard Sambrook (Cardiff University).

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As with many predictions reports there is a significant element of speculation, particularly around specifics and the paper should be read with this in mind. Having said that, any mistakes – factual or otherwise – should be considered entirely the responsibility of the author who can be held accountable at the same time next year.

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Executive Summary

This year's key developments will centre on fears about how changing technology is affecting the quality of information and the state of our democracy. The arrival of Donald Trump in the White House and elections in France and Germany will highlight the increasing power of new communication channels as traditional media continues to lose both influence and money.

More widely there'll be heated debate about the role and size of tech platforms and the extent to which their activities should be regulated. Artificial Intelligence (AI) takes over from mobile as the hottest topic in technology, though the practical and ethical dilemmas around how it will be used become ever more apparent through the year.

More specifically ...

- A raft of initiatives over so called 'fake news' from both publishers and platforms fail to restore public trust. Fact-checking services move centre stage.
- We'll see further job cuts and losses across the news industry. More papers in the US and Europe go out of business, slim down or become online-only.
- More focus on algorithmic accountability, the use of data for targeting, and the power of technology companies.
- We'll see a backlash from publishers over Facebook Live as initial investments prove hard to sustain and monetise.
- Publishers force more people to sign-in/register for websites and apps as well as investing heavily in data to help deliver more personalised content and messaging.
- Expect widespread innovation with messaging apps, chat bots and the art of 'conversational journalism'.
- More of us will be talking to computers via voice driven personal assistants, like Amazon's Alexa, Apple's Siri and Google's Assistant.
- Big year for audio/podcasts as Facebook rolls out social and live audio formats.
- There'll be an explosion of mobile alerts for news, as the battle for the lockscreen heats up.
- We'll see more experimentation with Virtual Reality (VR) and Augmented Reality (AR), but results continue to disappoint for news.
- Cyber-wars intensify along with the battles between governments and citizens over the limits of personal surveillance.
- More politicians follow the lead of Donald Trump in using social media to define issues, break new policy and as a substitute for traditional media access.

In our survey of 143 leading Editors, CEOs and Digital Leaders for this report ...

70% said worries over the distribution of fake/inaccurate news in social networks will strengthen their position, while...

46% say they are more worried about the role of platforms than last year

56% say Facebook Messenger will be important or very important part of their offsite initiatives this year. **53%** say the same for WhatsApp and **49%** for Snapchat

33% of respondents from a newspaper background are more worried about their company's financial sustainability than last year; just **8%** are less worried

(More data and comments from this survey throughout the report)

1. Looking Back at 2016

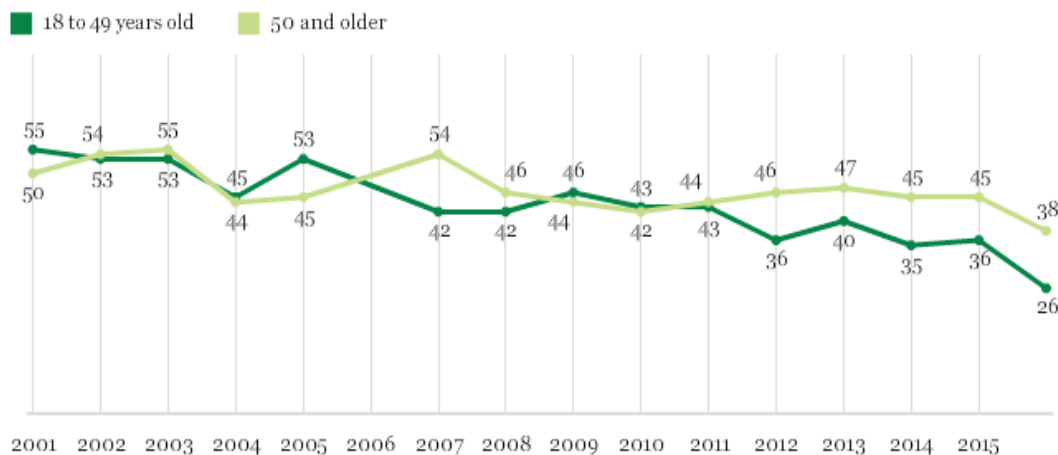
This was a historic year, but not always in a good way. Trump was elected, Brexit happened, there were repeated terror attacks in Europe, Aleppo was turned to rubble and David Bowie died. These were events that shook the world, but it was also a year in which the media itself became the news. Post-truth, the Oxford Dictionary’s word of the year, reflects a world where “objective facts have become less influential in shaping public opinion than appeals to emotion”. Experts and commentators were denigrated and at least some the news itself turned out to be not just biased but fake. BuzzFeed’s forensic uncovering of the mechanics of this phenomenon¹ marked giant steps for this emerging news brand and a huge statement too about how journalistic investigations are now increasingly about following and interrogating data.



In sharp contrast, we saw intense soul-searching by traditional media over how they could have become so out of touch and how they missed/misjudged these stories – with trust amongst old and young falling to historic lows (see chart).

Figure 1.1 Trust in Mass Media, by Age

% Great deal/Fair amount of trust



GALLUP

For many this was evidence of the corrupting nature of the internet. Were media companies too distracted by trends and technology? Were they part of their own filter bubble? Did they forget to talk to real people? But part of the analysis also reminded us of the structural and economic backdrop; how hollowed out journalism has become, particularly outside metropolitan centres.

A double-digit drop in print advertising revenues in many markets led to consolidation, job cuts and closures in the traditional media while it has become ever clearer throughout the year how big tech platforms are able to leverage their scale to drive the majority of online advertising revenue. In the United States, almost all the growth (99%) in digital advertising went to Google

¹ <https://www.buzzfeed.com/craigsilverman/viral-fake-election-news-outperformed-real-news-on-facebook>

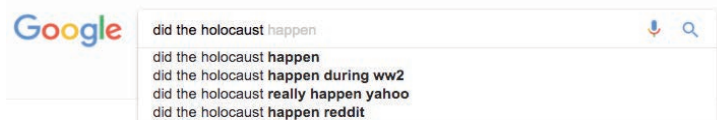
or Facebook between the third quarter of 2015 and the same period in 2016. Publishers ended the year desperately trying to work out how they can make money as we move faster than ever from print to digital and from an internet of websites to an internet of smartphone apps and social platforms.

US Ad Revenues	Q3 2015	Q3 2016	Growth	Share of Growth
Google	\$7.9 Billion	\$9.5 Billion	\$1.6 Billion	54%
Facebook	\$2.1 Billion	\$3.4 Billion	\$1.3 Billion	45%
Everyone Else	\$4.6 Billion	\$4.7 Billion	\$40 Million	1%
TOTAL	\$14.7 Billion	\$17.6 Billion	\$2.9 Billion	

Source: Jason Kint (Digital Content Next) analysis based on PWC/IAB and public data from Google and Facebook²

One thing that became clear in 2016 is that these forces are not just affecting traditional media. We suggested in last year's report that the gloss would soon start to come off new digital brands and their sky-high stock market valuations – and so it proved. Mashable, a site that had just raised \$15 million, laid off 30 people. Digital pioneer Salon announced a new round of budget cuts and layoffs. Even BuzzFeed was reported to have downgraded its 2016 earning targets by a considerable margin.³ Meanwhile the perils of relying on Facebook's fickle algorithms (posts by publishers and brands were de-prioritised in June) were illustrated by the balance sheet of Elite Daily, the US based entertainment site owned by the *Daily Mail*. Its losses more than doubled as the company wrote down its value by \$25m,⁴ making it effectively worthless.

Inevitably much of the blame for journalism's woes, along with the trends toward fake and partisan news, has unfairly been laid at the door of Facebook algorithms. A more specific and articulate complaint came in September with the intervention of Espen Egil Hansen, editor-in-chief of *Aftenposten*, whose open letter to Mark Zuckerberg called for greater transparency and responsibility for understanding the context of what happens on the network. A Facebook algorithm had been unable to distinguish a Pulitzer Prize winning war photo from child pornography and had removed Nick Ut's iconic image. "You are the world's most powerful editor", wrote Hansen. Facebook restored the image but the incident highlighted again the limits of rule-based computer algorithms in understanding complexity, nuance and cultural difference. While Zuckerberg continues to insist that Facebook is not a media company, many of his employees have apparently started to question what its responsibilities might be beyond helping people stay connected.⁵ The year ended with Facebook advertising for a high profile Head of News. Google has also come under pressure for refusing to manually edit its search results to remove unintended consequences of its auto-complete algorithms.⁶



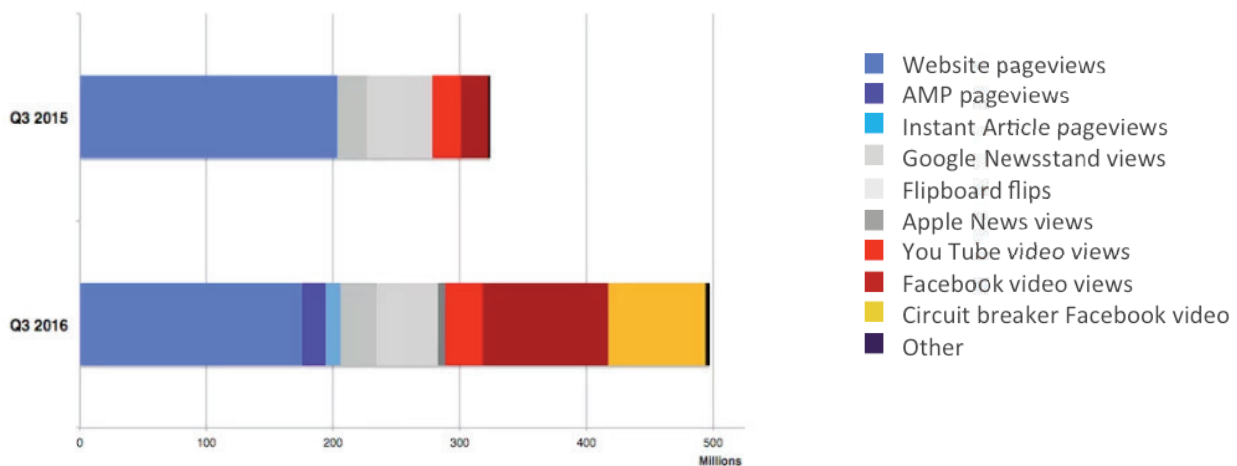
Top 10 reasons why the holocaust didn't happen. - Stormfront
<https://www.stormfront.org> › General › History & Revisionism *
 19 Dec 2008 - 10 posts - 8 authors
 The Holocaust Lie more than anything else keeps us down. The twin ... You can believe what you want, but i believe the holocaust did happen.

² <http://fortune.com/2017/01/04/google-facebook-ad-industry/>
³ <https://www.ft.com/content/26ebf992-00c4-11e6-99cb-83242733f755>
⁴ <http://mashable.com/2016/12/01/elite-daily-daily-mail-write-down/#AZE4orhGXmqj>
⁵ http://www.nytimes.com/2016/11/14/technology/facebook-is-said-to-question-its-influence-in-election.html?_r=0
⁶ <https://www.theguardian.com/technology/2016/dec/04/google-democracy-truth-internet-search-facebook>

The move to distributed publishing

In last year's *Predictions* we argued that the most significant development of the year would be the rise of platform (offsite) publishing and the implications both for business models and consumption. Facebook Instant Articles rolled out to more major sites in 2016 but just as significant for many publishers has been the growth of 'distributed' social video and Google's Accelerated Mobile Pages (AMP). These optimised pages, served from search results pages, only launched in February, quickly came to account for a significant share of publishers' page views. The chart below from the Verge website (part of Vox Media) shows how all the growth in the last year has come from distributed consumption with AMP pages making up 14% of article views, a bit more than Instant Articles.⁷

Figure 1.2 Verge Content Views by Source (2015-16)



Meanwhile Apple's iOS 10 update increased the prominence of its previously underwhelming News app along with improved notifications. For some publishers this was a 'game changer' with CNN reporting page views up to 35m in September from just 5m a month earlier.⁸ We can expect far more focus on these two platforms in 2017.

Year of Live and Social Video

Live news video has been around for more than two decades but exploded in the last year with the birth of Facebook Live. Such is Facebook's obsession with live video, they paid the world's top publishers to produce content for the platform, shelling out \$50m to BuzzFeed, the *New York Times* and the BBC amongst others. Instagram introduced live streaming in 2016 while Twitter added 360 degree live video within Periscope and has made live streaming a core audience and revenue focus for the company. Meanwhile SnapChat has had success with its 24 hour Live Stories, crowdsourced collections of digital media from a specific location.

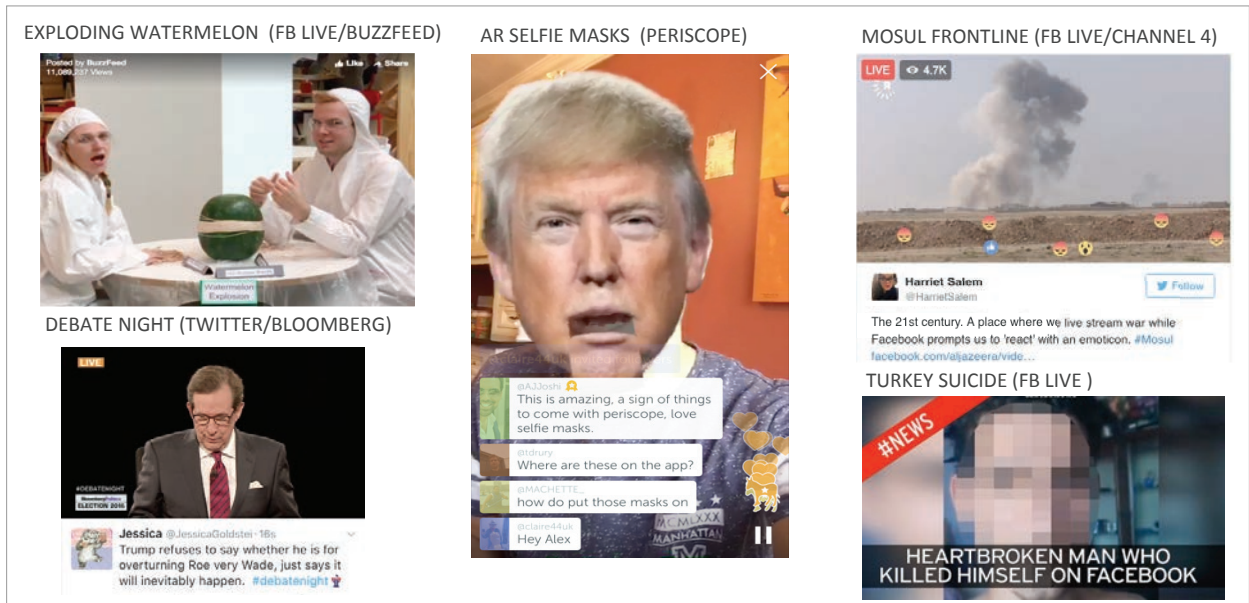
These developments are partly about using video's power to capture more attention (and thus more advertising) but also combine new forms of self-expression with a growing interest in 'what's happening right now'. "Fast forward five years, it's going to be [mostly] video", says CEO Mark Zuckerberg,⁹ while further out he's betting on more immersive experiences like AR and VR.

⁷ <http://www.theverge.com/2016/10/6/13188306/refreshing-the-verge-facebook-video-google-amp-future-of-the-web>

⁸ <http://www.niemanlab.org/2016/11/after-a-slow-start-apple-news-is-emerging-as-a-significant-traffic-driver-for-some-news-orgs/>

⁹ Referring to the Newsfeed at the F8 developer conference 2015 <http://fortune.com/2016/03/02/facebook-video/>

We strongly flagged the significance of live video in last year's *Predictions* report along with the new ethical dilemmas that would emerge. Facebook broadcast its first live murder, a live robbery, ISIS propaganda and an emoji filled frontline battle.



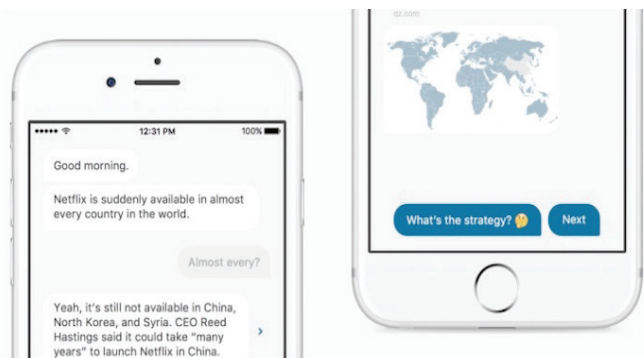
Last year's predictions ...

We said Snapchat would be a key network to watch due to its track record of technical innovation and audience focus. We also predicted the growth of professionally produced vertical and square video. But we failed to predict the arrival of 'round video' or Snapchat spectacles. These new camera equipped sunglasses capture video with a lens that mimics the human eye, though when viewed on a phone they can be cropped in either landscape or vertical view. This year may see 'round video' emerge as a new standard or disappear without trace but the renamed Snap Inc remains the most talked about company in Silicon Valley and is set for a lively IPO in 2017.



Last year, we also highlighted the rise of the bots and the trend towards conversational journalism. In February, Quartz surprised everyone with its conversational app that behaved like a bot. This was not true AI as humans write all the copy in the newsroom, but it sparked a new way of thinking about interacting with news on the phone and a host of imitators.

There was much we got right and more we got wrong. We said Yahoo would be broken up or sold. This almost happened in 2016. We said Twitter would be bought – again a near miss. Both companies are guaranteed to attract attention and deliver boardroom turmoil in equal measure in the year ahead.



2. Key Trends and Predictions for 2017

2.1 Fake News, Algorithms and Guarding Against the Filter Bubble

Fake news is not new but as Mark Thompson points out in his new book *Enough Said*,¹⁰ “our digital eco-systems have evolved into a near perfect environment for distorted and false news to thrive”. In the last weeks of the US election, according to an analysis by BuzzFeed News, fake stories such as the Pope endorsing Donald Trump and Hillary Clinton selling weapons to ISIS outperformed real news on Facebook with more shares, reactions and comments.

Figure 2.1 Total Facebook Engagements* for Top 20 Election Stories



*Engagement refers to the total number of shares, reactions and comments for a piece of content on Facebook.
Source: Facebook data via BuzzSumo

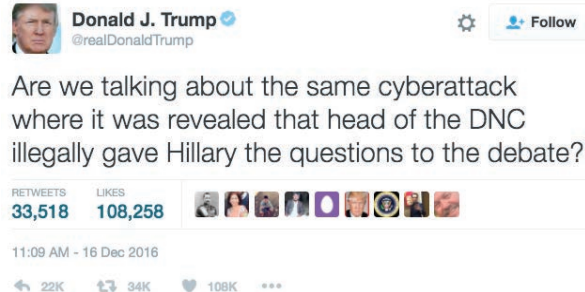
There is a danger of exaggerating the extent of fake news. Mark Zuckerberg argues that it amounts to less than 1% of what people actually see in their newsfeed, but the election has made a long-standing issue around fake and misleading content much more apparent. This matters because our Reuters Institute research shows that in almost all countries more people now rely on social media as a source of news than printed newspapers. More than one in ten (12%) now consider social media as their *main* source of news and around a quarter of adults under the age of 25.¹¹ But solving these problems is going to be complicated by a difficulty in defining fake news in an era of increased partisanship and polarisation – not least with the next president of the United States himself an enthusiastic practitioner and sharer of fake news. So will Facebook, as the largest social network, recognise and face up to its new editorial power? How might publishers respond to these trends in the year to come?

¹⁰ Thompson, *Enough Said: What's Gone Wrong with the Language of Politics?*, Bodley Head, 2016.

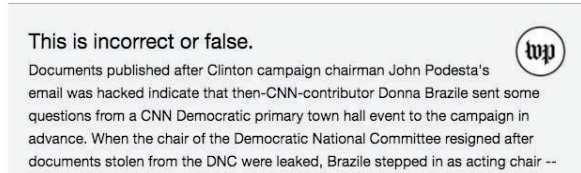
¹¹ 28% of 18-24s use social media as main source, 24% for TV news (average of 26 countries) Newman et al., *Digital News Report*, RISJ, June 2016.

SPECIFIC PREDICTIONS

1. Fact-checking explosion: These services will multiply in 2017 fuelled by funding from philanthropists, foundations and platforms. Google is supporting a number of new services as part of its Digital News Initiative (DNI). Facebook has announced plans to outsource fact-checking to services like Snopes, the *Washington Post* and PolitiFact and to algorithmically integrate these with the news feed. Expect controversies over which fact-checking services are used, who is funding them and why. Trump supporters will denounce them as part of a left-wing conspiracy and set up their own services to fact-check their political opponents and the media. Traditional news companies will also up their game in this area, creating or upgrading fact checking brands to increase credibility.



By the end of the year there are likely to be hundreds of browser extensions and message bots offering fact checking services (see *Washington Post's* trailblazer right).



Paul Bradshaw of Birmingham City University thinks we'll be surprised in 2017 by the level of automation within verification and fact-checking. "Nothing stimulates technological development like war, and the information wars are already generating increasingly 'augmented journalism' as news organisations - and social media - develop the weapons to fight back."

Quotes from the survey:

"Fake news threatens to undermine democracy all around the world. Faced with this threat, news publishers can't afford to retreat behind paywalls: we need to be out there, in people's newsfeeds, challenging the lies at scale, treating disinformation on social media platforms as an urgent frontline beat"

See more on the rise of fact-checking sites in our recent Reuters Institute report, *The Rise of Fact-Checking Sites in Europe* (Graves et al. 2016).¹²

2. Platform and algorithm changes: The leading platforms are already focusing enormous resources on dealing with fake news. They know that loss of confidence in the platform will affect their bottom line, but they'll also be desperate not to get drawn into the media business directly. Facebook is not going to solve the problem of fake news in the next year, but automatic picture recognition, machine learning, better verification and triaging all these programmatically are on the way.

In the short term, the main focus will be around penalising sources that do not have a strong track record and making it easier for consumers to report false news (and feeding these signals back into the core algorithms so these sources get demoted). Beyond that they'll be working on features to allow users to have better control of what appears in the news feed. Twitter release of a new 'mute' button shows that they have also begun to give users more options to manage the quality and type of news they are exposed to.

¹² <http://reutersinstitute.politics.ox.ac.uk/sites/default/files/The%20Rise%20of%20Fact-Checking%20Sites%20in%20Europe.pdf>

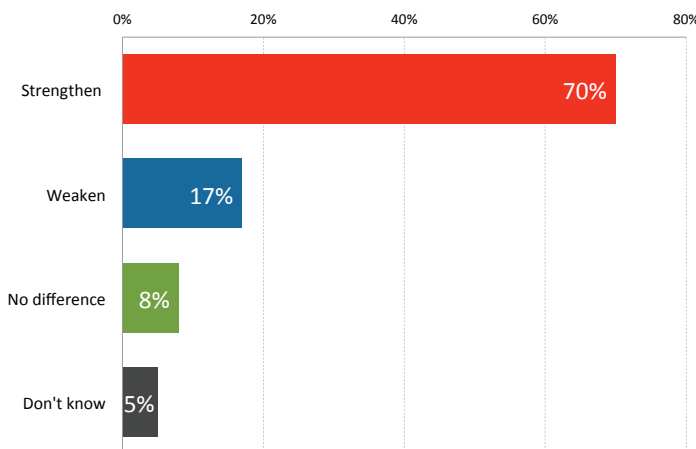
Publishers will also hope for stronger branding or other visual signals to reduce the flattening effect that Barack Obama noted is making hard for ordinary people to “separate truth from lies, fact from fiction”, reducing trust in the business of news.¹³

3. Regulation threats and take down dilemmas: This process has already started in Germany with suggestions by senior politicians that Facebook or other distributors of news should be fined up to 500,000 euros for each fake news story it fails to take down from its site. This is unlikely to happen but the pressure will force platforms to employ more senior editorial staff to make these calls and respond to requests, with the German and French elections being a particular flashpoint. Expect to see more allegations that websites supported by Russian president Vladimir Putin are trying to undermine the democratic process – particularly in former communist countries. The Czech government is setting up an ‘anti-fake news’ unit to monitor around 40 websites pushing conspiracy theories and inaccurate information about migrants in the run up to October elections. With democracy increasingly in the firing line, Facebook’s new Head of News will have their work cut out in 2017.

4. Serendipity algorithms: Expect to see the creation and marketing of services that challenge our prejudices; that give you more of what you *don’t* like. The *Guardian* has already started a feature: ‘Burst your bubble’, which offers links to conservative articles that thoughtful liberals should read.¹⁴ But countering the bubble, says City University’s Jane Singer, will be harder than it seems given “how viscerally it feeds our emotions and perceptions, and the extent to which every one of us exists within it”.

5. Flight to quality news brands: In many ways these developments offer an opportunity for existing news brands. Over two-thirds (70%) of respondents to our digital leaders survey say they think their position will be strengthened, by highlighting the need for trusted brands and accurate news at a time of uncertainty. Damian Radcliffe of Oregon University believes some audiences may “increasingly appreciate the importance – and value – of quality independent journalism” and points to the increased rate of subscription for the *New York Times*, and ProPublica amongst others immediately following the Trump victory.

Figure 2.2 Will worries over the distribution of fake/inaccurate news weaken or strengthen the position of news media like yours online?



Base = 143 Editors, CEOs and digital leaders

Quotes from the survey:

“Can only do good to force the platforms to address the issue [by promoting] trusted news sources”

“As a provider of high quality news we’re needed more than ever”

I hope ...the projects we have (a hoaxbusting tool in particular) will finally have consequences”

¹³ <http://www.gallup.com/poll/195542/americans-trust-mass-media-sinks-new-low.aspx>

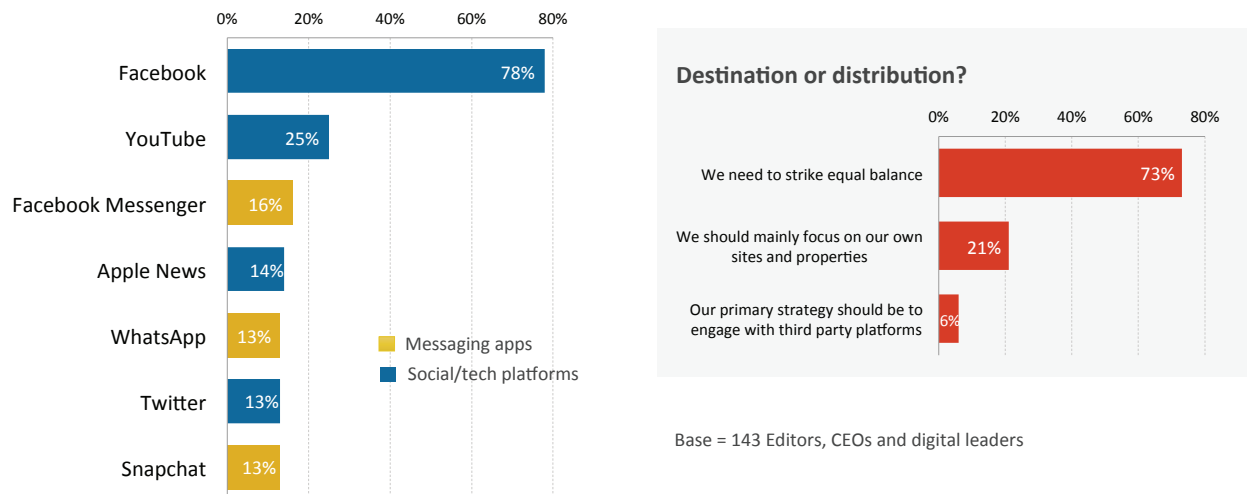
¹⁴ <https://www.theguardian.com/us-news/2016/dec/08/rightwing-news-conservative-articles-trump>

This may be wishful thinking with others pointing out that the discussion of fake news may further harm the public’s trust in media or cause people to turn away from news altogether. This is clearly a turning point for media and all eyes will be on how both publishers and platforms respond to this crisis of credibility.

2.2 Redefining Publishers’ Relationship with Platforms

A key question in 2017 is how the already tense relationship between publishers and platforms will develop. In our survey almost half (46%) said they were more worried about the role and influence of platforms compared with last year. Fewer than one in ten (9%) were less worried. Despite this, the vast majority of publishers plan to continue to invest heavily in Facebook and to a lesser extent other platforms this year. Three quarters (73%) said that their overall digital strategies aimed to strike an equal balance between their own websites/properties and distributing content via third parties with only a fifth (21%) saying they would be mainly focusing on their own sites and platforms.

Figure 2.3 Which platform investments will be MOST IMPORTANT in 2017?



Quotes from the survey:

“The news industry is happily starting to wise up to the fact that it has been thoughtlessly making Facebook and the other platforms better to its own detriment. It’s time for these relationships to be reset.”

“Platforms are eating up the audience and the advertising dollars that media companies depend on.”

“The power of GAFAs [Google, Apple, Facebook and Amazon] is both an opportunity to address more/different users and a critical risk to our media role of hierarchizing messages.”

“Instant Articles took up a lot of air time this year (rightly so) but it doesn’t seem to be delivering for publishers. My concern is how hard Facebook now pull the ‘incentive’ lever.”

Many publishers are unhappy with the amount of money they get from Facebook, especially with video monetisation yet to come on stream in a significant way. Access to customer data is also a big issue for some with at least one publisher withdrawing from Apple News. Reliable data is also a concern with Facebook having to apologise for overstating (for two years) how much time, on average its users were spending watching videos. And then there are worries about ownership and attribution with some publishers unhappy that Google's AMP shows their content framed with a Google url.¹⁵ And yet, despite all this, there remains widespread recognition of the positive side of the equation; that in a mobile and social world these platforms remain critical to reaching new audiences. So what might give? How can this asynchronous relationship become more balanced?

SPECIFIC PREDICTIONS

1. Publishers fight back - create platforms of their own: One Nordic publisher, Schibsted, has already started to build its own platforms for content and advertising to create the scale and data competence to compete with Facebook. Initially just Schibsted publishers will use the platform but expect to see this extended to other media partners through strategic partnerships. In China, the Bingdu app aggregates news from many different publishers, and has added Facebook style recommendation algorithms helping it attract around 10m active users.¹⁶ Axel Springer's Upday app for Android is another example of the same trend. Expect to see more publisher-owned news aggregators emerge over the next few years.

2. Platforms pay hard cash for content: Facebook has already set a precedent by paying around 140 different publishers to kick-start its live video business. But this is unlikely to be a one-off as platforms become more desperate for growth in an increasingly saturated and competitive market. High quality content will become more and more important to build loyalty and keep attention – even if only the largest and most prestigious publishers are likely to reap the benefits. With interruptive advertising on the way out, expect platforms like Snapchat to come up with new models including direct payment and joint sponsorship deals for its Discover platform. It is worth noting that this type of scheme already operates in Korea where Naver pays publishers around \$40m a year, with the money coming out of search and portal profits elsewhere. Regulation in Korea also ensures that smaller publishers get a share of the money.

3. Mergers and acquisitions: Squeezed profit margins and an oversupply of news online means consolidation is on the cards. Publishers need scale to balance the power of the tech platforms and to achieve economies around new technology and skills. Scale will increasingly mean operating across multiple platforms so expect TV/print mergers, challenging regulators to think differently about issues such as media ownership and pluralism. At the same time, the era of VC money flowing freely into pure media start-ups will come to an end as it becomes clear that the majority of ad revenue will continue to go to tech platforms. With media start-ups looking to be acquired, strategist Kevin Anderson predicts that “there will be a wave of acquisitions mostly by big entertainment and broadcasting firms”. This doesn't mean that there isn't space for new ideas, he says, “but general media properties, even those focused on the desirable millennial demographic will struggle to get more funding”.

¹⁵ http://www.nytimes.com/2017/01/01/technology/google-amp-mobile-publishing.html?_r=0

¹⁶ <http://www.storybench.org/how-a-chinese-news-app-has-users-earning-money-reading-and-sharing-news/>

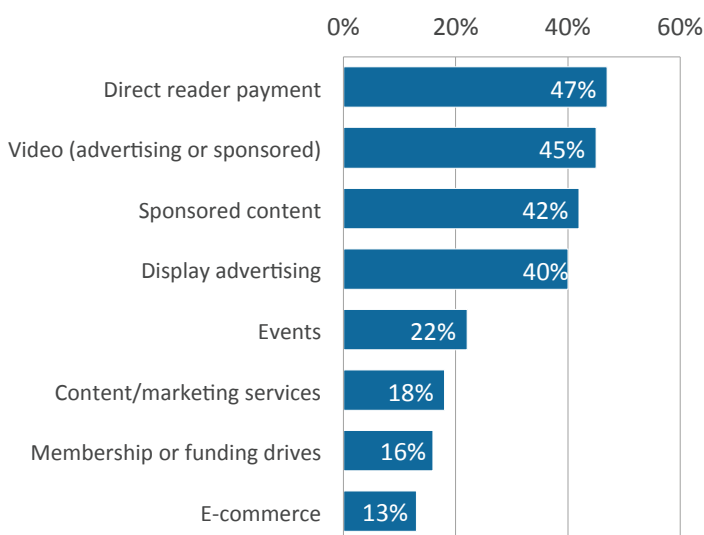
2.3 Digital Advertising and Sustainable Business Models

Moving into 2017, the mood amongst many publishers is subdued. A quarter (24%) of digital leaders say they are more worried about financial sustainability than this time last year, with the figure rising to a third (33%) of respondents from a newspaper background. Just 8% say they are less worried. Companies with a focus on subscription or sponsored content seemed to be a bit more confident about their future – while ad-dependent organisations in the UK, Spain, Italy and Poland tended to be more pessimistic. Advertisers and agencies are increasingly putting their money into platforms that are cheap, targeted, and easy to buy. That helps explain why Google and Facebook have been picking up most of the new spend along with a range of programmatic advertising networks. Respondents to our survey talk about the disappointing levels of advertising return and the need to ‘build out diversified revenue streams beyond digital display’.

In terms of most important commercial priorities, there is a clear move away from traditional advertising towards direct reader payment (45%), membership (14%) and sponsored content (42%) whether through text or video.

Figure 2.5 Which digital funding streams will you be focusing on MOST in 2017?

Base = 132 Editors, CEOs and digital leaders, 13 did not answer this question



Quotes from the survey:

“In 2017, we will start a new digital product for ZEIT aficionados, they will be able to reach the weekly premium package seamlessly through our website”

Götz Hamman,
Editor Digital Transformation

From the responses to our survey, we can detect five clear trends for 2017:

1. Membership and reader payment: We’ll hear less about paywalls and more about membership this year. The *Guardian* has spent much of the last year rethinking its commercial strategy and will be focusing far more on trying to extract payment from readers though scaling its membership scheme globally. For companies that already operate a paid model, the switch is more one of emphasis. “Our core strategy going forward will be a resolute focus on membership,” says the *Wall Street Journal’s* Chief Innovation Officer Ed Roussel “at a time when advertising revenue is an increasingly febrile business”. This applies not just to digital advertising but to print. The *Wall Street Journal* lost more than a fifth of its overall advertising revenue (21%) in the third quarter of 2016 with the *New York Times* showing an 18% loss.¹⁷ “We expect display advertising to have pretty much vanished by 2025”, suggests *The Economist’s* Deputy Editor Tom Standage.¹⁸ With print advertising set to decline further this year, news organisations will need to a) squeeze more

¹⁷ <http://www.niemanlab.org/2016/12/newsonomics-the-2016-media-year-by-the-numbers-and-a-look-toward-2017/>

¹⁸ <http://www.pressgazette.co.uk/economist-digital-strategy-chief-we-expect-display-advertising-to-have-disappeared-by-2025/>

money directly from existing customers, b) persuade new customers to start paying or c) launch new services.

2. Data, loyalty and personalisation: Related to the above most publishers are thinking about how to convert anonymous web users into loyal customers. Only by knowing more about customers can media companies hope to compete with Facebook in creating more relevant and personal experiences, which may eventually lead to revenue. This year, media companies will be investing heavily in data, segmentation and recommendation initiatives (61%) along with registration and sign-in drives (52%).



The BBC is planning to introduce mandatory sign-up for BBC iPlayer by the summer, which will automatically identify news and sport users too. This will allow personalisation technologies to be deployed to improve the relevance of content, along with notifications to bring users back more regularly and (for commercial players) drive membership and subscription. This focus on loyalty strategies also helps explain the rebirth of email in 2016. The *Washington Post* for example uses Facebook Instant Articles as a key weapon to drive email sign-ups while the *New York Times*, Quartz and *Financial Times* are amongst companies that have invested heavily in these owned channels.

Quotes from the survey:

“The big challenge will be converting our anonymous web users into known user segments, and the opportunity lies in what we’ll be able to do once this has been achieved in a robust and trustworthy manner.” (UK publisher)

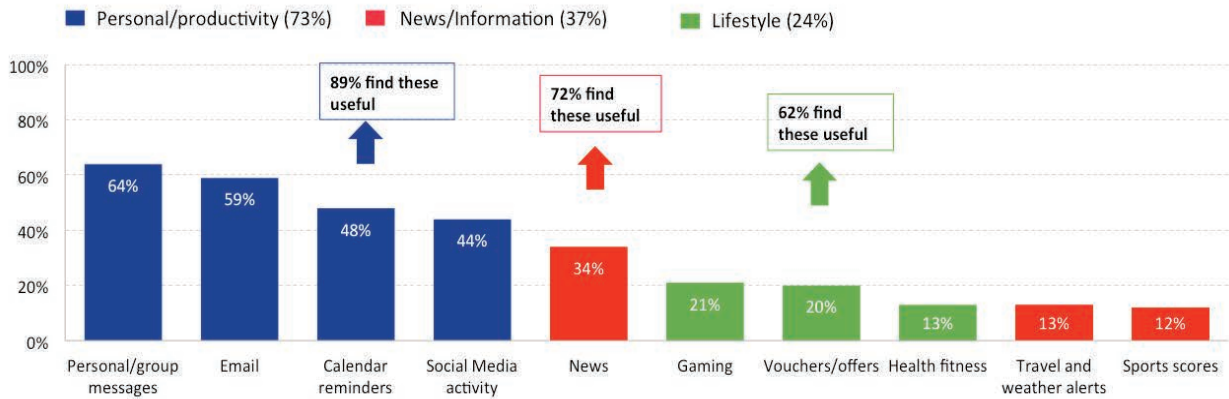
“This will be the ‘data year’ for media companies. We will be working better to understand and apply the concepts of machine learning, predictive analytics and anticipatory analytics.”
Joao Galveias, Digital Director RTP Portugal

3. Mobile Alerts and the Battle for the Lockscreen: For 2017, however, expect attention to switch to mobile (and desktop) notifications. In our Digital Leaders survey, 69% of respondents said they considered it ‘very important’ to up their game on news alerts in 2017. With mobile becoming the most important channel for news, more publishers are recognising the importance of creating a wider range of relevant alerts for smartphone users to attract people back to apps and websites. Publishers are setting up dedicated teams to experiment with different approaches but they won’t have it all their own way. Twitter is set to launch its own full-scale personalised news alerts service early in 2017.

Our report on this subject, *News Alerts and the Battle for the Lockscreen* (Newman, 2016),¹⁹ shows that news and sport are already some of the most highly valued notifications, but they have to fight for their place alongside personal messages, productivity alerts, shopping and games.

¹⁹ <http://digitalnewsreport.org/publications/2016/news-alerts-battle-lockscreen/>

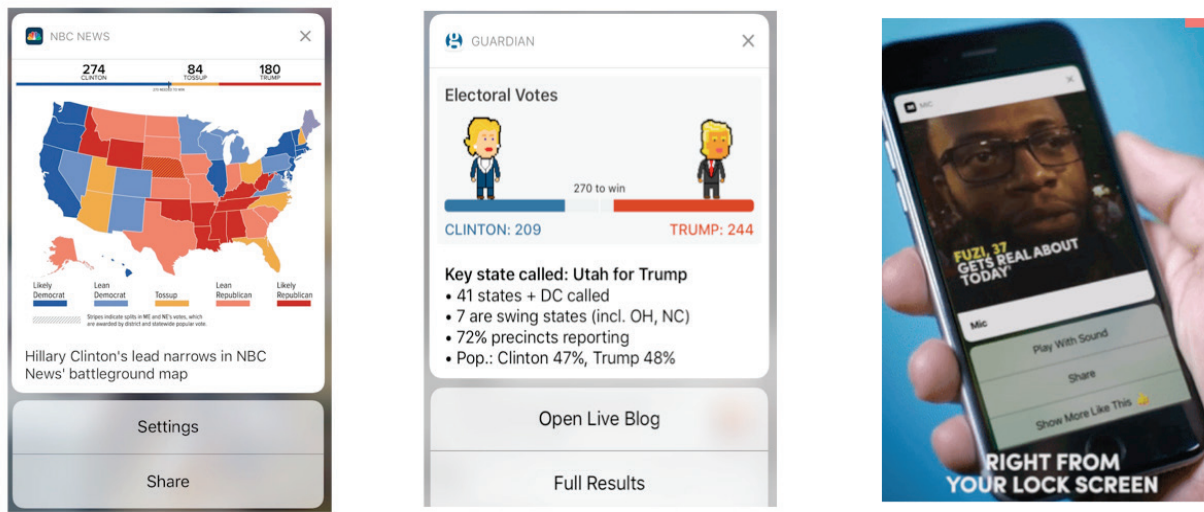
Figure 2.6 Popularity of different kinds of alerts



Source: Reuters Institute/YouGov survey of 7,577 adults in four countries

The *Guardian*, Mic and others have been experimenting with sending rich-media messages to the lockscreen, recently enabled by both Apple and Android. These include graphics, live data visualisations and even video. It is likely that the Android and Apple notification platforms will become every bit as important for the news industry as Facebook Instant Articles, Google AMP and Facebook Messenger and Snapchat Discover. The role of the lockscreen as a gateway to content has been talked about for many years but only now are we seeing the ease of use and range of functionality begin to meet those expectations.

Figure 2.7 Richer visual messages are on their way to the Lockscreen



NBC ALERT WITH MAP

GUARDIAN WITH LIVE DATA

MIC EXPERIMENTS WITH VIDEO

4. Acceptable ads and ad-blocking: Another key concern is how to deal with Ad Blockers which eMarketer predicts will grow by another 24% in the United States alone this year.²⁰ Meanwhile new mobile browsers, which block ads by default, are continuing to sweep through many Asian countries. With a focus on revenue, many publishers are now looking at the phenomenon as an opportunity to drive subscriptions/membership. Following the example of *BILD* in Germany, many

Quotes from the survey:

“Improving ad viewability and reducing ad-blocking on our sites is a major challenge.”
 Australian publisher

²⁰ <http://digiday.com/publishers/report-87-million-people-will-use-ad-blocker-2017/>

now block content for those using this software while offering a low cost ad-free alternative to catch more loyal users. As with this Wired example, (below) the messaging will increasingly focus on the cost of creating quality content.

Meanwhile expect some kind of industry-wide deal in 2017 around ‘acceptable’ or ‘sustainable ads’ that define concepts like non-intrusive advertising more clearly. To some extent this is already being enshrined within Google’s AMP and Facebook Instant Articles where only a limited range of formats are accepted and ad-blockers are largely excluded.



5. Sponsored content: A common theme from publishers this year is about the challenges of shifting the ad model from display to native. Publishers like the *New York Times*, the *Wall Street Journal* and the *Guardian* have invested deeply in studios to deliver branded content while Vice, BuzzFeed and Quartz say that branded and sponsored content now make up a substantial chunk of revenues. Since many of these in-house solutions are bespoke, they are proving hard to scale and making advertising look like content can raise issues of trust and credibility for many publishers.

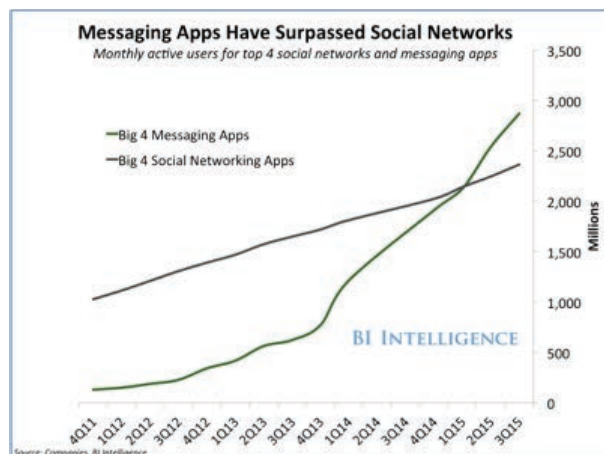
Of particular concern are the third party links offered by recommendation services such as Outbrain and Taboola, displayed under labels such as ‘Around the Web and Promoted Stories’. A number of prominent publishers (Slate and the *New Yorker*) have started to pull back from these services after readers’ complaints about clickbait headlines and inappropriate content. Expect to see this trend gather pace in 2017.

6. Pop-up newspapers and magazines: Political and social turmoil opens up new opportunities, while new technology means it is possible to spin-up new publications almost instantly. The *New European*, a profitable pop-up publication by local publisher Archant, was launched in just 9 days in the aftermath of the UK Brexit vote. Pop-up publishing could be a sensible and practical response to a world hungry for in-depth coverage on certain topics but for only a limited period of time. News organisations will need to get used to this kind of rapid experimentation and a greater level of risk-taking if they are to find new revenue streams and keep up with rapidly changing audience behaviour.

2.4 Messaging Applications and News Bots

For the first time, the four biggest messaging apps outstrip active users of the top social networks (see chart). Around 1 billion people use Facebook Messenger every month and between Messenger and WhatsApp, 60 billion messages are processed daily.

People increasingly prefer to share content not on big open networks – where they may have a very large and wide network – but within apps like WhatsApp, Snapchat and Facebook Messenger where they can have more control.



Users of WhatsApp, for example, are over 60% more likely to be sharing photos than Facebook users.²¹

Not surprising then that in our Digital Leaders survey, publishers say they will be increasingly focusing on these platforms. 56% say Facebook Messenger will be an important or very important part of their offsite initiatives this year. 53% say the same for WhatsApp and 49% for Snapchat. Other new platforms they are planning to experiment with include Kik, Viber, Telegram, Line and WeChat.

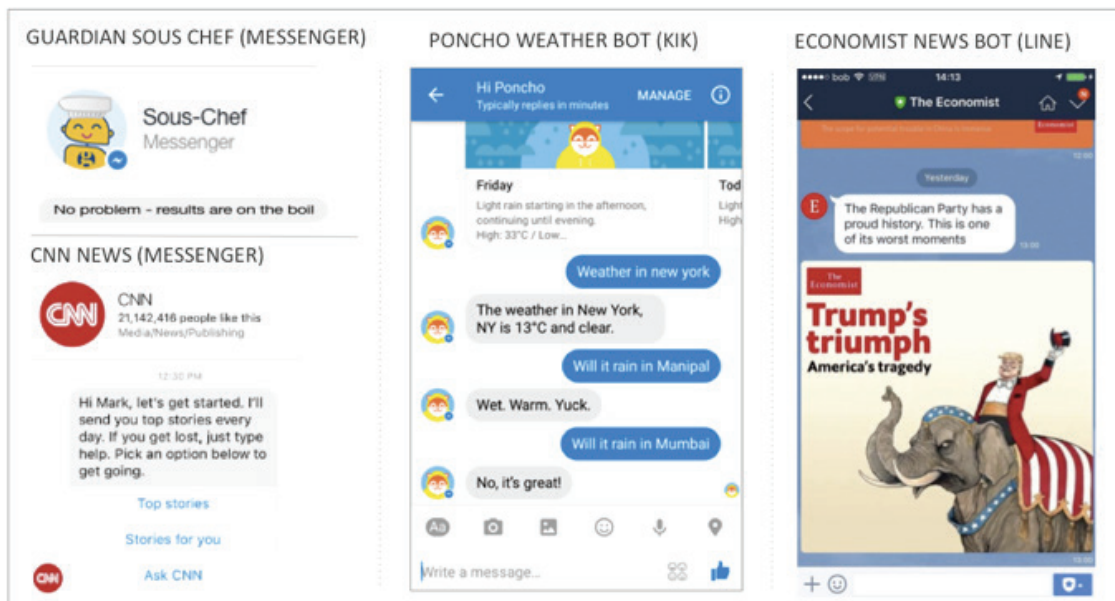
THE BOTS ARE COMING

Messaging environments have always been tricky for publishers to penetrate but the creation of bot platforms are changing the landscape. Bots are intelligent computer programs that chat (or simulate a conversation) with users – providing information in response to prompts. Sometimes they are driven by humans, sometimes by computers – or a mix of the two, but it’s really the conversational interface that makes them different. Chat bots can give you updates on the news, book a taxi or help you with a recipe for dinner – no need to download a separate app. Paul Bradshaw who runs the MA in Multiplatform and Mobile Journalism at Birmingham City University writes about three types of journalistic bot that have emerged in the last few years.²²

- A bot which automatically publishes **updates** on a particular social media account when it receives new information from a feed (such as new articles)
- A bot which can supply article **suggestions** in response to a query from a user
- A bot which attempts to provide **answers** to questions given by users

Over 30,000 bots have been created on the Facebook Messenger platform since launch in April and many more via platforms like Kik, Skype and Telegram, WeChat, and Line. CNN, the *Wall Street Journal*, *The Economist*, and the *Guardian* have been amongst those pioneering new experiences and a new tone of voice.

Figure 2.8: Publishers embrace chat bots



²¹ <http://insight.globalwebindex.net/trends-17>

²² <https://onlinejournalismblog.com/2016/12/21/how-bots-came-to-play-a-role-in-journalism-a-brief-history/>

SPECIFIC PREDICTIONS FOR 2017

1. Voice news bots: Now we can have conversations with voice-activated platforms like Amazon Alexa and Google Assistant. These in turn power devices like the Echo, Google Home, Google Allo and Google's new Pixel phone. Publishers and other third parties have already developed around 5000 'actions' for Alexa and Google's voice platform is catching up fast. Voice bots are likely to be one output from the Quartz bot studio, an innovation lab funded by a \$240,000 grant from the Knight Foundation, in the coming year along with a range of other news based bots.

2. Fact-checking bots: UK based Full Fact is already looking into developing a service that can fact check live press conferences. French newspaper *Le Monde* already has a search engine through which readers can fact check politicians' statements. Its 13-person fact-checking unit Les Décodeurs is looking to root out fake information at scale.²³

3. Conversational commerce: This year we'll get more used to calling a cab via a messaging service, most of which already have integrations with Uber and Lyft. Many commercial services will increasingly happen within other services or through notifications to the lockscreen. Watch out for travel bots like Crosby that read your email or group messaging conversations and send you recommendations for where to eat, what to do and when to leave for the airport. Trendbot advises you on new fashions and includes a button for inspiration. And this year most messenger platforms will add one-click purchasing options too. A mix of storytelling, product discovery, direct purchase and customer service is seen as the likely path ahead for chatbots; making consumer engagement possible at a much wider scale than could have been achieved before.

2.5 Voice as an operating system and the rebirth of audio

Voice activated platforms could be the breakout technology story of 2017 as the battle to control home digital ecosystems heats up. They may be frustrating, but systems like Amazon's Alexa, Apple's Siri, Microsoft's Cortana, Samsung's Viv and the Google Assistant are improving fast. Amazon say they sold nine times the number of voice-activated products over Christmas as they sold in the whole of 2015 – many of them the super-affordable (\$50) Echo Dot (below). Gartner predicts that 30% of web browsing will be done via these type of screen-less user interfaces (so called Zero-UI) by 2020.²⁴

These platforms won't replace touch screens but they further open up the internet to all those times when your eyes and hands are busy. Being able to summon up the news headlines while cooking is a great way to bring news into people's lives - but with it comes a whole new set of challenges around business models and storytelling. As Digital Publishing Strategist Adam Tinworth



notes: "Ambient computing – in the home, in the car ... extends the possibilities of computing. And as voice interfaces, machine learning and bots start to mesh together, we have the potential of creating something very interesting, that isn't dependent on a screen".

²³ <http://digiday.com/publishers/le-monde-taking-fake-news/>

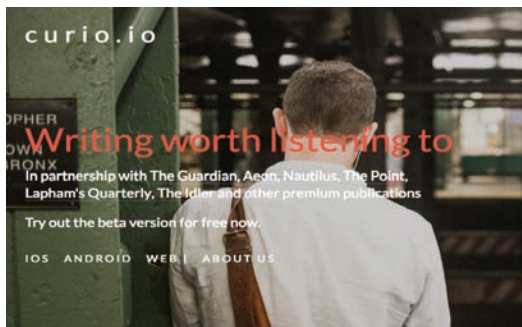
²⁴ <http://digiday.com/brands/wtf-is-zero-ui/>

In our digital leaders survey, almost a third of publishers (28%) told us that they are planning to experiment this year with voice-controlled assistants. The Huffington Post has developed a news briefing via Alexa and a headlines quiz game on the Google Assistant – one of many systems that is opening up to third party integration. “We’re all just at the beginning stages of learning how our consumers will interact with these devices to get news,” says Julia Beizer, Head of Product for the Huffington Post.²⁵

IMPLICATIONS FOR PODCASTING

More of these devices around the home could also add fuel to the recent revival of podcasts, radio and other forms of audio, which are increasingly being consumed on demand. More than 50m American listen to podcasts monthly²⁶ according to recent research, with growth of 23% in the last year. That’s good for existing producers but also for new players looking at the opportunities for disruption.

- **60DB** aggregates short stories, news, sports, politics and business from traditional brands and new players
- **Curio** takes thoughtful, longer pieces of journalism and gets a professional to read to you
- **Anchor** is one of many new audio blogging platforms that is focussed on creating and sharing content. See also Pundit which uses filters such as monster and robot voices to set it apart from traditional voice messaging apps



Another reason to be excited about voice in 2017 is the launch of **Facebook Live audio** with the BBC, Harper Collins and a range of other select partners.

The ability to use notifications to summon an audience for live audio broadcasts could be a game changer as discovery has been a significant problem until now. But Facebook audio could ultimately be a new outlet for a wide range of podcasts, which so far have not managed to generate the same level of virality as videos or news stories. Facebook will make live audio more widely available early in 2017 and if successful we can expect Twitter and other services to follow suit.

²⁵ <https://digiday.com/publishers/publishers-now-develop-two-voice-platforms/>

²⁶ <http://www.edisonresearch.com/wp-content/uploads/2016/05/The-Podcast-Consumer-2016.pdf>

SPECIFIC PREDICTIONS

1. Podcasts and audio books get a big boost in the car with more than 200 car models integrating with either Apple Car Play or Android Auto in 2017. These services support hands free messaging and integrated maps, alongside familiar app-like ways of discovering a wealth of audio content. The big mobile players are set to replace the manufacturer branded in car entertainment systems.



PICTURE CREDIT: APPLE

2. Improvements to data and advertising around podcasts lead to significant investments by publishers. Data on usage has been patchy but Nielsen's new measurement system is coming on stream and Swedish start-up platform *Acast* is creating more robust metrics and new revenue models such as dynamic ad insertion to help podcasts exploit their growing popularity. ESPN is amongst major publishers planning a new focus on the format with a series of audio sports documentaries while the *New York Times* has created a substantial podcast team focussing on news and opinion.

3. Businesses start to deploy Amazon Echo and Google Home speakers. Hotels could be first to install voice-controlled devices that enable guests to summon room service, change TV channels and help you locate the light switch.²⁷

2.6 Online Video and the Future of TV

Over the last few years we've witnessed an explosion of online video, driven by high quality smartphone cameras, better connectivity, cheaper cloud-based storage and new tools for creating and editing videos on the go.

Facebook, Snapchat and others have been able to integrate these tools allowing pretty much anyone to create, package and distribute videos to millions of people globally. Facebook, Twitter, Instagram, and Snapchat really put video content at the heart of all their strategies this past year with innovation around formats like live video and Augmented Reality (AR) masks.

This has led to an explosion of user-generated video – Snapchat alone generated around 8 billion videos a day in 2016 – as mobile became the main platform globally for viewing online video. According to Zenith, consumers now spend an average of 19 minutes a day viewing on a combination of smartphones and tablet computers – a figure that is set to double by 2018.²⁸

But these new developments also offer a huge opportunity for the creation and distribution of professional content. With advertising premiums for video remaining strong, publishers have been innovating in a range of video formats including social, long form and expanded news clips within

²⁷ <http://www.cnbc.com/2016/12/14/wynn-las-vegas-to-add-amazon-alexa-to-all-hotel-rooms.html>

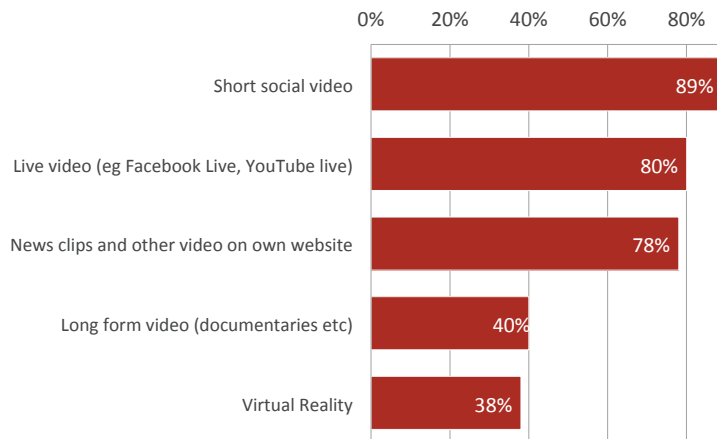
²⁸ <http://www.campaignlive.com/article/mobile-video-jumps-39-become-dominant-viewing-platform/1402542>

their own websites and apps:

- The BBC launched a new vertical video product ‘Ten to Watch’ within its app
- Unilad and The Lad Bible became the most successful publishers on Facebook with around 7 billion plays per month between them²⁹
- BuzzFeed split its news and entertainment video teams
- *The Economist* expanded its native video unit to 20 staff (Economist films)
- The *New York Times* launched The Daily 360 – one immersive video each day for a year

But producing online video remains a risky and expensive business. As we discovered in our research for the report *The Future of Online News Video* (Kalogeropoulos et al., 2016),³⁰ most of the action is happening on third party platforms where monetisation is still in its infancy. Growth is much slower on destination websites and apps where video is less prominent and formats less compelling. The video-enabled internet is changing the formats and style of digital content, providing competition for, but not replacing text. Even on sites like the BBC, only around one in ten use video on an average visit, though this can double for major breaking news stories.³¹ Despite this, as publishers gear up for 2017, video remains a significant bet for most publishers.

Figure 2.9 Which video initiatives will your company be focusing on in 2017?



Quotes from the survey:

“[We’re planning to] build up a new video department and produce lots of news videos.”

“We need to improve our video skills and produce video from every district and every street.”

“The biggest opportunity will be around VR and different, more immersive and engaging ways of telling news stories.”

The range of formats and approaches are often bewildering (live, social texted, square, round, loops, gifs, 360, VR). Ultimately this will settle down as standards and frameworks for digital video emerge. In the meantime, there will be innovation, confusion and some disappointment in 2017.

SPECIFIC PREDICTIONS

1. Disillusion sets in with Facebook Live: It is hard to see current levels of interest being sustained through 2017. Live video is an inherently inefficient way of conveying information at a

²⁹ <http://tubularinsights.com/top-facebook-video-creators/>

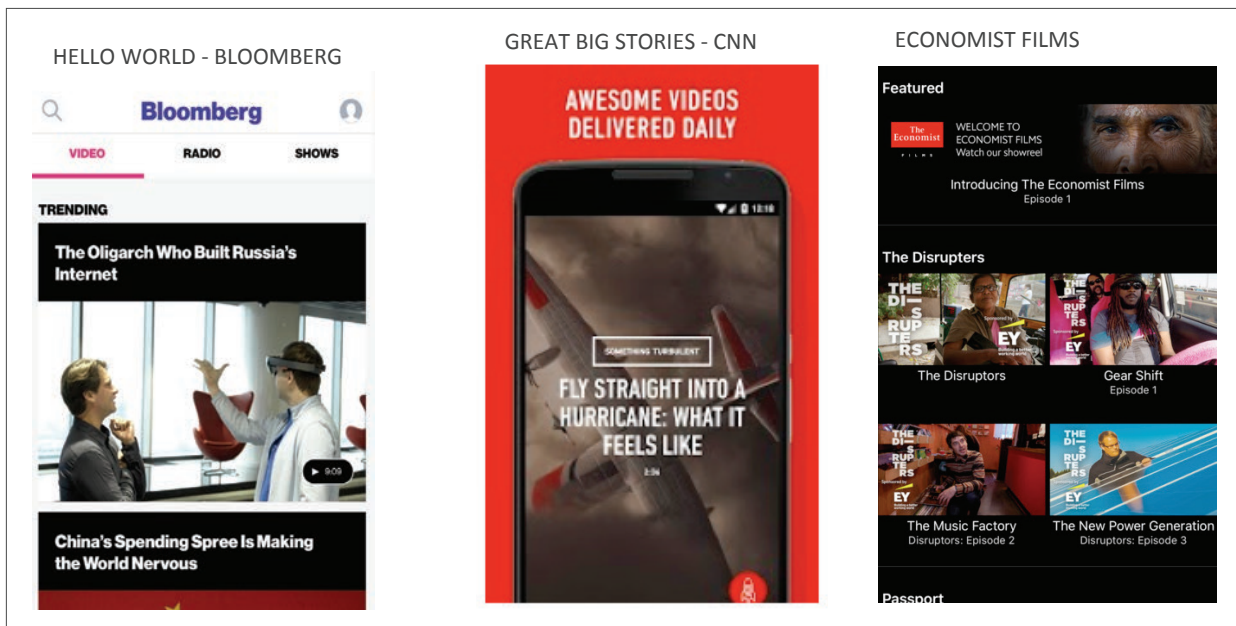
³⁰ Kalogeropoulos et al., *The Future of Online News Video*, RISJ, 2016, <http://digitalnewsreport.org/publications/2016/future-online-news-video/>

³¹ Ibid.

time when attention is increasingly at a premium. As Digital Publishing strategist Adam Tinworth points out: “Live will eventually settle into being a useful tool for situations with unknown outcomes and enough of an emotional investment that people actually want real-time updates”. The social element will also be critical. Twitter Bloomberg election debates were a compelling experience, because they combined the live pictures with the conversational backchannel. Twitter’s new NFL deal is likely to work for the same reasons. Expect to see Facebook’s money and attention shift towards sport and exclusive music, both areas with a proven track record of attracting audiences and advertising as well as being a good showcase for new 360 live functionality. Facebook’s introduction of new advertising formats around live video, are unlikely to make up for the loss of direct payments to publishers this year.

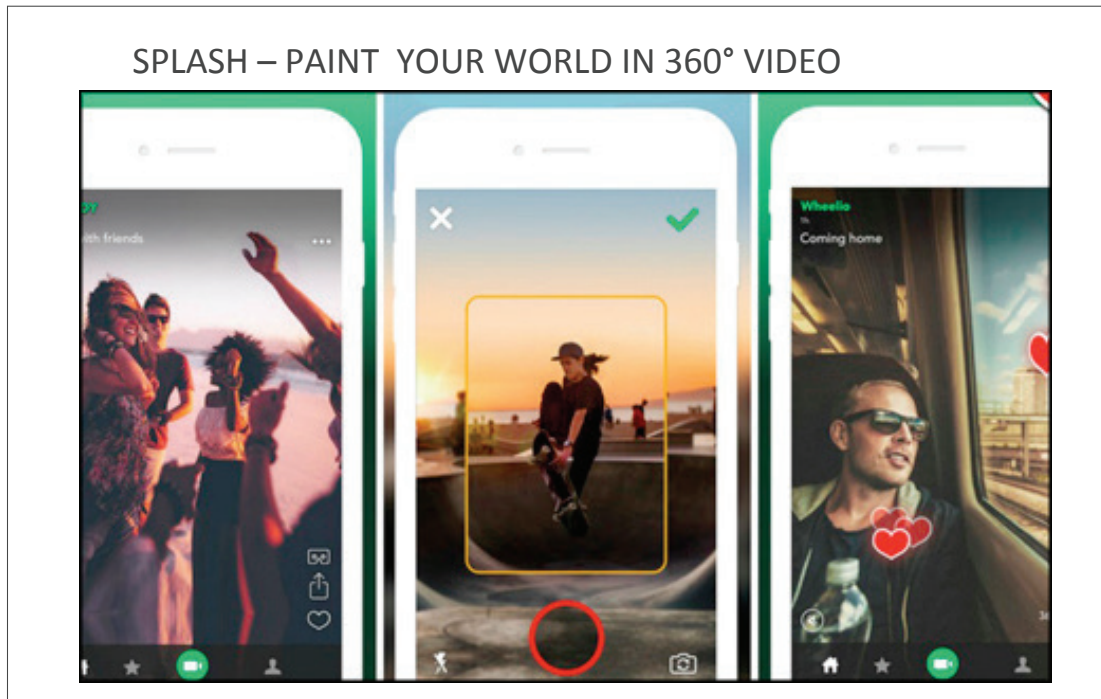
2. Oversupply of short form video leads to falling advertising premiums: Short form video (compressed storytelling) will be everywhere in 2017. Tools like Wibbitz (which automatically creates video from text), and Snappy TV (which enables existing TV to be recut and easily published to multiple platforms) will increase supply significantly. Ad premiums are likely to fall and the formats are likely to be devalued to some extent at least. Already some publishers complain that their short form video is no longer being prioritised in the news feed.

3. New opportunities with feature-based videos: BuzzFeed and Vice have already built large businesses in helping brands integrate messages into videos, and with marketing budgets shifting towards content expect other publishers to focus more on these lucrative feature-based opportunities in 2017. Great Big Stories, from CNN, is an attempt to engage younger audiences with uplifting substantive stories for the smart and curious distributed through digital channels. Bloomberg has also been experimenting with longer form video such as Hello World, a technology travel series hosted by Businessweek technology reporter Ashley Vance.³² The show will eventually work on television but is made in segments that can be cut up and shared on Facebook, YouTube and Snapchat. *The Economist* has expanded its films unit to focus on non-finance subjects like travel, social affairs, tech, and culture. What all these examples have in common is that the feature-based subjects make them more suitable for sponsorship and native advertising than traditional news.



³² <http://www.niemanlab.org/2016/03/bloombergs-hello-world-tech-and-travel-show-trades-talking-heads-for-vice-like-filmmaking>

4. Video-selfies with knobs on: In 2017 there will be more ways to play with video, as the competition between platforms intensifies. Facebook has been experimenting with new fantastical filters that allow anyone to annotate video with celebrity faces or football flags following the recent acquisition of start-up Masquerade. These technologies accurately pinpoint your eyes, nose and head to enable special effects to be added. **Splash** is a new app that allows you to create and annotate 360-degree experiences that can be viewed on smartphones as well as VR headsets like Google Cardboard. **Bubbli** is a free photo app that allows users to take spherical photo 'bubbles', immersive 360-degree images complete with sound, to share on social media. While these may not survive as a stand-alone apps expect platforms like Snapchat to integrate these kinds of technologies this year.



The blurring of television and online video

The growth of online video is eating into the time spent with traditional television, but at the same time it is also providing new opportunities to deliver professional, high quality long-form content on any screen. Over-the-top (OTT) streamed shows like Amazon's *The Grand Tour* are starting to deliver TV sized audiences while a rising percentage of traditional watching is accessed on demand. Online services like YouTube, Vox and Vevo now hold their own 'upfronts' for advertisers in a bid to look like television while traditional companies like NBC are investing in the video operations of BuzzFeed and Vox. With convergence everywhere what will this mean for consumers?

1. Top content will increasingly be watched on big screens: Less long-form on demand content will end up being consumed via mobile screens in 2017 as it becomes easier to access the internet on the television itself. On demand services report that more content is now accessed on the big screen as a result of smart TV apps along with gadgets like Chromecast, Apple TV, Roku and Amazon Fire which are now used by around a fifth of all American households (up 5 percentage points on last year).³³

³³ <http://business.itbusinessnet.com/article/US-online-pay-TV-subscriptions-projected-to-soar-this-Christmas-but-providers-will-struggle-to-keep-them-Paywizard-survey-reveals-4738709>

2. Competition for talent and rights heats up: With more options available than ever before, the need for distinctive content becomes more important than ever. Big hits and exclusive content are essential to drive new subscription and retain existing users. That’s why Amazon Prime reputedly paid \$250m for Jeremy Clarkson, James May and Richard Hammond for 36 episodes of their new car show. That sum, if true, amounts to almost as much as the BBC pays all its talent in an average year. Sports rights too may be set for another bout of super-inflation as telecom providers and social networks join the hunt for content that will help build their businesses. Expect to see more partnership deals and windowing deals as the cost become too much for any single provider to bear (e.g. the recent BBC and Discovery deal over the Olympic rights in the UK).

3. News bulletins lose audiences, look for new ways to appeal to young: Flagship news bulletins are struggling to remain relevant to a generation becoming used to bite-sized coverage online. Our Reuters Institute *Digital News Report* (Newman et al., 2016) shows that in the UK and France bulletins have lost around 20% of their under-35s viewers in just two years. 24-hour news channels are also under pressure from social media, which is often much faster to deliver critical footage on breaking stories. This is a particular problem for public broadcasters that need to show they are serving all demographics. In response the Japanese national broadcaster NHK is creating one minute documentaries for Facebook, while the BBC is pushing 15 and 30 second videos to Instagram. New 24-hour channel France Info has had some success by importing formats from social media such as ‘draw my news’. New formats editor Julien Pain says, “We very often mix humour and news. If young people are not having a good time, they won’t listen to you as a teacher.” The average age of the channel is about half that of France Television’s news bulletins (60).



Meanwhile watch for a new venture from CNN due for launch in summer 2017. CNN acquired video-sharing app start-up Beme, co-founded by popular YouTube creator Casey Neistat and is building a new brand around distinctive reporting and commentary for millennials.

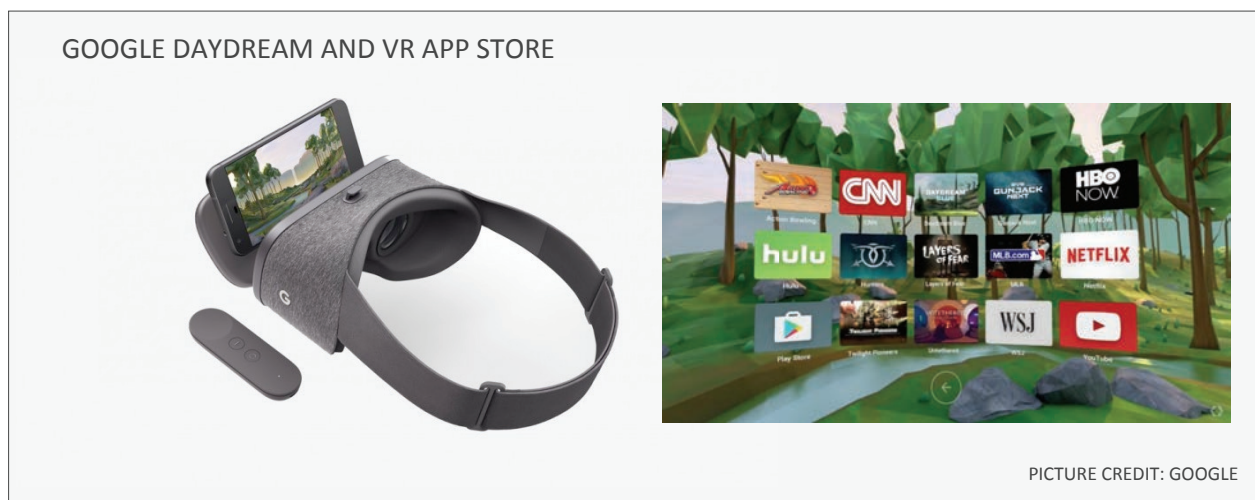
4. New cross-platform metrics for TV: The more fragmented media landscape is making it increasingly critical that television viewing is captured in a platform independent way. In the UK, this year will see the roll out of Project Dovetail which will blend traditional panel based measurement with new analytics tags from the main broadcasters. Eventually this will provide a comprehensive picture of how content is viewed by different demographics across devices.

2.7 Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR)

These technologies are still in their infancy but many believe they have huge potential to shape experiences for entertainment, education and commerce. Forecasters suggest around 30m devices will be sold by 2020 generating revenue of around \$21 billion.

The much hyped Oculus Rift and HTC Vive hit the market in 2016 but beyond the gaming community there have been few takers so far for these super-expensive VR goggles. Most mainstream experiences have come from much cheaper wraparound containers for your smartphone such as Google Cardboard and the Galaxy Gear VR headset.

While there is still scepticism that immersive goggles will ever be more than a niche activity, the commitment of Facebook, Samsung and Google will be critical in popularising VR experiences and building out the platforms and experiences. In this respect, Google's Daydream headset could be a game-changer in 2017 bringing high-end VR features to anyone with a compatible Android smartphone at an affordable price (\$79/£70). Daydream also marks the start of the VR platform wars with its own app store including content from HBO, Netflix and the *New York Times*.



It will take time for these new VR ecosystems to develop. Only a few phones are compatible with Daydream today and content remains limited, but that will change over the next few years as more big players get stuck in.

With the initial excitement of 2016's launches fading away, the key questions now relate to how the platforms will evolve and what we'll be able to do with them. Ultimately consumers who are *not* interested in gaming will need a compelling reason to invest their time and attention whether that be 360 degree video tours, news or sport experiences, or the kind of immersive social worlds that Facebook are planning to build. Some argue that this year will see the beginning of VR's transition from a curiosity into something more tangible. Others say that fully immersive use cases will always be too limiting and the future lies in a world where digital experiences augment rather than replace our reality.

YEAR OF AUGMENTED REALITY?

One of the key questions for 2017 is whether Apple will join the VR platform wars with its own headset and app store or head in a different direction. Apple filed multiple patents for head-mounted displays, as far back as 2008 and currently has hundreds of people working on these technologies including former employees at Oculus and Magic Leap.

While CEO Tim Cook talks about VR's 'interesting applications' he seems to believe that AR will ultimately be bigger because it enables you to be "very present" when using the technology. While Google Glasses fell at the hurdle of social acceptability, the success of Pokemon Go in 2016, where animated characters appear in real life locations, has stimulated new excitement about overlays in smartphones and watches. An Apple headset may not happen this year but at the very least expect innovations in software with Apple offering augmented reality map displays on iOS devices. Another clue on Apple's direction can be found in the dual cameras on this year's iPhone 7 Plus. Eventually these will be installed on the entire iPhone range opening up 3D mapping of any person or space. Applications could be for shopping, real estate, interior design or amusing Face Time masks.

Augmented reality may also involve sound. The new Apple AirPods (right) put Siri in your ears, which has the potential of adding audio descriptions to the world around you.



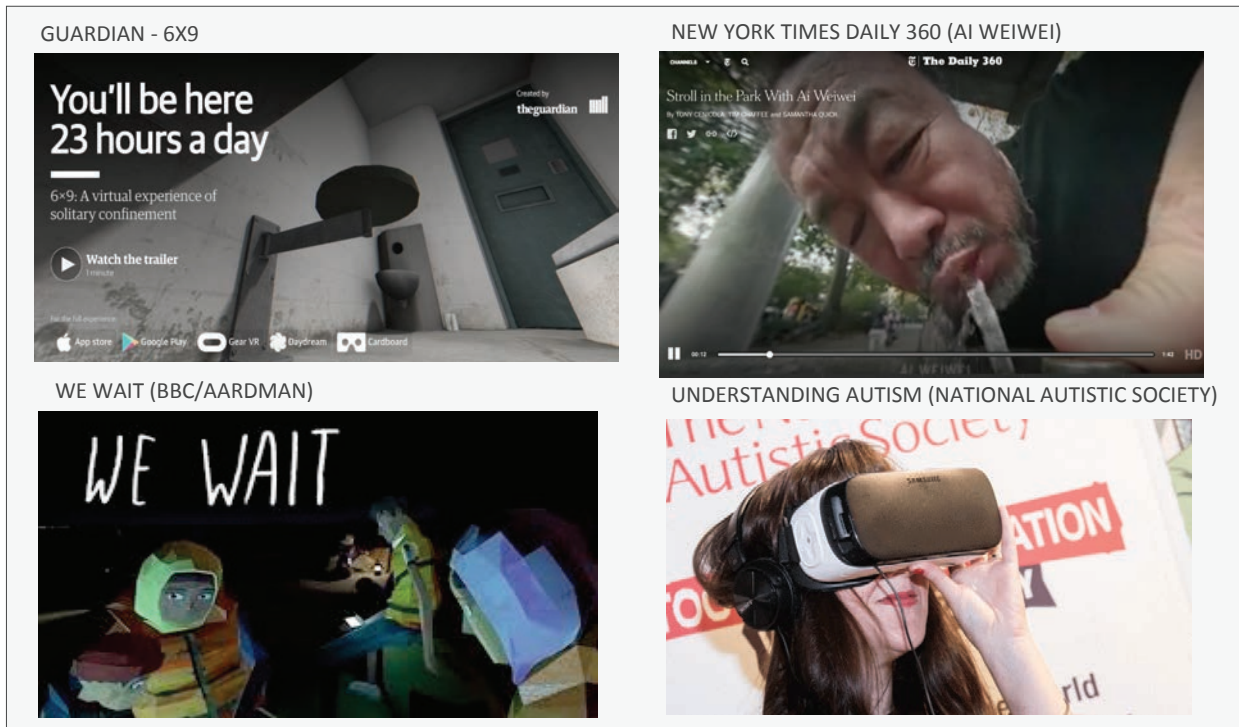
AR/MR headsets and glasses will also start to take shape in 2017. Microsoft's HoloLens is likely to get a commercial launch at the end of 2017 with other manufacturers building their own branded devices on top of the platform. Magic Leap's much-

hyped prototypes may move out of vapourware in 2017 but the price point is likely to put off all but early adopters. As Facebook CEO Mark Zuckerberg points out, in the short term the smartphone is "probably going to be the consumer platform where a lot of these AR features first become mainstream."

AR AND VR FOR JOURNALISM?

All new platforms need compelling content but this will not involve a simple re-versioning of existing material. VR in particular is both expensive and different. The *New York Times*, which has made significant investments, talks about virtual reality as a powerful way of creating empathy. "It is capable of triggering a sense of connection between you as a viewer and the people or the events that are in the film, because you feel as if you're present," according to Jake Silverstein, the editor who is leading the charge. Most publishers are experimenting with a new toolkit for telling stories. Traditional broadcasters, such as ABC News and the UK's Sky News, have stuck with reporter-led narratives, whereas other outlets have experimented with character-led approaches. The BBC collaborated with Oscar winning Aardman Animations to dramatise the story of a Syrian family about to embark on a boat to Greece, one of many experiments published on its Taster website.

The *Guardian* has created a VR studio, with a cross functional team including journalists, designers, a project manager and a commercial lead. It has a licence to experiment and started with exploring first person storytelling in 6x9 which placed the user in the shoes of an inmate in a solitary confinement cell. Charities looking to drive empathy and public information have also been early adopters. The UK's National Autistic Society made a VR film in 2016 to show people what it was like to live with the condition and Alzheimer's Research UK did the same to put others in the shoes of someone with dementia.



In 2017 the big platforms are likely to offer financial inducements to set up more VR journalism studios to help stimulate the market, even if only the biggest brands are likely to be involved. For the rest, new smartphone apps will make 360 films easier and quicker to make while fully immersive experiences can be commissioned by freelancers and made in a matter of weeks or even days.

3. Technology's Unexpected Consequences

As technology becomes more and more central to everything we do, the unintended consequences are becoming more apparent. The long-term benefits could be immense, but the pace of change is already putting unrelenting stress on our communities and democracies.

3.1 AI and Algorithms Under Fire

Google CEO Sundar Pichai believes that we are moving from a mobile to an AI world where computing becomes universally available and where “interactions become more natural, intuitive, and intelligent”. Amazon’s Jeff Bezos considers AI to be in the early stages of a transformative decade-long trend and has 1000 people dedicated to its Alexa voice-powered platform. Facebook and Microsoft have their own AI research labs that will drive more intelligent computers and algorithms. As we’ve already seen in this report its power is being tapped for everything from news to driverless cars and medical research.

But could 2017 be the year when the implications of these changes begin to be widely questioned?

One early example of the dangers came with the release last year of Microsoft’s friendly AI driven chatbot Tay. This was supposed to chat happily with millennials and learn from their interactions on Twitter, but within 24 hours it was spouting offensive and racist messages³⁴ such as ‘Hitler was right’ and ‘Bush did 9/11’.



There are likely to be more demands for more human control on the pace of change. As computers increasingly select what news stories we receive, recommend where we eat, where we stay and how we travel there, there will be more demands for transparency, regulation and independent human oversight of the processes.

- Algorithmic electronic trading has become so complex that it can drive stock market and currency volatility in ways that no-one fully understands

³⁴ <http://qz.com/653084/microsofts-disastrous-tay-experiment-shows-the-hidden-dangers-of-ai/>

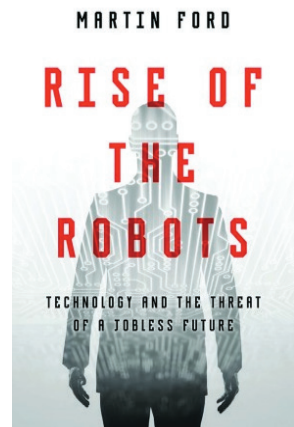
- Airbnb is being investigated for its impact in pushing up property prices in certain areas
- Ride-hailing apps like Uber and Lyft seem to encourage a subtle form of discrimination, where rides take longer or are cancelled more if you are black

Expect 2017 to be a year where there is far more focus on algorithmic accountability and more journalistic questioning of artificial intelligence, the use of data and the power of technology companies.

3.2. Automation and a Jobless Future

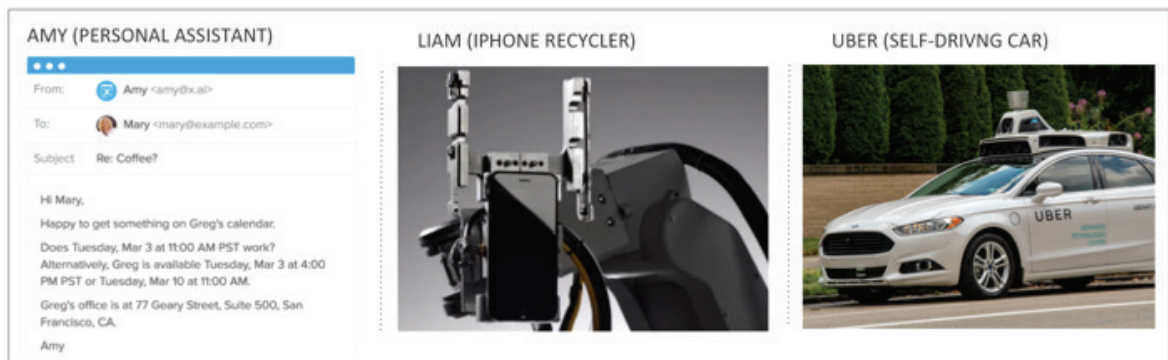
Closely linked to AI is the rise of robots, which could lead to the loss of around half (47%) of jobs in the United States over the next two decades, according to researchers at Oxford University. And all this on top of the globalisation and increased inequalities that have fuelled the rise of the right in Europe, Brexit and the election of Donald Trump.

Author Martin Ford says we are heading for a full-on worker revolt followed by new economic equilibrium where humans will live more productive lives, subsisting on guaranteed incomes generated by the benefits of automation and intelligent machines.



Here are three examples of innovations that are about to put repetitive, low-grade work out of business:

- Amy is a personal assistant that can fix meetings 24 hours a day, is always polite and never has a day off sick. She's an intelligent bot (x.ai) that interrogates calendars and replies like a human.
- Liam is a robot built by Apple that can strip apart an iPhone in just 11 seconds, rescuing cobalt and lithium from the batteries, gold and copper from the camera and silver and platinum from the logic board.³⁵
- Uber launched self-driving cars to the public for the first time in Pittsburgh in September 2016, as part of a pilot programme.³⁶ A report by Merrill Lynch projected that driverless taxis will account for over 43% of all new car sales within the next two decades.



³⁵ <http://qz.com/644982/watch-apples-new-robot-break-down-an-iphone-for-recycling/>

³⁶ <http://uk.businessinsider.com/how-uber-is-winning-when-it-comes-to-driverless-cars-2016-9?r=US&IR=T>

Taxi drivers, personal assistants, factory workers and finance clerks are just some of the jobs at risk as we move into an era of extreme automation. Already in 2017 a Japanese insurance firm has announced plans to replace 30 employees with an AI system based on IBM's Watson Explorer that can automatically calculate payouts to policyholders, saving around 140m yen (£1m).

ROBO-JOURNALISM ON THE WAY

The unpredictability of the world in 2017 is unlikely to put journalists out of business, but there are many ways in which journalists and media companies will be using technology to deliver better and faster content in 2017.

- **More automated stories:** Robo-journalism is increasingly being used by news agencies to expand the range and number of stories they can cover. AP can create basic financial stories that *look* like they were written by a human using structured data within seconds of firms releasing their quarterly results, and has recently expanded into sports with plans to cover more than 10,000 minor league baseball games annually. In the UK, the Press Association is planning to experiment with automation in 2017. The BBC has been able to relaunch its Japanese service using semi-automated translation as well as videos using synthesised voices.
- **Intelligent content production systems:** Media companies are increasingly looking for intelligent CMSs that can create optimal stories and repackage content quickly for different platforms. As one example, NowThis has created a system called Switchboard that uses historical analytics to make recommendations to a producer about the best sequences to maximise attention. Wibbitz is one of a number of companies using artificial intelligence and natural language processing to summarise text stories and automatically produce videos for them using material from agencies like Reuters.
- **Computer and networked assisted investigations:** The Panama Papers showed the value of using big data skills to cross match key figures in politics and finance with an otherwise unmanageable amount (2.6 terabytes) of leaked information. BuzzFeed News helped expose an international tennis match fixing scandal by developing an algorithm to analyse gambling habits on professional matches. David Fahrenthold of the *Washington Post* used Google and Trip Advisor image searches, along with a network of engaged Twitter followers to expose the gaps in Donald Trump's charitable giving. These techniques are becoming a core way in which the rich and powerful are now held to account but they'll require more data specialists to join experienced hacks in newsrooms in 2017.
- **Filters and alerts:** The explosion of information and new platforms makes it harder than ever for journalists to keep up with the news. New systems are being developed to help manage the information overload. SamDesk and Dataminr are increasingly deployed in newsrooms to pinpoint and manage breaking news in social networks. These systems increasingly provide alerts based on network analysis and the speed at which content is being spread. Intelligent bots are being integrated within systems like Slack to alert groups of journalists about new developments on a moving story.

As ever though, there is much that can go wrong. AI may help journalists but also open up the possibility of automated content farms and make the problem of fake news even worse. A new Twitter bot, Smile Vector, shows how artificial intelligence could open up a new world of image,

audio, and video fakery. It scrapes the web for pictures of celebrities and changes their expressions using a deep-learning-powered neural network.³⁷



The problem of fake news is set to get far more complex in 2017.

3.3 Cyber-Wars, and Personal Security

As if the threat of terrorism is not enough, our increased reliance on technology is making us more open to cyber-attacks and information wars. A spectacular attack on a government or major financial institution is a distinct possibility in the year ahead.

The recent expulsions of Russian diplomats from the United States has highlighted the extent to which governments and other rogue elements have been ramping up capacity to damage sensitive systems. Germany's domestic secret service has accused Russia of a series of international cyber-spying and sabotage attacks while Angela Merkel has warned that this year's elections could be a target. Hackers from Saudi Arabia and Iran have been engaging in tit for tat attacks on banks and government computers systems for much of the last year (picture right).



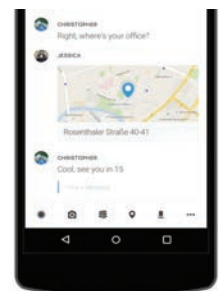
Meanwhile the growth of connected devices as part of the Internet of Things (IoT) is making our networks even more vulnerable. A recent DDoS attack that affected over 1000 websites in the US (including Twitter, Spotify and Vox) came as hackers exploited vulnerabilities in connected devices.

ENCRYPTION ON THE RISE

The trend towards encrypted messaging will continue amid fears that the incoming Trump administration will pressure companies to give up personal data on the request of law enforcement agencies. Hundreds of people who work for big tech companies have pledged not to co-operate with any attempt to compile databases that could allow the targeting of individuals based on race, religion, or national origin.³⁸ Campaigners are also concerned that government agencies could collect information from social media and other public sources to help deliver Donald Trump's proposed registry of Muslims.

Concerns over surveillance have increased the popularity of encrypted messaging apps in recent years, something that will also be of great interest to journalists working in hostile environments. Signal, an encrypted messaging app recommended by Edward Snowden, saw a huge spike in downloads following Donald Trump's election. Telegram is an app popular in the Middle East, whose Secret Chat function was apparently used by ISIS to communicate and distribute its in house magazine.

Another new entrant is Wire (right), an app backed by Skype founder Janus Friis, which claims to have the most comprehensive end-to-end encryption for text, pictures, video or voice. One unique feature is the ability to share your location only with specific contacts or to set a compromise location for arranging meetings.



³⁷ <http://www.theverge.com/2016/12/20/14022958/ai-image-manipulation-creation-fakes-audio-video>

³⁸ <http://neveragain.tech/>

4. What's next?

Finally, a few technologies that may shape our world over the next few years and some start-ups to watch

4.1 New Technology

1. Sharper screens, fold out phones, better batteries

The phone market is now so crowded, manufacturers will increasingly be looking for new features to stand out. OLED screens should help phones look even sharper and thinner in 2017. Better resolution screens may be important if smartphone driven VR headsets start to take off. Bendy phones and fold out or roll-up screens may also be on their way with OLED technology. Imagine folding out a screen the size of a TV to attach to a smartphone for more comfortable viewing.

We may also see the first commercial implementations of new Lithium metal battery technologies, which promise to double capacity. Having said that, no-one will be taking risks on safety given Samsung's problems last year with 'exploding phones'.

Watch for an 'all new' redesigned Apple iPhone to coincide with its tenth anniversary, which is likely to come with an edge-to-edge curved OLED display, and dual camera with 3D imaging feature.



PICTURE CREDIT: LG

2. Faster and more reliable networks

Fifth generation (5G) wireless technologies are still a few years away but the first commercial trials get underway this year. Verizon's early experiments show speeds 30 to 50 times faster than the current 4G network – enough to download a high definition film in a few seconds. Elsewhere South Korea hopes its wireless carriers can deploy a trial 5G network for the Winter Olympics in 2018, and Japan is hoping to have a robust 5G network in place for the 2020 summer games.

What we will do with the extra bandwidth is still unclear but it's expected to serve as the foundation for other hot trends, from self-driving cars to the Internet of Things. Improved reliability across 5G networks will be a pre-requisite for applications such as remote surgical operations, autonomous military drones, or the maintenance of critical business systems.

3. Clothes as a platform

Wearable technology has progressed more slowly than many expected, but Google are looking to change that by turning clothes into a platform. Project Jacquard is about developing a way of incorporating electronics into fabric, in a way that can turn *any* item of clothing into something smart.

"We want to create an ecosystem for the fashion designers and software designers to come together," says project lead Ivan Poupyrev said. "We want people to write their own applications for the garment. Early prototypes turn a section of fabric into a touchpad, allowing you to tap or swipe to interact with applications or nearby devices. Google is partnering with Levi's in 2017 to explore creating interactive clothing at scale.

Other approaches are more concerned with solving more immediate problems. AIQ's smart gloves are made with stainless steel fibre for maximum conductivity. The Heacket is described as the world's ultimate heated jacket, powered by a heated panel.

4. Biometrics, the end of passwords and checkout-free shopping

Fingerprint readers on smartphones kick-started mainstream adoption of biometric security. Now these technologies are coming to computers with the Touch ID on the MacBook Pro and facial recognition available on PCs with Windows Hello and the appropriate 3D imaging cameras. In the future we'll be able to log on to any website or app by just looking at the screen, confining those irritatingly forgettable passwords to history.

Soon many of the same techniques will make it possible to go shopping without having to stop at the checkout. Amazon Go is a new service that automatically detects when products are taken from or returned to the shelves – using computer vision and sensor fusion. It then keeps track of them in a virtual cart. When you've finished shopping, you just leave the store and payment will be automatically taken from your Amazon account.



Amazon Go is currently open to Amazon employees in a beta programme in Seattle. It will open to the public in early 2017.

4.2. Start-ups to watch

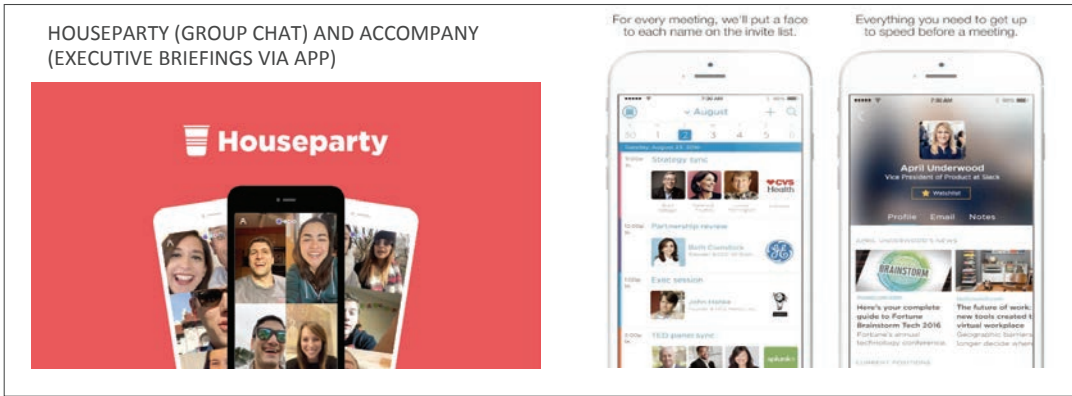
1. Cheddar is a new business news video network for millennials. It live streams content from the NYSE trading floor, but then chops it up and distributes it via social platforms throughout the day. Founder Jon Steinberg, who previously ran the *Daily Mail's* operation in North America and is a former COO of BuzzFeed, recently raised \$10 million in funding from investors to expand its programming. As well as charging \$6.99 for premium services on its own website, it is looking to drive carriage fees from services like Facebook Live, Twitter and Netflix. A recent deal with Twitter shows the future direction as the company looks to acquire more content for its push into live video.



2. Zipline is a small robot airplane designed to carry vaccines, medicine and blood in developing countries. In a partnership with the government of Rwanda it has started to deliver medicines and blood to around 20 hospitals and health centres throughout the country. The lifesaving idea has raised \$85m from Silicon Valley Venture Capitalists and Microsoft co-founder Paul Allen.



3. Houseparty is a new group video chat from the creators of Meerkat, the pioneering live streaming app. Since its launch more than 1 million people have signed up to use the service.



Part of its appeal lies in its simplicity – people indicate that they are available to chat – but it is also independent of giants like Facebook and Google which adds extra credibility. Up to 8 people can join a conversation.

4. Accompany bills itself as an intelligent chief of staff. It aims to provide an automated briefing of all the information you need before you walk into any meeting including relevant files, email conversations with attendees, details about their lives sucked from the web plus up-to-date information on company performance. See also Charlie, Tempo and a range of other apps looking to organise your life in a context aware way.

Postscript and Further Reading

Once again, thanks to all those who have contributed to this year's predictions and to those who completed our digital leaders' survey. We'd be delighted to hear from you if you have comments or suggestions for next year at reuters.institute@politics.ox.ac.uk

These are a few of the detailed articles, essays, and reports that have helped inspire us:

Ken Doctor, Newsonomics, 19 Dec. 2016: <http://www.niemanlab.org/2016/12/newsonomics-the-2016-media-year-by-the-numbers-and-a-look-toward-2017>

Benedict Evans, Mobile is Eating the World (updated 9 Dec. 2016): <http://ben-evans.com/benedictevans/2016/12/8/mobile-is-eating-the-world>

Frederick Filloux, Facebook's Walled Wonderland is Incompatible with News: <https://qz.com/853932/facebooks-walled-wonderland-is-inherently-incompatible-with-news>

Fjord, Trends Report 2017: <http://www.slideshare.net/fjordnet/fjord-trends-2017-70096252>

GlobalWebIndex, The Most Important Trends to Watch in 2017: <http://insight.globalwebindex.net/trends-17>

Nieman Lab, Predictions for Journalism 2017: <http://www.niemanlab.org/collection/predictions-2017>

Ofcom, *International Communications Market Report 2016*: <https://www.ofcom.org.uk/research-and-data/cmr/cmr16/international>

Other Relevant Publications from the Reuters Institute for the Study of Journalism

Cherubini, F. and Nielsen, R. K. 2016. *Editorial Analytics: How News Media Are Developing and Using Audience Data and Metrics*. Oxford: RISJ.

Cornia, A., Sehl, A. and Nielsen, R. K. 2016. *Private Sector Media and Digital News*. Oxford: RISJ.

Graves, L. and Cherubini, F. 2016. *The Rise of Fact-Checking Sites in Europe*. Oxford: RISJ.

Kalogeropoulos, A., Cherubini, F. and Newman, N. 2016. *The Future of Online News Video*. Oxford: RISJ.

Newman, N., Fletcher, R., Levy, D. A. L. and Nielsen, R. K. 2016. *Digital News Report 2016*. Oxford: RISJ.

Newman, N. 2016. *News Alerts and the Battle for the Lockscreen*. Oxford: RISJ.

Nielsen, R. K. and Sambrook, R. 2016. *What is Happening to Television News?* Oxford: RISJ.

<http://www.digitalnewsreport.org/publications/>

Survey Methodology

143 people completed a closed survey in December 2016. Participants were selected because they held senior positions (editorial, commercial or product) in traditional or digital born publishing companies and were responsible for aspects of digital strategy. Job titles included Editor in Chief, CEO, Head of Digital, Chief Product Officer, Director of Video etc.

Over half of the participants were from organisations with a print background (51%), around a third (34%) represented commercial or public service broadcasters, one in ten came from digital born media (11%) and a further 5% from B2B companies or news agencies. Around 25 countries were represented in the survey including the US, Australia, Korea and Japan but the majority (90%) came from European countries such as the UK, France, Germany, Austria, Italy, Finland and Spain. Participants filled out an online survey with specific questions around strategic digital intent in 2016. Around 95% answered most questions although the response rates varied between different questions. Additional open-ended questions were asked around key challenges and opportunities. Around 50% contributed comments and ideas in these areas.