TECHNOLOGY

Citizen journalism: The value of effectively leveraging user-generated content for news provision

August 2018

Executive Summary

- The rapid rise of user-generated (UGC) content is fundamentally changing the provision of news – IHS Markit estimates that citizen journalism will account for just over 12% of all UGC in 2018, and almost a fifth by 2025.

- News organisations must implement systems for integrating this content into their workflows and reporting – those that fail to do so will struggle to survive, as traditional journalism alone will not be enough to retain audiences.

- Transformative technologies provide the tools newsrooms need to aggregate, contextualise, verify and license UGC. Artificial intelligence and machine learning are chief among them – advancements will enable full automation of metadata creation for content, resulting in scalable and efficient digital libraries for use in news production.

- These technologies' image-recognition capabilities will also improve the efficiency and accuracy of the verification process. Human assessment will be an essential part of this initially, but the reliance will shift towards automation over time.

- Blockchain will be a key technology for tackling so-called 'fake news' and establishing trust in citizen journalism content – news agencies, social networks and other organisations and platforms will increasingly use it to ensure that those who share content are traceable and accountable, and that they are genuine users (not bots).

- The next phase of growth in UGC and citizen journalism – which will see the number of citizen journalists increase by a compound annual growth rate of 145% each year to 2025 – will be driven by a combination of new device capabilities and ubiquitous, ultra-reliable connectivity. Adoption of AR-enabled devices, including smartphones and wearables, will encourage always-on content capture, with the sharing and broadcasting of this content enabled by 5G and the increasing proliferation of satellite technology.

- New competition is emerging and newsrooms must adapt quickly to the fast-changing landscape. Not everyone will make the right transition, as aside from technology investments, it requires additional skills and expertise from both journalists and managers.

Research Background and Methodology

This report was commissioned by Sony Professional Solutions Europe (PSE) to raise awareness of, and provide guidance on, the significant technology-driven change impacting the news broadcasting sector. To fulfil this brief, IHS Markit drew on proprietary datasets and insights from discussions with media and technology executives to produce an analysis of citizen journalism, assessing its impact on news capture and production, as well as what it means for the evolution of the modern news outlet.

IHS Markit defines citizen journalism as news and information published by individuals that are not professional journalists and who are not affiliated with any official news organisation. This user-generated content (UGC) broadly includes anything that is non-fiction, ranging from comments, photos and videos related to news-worthy events or stories, to long-form blogs and articles and video reviews. Forums for publishing material include mainstream social networks and media-sharing platforms, such as Twitter, YouTube and Facebook, and smaller websites and blogs.

Introduction: Social media and citizen journalism are reshaping news provision

The proliferation of video-enabled mobile connected devices is profoundly changing both media consumption and capture. Smartphones and tablets have become primary points of access for video, music, news and other media content, and the impact these devices are having on content production is also hugely significant. Individuals are now empowered to be content creators, dramatically increasing the volume of media being produced, processed and distributed – IHS Markit estimates that UGC will account for just under 10% of all online content globally in 2018, and forecasts that this will rise to just under 20% by 2025.

Global: UGC as a percentage of all online content forecast

Source: IHS Markit   © 2018 IHS Markit
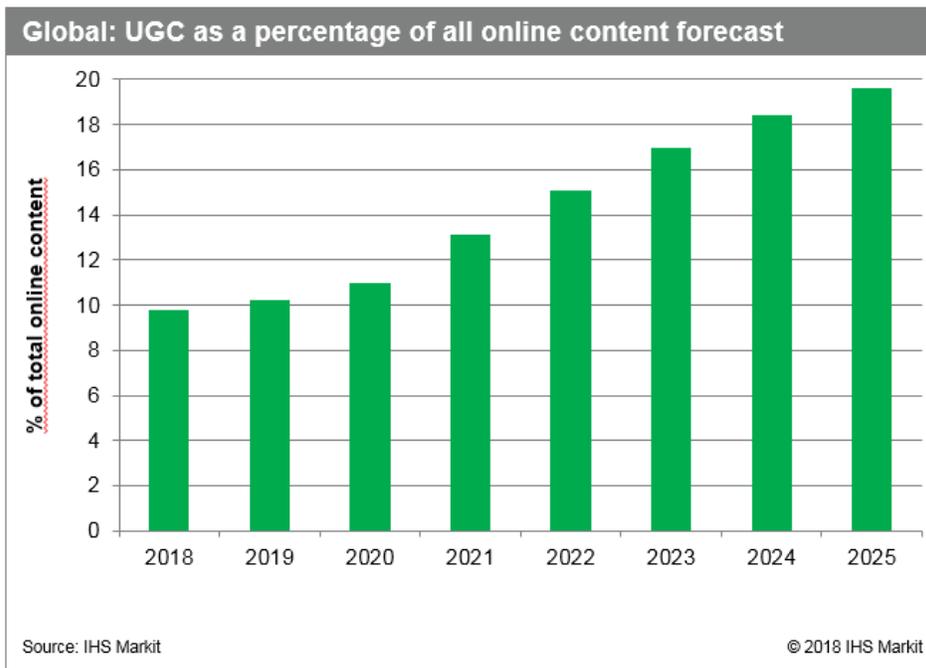
This dynamic of more people making content and more content being made has blurred the lines between professional and non-professional video and media. The rise of multi-channel networks (MCNs) effectively illustrates this, with new-wave channels aggregating and managing UGC for distribution across digital platforms such as YouTube and attracting audiences large enough for them to become acquisition targets for established media companies (e.g. Maker Studios, which was the subject of a $500 million takeover by Disney in 2014).

Outside of these bundled content offerings, a massive volume of hugely diverse, non-curated media content is being shared – including via live broadcast – on social networks. Social networks have developed mechanisms (based on AI technology) to promote the content that may be most relevant to their audience, a practice that also benefits from these companies' ability geo-locate their users. This mass of shared content is of value to media companies too – chief among them, news organisations seeking immediate access to eyewitness accounts of news events, as well as a higher level of engagement with the digital audience. As such, the practice of journalism is evolving fast, with citizen journalism necessitating significant change in the workflow of the modern newsroom.

IHS Markit expects the number of citizen journalists to increase by a compound annual growth rate of 145% each year to 2025. With various backgrounds, experiences and focuses, these people create

blogs, update their audiences on upcoming trends and products, and recommend solutions, often in more digestible ways than traditional marketers and PR specialists. Some of these citizen journalists are already able to earn a good living from this work, and we expect that the trend will continue to grow – and that they will swallow larger percentages of advertisers' budgets over time.

The change citizen journalism brings will be far reaching, impacting everything from journalistic practices to the capture and production of non-fiction content. The dramatic increase in volume of news-related public content has arguably already made the life of a journalist much easier than it once was. For instance, rather than approaching unfriendly territory under political uncertainty, news production teams can search for existing content produced by locals who inhabit that area. Or rather than having to reach out and request comment from public figures whose opinions on a story may be valued, journalists can simply mine these reactions from Twitter.
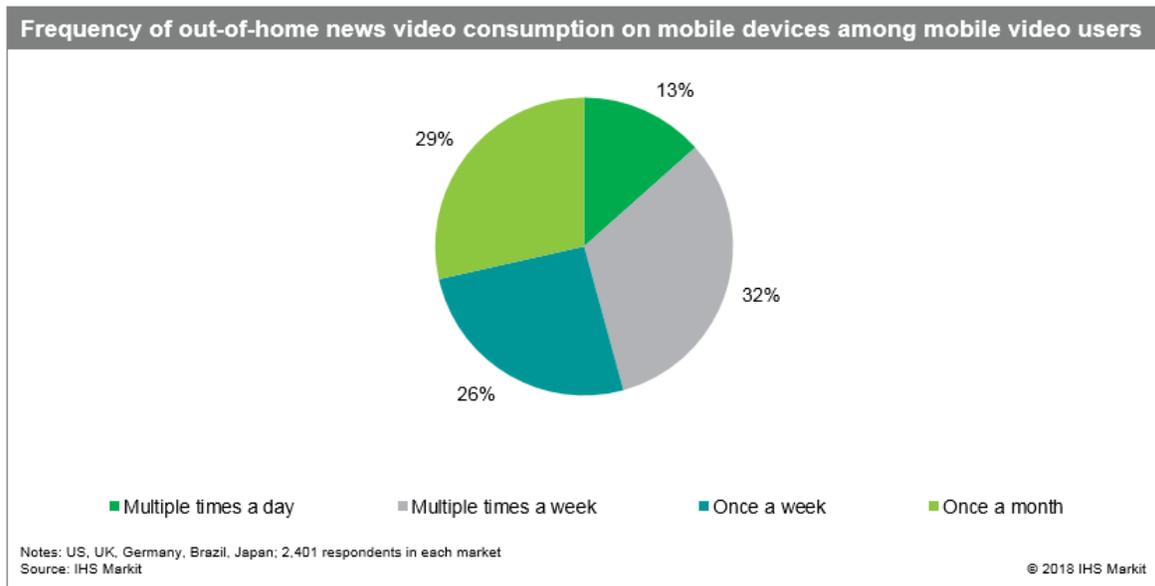
The major disadvantage of this process is the reliance on public content, which is likely to result in journalists doing less onsite reporting, of things like local elections, court proceedings or council meetings – this would mean that documentation of such events for historical archives may become patchy and incomplete. On the other hand, it saves organisations trips and time spent on speculative stories, and allows them to focus on in-demand facts. In this scenario, professional journalists act as consultants on human behaviour, selectors of the most intriguing and interesting news, rather than reporters from the field witnessing and commenting on their own onsite interpretations.

The rise of UGC has also put an onus on professional media companies to aggregate and utilise this material not only to improve coverage of events and stories, but also to defend against the growing consumption of this material in lieu of traditional news reporting, a trend that is causing audience erosion. The barriers to entry for amateur reporting and film-making have been significantly lowered, with any Internet user with a little technical knowhow able to curate social content into non-fiction programming, like documentaries, with relative ease. This puts pressure on professional journalists to go further than the citizen journalists do by augmenting UGC with professional reporting, thereby asserting the value and quality of an official media outlet's coverage and production and ultimately keeping the audience with the newsroom.

Importantly, with this new resource comes responsibility – UGC provides valuable material for news reporting, but it must be used responsibly to avoid sensationalism and reporting of so-called 'fake news', with organisations facing increasingly levels of scrutiny for spreading disinformation as a result of failing to exercise due diligence.

Newsrooms that fail to embrace UGC integration will struggle to survive

The schedule- and deadline-based model of news provision is increasingly giving way to round-the-clock, constantly-updated news reporting. This began with the advent of digital TV and the birth of 24-hour news broadcasting, and the proliferation of smartphones means that a significant majority of consumers can receive alerts and access information about news events as they are happening, wherever the users are. Nightly news bulletins and morning newspapers still have their audiences/readership, but consumers are increasingly able to access news reporting at their own convenience. IHS Markit's consumer research shows that news is the most common genre of video content accessed on mobile devices outside of the home, and that almost 40% of mobile video users access news video daily, with almost 75% accessing it at least once a week.

Frequency of out-of-home news video consumption on mobile devices among mobile video users

- Multiple times a day: 13%
- Multiple times a week: 32%
- Once a week: 26%
- Once a month: 29%

Notes: US, UK, Germany, Brazil, Japan; 2,401 respondents in each market
Source: IHS Markit

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There is therefore an expectation from news-app users that news outlets should break stories and deliver up-to-the-minute information on events as they happen (including outside of traditional working hours). While these outlets can have journalists based in major cities around the world and other places of significance, having reporters on the ground for instant coverage of all possible events and available around the clock is clearly not logistically or financially feasible. The solution is to make use of the media that citizen journalists – those witnessing and observing news-worthy events, and capturing photographs and footage of them – share via the public forums of social networks, and aggregate them as quickly as possible into news reports.

The rationale of doing so is based on leveraging the 'wisdom of the crowd' philosophy using state-of-the-art technology, i.e. the aggregation of diverse, independent and decentralised material to obtain as accurate a picture of the truth as possible, coupled with professional layout and objective reporting. Objectivity is key, as in many instances citizen journalists will lack this, especially in situations affecting people close to them, or while witnessing things (i.e. potentially traumatic events) they are not used to seeing in person.

Embracing citizen journalism serves several purposes for news outlets, which must modernise and adapt to the fast-changing media landscape. As well as making the early-stage news gathering process fast and giving them quick access to valuable material, it also helps to provide colour and broader coverage of an event as the story unfolds. This applies at both a global and local level – indeed, social media has made highly localised information much more accessible, a major part of its appeal that national- and international-scale news organisations must tap into. Furthermore, sourcing material from users also serves to involve them, thereby building the digitally-engaged audience segment.

Impact on the technology ecosystem of news production

Reorienting newsrooms around the aggregation, contextualisation, verification and licensing of UGC represents a significant change for media organisations. Systems must be implemented for managing huge volumes of content – IHS Markit estimates that the share of UGC attributable to citizen journalism will be just over 12% in 2018, and rise to just under 20% by 2025. If sourcing is comprehensive – as it should be, pulled from Facebook, Twitter, YouTube, Instagram, Tumblr and

other platforms – material will be in a variety of types (text, photos, videos, audio, etc.) and file formats. This all needs to be ingested and processed into a single format, with consistent meta-tagging applied.

Global: Share of UGC attributable to citizen journalism forecast

Source: IHS Markit

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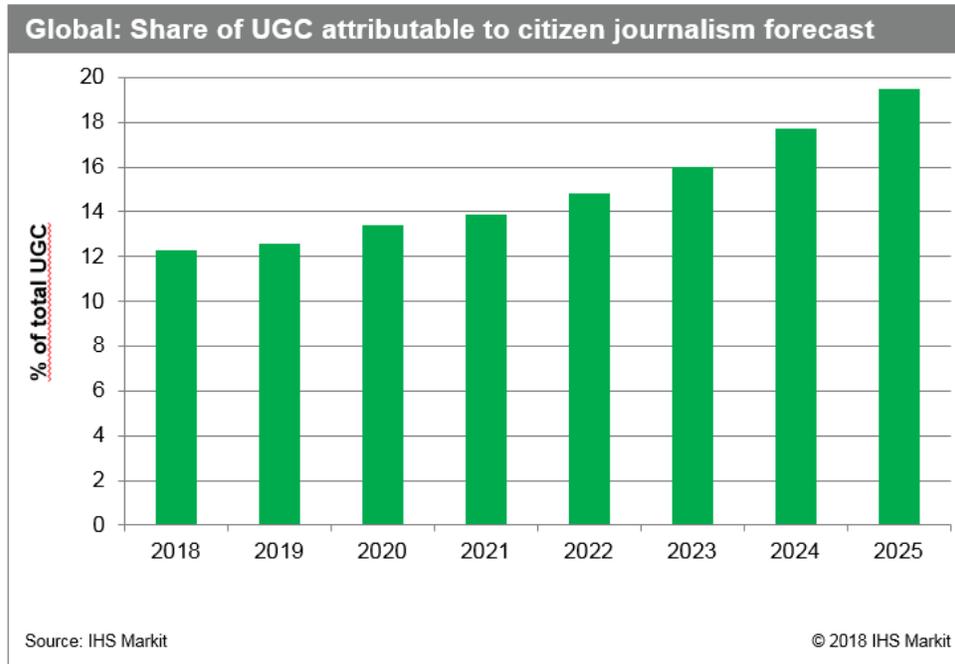
At the heart of this new workflow are several transformative technologies, necessary for executing an efficient citizen journalism strategy.

AI and machine learning bring efficiencies, but also potential controversy and threats

Artificial intelligence (AI) and machine learning (ML) are essential tools for maximising the efficiency of newsrooms' incorporation of UGC. Intelligent image-recognition, for instance, can identify the contents of photos and videos and tag and categorise them accordingly. One recent use of AI in live reporting was in Sky News's coverage of May 2018's Royal Wedding in the UK, with the broadcaster using Amazon's Rekognition technology to identify celebrities attending the ceremony.

Identifying celebrities in a large crowd via video feeds is a first step into advanced metadata creation via audio and video feeds that will serve in building scalable and efficient digital libraries used in news production. Media companies will aim to fully automate that process as the technology matures. Modern newsrooms are already digitised and possess huge volumes of data – that data needs to be cleaned, verified and tagged if it is to be used more effectively and better benefit the business. New technology, coupled with skilled resourcing, will drive that execution.

The use of AI for facial recognition is more likely to be restricted by privacy concerns than technological limitations. Identifying celebrities – popstars, politicians, athletes, etc. – in a high-profile wedding in the public interest is one thing, but doing so in situations where they may not want to be recognised raises some ethical questions. This feeds into a long-running debate about the level of privacy that should be afforded to those forging careers in the public eye.

Extending AI-based facial recognition to capture the images of private citizens raises even bigger ethical concerns. Doing so without their consent would be both problematic and hugely controversial – particularly in the event of data breaches. Government legislation must play a key role in protecting citizens.

There are several other dangers related to machine learning and its facial-recognition capabilities. If coupled with unmanned vehicles (drones), for instance, its ability to fly beyond the line of sight and locate potential targets in the crowd raises concerns. Again, regulation must provide assurances that there is policy and, most importantly, tools to prevent such events.

Transformative technologies will drive authentication, verification and licensing of UGC

Gathering and ingesting the material shared by citizen journalists is one piece of the puzzle for newsrooms – journalists must ensure that the material they publish as news is appropriately verified as legitimate, and not fake or falsified.

AI and ML will play a central role in this. For instance, image recognition can be used to perform checks to validate that a photo apparently taken in a certain place was genuinely taken there, such as identifying landmarks in that location by cross-referencing existing libraries of photos. The technology can also search for clues in doctoring, such as in videos that falsely portray people, e.g. celebrities, saying things that they did not.

Verification of citizen journalists' material is a process that cannot yet be fully automated, however, with at least some level of manual, human assessment required. The process is evolving, and the first social media news agencies that source, verify and acquire UGC have emerged, with these companies relying primarily on a team of journalists to carry out this work, through engagement with content creators, various checks of the material itself, and an assessment of the credibility of those sharing it. Once more automated systems become commercially available, there will be a major shift towards them.

Blockchain will be used to instil a measure of trust in the authenticity of citizen journalism. It is in this context that some emerging companies and organisations are using the technology. These include Publiq, a non-profit organisation that provides a platform for UGC sharing and promotes quality by making all those who post content traceable and accountable, as well as by rewarding those who are able to build a good reputation among other users with the platform's own cryptocurrency, PBQ. Another example is Nwzer, a company using blockchain's distributed ledger technology to attempt to build what it claims will be the world's first user-generated news agency.

Used in these ways, blockchain can support the provision of trustworthy citizen journalism. Indeed, the European Commission (EC) believes that blockchain is a fundamental tool for combating fake news. Announcing a new Code of Practice of Disinformation in May 2018, the EC identified blockchain as a technology that 'can help preserve the integrity of content, validate the reliability of information and/or its sources, enable transparency and traceability, and promote trust in news displayed on the Internet'. It also identified AI as a 'crucial' tool for verifying, identifying and tagging misinformation' – though this would be 'subject to appropriate human oversight'.

Such high-level regulatory endorsement of blockchain paves the way for fast and accurate tracking of bot accounts spreading disinformation via social networks, including those controlled by humans, though these are harder to detect. This will result in a higher proportion of content from untrustworthy sources being pulled before being widely seen, or clearly identified to users as unverified or from a questionable source. This, coupled with the greater accountability blockchain fosters among content

creators and other platform users, will help to supress and discourage disinformation campaigns, giving newsrooms the confidence to treat the content they discover as reliable and usable.

The final hurdle to clear once UGC is deemed appropriate for the news outlet's coverage of a story is licensing – even though that content has been posted in the public domain, the creator can claim copyright and challenge any unauthorised reuse. Permission must be sought, and ideally obtained, from the creators, and getting this in a timely manner may not always be possible. In such cases, news providers may deem it necessary to publish UGC without permission, potentially breaching the individual's copyright. The BBC, for instance, has done this for material that it deems to be in the public interest, with examples including its coverage of the 2011 terrorist attacks in Norway, and the London riots of the same year. Some level of automation can make this licensing process relatively quick and efficient – but human-initiated contact with content creators is necessary in many cases, particularly for material covering breaking news.

5G, AR, and the proliferation of drones and satellites will give rise to always-on content capture

Just as devices (smartphones), platforms (social media) and networks/connectivity (4G) were collectively the catalysts for the rise of citizen journalism, so too will they drive its next growth phase. Technological advancements in each of these areas will significant increase the volume of UGC being captured.

On the consumer-technology side, smartphones have been citizen journalists' primary tool in capturing content to date, and the addition of augmented reality (AR)-capability to these devices will increase their use for content capture. Mobile AR enables the user to move around and interact with their environment, and can be used in the home, office, or out and about – AR therefore has the potential to be a true 24/7, mobile experience. IHS Markit forecasts that the installed base devices supporting Apple's ARKit SDK will rise from 375 million globally in 2017 to 1.2 billion by 2021.

Global: ARKit installed base by region forecast

Source: IHS Markit

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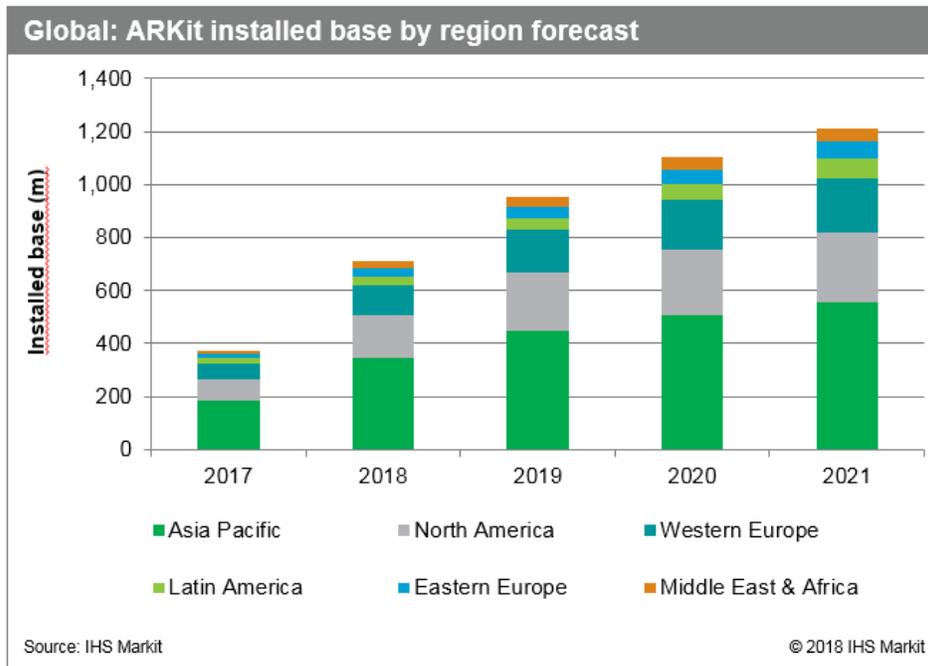
In addition to smartphones, other camera-equipped devices will also support the citizen journalism growth trend. Adoption of wearable cameras with always-on capability is starting to rise, with consumers able to attach increasingly compact, high-spec cameras on their person. More covert devices integrating cameras, such as glasses, watches and badges and other lifelogging devices are also attracting a growing niche, with these hidden cameras – some of them AR-capable – particularly well-suited to citizen journalism.

The volume of remote cameras, meanwhile, will rise through the increasing proliferation of drones, both consumer and commercial. According to IHS Markit data, 59% of professional drones will be equipped with cameras by the end of 2018, rising to 61% by 2020 and over 65% in 2025. This is a very high penetration ratio given that drones serve various purposes, many of which do not require cameras.

Drones have already changed the way journalists operate in the field, especially in conflict areas, where journalists no longer have to climb a hill to see what is behind it (assuming they have no live satellite earth imaging feed). Drones are also employed for inspections and maintenance of infrastructure used for content distribution, and can provide fixed-wireless access if there is no other wireless network available, in areas affected by natural disease, for instance, or very crowded spaces like stadiums and halls. First responses on disaster situations such as floods, hurricanes and earthquakes is a key application for drones. In this context, they can be used for medical applications, offering a rapid response to emergency scenarios, or the delivery of first-aid equipment and materials to isolated areas and/or scarce populations. Furthermore, drones create footage from, and provide network access to, affected areas so that the help and support can be immediately delivered.

Drones' influence is set to increase, as legislation is becoming more accommodative to the use of AI and drones. IHS Markit believes that the legislation around drones and their usage by certified professionals is about to change, as Beyond Visual Line of Sight (BVLOS) operations enabled by Detect and Avoid (DAA) collision avoidance and other similar technologies mature.

As drones become more efficient in terms of battery endurance and utilise more technologies like AI and ML, they are going to be widely used to cover news stories across the world. With the inception of new technology, drones can analyse in real time whether a live story they record – for instance a robbery, a collision or any other dangerous situation – could have the potential to become an interesting story worth sharing. They can fly on their own in search of situations worth transmitting and only land to charge batteries. This scenario, although possible, will face a lot of resistance, though, as while searching for interesting stories, drones will also record situations not approved to be shared with the public, such as children's parties, covert police operations and sensitive financial discussions.

The capabilities of all the camera-equipped devices described above will be maximised by advances in network and transmission technologies. Of these, 5G will be the most transformative, introducing the massive mobile broadband that will enable mass sharing of high-quality video and other content. The ultra-reliable and low-latency communications 5G brings will drive adoption of always-on video-capture devices, and facilitate frictionless personal broadcasting – including in densely populated locations such as stadiums and other large venues (subject to copyright), where current-generation mobile networks struggle to support the huge volume of localised traffic. Widespread adoption of 5G is someway off, but once deployments gather momentum, take-up will increase rapidly – IHS Markit expects global 5G subscriptions to pass the 1 billion mark in 2023.

Global: 5G subscriptions by region forecast

Source: IHS Markit   © 2018 IHS Markit
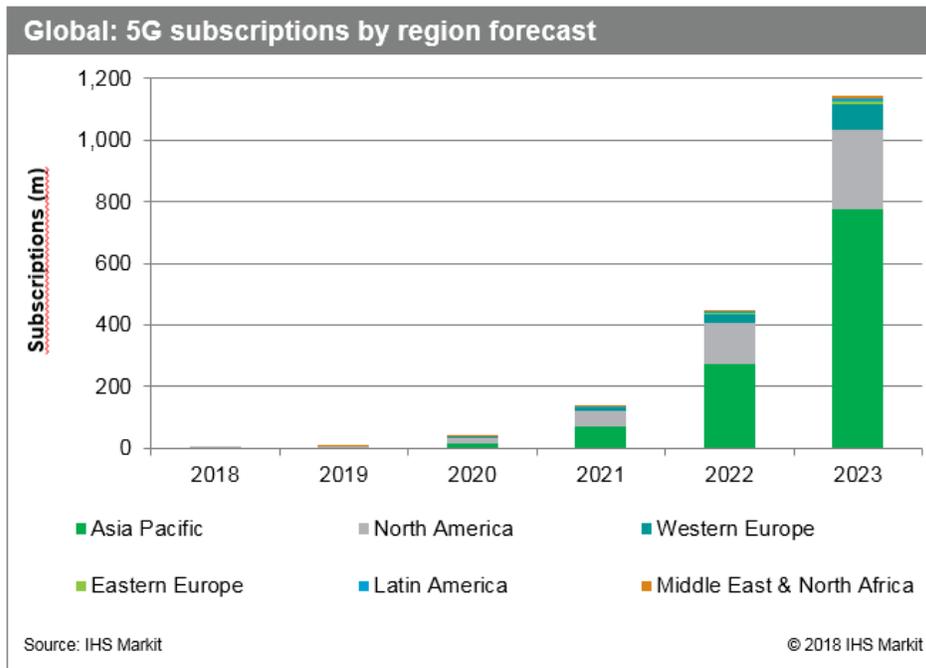
Advances in satellite technology will also support ubiquitous access to video with swarms of small satellites monitoring, in real time, everything around the world. We anticipate that, by 2025, every inch of the inhabited world will be covered by imaging satellites offering live content capturing. The first companies aiming to deliver such a service have already been established, with the first rounds of funding completed. Given that the technology already enables the creation of small satellites with live capturing and streaming abilities, and that these projects are backed by the major technology giants, earth imaging satellites are going to emerge unless regulation stops it. Similar to face recognition, a combination of AI, ML and satellites can bring innovation that is exciting and frightening in equal measure, capturing every element of our lives whether we want it or not.

With the volume of UGC attributable to citizen journalism set to rise steadily in the coming years, its importance as a source of news material will continue to grow, leaving newsrooms that fail to embrace it a significant step behind their competitors – both established outlets and social networks themselves. This does not have to mean a departure from leadership in news creation and agenda setting that established newsrooms have built their reputation on. Having correspondents on the scene of major events is important for maintaining prestige and authority – but augmenting this approach with citizen journalism will serve to not only break stories faster, but also better engage and build the audience in an app-driven digital ecosystem.

The result will be a shift in how content is sourced – away from professional journalists and towards citizen journalists. In this new dynamic, established news outlets must prioritise aggregation, production and editorialising to maintain their position as go-to sources for news and information.

IoT will drive content production and delivery as devices evolve

IoT is not a specific device or technology – rather, it is a conceptual framework driven by the idea of embedding connectivity and intelligence in a wide range of devices. IHS Markit defines an IoT device as one that can be directly connected – wired or wirelessly – to the Internet and/or connect by

tethering to an IP-addressable device. It can include a range of sensors, as well as some type of user interface, but neither are required to qualify it as an IoT device.

The use-cases for IoT devices as tools for content production and delivery – aside from drones and wireless 5G technology discussed above – remain limited due to privacy concerns. Most camera-equipped IoT devices are either in people's homes (personal devices), the automotive industry, or used by governments to monitor cities via their safe/smart cities initiatives (e.g. CCTV cameras on crossroads and highways, environmental controls or tourist attractions). The use of consumer equipment will not be permitted to obtain news stories, while access to public CCTV is restricted to the government and its forces.

Devices not equipped with cameras (excluding for personal use) can, based on sensors, provide alerts about a potentially newsworthy event, and a drone or a crew can be sent to capture it. Their main purpose, however, will be to provide analysis on things like environmental levels, statistics from roads, crowd reactions at events, delays and cancellations, and other information that will support the narrative.

IoT will have a deeper impact on citizen journalism as new devices monitor, record, analyse and deliver content captured by citizen journalists faster and more accurately, while providing any person with tools that previously were only available to large newsrooms. Growing access to consumer IoT devices is one of the key drivers of citizen journalism, and a key enabler for shifts in content consumption.

UGC-based news gathering will become largely automated and highly efficient

Artificial intelligence and machine learning will make the aggregation and ingestion of UGC content an increasingly smooth and efficient process, giving journalists quick access to both new footage/material and archive content. This will be increasingly automated as image- and audio-recognition improve, with all these technologies to be utilised to verify content's authenticity as well.

This battle against fake news will also be aided by blockchain, as both established and emerging organisations and platforms begin implementing the distributed ledger technology. This will aid fast and efficient identification of bogus user accounts, as well as make genuine users accountable for what they post, thanks to blockchain's immutability.

Automation based on AI and machine learning, voice and face recognition will enrich newsrooms' capability to collaborate with other divisions within the same business, breaking down existing siloes and enabling creation of new and valuable content. This will ultimately enhance organisations' understanding of their own libraries and help them to improve their offerings.

Conclusions: The news landscape of the future – newsrooms must adapt

In the future news cycle, advancements in transformative technologies and the ever-growing reliance on video – including near-future AR, 8K and beyond – for most human activities will support the creation, as well as consumption of, all forms of video content. IoT, robots, drones and autonomous vehicles will all aid the capture and processing of huge amounts of data, with the ubiquitous connectivity that 5G and advances in satellite technology bring facilitating instant sharing and

broadcasting of this content. It will unearth interesting facts, stories and observations that may be used directly or contextually in newsrooms.

At that stage, citizen journalism will transition into 'journalism of people and things' and newsrooms will get an opportunity to position themselves as aggregators of all these feeds and selectors of the most newsworthy stories. In parallel to this, profiling and segmentation of audiences will enable advanced personalisation of deliverables and – crucially – further monetisation. In parallel, newsrooms will need to adopt a new ethical approach – as dictated by governing bodies – and respect privacy, even at the cost of not emitting newsworthy material.

Inside newsrooms, there will be a similarly large-scale shift, as additional skills are required for reporting journalists to transition to generalists with an understanding of econometrics, psychology and crowd mentality. These generalists will pick the themes from the range suggested by machines, and machines will create the information based on that selection, including all available sources and material. This process will greatly reduce the time needed to air stories and scope the information provided, as well as the cost of reaching out – often in person – to numerous witnesses and others involved. News stations' management teams will be responsible for deploying innovative technologies that expand the range of news sources available, rather than supporting staff on day-to-day reporting work.

News is the most important piece of information sought every day. From weather forecasts to train timetables, from local to international events, from sports results to betting information – everything is some form of news. Citizen journalism is a natural complement to existing professional studios and can make information more interesting and engaging. Further technological advancement, if applied appropriately, will enable the emergence of a truly 360-degree view of the world and all its events.

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