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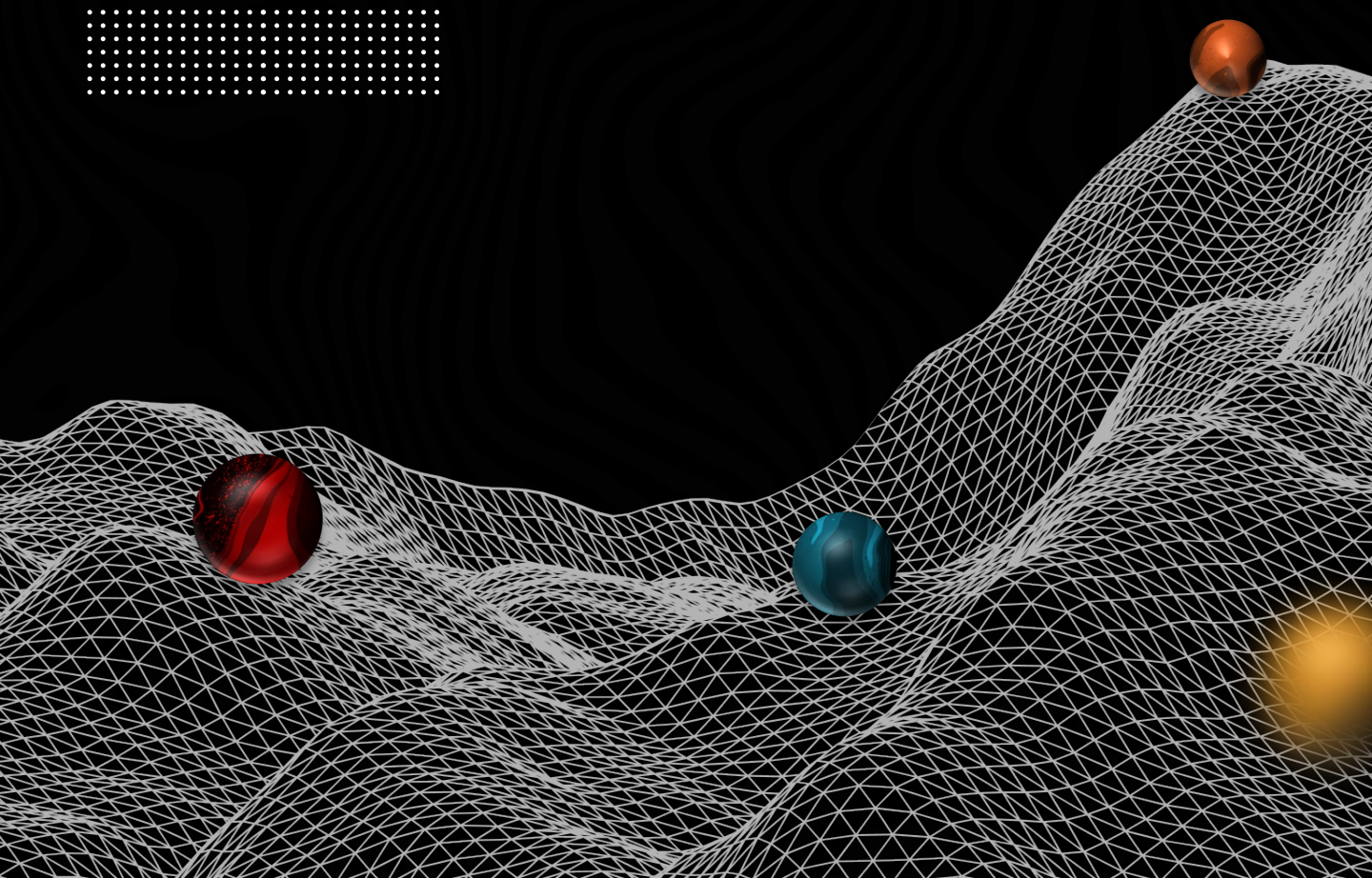
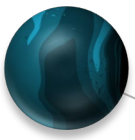
PLATFORMS AND ECOSYSTEMS:

THE FUTURE OF MEDIA AND ENTERTAINMENT

Television and Digital Publishing





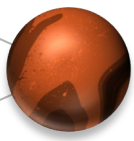
DIGITISATION AND THE CONSUMER

The impact of successive waves digital transformation on the media industry

Demographics

Ecosystem

Technology



FUTURE STATES

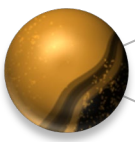
Strategies for growth and profitability

The Future of TV - Broadcasters, Pay TV & Video Streaming

The Future of Digital Publishing

Business Model Convergence

Digital Ecosystems



DATA MANAGEMENT AND CUSTOMER EXPERIENCE

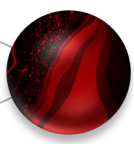
How data is reframing the consumer relationship

The Rise of the Customer Data Platform

Profiles, Disparate Data and Data Models

Consent, Identity & Privacy

Data Governance



CUSTOMER EXPERIENCE MANAGEMENT AND TECHNOLOGY

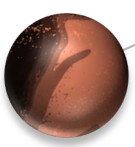
Applications and intelligent services transforming customer experience

Journey Analytics

Journey Orchestration

Content & Data

Business application of Artificial Intelligence



THE COGNITIVE ENTERPRISE

Operating models, technology infrastructure and platforms

Technology and Infrastructure

Decentralising Systems

Decentralising Data Management

Customer Experience Architecture

Platform Blueprint for the Cognitive Enterprise

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DIGITISATION AND THE CONSUMER

THE IMPACT OF SUCCESSIVE WAVES DIGITAL TRANSFORMATION ON THE MEDIA INDUSTRY

- Demographics
- Ecosystem
- Technology

Digitisation and the Consumer

Technology advancements and consumer demand have transformed media over the last 20 years as file-sharing, video streaming, social platforms and mobile created successive waves of digitisation. With gigabytes of data and content being created every second and 82% of all IP traffic being video, media companies are engaged in a relentless battle for consumer attention. From buying a newspaper to using a news app or social newsfeed, from renting a DVD to streaming video on a connected TV, from consoles to cloud-based online gaming, it is clear that digital transformation of the industry will continue to evolve.

The media sector has become increasingly competitive and quality content is now no longer enough. High quality user experience, new content formats, intuitive recommendations and a more personalised advertising experience have become critical factors to achieving competitive differentiation and improving revenue performance.. To build a more sustainable future, media companies need to coalesce technology, data and business strategy and move towards a new customer-centric operating model to create more compelling consumer products and services.

In this paper, we analyse the most important trends that are driving digital innovation in the broadcast and publishing industries and forecast how data platforms, cloud infrastructure and technology require a new operating model.

To build a more sustainable future, media companies need to coalesce technology, consumer data and business strategy with a new operating model to create more compelling consumer products and services

Demographics

According to the World Economic Forum the middle class is expanding as the global economy grows (from 1.8 billion people in 2009 to an estimated 4.9 billion in 2030)[1] and as a result there is increasing demand for new entertainment, content, gaming and video formats.

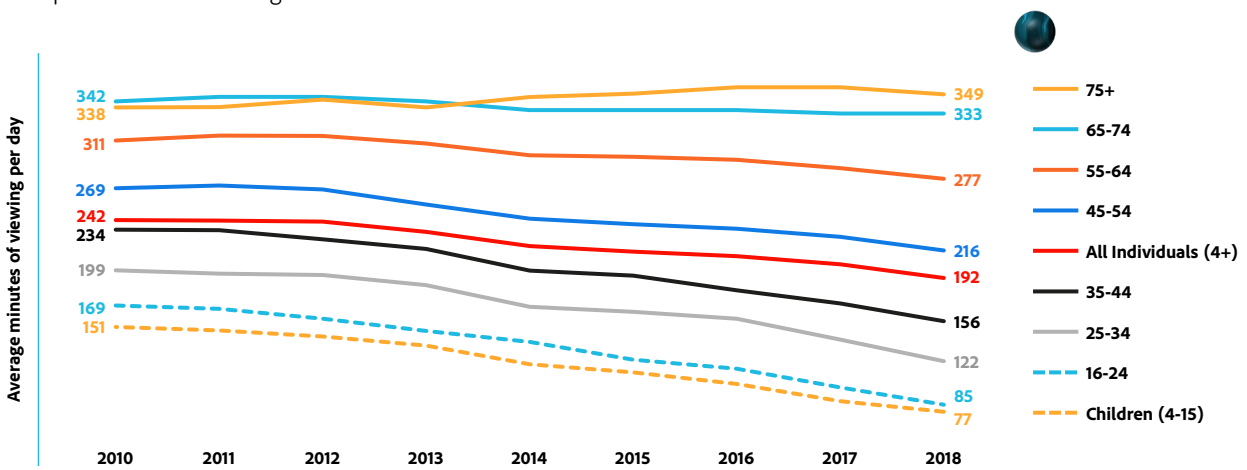
The millennial (born between 1981 and 1997) and Gen Z (1998-2008) demographic groups are creating further demand for digital products and services that enable convenience, experience and instant access to content.

	Gen Z	Millennials	Gen X	Baby Boomers
On a mobile plan	84.2	86.6	90.3	90.7
Have access to a streaming service	76	77	67	42.6
Use streaming services at least 1x per month	73	74.3	59.6	30.4
Involved in a selection of streaming services	61.3	65.6	56.1	28.3

The change in consumer behaviour and expectation

Increased technology adoption of these younger demographic groups is creating an even broader digital media repertoire.

- **Average daily minutes viewed per person, by age**
  As younger demographic groups have developed broader content repertoires their expectations for real time horizontal access across platforms has increased and as the boundaries between channels blur, consumers now judge providers on their comparative experience. Broadcasters and publishers are not only competing within their sector but now also with other digital services for finite consumer attention and spending power. The rapid decline in TV viewership across all age groups and the growing array of social and messaging platforms such as Twitch, Tik Tok and SnapChat are forcing media companies to re-evaluate their multi-channel and multi-platform content strategies.

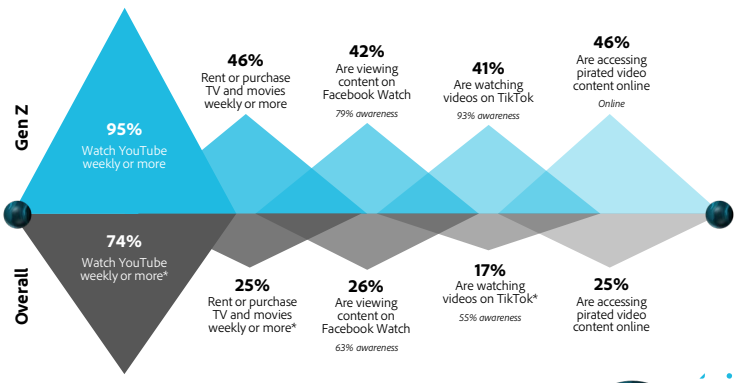


Source: https://www.ofcom.org.uk/__data/assets/pdf_file/0019/160714/media-nations-2019-uk-report.pdf

- **The emergence of social platforms and content creators**

Millennials and Gen Z are increasingly consuming channels run by amateur content creators, influencers and bloggers such as Dude Perfect, who have 50 million subscribers on their YouTube channel[2] and TikTok star Charli D'Amelio who became the first creator to hit 50 million followers. These content creators have created a new kind of relationship with their audience, building up a dialog and bi-directional relationship with fans.

Gen Z spends their time on a multitude of alternative platforms



- **Ad blocking**
  Media companies remain primarily ad funded and depend on online advertising revenues to operate sustainably. The sharp rise in ad blocking software due to poor user experience, intrusive advertising and slow page load times has limited the ability for media owners to monetise their content. Research indicates that around 30% of all internet users now use ad blockers which leads to significant negative impact on the ability to monetise premium content.

- **Proliferation of consumer devices**
  Major changes in technology and consumption habits are transforming how people interact with video and news content. As these digital touchpoints proliferate so viewers expect to be able to access content on an ever-increasing range of devices with a consistent user experience. As TV streamed over IP increases broadcasters have to overcome complex technical and operational challenges to deliver content experience across linear tv, set-top boxes, Connected TV's, mobile, desktop, HDMI sticks and gaming consoles. At the same time the consumer, enabled by technology, has developed new viewing patterns across live, catch-up, simulcast and on-demand (VOD) with an increased expectation of a consistent user experience.

- **Security, privacy and trust**
  There is a growing awareness among consumers around privacy issues when it comes to use of their data. The industry is working toward more user-centric privacy policies based on principles of transparency, choice and control for the consumer in order to build trust and improve both personalisation and user experience.

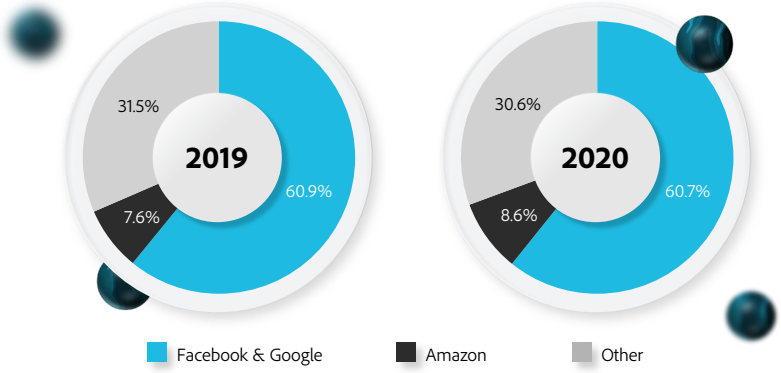
Ecosystem

As the media industry adapts to the changing habits of its customer base this is giving rise to significant changes in the media ecosystem.

- **Digital start-ups**
  As technology matures and applications become increasingly cloud-based then native digital start-ups, with more lean business models, are launching. These companies can reach scale, invest in quality content and develop new products and services and bring further competitive pressure on traditional media companies that are encumbered with legacy infrastructure and inefficient processes. These new digital platforms are also increasingly more agile in keeping pace with the fast-changing preferences and habits of the consumer.

- **Advertising monetisation**
  The structural decline in the digital advertising market has been driven in large part by the dominance of Facebook and Google and increasingly by Amazon:

Facebook & Google vs. Amazon Share of US Digital Ad Spending, 2019 & 2020
% of digital ad spending



The economics of the programmatic ecosystem are no longer sustainable for media companies – fees from ad tech intermediaries and the scale of click fraud have progressively stripped value and revenue from the advertising ecosystem and with the major browsers – Chrome, Safari and Firefox - deprecating 3rd party cookies by 2021 the end of cookie based advertising monetisation is in sight. In addition Apple has announced that in its iOS 14 IDFA release users will now have to opt-in – effectively give permission to be tracked – and with Google expected to follow suit with GAID (Google ID) the negative impact on mobile advertising revenue will also be significant.

It is risky for media companies to depend exclusively on advertising and the industry has yet to reconcile what its long-term future and commercial model looks like but current approaches are fragmented and are not advancing the cause for the collective good.

- **Rise of the subscription model**
  With advertising revenue becoming highly unpredictable, the subscription model is the key area of investment for media companies looking to monetize their content. The industry is having to adapt to a direct to consumer strategy by diversifying products and services and applying new skills and technologies to acquire new subscribers to build a profitable subscription business. But the subscription market is challenged by multiple services and the consumers propensity and willingness to pay for content.

- **Piracy**
  Legal frameworks surrounding intellectual property are not ready for a new generation of media consumers who expect instant access to content. With free software allowing users to access all the media they wish from a single platform without advertising, regional restrictions or latency combined with a great user experience then media companies will find it very challenging to retain their audience. For example, many consumers are choosing to bypass conventional means to access content using Virtual Private Network (VPN) services to access geo locked services.
- **Increasing Regulation(GDPR and CCPA)**
  New regulation and legislation in the form of GDPR and CCPA is leading to a shift for publishers in how they manage data collection, gain consent from users and give transparency on the purposes of data usage and this represents a real opportunity for media companies to build deeper relationships with their audience.

Technology

The increase in mobile and internet penetration has made being connected a way of life for consumers and now through the widespread availability of sensors, connected devices and cloud computing, the sector is seeing IoT well into adoption. Networks of connected machines delivering smart services will offer the media industry a whole range of new opportunities to create seamless, personalised services.

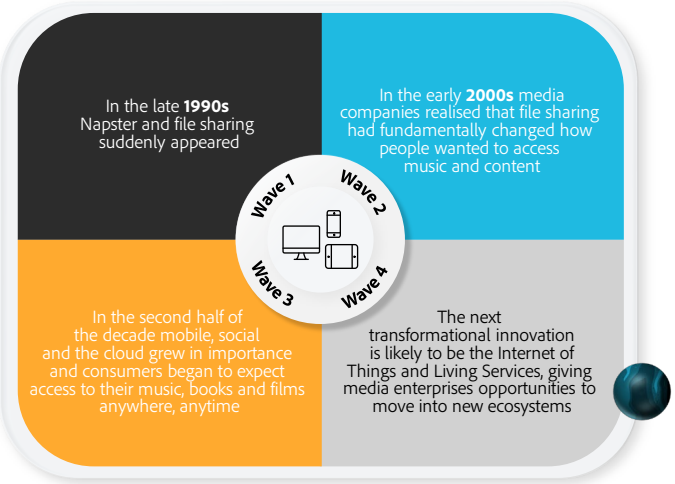
Against the background of these broader technological advances, there are a number of technological trends that will be central to the digital transformation of the media industry.

- **Legacy infrastructure**
  Linear broadcasters, newspaper publishers and film studios have struggled to develop their processes, operations and structures for the digital age. Many companies have placed too much emphasis on adopting new technology rather than overhauling digitisation of content and processes to adapt their business for social and mobile.
- **Digitisation**
  Other industries are still in the early stages of digital transformation and the media industry is arguably more advanced than other sectors. Digitisation can have a negative impact on economic performance as it can lower barriers to entry from digital first start-ups and increase competition and revenue pressure.
- **Automation**
  Automation is transforming how content is created, distributed and monetised. As content and data workflows become increasingly cloud-based the opportunity to automate and execute tasks at scale is being introduced at every stage of the media process - from creating content and optimising distribution to digitising back catalogues and inventory management all the way through to improving personalisation and customer experience.
- **Cloud-based workflows**
  For media organisations to create the right content and present it in the correct context requires innovation and digitisation throughout the business, from discovering new methods of creating content to experimenting with omni-channel platform distribution. Digital transformation is pushing companies toward the industrialisation of their content-creation and distribution processes in real-time.
- **5G**
  The emergence of 5G networks is set to unleash a wave of innovation through new players, increasing consumer expectations for immersive experiences and there is potential disruption in the existing value chain as video consumption grows more mobile. 5G networks promise faster speeds, more reliable connections and lower latencies lending itself perfectly to deliver better quality video on mobile devices and more immersive experiences with VR and AR among the benefits.
- **Edge**
  Edge technology brings computing, data storage and processing power closer to the point of action or occurrence of an event. Processing data where it is created at the Edge allows for more immediate application of analytics and AI capabilities to drive improved insight, decisioning or outcomes. According to IBMs Institute of Business Value, almost ¾of organisations say they will invest on AI in the next 3 years to create new business models at the Edge as boundaries between the physical and the digital continue to erode.

- **Digital Ecosystems**
  As the industry continues to face increased disruption through advances in technology and competition, media companies are developing linear and non-linear partnerships to create competitive differentiation. These new partnerships and strategic alignments are giving rise to a new digital ecosystem model designed to be customer-centric - offering a simplified user journey to consumers to enjoy competitive products and services through a single access point.

- **1st party data and analytics**
  The increased investment in data and analytics is becoming business critical as media organisations no longer just create content but also deliver experiential services built around that content. With improved connectivity, data collection and analytics, content creators are now able to take advantage. Data management is becoming a central function for media and entertainment brands to scale and monetise their audiences. It is not only the capture, storage and manipulation of the data that matters. It is also key that insight and activation is immediate – real-time is the baseline across all data and analysis and this brings with it some particular challenges of scale and architecture.

How digital innovation has already transformed the media industry



Source: World Economic Forum

Digital has become so important that the boundary between media and technology have broken down. This has implications for both traditional media companies and digitally native start-ups. To survive, all these enterprises need to address the exponential transformation in technology and digitisation, to help them reach younger audiences, create compelling content and services, and distribute and monetise their content more efficiently. In this paper we are aiming to tie together the key drivers and the resultant capabilities needed to succeed in a market where consumers have the ability to exercise choice with few barriers, and a market where brands have to exceed expectations to deliver cost effective returns.

Digital has become so important that the boundary between the media and technology industries has broken down. This has implications for both traditional media companies and digitally native start-ups

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FUTURE STATES

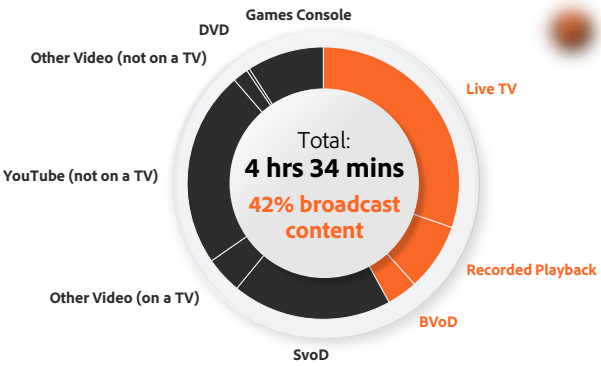
STRATEGIES FOR GROWTH AND PROFITABILITY

- The Future of TV - Broadcasters, Pay TV & Video Streaming
- The Future of Digital Publishing
- Business Model Convergence
- Digital Ecosystems

The Future of TV - Broadcasters, Pay TV & Video Streaming

According to Ofcom viewers increasingly see video on demand as the main way to watch TV and film – with 42% of adults considering online video services to be their main way of viewing with 38% of SVoD users believing they will not watch broadcast TV at all in five years' time.

Total video minutes per person per day, adults 16-34, all devices: 2018



Source: Ofcom total AV modelling using BARB, TouchPoints and Comscore data

As the impact of the decline in linear TV viewership is felt across the industry broadcasters face further competitive pressure from the digital platform companies with Amazon, Apple, Facebook, Google and Netflix continuing to disrupt the market with unrestricted access to vast volumes of behavioural data to monetise their global audience base.

In order to compete and maintain a stake in distribution and consumer relationship broadcasters have had to evolve and invest heavily in technology infrastructure to build their own direct to consumer platforms whilst continuing to support investments in legacy satellite and cable infrastructure.

In addition national regulation means that broadcasters are constrained by their public service charter which gives them prominence and government funding in exchange for a commitment to deliver public value and impartiality and maintain significant investment in regional content production and employment which is rigorously enforced.

The digital platform companies are not governed by these same principles of regulation and this inconsistency indirectly hands them further competitive advantage over national broadcasters with many TV executives arguing that public service charters restrict their business model and ability to operate profitably - pointing to the vital role that national broadcasters play in delivering reliable and credible news and information. The debate on regulation will be played out on a national level and it is important for both the industry and the consumer that the role of public service broadcasting is protected.

These proprietary operating systems will further consolidate the reach of Google, Apple and Amazon in the sector and in the near term the TV industry needs to confront the next challenge for 'control of the screen'

android

tv

With increasing consumer adoption of internet connected TV's the competition for the direct consumer relationship is now extending even further into the TV operating system.

Apple iOS and Google Android operating systems support 95% of the worlds mobile devices and in the smart speaker ecosystem global market share is dominated by Google (Home assistant) and Amazon (Alexa) enabling these technology platforms to have access to the home. The focus now is in extending reach into the most important screen of all – the TV. Already Amazon firestick, Apple TV and Google Chromecast HDMI sticks are leaders in the video streaming market and soon Amazon are to launch Fire TV sets with an Android operating system with recent forecasts suggesting that Google's operating system (Android TV) is set to be the default operating system on over 50% of future TV sets sold.

Growth is also coming from new platforms in the content space - Snapchat continues to show significant growth, TikTok is gaining traction and Quibi has launched in the US with its proposition of 'short-form' video content - the latest innovation trend in video.

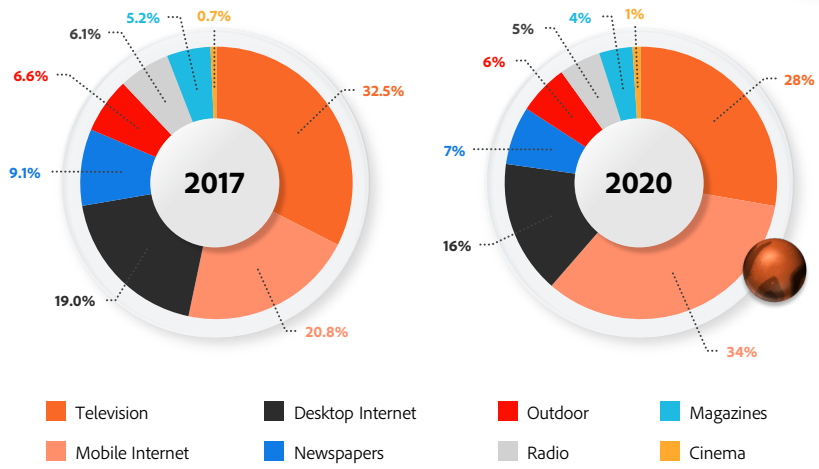
The launch of Quibi and the growth of these new platforms are predicated on mobile being the primary channel and align with forecasts that advertising revenue on mobile will eventually overtake TV.

Despite a difficult launch and commercial headwinds Quibi has significant content budgets and ambitious plans to create a whole new segment of 10-to 12-minute broadcast-quality content and reports. These new short form formats are designed to 'reach the unreachable' for content and advertising – those younger viewers who watch no TV.

Quibi

TikTok

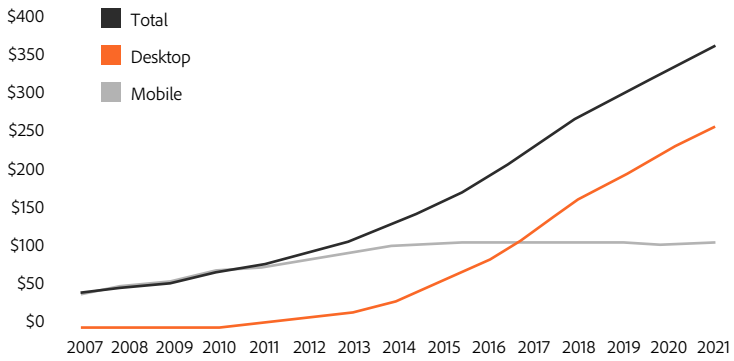
Mobile ad revenue will overtake TV ad revenue for the first time in 2020



Source: Zenith, Advertising expenditure forecasts September 2019, September 2019.

Mobile is clearly the main driver in advertising spend.

Mobile is propelling growth in all online ad spend
Internet advertising expenditure (US$ billion)



Source: Zenith, Advertising expenditure forecasts September 2019, September 2019.

Further competitive disruption in the sector is being driven by the major movie studios and production companies building their own direct to consumer streaming platforms with these new launches further indication of the power of the single technology platform as core to success

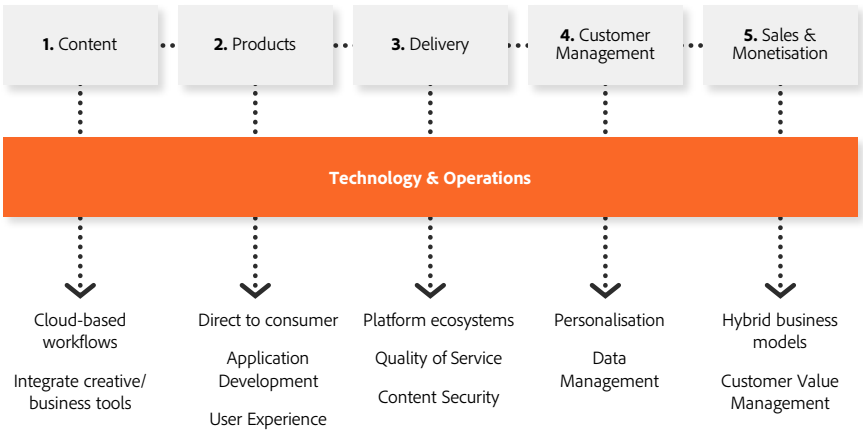
Production Companies

Further disruption in the sector is being driven by the major movie studios and production companies building their own direct to consumer streaming platforms, these new launches a further indication of how digital-first technology platforms are critical to success. The aggregation of premium content on major streaming platforms, irrespective of the original production company helped to drive the rapid global growth of Netflix, Amazon, Hulu and other streaming platforms and now the re-appropriation of these assets by their originators is well underway. Disney and Warner Media have both successfully launched their own global streaming platforms - Disney+ and HBO Max respectively and the impact of these moves cannot be underestimated – in the US the most popular programme on Netflix is the US version of The Office, accounting for 7% of all traffic and this has been 'reclaimed' by NBC-Universal from 2021.

As the market diversifies with more new players (Disney+, HBO Max, Discovery – D Play and others) Netflix, Amazon and Apple TV+ have all been increasing investment in commissioned content. Despite early success, the rapid expansion of streaming providers also comes with commercial risk as the appetite of consumers to add more subscriptions to their monthly household expenditure is limited and as a result a more customer-centric ecosystem is emerging where these players are evaluating strategies to co-exist across competitor platforms.

In the UK 40% of households have a Netflix subscription with a quarter of UK Netflix subscribers buying the service as part of a Sky package (alongside Disney+, DPlay, Spotify and other providers) This allows Sky subscribers to able to access a broad range of content through a single subscription and for the streaming services this aggregation in a quasi-D2C (direct to consumer) model gives all parties the best of both worlds, ownership of customer relationship, revenue and data without impact on reach delivered by distribution partners.

Media companies have tended to over focus on adopting the latest new technologies rather than addressing and transforming fundamental basics: comprehensive digitisation of content, processes, workflows, organisational design and talent to adapt their business around user experience and consumer journeys



These forces are driving the next phase in digital transformation across the industry as TV companies look to overhaul processes, operations and structures to become digital enterprises. In recent years media companies have tended to over focus on adopting the latest new technologies rather than addressing and transforming the fundamental basics: comprehensive digitisation of content, processes, workflows, organisational design and new digital talent to adapt their business around user experience and consumer journeys.

To compete with digitally native media organisations and become leaner, nimbler and better suited to keeping pace with the fast-changing preferences and habits of consumers they need to consider and plan technology and operations across the five key areas – content, products, delivery, customer management, and sales and monetisation to adapt and be able to deliver market-leading offerings for consumers.

Future Scenarios in TV

There are 4 possible outcomes:

Scenario 1

The global digital content platforms and **TV operating systems** take the lead role from national broadcasters and dominate the TV and video streaming market by exploiting their technological advantage. Using AI and customer-centric tools, they consolidate the TV value chain and manage the direct consumer relationship through advanced aggregation, distribution and content recommendation capability.

As consumers become frustrated with the proliferation of content providers the digital platforms and **TV operating systems** gain further advantage. **Broadcasters** become disintermediated and lose their stake in distribution or customer relationship - their role relegated to streaming their channels onto the digital platform providers.

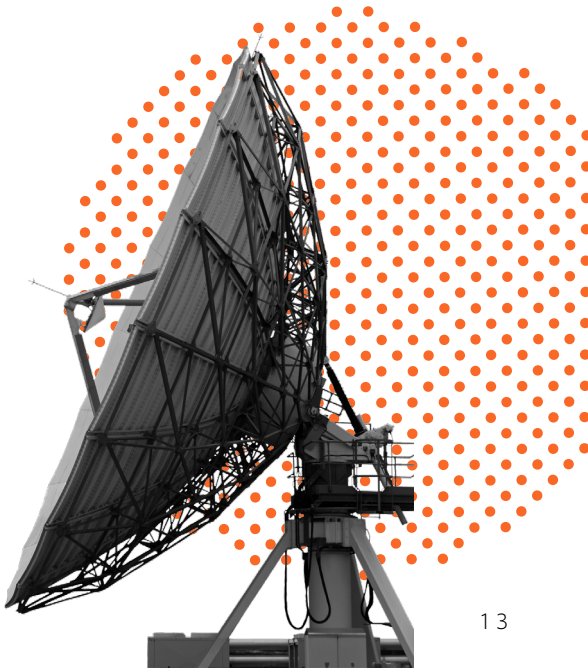
Digital Content Platforms and **TV operating systems** control the screen as well as direct consumer and advertiser relationships with advanced capability in data and insights**. Broadcasters** and **production companies** become more dependent on the revenue shares from TV platforms and cut off from direct content, subscription and advertising revenues.

Scenario 2

Premium content becomes the main differentiating factor and technologies such as distribution, search and recommendation become a commodity. **Broadcasters** shift their focus to the creation of quality localised content formats and benefit from the protection of national regulators and license their content to the digital platform companies.

Digital platforms and **TV operating systems** become subject to regulatory oversight and as technical capability becomes a commodity they become relegated to the role of distribution channels focused purely on technical delivery.

Broadcasters and production companies maintain the direct to consumer relationship and build advanced data and advertising capability to deal directly with advertisers.



Scenario 3

Broadcasters accomplish successful digital transformation by building their own streaming platforms. They pursue closer collaboration with other broadcasters with a view to forging strong customer-centric content ecosystems. These partnerships are increasingly underpinned by an advanced data architecture to enable a variety of hybrid business models based on deep audience insight.

Digital platforms and **TV operating systems** have to coexist with **broadcasters** and **production companies** in the market and TV viewers have a choice between linear or non-linear content from global and national providers.

Aside from content partnerships within the industry, technological alliances shape the TV market. **Telecoms operators** become mature players and create partnerships with broadcasters by providing the technology backbone to compete with the digital platforms and operating systems.

Broadcasters and Telecoms operators develop an ecosystem of content and data partnerships to develop monetisation strategies across subscription and advertising.

Scenario 4

Digital platforms, broadcasters and **production companies** all create their own digital platforms and direct to consumer relationships. Consumers are only interested in content and are no longer loyal to any one platform.

Telecoms operators act as super-aggregators by providing access to content and structure the market into a customer centric model by enabling ease of navigation and guidance across a wide range of platforms. The competitive threat of **TV operating systems** is kept in check.

Broadcasters and production companies maintain the direct to consumer relationship and build advanced data and advertising capability to deal directly with advertisers.

TV as a Platform – the Rise of Aggregation and Collaboration

There is consensus amongst industry executives that no single market player can adapt fast enough to the rapid transformation in market disruption and consumer behaviour with viewers now faced with a paradox of choice and little patience in switching between providers and platforms. It is evident from the above scenarios that platforms, broadcasters, production companies and also telecoms operators cannot rely on their current market positions and the industry is thinking differently about the next phase of growth.

As the sector becomes increasingly disrupted broadcasters are developing new products and services amongst all the current uncertainty to safeguard business models and future revenue streams.

Driven by digitisation ecosystems partnerships are developing rapidly across the sector as media companies incorporate new products and services into their customer experiences and begin to converge under broader and more dynamic strategic alignments

Driven by digitisation ecosystems partnerships are developing across the sector as media companies incorporate new products and services into their customer experiences and begin to converge under broader and more dynamic strategic alignments.

These new partnerships are based on a customer-centric model, where viewers can enjoy an end-to-end news or content experience for a wide range of products and services through a single gateway, without leaving their chosen provider.

European operator Sky/ Comcast is one example of pursuing such a strategy - the Sky Q platform now aggregates content from not only the UK broadcasters but also Netflix, HBO, Disney+, Spotify and even BT Sports now available through their platform. At the same time Sky has pursued an advertising alliance with Channel 4 with its award winning AdSmart platform and is also developing technology partnerships with BBC and Virgin Media.

Within the UK the BBC , ITV and soon Channel 4 and Channel 5 have collaborated to build BritBox as an ad free subscription streaming service to monetise their archives, gaining over 1 million subscribers within the US and across Europe. And there are numerous examples of this trend on the rise across Europe with RTL Netherlands building its own advertising platform after the acquisition of Spot X and Clypd. In France rival broadcasters TF1, France Télévisions and M6 come together to launch the Salto streaming platform in response to the competitive threat of the global content platforms.

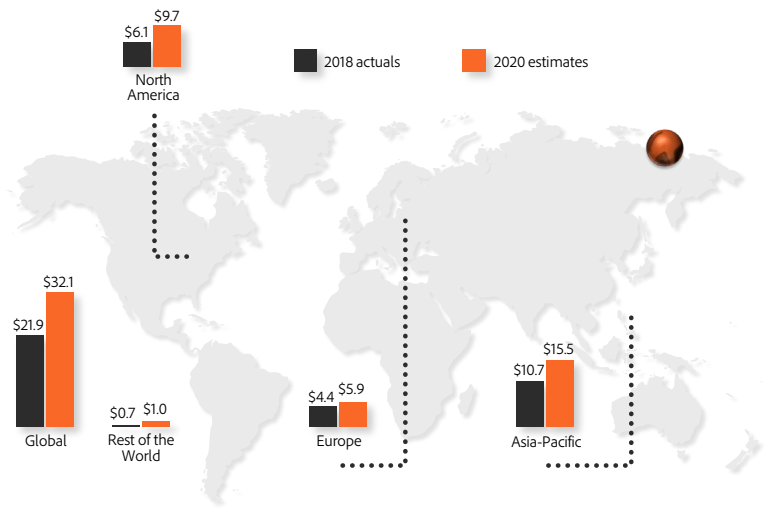
See Part 3 – The Rise of the Digital Ecosystem

The Rise of Addressable TV – Advertising Video On Demand (AVOD)

In parallel broadcasters are developing addressable advertising platforms to target viewers better and offer advertisers viable alternatives to compete with Facebook and Google. The market is still embryonic in real terms but global spend on addressable advertising via set top boxes and OTT (over the top internet enabled devices) will top £5.6 billion in 2020, up 38 per cent year on year, but only a 3.3 per cent share of the total TV ad market.

Traditional linear broadcast advertising has been traded against pre-defined audience segments whereas addressability allows advertisers to target viewers based on a diverse range of demographic, behavioural and contextual segments. As linear viewership continues to move to digital platforms the challenge for broadcasters is to grow the advertising value of content and enable audience-based buying across all digital inventory across an increasingly complex device landscape – set-top boxes, connected TV's, 5G mobile devices, HDMI sticks, consoles and desktop. This is enabling digital addressable advertising to be bought and sold in real-time. and eventually linear TV inventory will also become exposed to the same data-driven, automated trading.

Global ad-supported video revenues (US$ billions)



Sources: Digital TV Research, "Global AVOD Forecasts," June 2019; Deloitte analysis

Addressable TV makes it possible for brands to target individual households with messages relevant to that viewer and their unique user journey. For example, if viewers have been browsing social media platforms relating to cars, an automotive brand can target that user with advertising offering a test drive or car finance.

Addressable advertising can deliver TV companies the incremental value and revenue of highly personalised advertising regardless of platform. Deployment of segmentation and identity technologies and cross-platform targeting and measurement capability is critical and audience definitions, attributes and currencies need to be standardised.

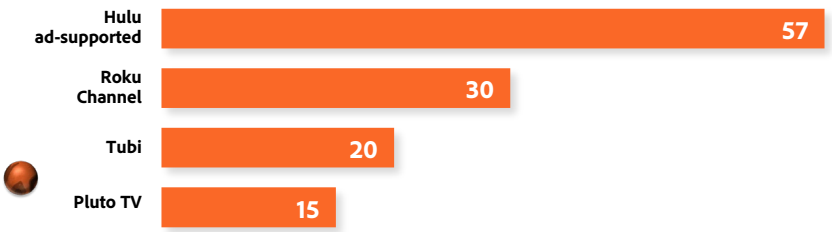
The challenge to build an addressable TV audience lies in building data infrastructure that can enable real-time bi-directional access to linear and OTT device data (behavioural/ metadata), census-level viewership, advertising and segmentation data to support household and device level profiling to build a detailed picture of viewing behaviour.

Addressable TV has huge potential for advertisers by offering a premium environment and content experience. Sky has been one of the key players in the drive for adoption of addressable advertising across Europe., its AdSmart platform dynamically serves advertising to households and individuals while they are streaming content. The benefit for advertisers is that they don't have to commit to buying pre-planned schedules on specific programmes or channels. Sky wants AdSmart to be adopted as the standard addressable TV platform.

We can see that digital transformation is evident in all aspects of TV as new technologies continue to transform processes and operating models. Data and analytics tools make it possible to create new value and insights that apply across the wider business; helping content providers meet the needs of both subscribers and advertisers by improving internal decision making. In addition, broadcasters are now fully integrating their digital teams into their core TV business rather than running them separately and some are even rebuilding their platforms with an entirely new business model for measurement.

Data and analytics tools are creating new value and insights that apply across the wider business; helping content providers meet the needs of both subscribers and advertisers by improving internal decision making

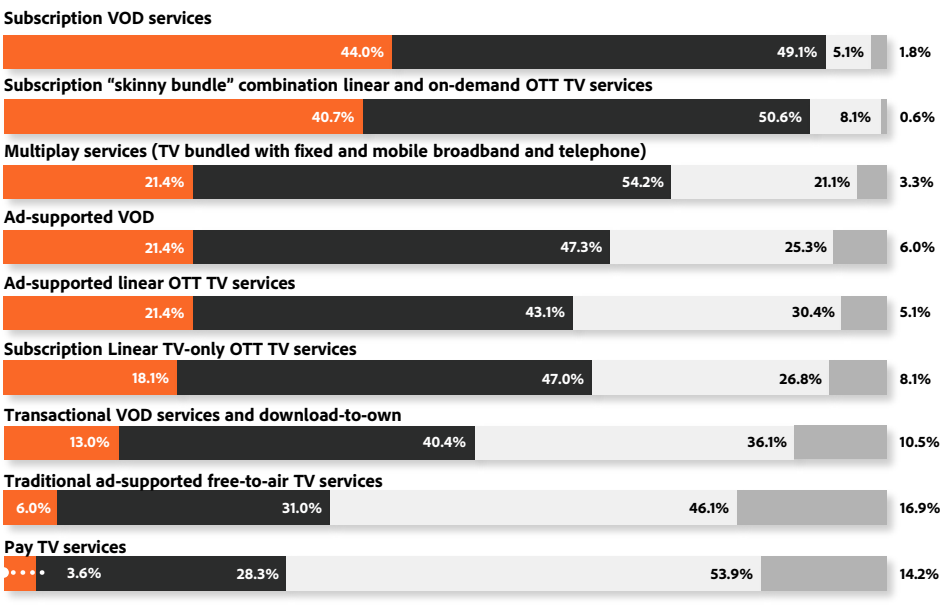
Ad-supported video services have quickly built sizable user bases in the United Stated
US user base for ad-supported video, MAUs (millions)



Sources: Hulu

Broadcasters and pay TV platforms are having to prioritise investment decisions around the opportunities enabled by digital transformation through using digital tools and technologies and more importantly how they use data to create optimal incremental value from a range of monetisation models, including AVOD, SVOD and transactional funding.

How do TV industry professionals worldwide expect select TV/video-on-demand (VOD) services to grow?
% of respondents, Jan 2019



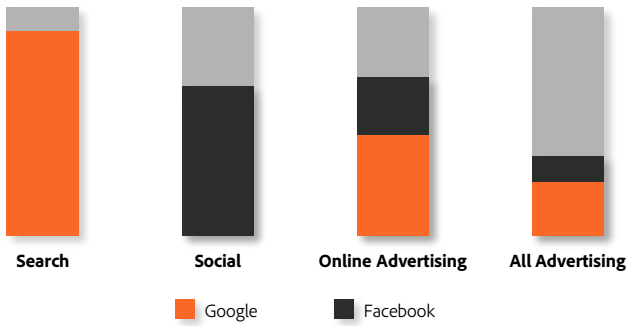
Source: Digital TV Europe, "Industry Survey 2019," Feb 27, 2019

The Future of Digital Publishing

Digital news publishers know that their business models need to change. The last decade has been defined by the combined disruption of mobile and social media that have fragmented consumer attention and thereby undermined the advertising-based business model with the indirect result of weakening the role of journalism and the publishing industry in general.

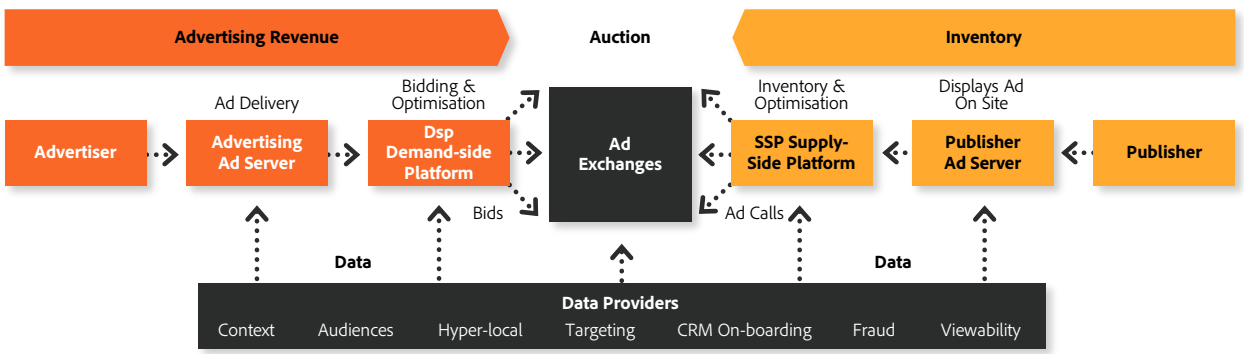
Publishing is still a predominately advertising funded business and the current economic and technology structure of the digital advertising industry is unsustainable. Firstly, gaining share of the advertising market is a challenge with Facebook and Google absorbing all digital ad revenue growth (+20% in 2019) within their so-called 'Walled Gardens' and secondly because the financial viability of the ad tech ecosystem is under threat with 3rd party ad tech fees, data leakage, ad blocking, 3rd party cookie deprecation and programmatic fraud all losing potential revenue, reducing margin and advertiser experience.

Google and Facebook clearly have dominance in major markets: the question is what (if anything) to do
Market share, global ex-China, 2019



Source: Benedict Evans - January 2020

The programmatic advertising business model led media companies to allow access to data about their visitors to be aggregated by a wide range of external partners and technology intermediaries to aggregate audiences into larger buying points and provide access to data interchange and programmatic trading structures. These intermediaries placed cookies across digital publishing platforms to build substantial databases of information to link individual consumer behaviour across websites and applications, allowing them to track users significantly better than either individual media owners or advertisers and by consequence it greatly reduced the rates that publishers could charge to advertisers. Additionally, cookie-based tracking allowed social media and platforms to link detailed behaviour tracked within a 'walled garden' to be integrated with insight about behaviour on publisher sites.



The next decade will be defined by increasing regulation of the internet in the shape of GDPR and CCPA combined with a sharp rise in consumer privacy concerns across the globe motivating the major browser providers to block 3rd party cookies – Safari, Firefox and Chrome have already made this move with Google finally implementing a total ban by the end of 2021. Forecasts suggest that the regulatory and browser changes will drive an imminent wave of consolidations and closures in the ad tech sector All this against a backdrop of economic and political uncertainty which will throw up further challenges to the sustainability of many news organisations.

Faced with these challenges, publishers are in the early stages of building new advertising sales strategies and developing what may be a more sustainable business model based on the primacy of 'first party' data to drive incremental revenue. In anticipation of new regulatory frameworks, media owners are consolidating ad tech infrastructure, supply side intermediaries and 3rd party data vendors. Instead they are focusing investment in first party advertising, analytics and data initiatives, which can help them create advanced audience and contextual targeting. By combining real-time analytics and segmentation capability publishers can create deeper audience insight and give detailed, transparent reporting to advertisers on campaign performance, attribution, on-site behaviour and viewability. This will drive higher rates, potentially gain market share from social media distribution points and deliver better value for advertisers.

Faced with these challenges, publishers are in the early stages of building new advertising sales strategies and developing what may be a more sustainable business model based on the primacy of 'first party' data to drive incremental revenue. In anticipation of new regulatory frameworks media owners are consolidating ad tech infrastructure, supply side intermediaries and 3rd party data vendors to focus investment in first party advertising, analytics and data initiatives to create advanced audience and contextual targeting

4.2

Average number of tech intermediaries employed by publishers selling **mobile impressions** in February 2019

6.3

Average number of tech intermediaries used by publishers selling **desktop impressions** in February 2019

4.6

Average number of tech intermediaries used by publishers selling **video impressions** in February 2019

For news brands the ability to both understand the individuals on their platforms consuming their content (who may, of course not be the same as the registered user/subscriber) and the ability to monetise this through both direct to consumer payment models and via advertising or brand partnerships is within the remit of the next phase of development in the publishing sector.

Forecasts suggest that a smaller number of single-platform companies may emerge, able to provide 'end-to-end' technology and create a more transparent, dynamic and efficient marketplace that powers the exchange of data, content and digital inventory across multiple formats (like video and display) and devices (desktop, mobile, tablet). Consequently, there is a move towards increased automation and platform-based approaches that will help simplify the buying experience for advertisers, standardize data management, enable activation at scale, uphold data governance and respect consumer privacy & regulation through the implementation of auditable AI.

There are several interesting developments occurring in the industry to address these structural changes. Publishers are building private marketplaces (PMP's) and direct advertising initiatives with advertisers in 1st party data and in parallel innovating with native advertising formats, branded content and sponsorship. There are also moves from publishers to build cross-industry platforms to collaborate with industry competitors and create their own walled gardens - with new advertising platforms, data as a service, single sign-on and identity initiatives to challenge the reach of Facebook and Google. These strategies require a complete overhaul of the current supply side data ecosystem as the industry re-evaluates its current technology and data infrastructure and move toward a more open ecosystem with increased interoperability supported by API's, connectors and pipelines to stream real time data, operate and communicate across partners and with advertiser brands more efficiently and compliantly using open source standards.

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Premium publisher alliances are developing across Europe and for the publishing industry represent the next stage of evolution in digital ecosystem.

Ozone Project UK
https://www.ozoneproject.com/

The Ozone Project is an advertising and audience platform owned and operated by UK News publishers, combining their resources to create a scaled digital ad network using unique publisher-owned data. The initiative claims to enable advertiser brands to reach audiences in trusted, brand-safe, fraud-free, premium environments from a single buying point.

Approved data from comScore shows that the participating news brands have a combined audience of 44 million adults - the ability to reach 93.6% of the UK adult online population - and with an adult audience of over 40 million puts it hot on the heels of Google and Facebook, making The Ozone Project the 3rd biggest property in terms of audience reach and a strong competitor to Facebook and Google to reach premium audiences.

The project has been developed in response to industry-wide concerns across the digital advertising ecosystem around brand safety, data governance, lack of transparency in the supply chain and ad fraud, as well as calls from advertisers for a single point of access to publisher inventory to facilitate an easy buy for scaled quality.

Ad Alliance DE
https://www.ad-alliance.de/

In Germany Ad Alliance - IP Deutschland, Gruner + Jahr, Smartclip, and Spiegel Media – have joined forces with Media Impact - Axel Springer and Funke Mediengruppe – to build a media portfolio that comprises seven TV brands, 91 print brands and 110 digital brands as well as the Audio Alliance reaching practically the entire German population and providing a gateway for advertisers and media agencies to reach audiences and develop cross-media solutions and innovative advertising products. The collaboration has created the largest digital marketing offering in Germany in terms of reach with about 50 million monthly users, according to statistics released by AGOF, the association for online marketers in Germany.

Skyline – FR
http://skyline-directmarketplace.com/

The threat of Google and Facebook is causing competitors to ally in France. Major French national newspaper and magazine groups are setting aside traditional rivalries to scale their digital advertising offers as direct competition, while also ridding their digital ad supply chains of unnecessary intermediaries. Le Monde and Le Figaro, traditionally fierce newspaper rivals, are letting advertisers book digital ad campaigns across their combined portfolio, using the same display or video ad formats for the first time. Both Le Monde and Le Figaro have stressed that combining forces in this way is a necessary step if they're to compete with the likes of Facebook and Google for advertising spend. Their alliance, called "Skyline," is an intentional show of strength to the advertising market. Together, these media groups generated 35 million unique users, according to Médiamétrie.

Alliance Gravity – FR
https://www.alliancegravity.com/

At the same time Les Échos, Le Parisien, SoLocal Group, SFR-Altice, M6, Prisma Media, L'Équipe, La Dépêche du Midi, Sud Ouest, La Nouvelle République du Centre-Ouest, Le Télégramme, La Montagne1 and Lagardère Active have all come together to pool audiences and data to create advertising initiatives with brands and media agencies directly.

Log-in Alliances

As new privacy regulations and recent anti-tracking moves from browsers take hold, attracting registrations is also becoming a key tactic for publishers looking to build a direct relationship with their users and gather first-party audience data for advertisers. This has led to publishers establishing login alliances that enable readers to use a single account to register with multiple sites.

The German market is probably the most advanced to date when it comes to offering unified login solutions. German broadcasters RTL Group and ProSiebenSat.1 Media SE joined forces with internet service provider United Internet to create a unified login service in 2017. and the following year the European NetID Foundation was formed.

Elsewhere in the German market, Verimi, which launched in 2017, sees itself less as a publisher login alliance and more as a safe alternative for an internet users' entire digital identity,, to let them open bank accounts or access government services online, for example. Shareholders include Axel Springer, Deutsche Telekom and Allianz.

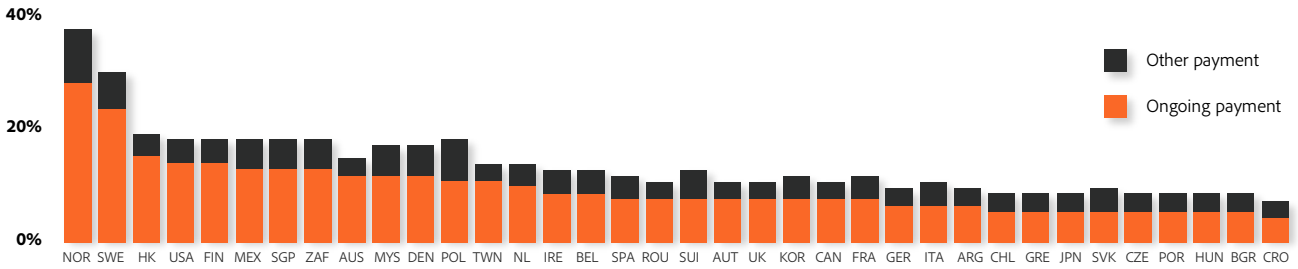
In France, publishers are trying out a lightweight model. Ten media companies in France across news publishing, radio and broadcast pooled resources earlier this year to create "PassMedia," allowing French internet users to login with the same details across their online offerings.

While rival publishers and broadcasters in the U.K. and the U.S. have come together before to form ad sales and data alliances, consumer-facing login solutions may not be feasible and some analysts believe that there is less incentive in these markets to cooperate, especially with those publishers who see data management and technology platforms as sources of competitive advantage. At the same time approaches to identity strategy are becoming increasingly decentralised in the data ecosystem.

Subscription – The rise of Direct to Consumer

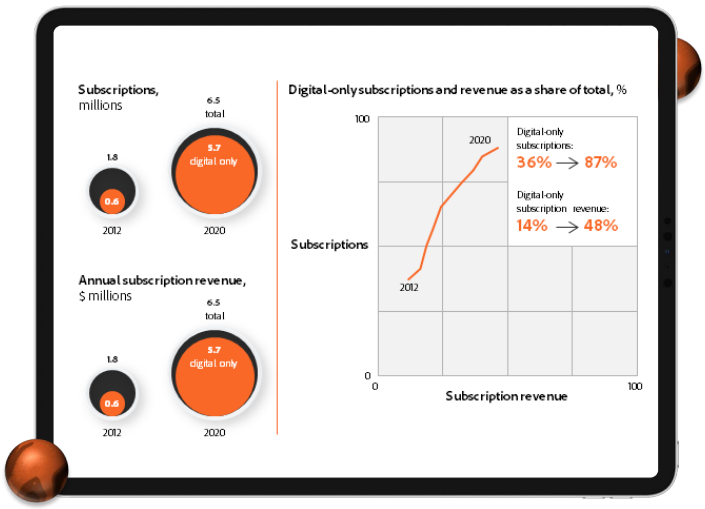
The news and entertainment sectors differ in certain aspects and research suggests that consumers have been comfortable with multiple subscription products in entertainment (Netflix, Amazon Prime, Hulu) in a way that most have not with news brands. However, news brands have the harder challenge of packaging their pricing against ostensibly 'free' news sources through providers in social media and public service news channels. This in turn means that pricing and packaging needs to be flexible.

Proportion that made an ongoing news payment in the last year
Selected Markets



Source: Reuters Digital News Report 2020. Base: Total sample in each market = 2000, Taiwan =1005.

Within the publishing sector a global leader for subscription model has been The New York Times. The number of paid subscriptions across digital and print has reached 6.5 million - made up of 5.7 million people paying for the publisher's online products. In August 2020 The New York Times for the first time reported quarterly revenue that owed more to digital products than to the print newspaper - achieving $185.5 million in revenue for digital subscriptions and advertising during the second quarter of 2020 with the number for print revenue $175.4 million. The cost base for scalability is strongly in favour of a more digital future with the The New York Times on track to achieve their ambition to reach 10 million subscribers by 2025.



Source: New York Times

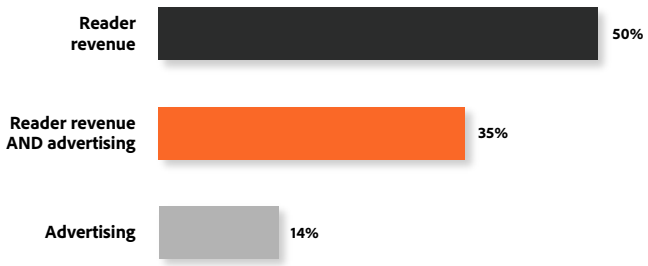
The Financial Times has also broken through its 1 million subscriber target, while The Guardian returned to profit – after years of heavy losses – off the back of more than 1 million reader contributions over the past three years. News executives across many countries believe that reader revenue is providing stable and growing income while advertising has remained volatile, with many reporting worse than expected results in 2019.

'Growth engines, reader revenue specifically, has very positive prospects; advertising revenue remains a major concern'.

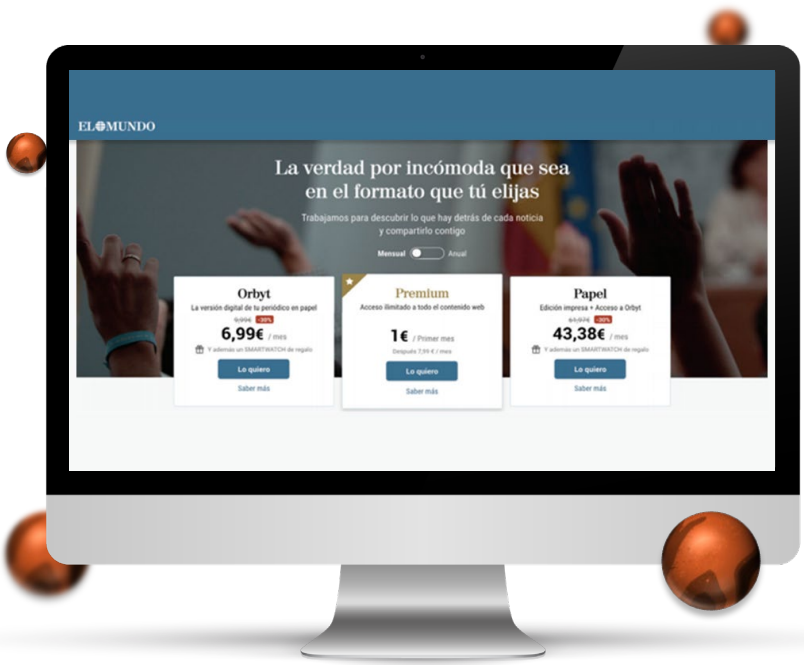
Jon Slade, Chief Commercial Officer, FT.

The future will see more European media companies further refining and developing their subscription models. In Spain, El Mundo has already begun to charge users for premium content and El País is establishing a similar model by requiring readers to register for free to gain access to opinion pieces and editorial features. This represents a change in direction for publishers that have previously pursued a strategy of scale which can sometimes be to the detriment of quality journalism.

Most important revenue stream for my company going forward?

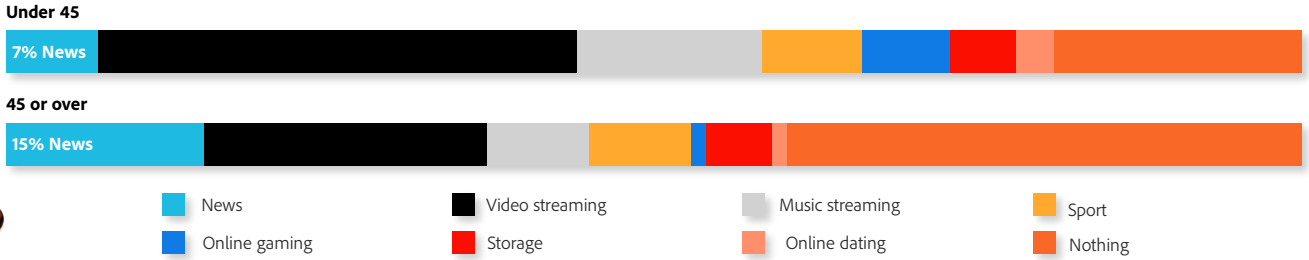


Q3. Thinking about your own company, which of the following statements do you agree with most. Reader revenue will be the most important revenue stream going forward/reader revenue and advertising will be equally important/advertising will be most important. N=189
Source: Reuters Institute



Source: Reuters Institute.

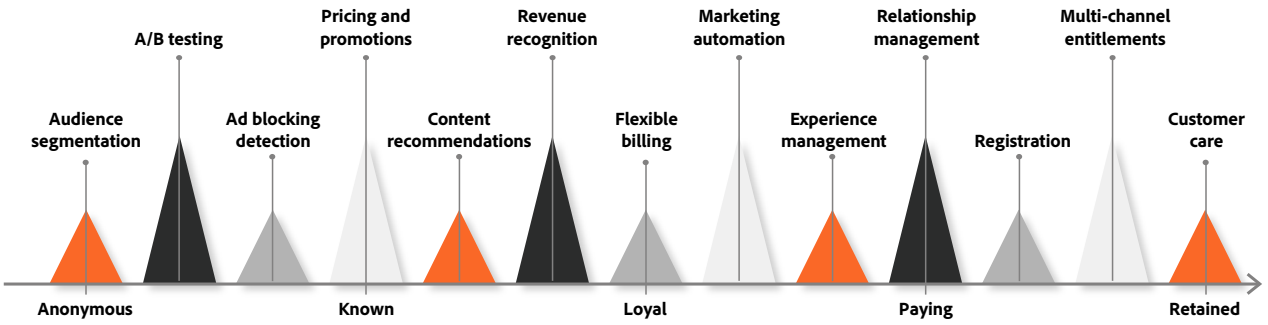
If you could only have one media subscription for the next year, which would you have
Selected Markets



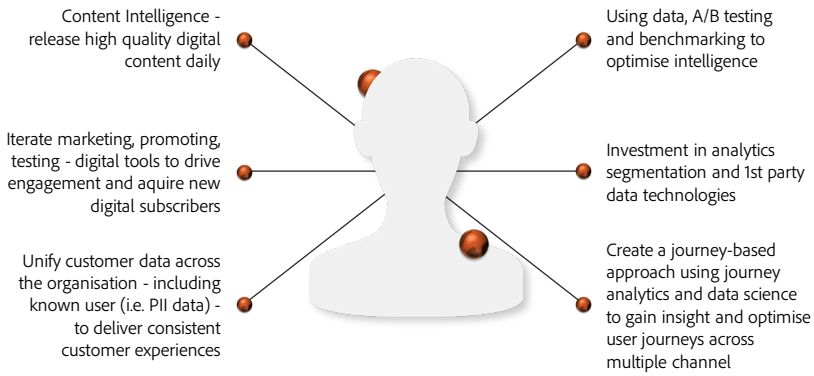
Base: Under 45s/Over 45s: selected markets = 1760/2165
Source: Reuters Digital News Report 2020

There are 3 types of paywalls that are typically deployed:

- **Hard paywalls** require a payment (such as a paid subscription) before any content can be viewed. Hard paywalls generally succeed where there is a loyal audience and content is considered sufficiently differentiated from the competition and therefore valuable.
- **Soft paywalls** (metered paywalls) allow users to view a restricted number of articles before needing a paid subscription. The main benefit of this model is it allows light-user traffic to be retained and monetised through advertising. There's also the added benefit of giving readers a chance to 'try before they buy'. A variant of the soft paywall may allow a preview of the article, or first half, to be viewed while the deeper analysis can be accessed by subscribers only.
- **Dynamic paywalls** (or variable paywalls) fall somewhere in between. These paywalls might be designed to hide some articles but not others, such as allowing access to breaking news and weather, but putting in-depth research, comment or insight content behind a barrier. This has been the strategy of choice for mastheads such as The Washington Post, the Wall Street Journal and The Telegraph. The data used to discriminate between who gets to see what for free needs to be collected and analysed in real-time.



According to Reuters the dynamic paywall developed by the Wall Street Journal is arguably the most complex as it adapts the positioning of the paywall in the user journey depending upon 60 or more variables – including frequency, recency, depth of content engagement, devices and content type. A propensity score is calculated by a machine learning algorithm to create a probability score and this informs the amount of free content viewable before a paywall is displayed. All of these variables are scored and integrated into the user journey in real time to inform the next best action.



The dynamic paywall, to the reader, simply looks like a normal freemium solution, which is a core part of the benefit. It appears to be primarily customer focused. Learnings have shown that sampling content is complex and the likelihood of subscribing can be maximised via this path.

Resurgence of the Newsletter - Dynamic Personalisation

In an attempt to launch or maximise their subscription businesses, publishers are now working on building loyalty by improving their readers' experience. They do so by introducing personalised news which rely on algorithms and other pattern recognition solutions, or on the direct input from readers.

The shift in editorial strategy, which implies moving away from quantity towards quality and relevancy, has happened in most newsrooms. According to this year's survey by Digiday, 70% of publishers personalise content for their readers while the half of them who do not – plan to in the near future.

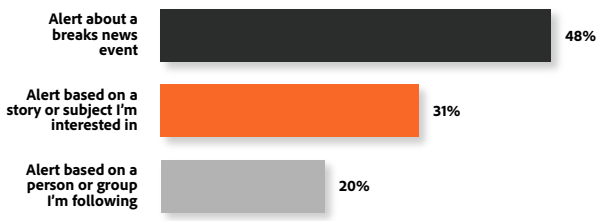
Advanced automated strategies in e-mail, in-app and push notifications have evolved personalisation, dynamic content recommendations and microsegment targeting – all used together across e-mail and web – is the silver bullet to improving on these metrics and meeting both short-term and long-term revenue goals.Typical strategies involved are:

- Automated targeting based on online behaviour.
- Re-engaging lapsed customers with personalised 'offers'.
- Ongoing editorial newsletter delivery with hyper-personalised content 'fragments'.
- Push notifications to drive app engagement.

The Economist has evolved their strategy to deliver results:

- 160% lift in web pageviews from e-mail subscribers.
- 79% increase in pageviews per click.
- 17% increase in CTR.

Alerts that arrive irregularly triggered by events

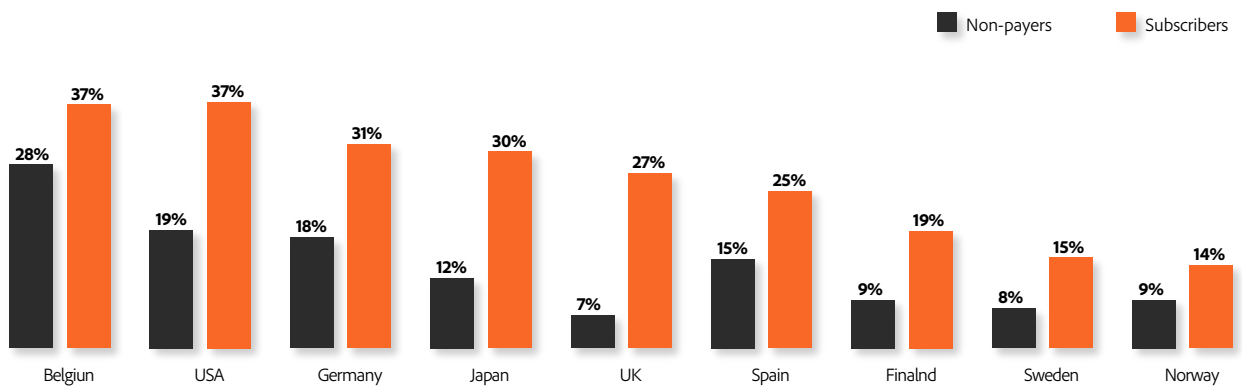


Source: http://www.digitalnewsreport.org/survey/2020/the-resurgence-and-importance-of-email-newsletters/

For readers newsletters are becoming an increasingly useful tool to curate their personalisation experience via alerts.

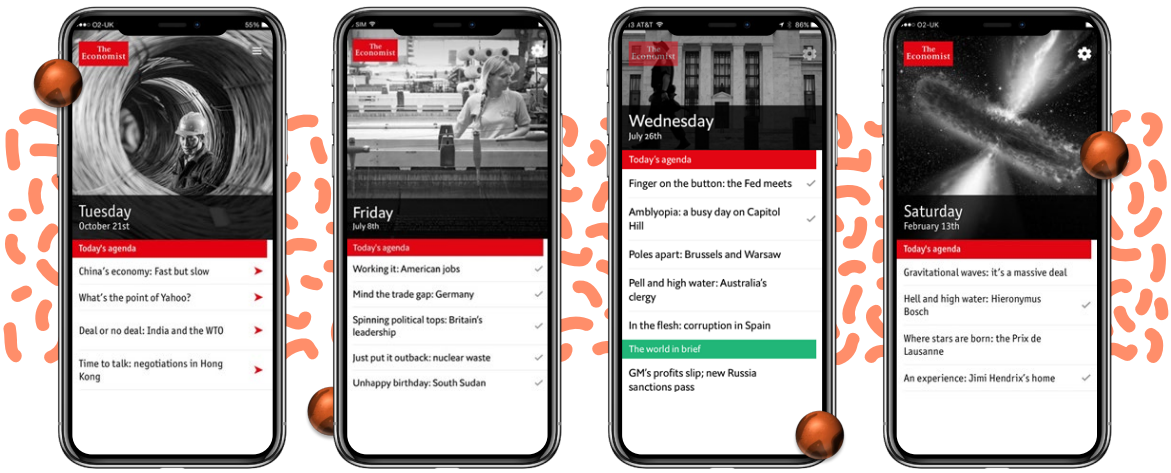
Advanced automated strategies in e-mail, in-app and push notifications have evolved personalisation, dynamic content recommendations and microsegment targeting – all used together across e-mail and web – is the silver bullet to improving on these metrics and meeting both short-term and long-term revenue goals

Proportion of paid subscribers and non-payers that accused news via email in the last week
Selected countries



Source: http://www.digitalnewsreport.org/survey/2020/the-resurgence-and-importance-of-email-newsletters/

And according Reuters they are effective at increasing engagement for both subscribers and free users to drive revenue.



In a recent interview with Reuters Community Sunnie Huang, newsletters editor of The Economist articulated how newsletters had become central to strategic business objectives:

Counteract the decline in traffic from social media

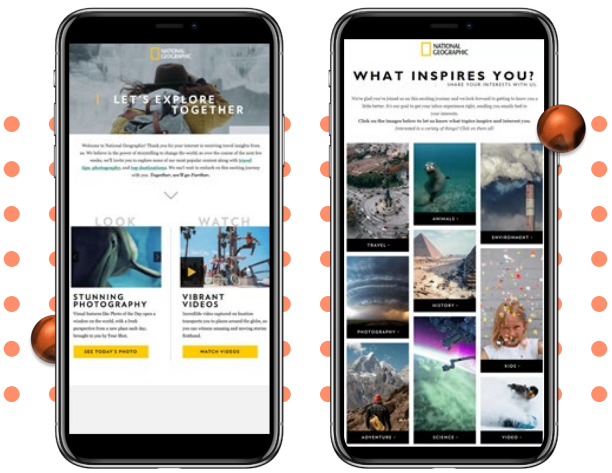
"We wanted to invest in a platform that we can control. With emails, we can control the design, the presentation, the timing and the audience. So newsletters help us build a direct relationship with readers without being over-reliant on third-party, algorithm-based platforms"

Renew focus on our own digital products

"We pride ourselves in our world-class journalism; we should complement that experience with world-class digital products."

Do more with budget-friendly channels

"Compared to other digital products, newsletters are versatile and relatively low-cost and low-risk. Different newsletters can be shaped to target different audience segments and meet different business goals. There's a lot of room to experiment".



Source: The National Geographic

Many quality publishers like National Geographic and Telegraph Media Group are developing personalised newsletter offerings through active and passive personalisation and reader curation.

Telegraph Media Group – Data Driven Operating Model

The UK based Telegraph Media Group is at the forefront of innovation in journalism. Real time analytics now enables publishers to measure the impact of each news story as soon as it has been published and effective use of these insights is critical in improving the reader experience across websites and apps and ultimately driving registrations and subscriptions - knowing what content and articles readers want can also inform editorial commissioning.

To achieve this aim data engineers at The Telegraph created Pulse – a responsive real time dashboard built from open source and 3rd party software that allows all users to explore and analyse the performance if each article, section and piece of content in real time and has become a vital tool for both journalists and executives.

"Pulse created a centralised view of how content changes the behaviour of readers in real time. It allows us to measure and make available the relevant, personalised metrics in a more dynamic and accessible way. Its streamlining feeds, in addition to creating actionable audience metrics for each newsroom desk, allows us to serve the reader better, write new content based on information collected in every second on background and areas of interest to its readers."

Justyna Owczarek Head of Technology - Data

As both the publishing and TV sector continues to invest in technology and operating models to support continuous innovation and diversification of product and service offerings the industry is coalescing around a more customer-centric strategy. In the next section we will look at how hybrid business models and digital ecosystems are driving the next phase of growth.

Business Model Convergence

The challenge for the media industry is on two fronts – firstly to drive registration and subscription by building direct to consumer products and services and secondly to develop advanced advertising solutions with deeper audience insight, segmentation and targeting capability to improve the advertising experience for users and at the same time creating more value for advertisers.

For subscription the key attribute in content and user experience personalisation is to orchestrate content recommendation in real-time through the correlation of 1st party behavioural data across the multi-device, channel and platform environment. By collecting, analysing and leveraging first party data, media companies can build new products, channels and audiences and this has driven investment into technology infrastructure that can support the collection of unstructured behavioural data.

These same investments can also drive business value in the supply side advertising ecosystem - using first party data and analytics to build more profitable strategies in advertising monetisation. As media companies, agencies, and advertisers have more and more access to proprietary data sets and rich consumer data this in turn is creating opportunities to establish new forms of advanced advertising targeting and audience buying, new trading models and better personalised advertising experiences for the user.

As advertisers increasingly in-house their media operations they are demanding more efficiency as they look to scale audience-based buying across inventories with measurement more precisely tied to business metrics with robust attribution and performance measurement. In addition, there are calls from advertisers for a single point of access to publisher inventory to facilitate an easy buy for scaled quality media and giving advertiser control of their data, decision making and optimisation and by working directly with media companies on proprietary data advertisers can fine tune audience definition in custom segments and offer a closer relationship between advertiser brand and media owner.

Media companies are therefore re-evaluating their data architecture to encompass both subscription and advertising models and investing in the technical infrastructure to enable real-time collection of first party and behavioural data to build more profitable strategies across both.

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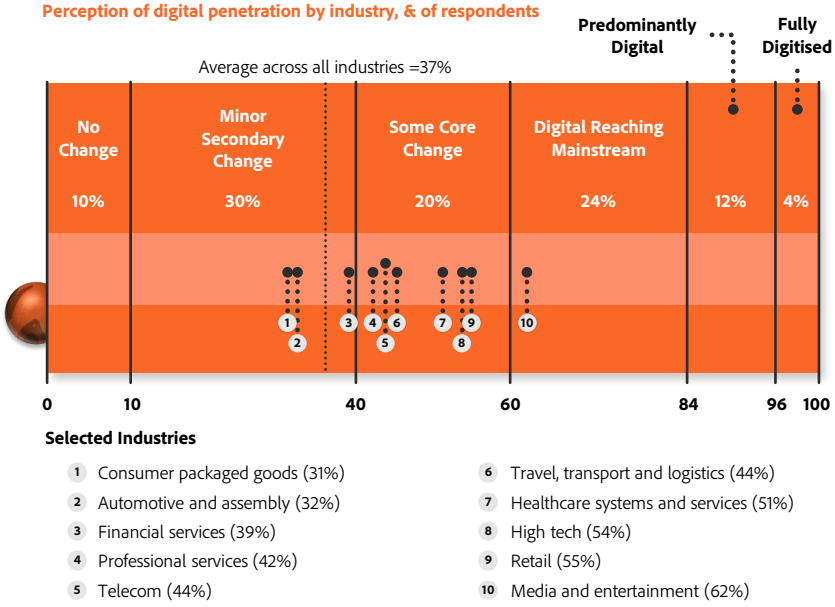
Digital Ecosystems

The media industry is more advanced in digital transformation than any other sector but digitisation has delivered a negative impact on the economic performance of the media companies with digitisation lowering barriers to entry and bringing competition from digitally native businesses and this has put pressure on operating revenues and profitability.

As the industry becomes increasingly disrupted by technology and competition, many are struggling to develop new products and services to keep pace with consumer expectation. As we have seen many former industry competitors are looking to build a broad, more collaborative ecosystem in order to boost their collective competitive strength. The industry is now undergoing a phase of convergence to build more dynamic alignments and create digital ecosystems. These platforms are customer-centric and user journey based where viewers can enjoy an optimal content experience for a wide range of products and services through a single access, without leaving the ecosystem.

We have looked at how Sky is now pursuing a platform strategy across content, advertising and technology in its partnerships with Netflix, BT Sport, Channel 4 and Virgin Media respectively. BBC, ITV and Channel 4 have put aside rivalries to launch BritBox and there are similar initiatives in France with Salto. The rise in aggregation to solve the consumers paradox of choice will shape the TV industry in the years to come.

Perception of digital penetration by industry, & of respondents



Selected Industries

1. Consumer packaged goods (31%)
2. Automotive and assembly (32%)
3. Financial services (39%)
4. Professional services (42%)
5. Telecom (44%)
6. Travel, transport and logistics (44%)
7. Healthcare systems and services (51%)
8. High tech (54%)
9. Retail (55%)
10. Media and entertainment (62%)

Source: McKinsey

We have also discussed how the advertising industry in particular is witnessing exponential growth in collaborative strategic alliances – we have already discussed RTL Netherlands acquisition of Spot X and Clypd RTL and subsequent strategic partnerships for its AdConnect platform. In the UK News UK Wireless and Bauer media have joined forces to launch Octave Audio, a new digital audio advertising platform and across the digital publishing sector there are numerous advertising platform and data partnerships aiming to counter the dominance of Google and Facebook and build alternative audience solutions for advertisers – Ozone Project (UK), Verimi (DE) and Gravity (FR) are just some examples of these initiatives.

Telecom operators are also expanding their connected services into TV, media, music streaming services and smart homes with these connected into a single gateway ecosystem by offering the end user multiple applications through the operators technology infrastructure.

Digital ecosystem partnerships within the telecoms sector point also to the future direction of the media industry with new alliances being built on a wide variety of structures - joint ventures, mergers and acquisition, exclusive partnerships and many more that are transactional such as API transfers that enable different systems to talk to one another to trigger tasks and events. The emergence of media ecosystems marks a shift as boundaries between industry players further converge and legacy strengths become less of a competitive differentiator. It also marks a transformation in how business and technology support ecosystem relationships.

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The profitability and viability of these ecosystem strategies depends on understanding the combined value proposition with partners – for example content, customer relationships or data. There are market opportunities emerging across the industry and the sector is evaluating collaboration opportunities with an eye to finding capabilities, markets and technologies that complement and support strategic ambitions.

Faced with the digital ecosystems velocity, both TV and publishing industries are pursuing and evaluating these new business models security, intellectual property, data ownership, licensing, privacy, profit sharing, liability, regulatory compliance and customer management.

Platform technologies and infrastructure are central to supporting the level of flexibility and agility needed in digital ecosystems with investment in open IT architecture, open source software, API's and microservices being central to developing connectivity between disparate systems as well as establishing common governance, standards and metrics. Central to this transformation and its success will be how companies within the media sector can build infrastructure based on decentralised systems and data management to support their own infrastructure and these non-linear relationships.

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DATA MANAGEMENT AND CUSTOMER EXPERIENCE

HOW DATA IS REFRAMING THE CONSUMER RELATIONSHIP

- The Rise of the Customer Data Platform
- Profiles, Disparate Data and Data Models
- Consent, Identity & Privacy
- Data Governance

The Rise of the Customer Data Platform

In this section we will look at how transformation in data strategy is supporting the convergence of new business models and also the evolution in new digital ecosystem partnerships.

Data Management Platforms (DMPs) and Customer Data Platforms (CDPs) – are central to this evolution in data management. These two previously distinct and separate businesses areas are now becoming complementary and accretive, partly because the ability to segment customers in real-time is still essential to any engagement strategy. This is critical as the industry moves from an anonymous world to one based around identity – where consumer consent, permission and privacy is respected.

The impact of this convergence is horizontal across key areas:

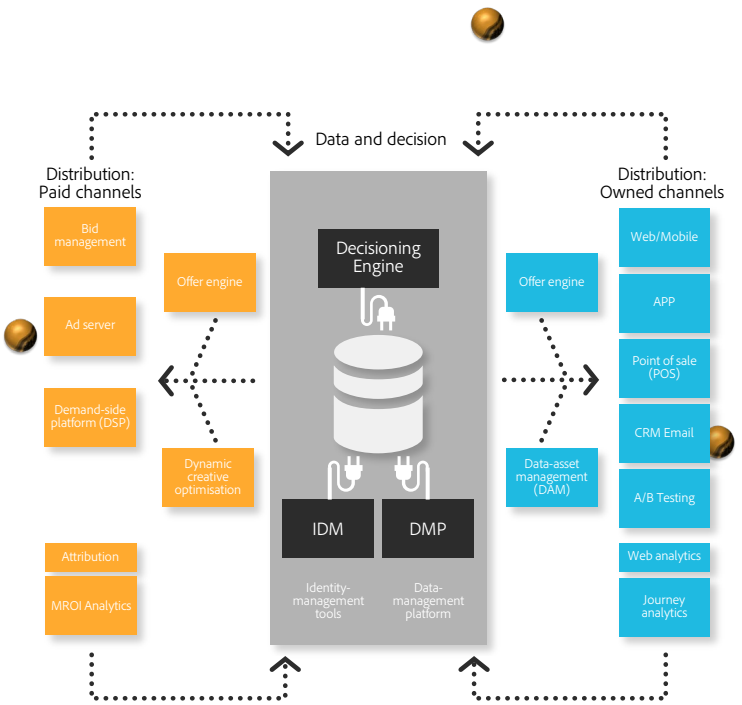
- Capability to process data increasingly faster to enable a hybrid strategy of personalising the advertising experience in conjunction with user journey management and orchestration in real-time.
- Convergence of personalised messages in owned media and targeted messages in paid media (advertising), is driving towards synchronisation and optimisation across the broader customer journey cycle.
- More effective targeted and higher yield advertising campaigns enabled by integrating aggregated pools and external data sources from ad tech systems with information related to specific individuals in customer experience (CX) platforms.
- Decisioning and the ability of CX platforms to track attribution across channels combined with the real-time bidding and optimisation of ad tech systems are rapidly intersecting with newer areas like AI/ML-based bidding and content generation.

The ability to gather these areas of data and understand them in real-time is key to successful revenue generation, whether that is through the decisioning made at a dynamic paywall or for the opportunity to monetise a moment of consumption with an advertiser or partner. This means that both speed and interoperability are critical parts of the solution. Within media, CDP technology needs to have a broader platform base that is capable of maintaining a unified profile from multiple decentralised data sets, manages governance rights and permissions, implements advanced analytics through artificial intelligence and executes in real-time.

The CDP has four key capabilities:

- Ingest and integrate customer data from multiple sources.
- Deliver customer profile and identity management.
- Support 'real-time' and dynamic customer segmentation.
- Make customer data accessible to other systems.
- Privacy and data governance controls.

Key within the capabilities of a CDP is to be the 'single brain' of the data enabled organisation. The ability to have this 360 degree knowledge and make critical decisions is largely valueless without the ability to connect, in real-time, with technologies for execution and activation. This is normally achieved through a range of published API's or connectors and open data interchange standards. Mature CDP solutions have proven, fully featured connectors and API's that work across advertising technology, CRM, marketing technology and reporting/BI solutions.



The data and martech stack to enable personalisation at scale

[1]Source: *"Deconstructing Customer Data Platforms, Winterberry Group. Bruce Biegel & Michael Harrison"*

As user behaviour is increasingly driven by multi-device and multi-channel engagement habits, engagement cycle times have collapsed. It is not unusual for a customer to engage via in-app or via e-mail, text, and social media or to enter and exit a geofence, all within minutes. As a result a data architecture needs to be able to be able to:

- Capture event-level behavioural and browsing data from websites, apps and mobile browsers and OTT platforms that users have chosen to share.
- Resolve customer identity regardless of the channel or device a consumer is using – resolve identities, segment and score, measure and attribute.
- As users become recognised, link anonymous actions to customer profiles –by capturing previous activity, third-party and contextual data and maintaining persistent profiles, CDPs power personalisation initiatives to anonymous and known customers.
- Create and manage persistent, universal customer profiles leveraging a range of keys and linkage approaches to support both CX and advertising use cases.
- Build and maintain universal audience segmentations in one place and in real-time, that can be actioned anywhere –by storing data in a single, persistent database, enabling marketers to more easily and consistently combine different types of data to get a richer view of the customer and of their cross-device behaviour.
- By capturing engagement and behaviour in a single profile, marketers can evolve beyond 'messages' into conversations that take into account a customer's previous interactions and behaviour.
- Ability to activate customer data at the moment of interaction, allowing brands to personalise content, push recommendations, next best action, channel orchestration and timing of customer communication via channels and devices. Visualise key customer experience and channel performance KPIs to evaluate ROIs.
- Support consent management and data governance by ensuring right data governance and controls are in place to enforce and apply consent globally, and also be compliant based on evolving data legislation and regulations i.e. GDPR, CCPA.

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To achieve this a CDP needs to be based on an architecture that can access the range of data in real-time. This has been made possible by a step change in software technologies that allow systems to interact and prioritise in real-time across data sets and resources. At the core of this is a de-coupled microservices architecture linked in a flexible, fault tolerant way.

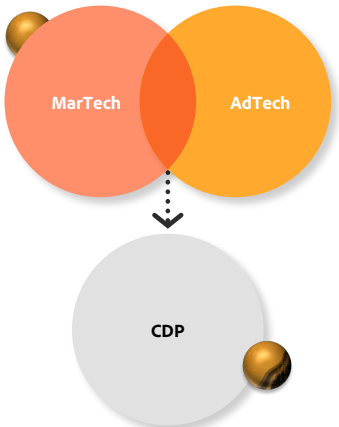
Users of a CDP need not be technically skilled software engineers - the management of contacts and communications can be done via accessible graphical user interfaces and the integration between systems, once configured, is seamless.

Data integrity
Transparent & granular customer insights

Personalisation
Orchestrated 1:1 customer experiences

Retention
Cross-sell & upsell of known customers

Owned / Earned
Marketer owned & earned environments



The first real point of convergence between MarTech and AdTech

Scale
High reach & lookalike targeting

Accessibility
Data flow from one system to another

Acquisition
Engagement with unknown prospects

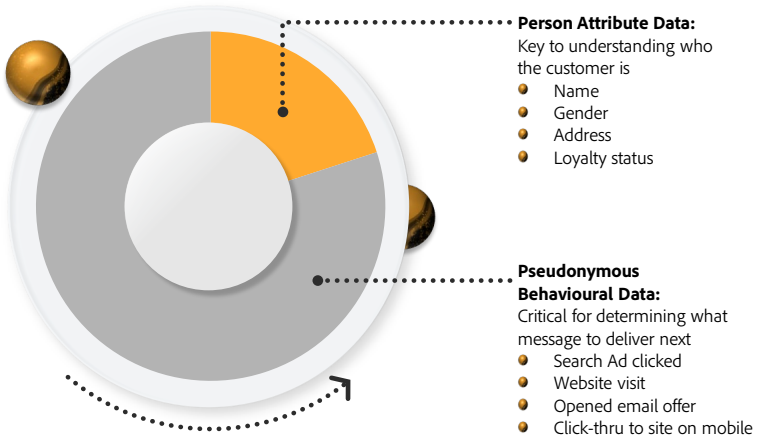
Paid
Third-party owned environments

Profiles, Disparate Data and Data Models

CDPs work by facilitating the collection of data from multiple business systems and combining it into a unified user profile. That profile must be a singular representation of the attributes of both identified and partially identified users and contain two types of data: attribute and pseudonymous. User profiles that are well known may contain detailed personal information such as name, gender, date of birth, location and contact information including phone numbers and e-mail addresses – typically the types of data found in CRM systems.

Profiles containing less identifiable data may consist only of pseudonymous behavioural signals like browser cookies. In this case, the sparse profile data may be expanded by recording the interests and preferences of the anonymous profile, which are then collated and stored. These identifiers may provide more detailed profile information over time as the subject signs up for notifications, subscriptions, purchases and so on. This increase in profile attributes may eventually result in an identified subject and allow for a higher degree of targeted engagement.

As a consumer profile continues to grow, it becomes a robust repository of personal information collected from the data subject, as well as a record of interactions with the customer – every ad sent, recommendation made, email opened, etc., – that provides historical context and informs the next engagement that the business makes with that customer.



Bringing data together within the profile is not without its challenges. The reality of digital ecosystems is that companies adopt multiple cloud and on-premise applications. Each comes with its own data model, which forces developers to build, test and manage custom code that is necessary to map and translate data across different systems. Instead of accelerating digital transformation and ecosystem advancement, this process slows innovation and leads to brittle integrations. The cloud software industry is moving to provide common standards and source code to make it easier for companies to connect data across multiple cloud platforms and disparate systems.

To help make this integration easier, many media companies and technology companies are now publishing a common data model for their software, business systems and or industry verticals. The Open Data Initiative (ODI) was created for the Adobe Experience Platform, Microsoft Dynamics 365, Office 365 and SAP C/4HANA as a way to reduce the complexities of harmonising data across cloud applications by standardising the way that data are tagged, and increasing interoperability guidelines to connect data sources. At the same time Salesforce, Amazon Web Services and Linux have created the Cloud Information Model as an open source alternative with each company using different applications, clouds and marketing stacks, along with different IT Architectures.

Ultimately, most companies, industries and digital ecosystems will end up having their own data models – leveraging as much from 'standard' models as they can, but also having unique needs in some areas that require some adaptation. The unification of data model standards will make it possible for all customer experience data to be incorporated into a common framework in a faster, more integrated way – helping companies to gain valuable insights from customer actions and define customer audience segments for personalisation purposes.

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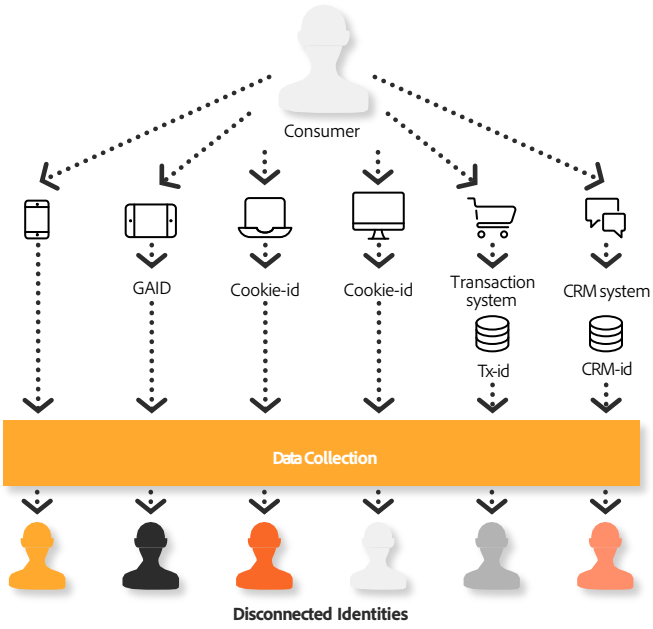
Consent, Identity & Privacy

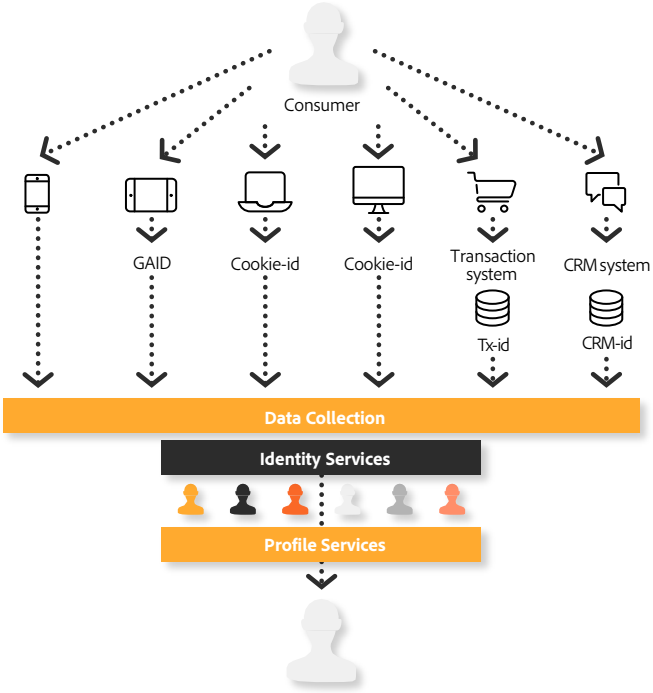
Regulation around how data is collected and used while respecting consumer privacy is leading the industry to develop more advanced identity management solutions. With an increasingly customer-centric model an identity strategy needs to reflect the user journey, with user data collected and activated in real time in a compliant way. To deliver real-time personalisation – either through content recommendations or targeted advertising - an identity strategy must have the capability to build dynamic user profiles that can manage and track user consents and permissions for both advertising and marketing use cases.

A 'unified' profile is a repository where data from multiple sources is collected in order to develop a comprehensive profile of a customer. Creating a 360 view of the user has been held back by the slow, expensive and difficult-to-sustain level of integration required across many operating systems, devices, applications and databases. As a result data has become siloed across customer applications and internal business units - e.g. registration and subscription data, mobile, web, advertising, call centre, OTT devices, Connected TV's, HDMI sticks, social, chatbot, home assistants, IoT etc.). At the same time for advertisers it is extremely difficult to know what data exists about a specific customer if they arrive via one channel and systems need to reference other data sets to target the customer with a personalised advertising experience. As well as compliance with legal and regulatory frameworks the challenge for media companies in managing consumer preferences lies in the ability of their systems to wrangle and integrate data with different consumer identifiers, structured and unstructured data and known and anonymous consumer data.

Traditional data architectures have relied on rigid identity schemas, which may suit a single application (such as e-mail or web cookie IDs), but do not capture the full range of device identifiers, user profiles and other personal data from other applications on each user. To build a unified user profile companies need to:

- Ingest and integrate customer data from multiple sources in a manner that allows opt-outs and other customer preferences to be honoured, as well as comply with applicable data protection laws.
- Include functionality for customer profile management.
- Make customer data accessible and compatible with other systems (subject to the organization's governance rules and legal requirements).





Media companies need to integrate and support an array of technologies to support real time data management, identity graph management, decisioning and orchestration, advanced analytics, customer engagement, attribution and measurement to build a strong unified profile system.

An effective identity management strategy needs to be highly contextual, and capable of 'recognising' or 'un-knowing' an individual depending upon the application and applicable legal limitations – with different rules for serving ads versus performing analytics, for example – the individual's stated preferences, the business's own strategy and the regulatory context. This is where the data architecture and taxonomy become critical, allowing different types of data to be used dependent upon the use case.

To drive a more customer-centric approach and manage consumer privacy, media companies are balancing regulatory requirements with building enhanced consumer trust solutions. Consumers want the ability to access their data and control how it is used.

Data Governance

Data Governance refers to the management of data in accordance with corporate priorities and policies, social responsibility, risk tolerance and compliance with applicable laws and regulations, as well as other legal obligations. Data governance often includes policies, processes and rules governing how data is collected, processed, stored, deleted and disclosed. In general, data governance works in three stages:

- **Data classification**
  As discussed previously, standardised data models help to simplify the integration of disparate data into normalised schemas. Data classification facilitates the categorization of similar types of information, marking data with labels such as (but not limited to) internal, confidential, restricted, or public that should be defined in the applicable data classification policy. Data may also be further categorized with labels that reflect a particular type of information, e.g., where it originated, or the application of specific legal obligations, etc,.

Contractual Data Labels

Used to label data that has contractual obligations or is related to a customer data governance policies

Identity Data Labels

Used to label and categorise data that can identify or contact a specific person

Sensitive Data Labels

Used to label and categorise sensitive data such as geographic data

GDPR Data Labels

GDPR data labels are serviced in reference to data governance policies such as GDPR

- **Data Usage Rules**
  These dictate the type, purpose, retention, disclosure and security that apply to how data may be used. An example would be that when a media company creates an audience segment for advertising, that segment must only include people who have consented to this use of their data (usage rule one) and when that segment is sent to a third party ad server, limiting the information to only anonymous data per a contract with the data broker who provided the segment (usage rule two). However, if that segment is used within the media companies own smartphone app, then it can use personal information included in the segment to serve ads to individuals who have consented to receive them (usage rule three).

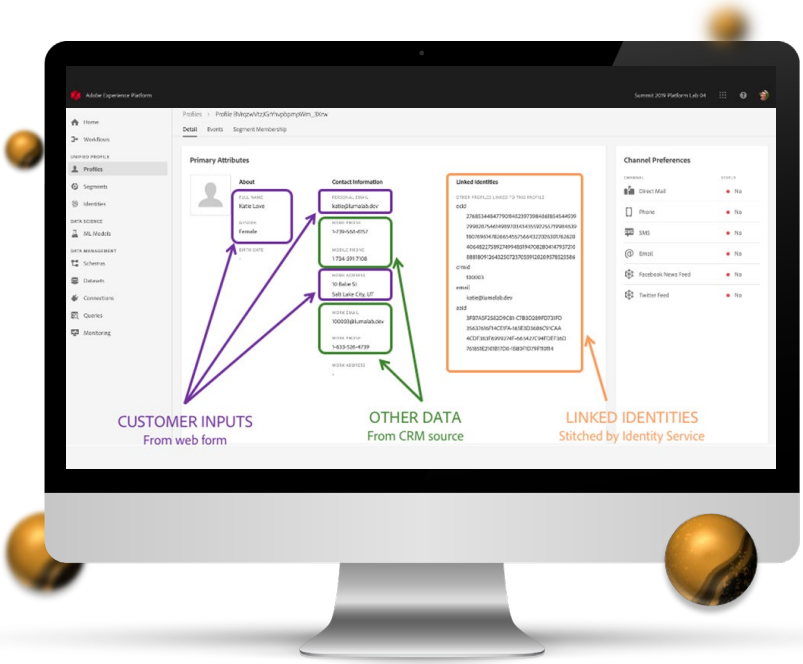
- **Enforcement**
  A good CDP will allow data to be shared only according to the data usage rules that have been created for that data. Access controls can be designed to check the data request against the usage rules so only data that complies with the applicable data usage rules can be passed to another system. This helps media companies control access, use and disclosure of personal data in accordance with applicable laws and contractual obligations.

How Enforcement on Activation Works

Evaluating Customer Data: Segmentation in real-time

Creating a unified customer profile, as we have discussed, has many benefits. One benefit, often overlooked, is that this data provides all the data needed to perform advanced segmentation.

Having consolidated data from disparate data sources into a single normalised, constantly updated, collection of attributes and events, we now have a single data source from which we can segment users into defined audiences. As the data changes in real-time, so the user profile falls in and out of the different audience segments you have created.



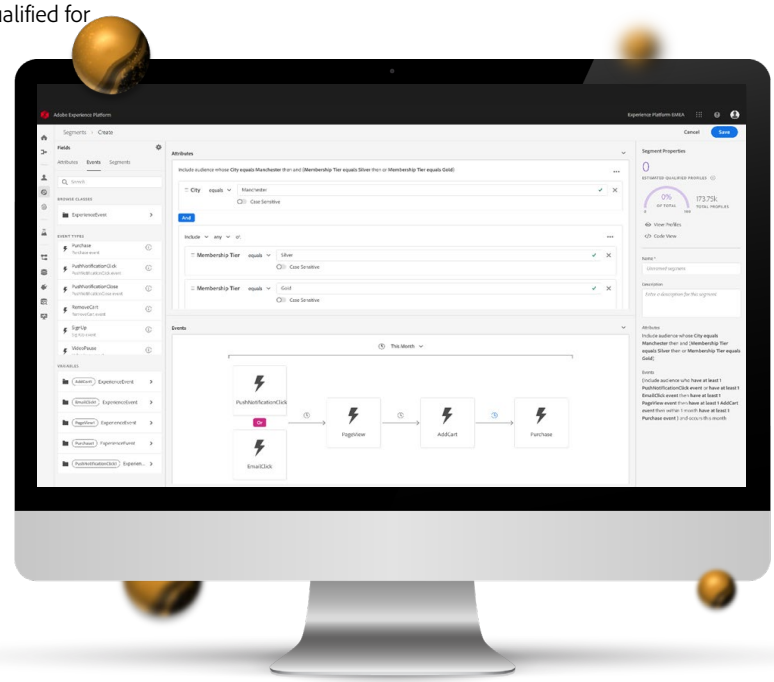
Marketing departments have been using audience segmentation for many years to discover who is relevant for what messaging, usually via a DMP. Historically there have been two issues with DMP-type segmentation:

- Audience data is usually batched, not real-time, and anonymous
- Audience segments are points in time when the user had qualified; they have no notion of time or sequencing themselves.

The first point is partly solved by CDP's, where data is collected at a known user level, potentially in real-time. The second point though, requires a different take on segmentation.

Bringing together data from attributes and pseudonymous sources increases the variety and types of data that can be used to define a segment. Additionally, as we are now using time-series event data, we have an understanding of time within the segmentation tool and can sequence events to create more complex audiences.

In the below figure, we can see Adobe Experience Manager's segmentation tool and how it allows combination of data from attributes (e.g. CRM or PoS data), events (has clicked on; has opened; has just walked into shop, etc) and other segments that this person has qualified for



That data can be used to create a typical DMP-type audience segment:

> Find people who live in Manchester, and have a Silver or Gold status in my loyalty program

Further events can now be added to provide time awareness:

> Find people who live in Manchester, and have a Silver or Gold status in my loyalty program **and**
>
> have either clicked on a push notification from me OR an email I sent **and**
>
> within 2 days viewed the product page **and**
>
> subsequently added the product to the cart within 4 hours **and**
>
> made a purchase within a day of putting it in the cart, **all**
>
> of which events happened this month

Now we can activate these people who qualify for inclusion in both the attributes and events, and the timeframe. This capability allows for more sophisticated targeting then just attribute- or event-based segmentation. As already discussed, since this segmentation decision is updated in real-time as the data changes, we are able to understand what the user is qualifying for as they actually qualify. This enables us to refocus content, adverts, offers, etc,. and thereby enable personalisation across devices and applications

Real time personalisation is becoming increasingly interesting to businesses as they seek to build stronger experiences and engagements with users. In order to make this technically feasible, many vendors are moving this segmentation capability to the edge network, ensuring the lowest latencies possible between a user's qualifying event and their inclusion or exclusion in a particular audience segment.

Being based off the Unified Profile, of course, means that when these segments are processed by systems that enact the advert or personalisation decision (e.g. Google DoubleClick or Adobe Target), labels and access controls laid out in a data governance strategy or policy can help ensure the data is processed and handled only as permitted. This ensures that the information about a user that a segment contains can be controlled by rules determining what data is allowed to go to what destination. For example, you could create a segment definition that gives you, in your app all the personal information necessary to make a custom, individually named, offer to your customer. Or, using the same segment, all identifiers are stripped before the segment is shared with a third party.

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CUSTOMER EXPERIENCE MANAGEMENT AND TECHNOLOGY

APPLICATIONS AND INTELLIGENT SERVICES TRANSFORMING CUSTOMER EXPERIENCE

- Journey Analytics
- Journey Orchestration
- Content Orchestration
- Business Application of Artificial Intelligence

Architecting the Customer Experience – Applications and Intelligent Services transforming Customer Experience.

We have outlined how business model, regulation, consumer privacy and identity are transforming data strategy and converging the previously disparate technologies of advertising and marketing. The goal of this convergence is to drive value and monetisation by creating an improved content and advertising experience for the user through personalisation along the entire customer journey – delivering real time recommendations, offers, content and targeted advertising across all channels, platforms and devices tailored to the individual.

Effective personalisation requires moving from targeting broad audience segments to targeting the individual user and having the capability to do so at scale, creating complexity in orchestration and co-ordination of data and content technologies across siloed and disconnected channels to support business strategy. As the variance in user journeys exponentiates then anticipating the next best action or experience in real time for the user moves further beyond the capability of data science to map the user journey and deliver the right experience.

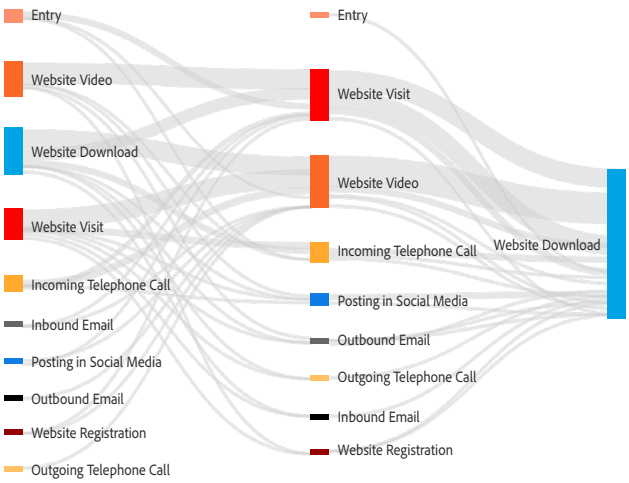
In this section we look at how increasingly, machine learning and artificial intelligence developed within core marketing products and applications are being used to optimise decisioning and infuse intelligence into data and activation technologies to build a true customer experience architecture.

Journey Analytics

Media companies collect mountains of data – both structured and unstructured – in their quest to better understand their users. To understand what drives someone to purchase a news or OTT subscription and build an efficient strategy, it is necessary to quantify and understand how each stimulus, both on-site and off-site, influences and contributes to traffic, user registration and subscription. The challenge is not just collecting more data, but how to integrate, model, understand and activate that data across the business. It requires the right data, from all channels, working together to paint a holistic picture of the customer journey, as well as the right tools to model the journey and quickly activate discovered insights.

To address identity and at the same time scale and monetise content and audiences there are challenges in current infrastructure:

- Operationalise data – data remains siloed across systems, communication channels and organisational functions.
- Volume of data – traditional database approaches cannot handle real-time data.
- Restricted to personalisation in individual channels based on a visitor's modelling.
- Fail to take a holistic view of a consumer across channels and over time.
- Leverage a fraction of the available data, and struggle to activate the data that they do have in a broad range of use cases.



Analysis of multiple data sets is required – web browsing and mobile application data, product and content consumption, social media interactions, transaction data, marketing automation data, contact centre information and digital advertising performance. Each potential subscriber is exposed to different content, advertisements and messages both on and off-site – and an increasing number of connected devices. Separating these influences is an overwhelming task but understanding the power of content and marketing drivers is necessary to build an effective subscription business.

Typically campaign effectiveness is being measured within silos using separate tools for web analytics, mobile analytics, social media sentiment analysis, CRM analytics and more. Data are fragmented, and analytic results provide only siloed views of the customer experience (i.e., the website experience, social experience or the mobile experience). This gives rise to need for an ability to analyse customer journeys and media impact across all channels, based off the understanding that a potential client will likely receive messages, offers and marketing across a multitude of channels, and so a coordinated, multi-channel, understanding of their user journey is needed.

Most current analytics methodologies offer the ability to determine signal from noise, but each comes at a great cost in terms of both time and money. For data scientists a considerable amount of time and resources can be spent passing data, validating it, building a model and gaining the necessary insights. Due to the steps required, a typical model can take weeks to come to fruition. But media companies need to deliver user experience and user journeys more immediately.

The challenge is to build and quantify all drivers holistically and create a data science process to decouple competing subscriber-conversion events; to create a time series, multivariate regression model to understand how individual channels are driving subscriptions.

The most important dataset is 1st party event based on-site behaviours – it can help media companies to understand what content may be impacting subscription but at the same time understanding what off-site influences drive traffic is critical. Almost all of this data comes from third-party social platforms, but generally is used by analysts and marketers in a siloed UI. Data accessibility is an obstacle, so it is necessary to build APIs of each external data source to funnel into one cloud storage.

This data is streamed into a central data warehouse, but typically in different formats that cannot be easily pulled into a statistical model. For that technologies such as Python is used to clean and format the data and to run complex regressions to create insights. Creating a cloud-based reporting infrastructure connected directly to the data warehouse allows for the data inputs for modelling to be transformed and directly pipelined to analysts who can monitor the data for accuracy as soon as it is ingested from the APIs. Data validation is thus a daily process which allows data analysts to focus their effort on modelling. Often in data science the majority of the time spent on building a model can be in the prep before any actual modelling has taken place and therefore reducing the time spent for processing is critical – ingestion, manipulation, migration to activation points and data visualisation tools via API's needs to happen in real-time and be one rapid and simple process and reducing friction from a process rife with data transfers is essential to getting answers quickly.

It is not only the capture, storage and manipulation of the data that matter, it is also key that availability is immediate – real-time is the baseline across all data and analysis, and this brings with it some particular challenges of scale and architecture. The underlying architecture of data platforms can enable the scalability, future proofing and flexible monetisation of data.

The underlying architecture of data platforms can enable the scalability, future proofing and flexible monetisation of data

Journey Orchestration

Customer journeys today are non-linear, customers start their journey in one channel and want to switch to a different channel or device – however they expect an un-interrupted customer experience having the ability to pick up where they have left previously. For example, this might be watching their favourite show during their commute on a mobile app, and later switching to a connected TV, or reading a news article on mobile publisher App, and switching to desktop news website.

The ability of a CDP to detect user behaviour in real-time offers up a new opportunity for media companies: personalised user journeys. All media businesses, whatever their business model, need to guide users towards a certain direction; towards the subscription package we need to sell them, or towards the next generation application. Journey Orchestration (JO) provides that capability.

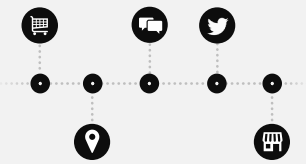
Journey orchestration works by recognising a 'trigger' in real-time (user has clicked on, has abandoned a cart, has opened an e-mail, etc), and then making a decision about what the user journey needs to be to re-engage that user – perhaps an SMS reminder within a couple of hours of the event, or a further discount to sweeten the subscription deal, sent by email.

Utilising machine learning (ML) to determine the propensity of certain actions to lead to certain outcome, JO anticipates what the user might do, based on the ML algorithm having learnt from thousands of previous user event, actions and journeys what the probabilities are. Having established the likely way to entice the customer, JO can then be used to select an appropriate user journey for that user, which can involve several stages of communication or recommendations, etc across multiple channels.

Building Blocks for Journey Orchestration

1

Anticipate
Events



Each journey starts with a real-time event, which includes customer interactions and profile updates

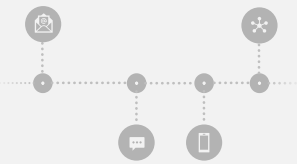
2

Orchestrate
Journeys

As events occur, applied conditions guide customers through the most optimal in-moment experiences

3

Personalise
Experiences



Based on the conditions, relevant experiences are delivered across all channels through any system

For each stage in that journey, the actual message or offer or recommendation can be personalised for that specific user – bearing in mind the governance of that data – increasing the statistical likelihood of a successful end result.

Content Orchestration

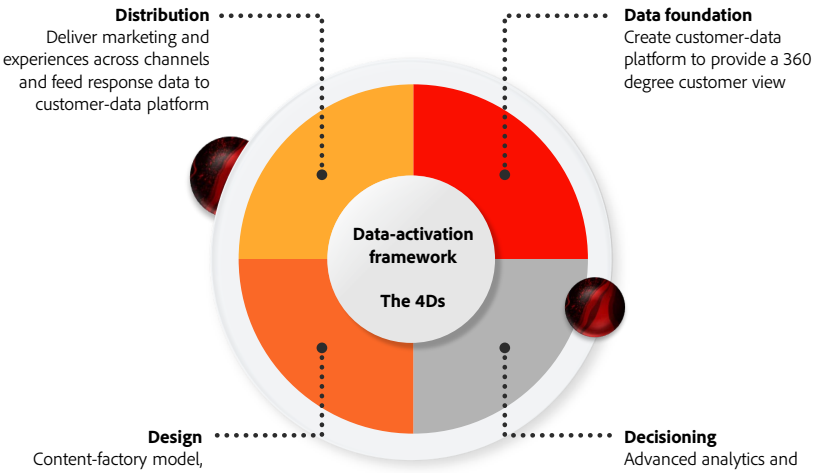
Media companies are in the trenches of digital transformation, challenged to balance fostering creativity with increasing demands for productivity and speed from their businesses.

To meet the expectations of consumers, content production and distribution must incorporate high-quality service elements including UX design, easy and intuitive navigation, personalisation and customisation elements. From a digital delivery standpoint, this means an increased emphasis on high performance across the content workflow including ingest, encoding/ transcoding, metadata and analytics data and also a requirement in digital distribution to support not only linear and non-linear services but also a wide range of social channels and platforms.

Given the variance in viewing and consumption trends the delivery, service offerings, and video workflow demand across different services (e.g. live streaming, on-demand, broadcast, pay TV services over STBs, or web-based OTT services) is under pressure and at present there is little standardisation of the end-to-end workflow. As consumer adoption of proliferating platforms evolve, so do digital workflow needs, including simultaneous encoding/transcoding for multiple content formats, coordinated content distribution for on-demand, analytics and metadata frameworks. Cloud-based digital content workflows are creating efficiencies in the way content is orchestrated and distributed over multiple concurrent channels and developing reliable and scalable content management system (CMS) and digital asset management system is complex and time consuming. Delivering a CMS that supports easy and frictionless consumer access to content across extensive libraries, is a critical facilitator of positive consumer experience.

With the increasing importance of direct to consumer services and UX, media companies are moving towards expecting customer-centricity and creative teams need increased access to and fluency with data to understand consumption patterns, increase personalisation and engagement but also to inform and justify creative decisions.

In undergoing digital transformation to improve the uniqueness and quality of content and creative output media companies need to evolve and integrate data into the content workflow to measure the success of content output. As well as improving UX the demands from the content process has to demonstrate how it can impact the bottom line by demonstrating the ROI for the business and also increase quantity of creative output and reduce cost per output.



Reference: https://www.ibm.com/blogs/think/2016/08/cognitive-movie-trailer/

Media companies are also increasingly embedding cognitive capabilities to streamline their authoring workflows, using these systems to drive automated processes to support categorisation, translation and authoring of assets and digital content. Artificial Intelligence is also being used more creatively upstream to analyse 100's of film clips and content to create an algorithmically perfect movie trailer. IBM has partnered with 20th Century Fox to develop first-ever "cognitive movie trailer" for its suspense/horror film, "Morgan", and with FIFA to develop World Cup Highlight Machine, a one-of-a-kind, cognitive-based platform that lets fans create and share their own customized soccer highlight videos.

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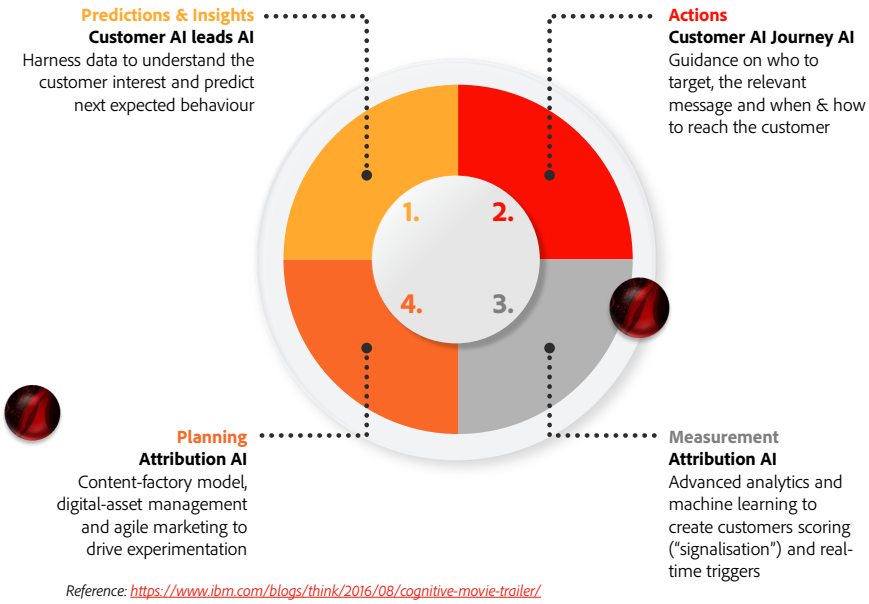
[1]*Reference: https://www.ibm.com/services/ibmix/case-studies/fox-sports.html*

Business application of Artificial Intelligence

The core challenge for media companies lies in their ability to coalesce product and application development life cycles with data infrastructure activities to address the digital user journey. The need for this ability will only increase as the number of apps, devices and ways of consumer interaction increase, which in turn requires more data analysts or support engineers.

For most businesses, understanding their customer, improving operational efficiencies and reducing cost of operations are the main drivers for automation. With the increased volume of data available, sifting through it all and identifying trends can become laborious. Converting this into data to use in personalisation of content or offers to the customers is equally time consuming, especially in the rapidly evolving world of broadcasting and media where watching habits can change overnight. Using AI to analyse, interpret and cross-reference all of this data can provide organisations with the ability to provide customers with near-real-time promotions, offers or recommendations.



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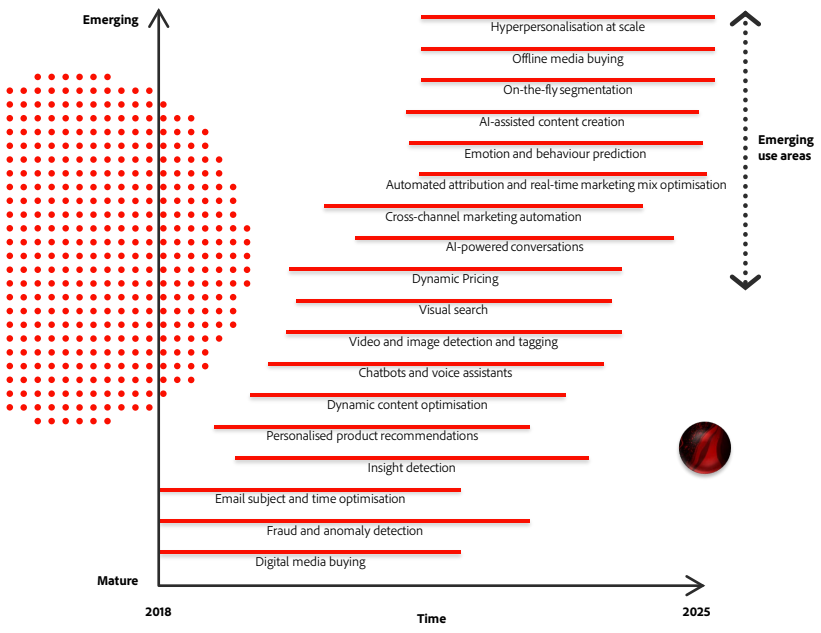


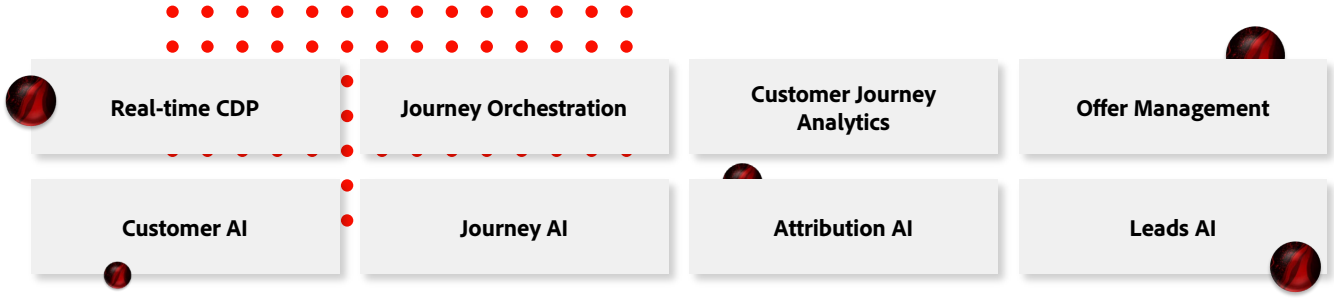
Given the range of data assets and data points the key requirement of any operating model is to not only to automate and scale of processing of data but also to minimise the time that data scientists time spend preparing data sets for analysis – rather than building algorithms – to maximise the benefits of intellectual input and automation.

At a functional level, a library of prebuilt algorithms, with an accessible and modifiable codebase is needed. The success of Python as a common data science solution has been based partially around the prebuilt code that is freely available via the Pandas library. However, the disadvantage of this approach is that the data wrangling remains and while this is useful in data exploration, it is not the solution for scale.

Supported by a robust data infrastructure the use cases of AI and ML are increasingly emerging across all areas of operations and these are exponentiating as efficiencies and business applications are realised.

The ability to mechanise and optimise existing analysis via machine learning algorithms to build propensity models, make recommendations, promote content or dynamic offer management means that timing is critical to the modern media revenue model. However the current state is not a scalable ratio and is indicative of the toolsets and ways of working that have existed to date. Journey analytics and orchestration allows brands to optimise interventions to drive experience or revenue outcomes with user journey maps used to identify the stages a customer might go through to register, subscribe and buy and use products.

The need for this ability will only increase as the number of apps, devices and modes of interaction increase. This requires the right specialised cloud infrastructure to integrate required systems and bring data together to deliver new experiences in real-time. Developers are also using prebuilt services to add AI functionality to their own applications, without having to develop models from scratch to extract, clean and visualise relevant data, all without the need for technical expertise.



Intelligent Services enable analysts and practitioners to leverage the power of artificial intelligence and machine learning in customer experience use cases. This allows for analysts to set up predictions specific to a company's needs using business-level configurations without the need for data science expertise.

Intelligent Services gives marketers responsible for customer experience access to AI-as-a-service, making it easy for anyone to predict customer behaviour, measure the impact of a campaign, or ensure better return on every investment. Listed below are some of the benefits that Intelligent Services provides.

- **Cost efficient speed to market**
  Intelligent Services have been designed specifically for marketers to get AI/ML off the ground immediately for common marketing use cases without the need to hire scarce and expensive data scientists, accelerating speed to market and actionability.
- **Higher accuracy in predictive insights**
  Developed with a higher level of accuracy resultant through the adoption of advanced algorithmic AI/ML models; the ability to run AI/ML on a common dataset with the depth and granularity to enable slicing and dicing of predictions; and intelligence to provide the what and why behind predictive customer insights.
- **Fast time to insights and ROI**
  Enables analysts to immediately deploy AI/ML right and start improving marketing ROI with new self-service workflows, custom configurations and flexible options to operationalise predictive insights.

Intelligent Services enable analysts and practitioners to leverage the power of artificial intelligence and machine learning in customer experience use cases. This allows for analysts to set up predictions specific to a company's needs using business-level configurations without the need for data science expertise.

Adobe × IBM

THE COGNITIVE ENTERPRISE

OPERATING MODELS, TECHNOLOGY INFRASTRUCTURE AND PLATFORMS

- Technology and Infrastructure
- Decentralising Systems
- Decentralising Data Management
- Customer Experience Architecture
- Platform Blueprint for the Cognitive Enterprise

Technology and Infrastructure

Decentralising Systems

In moving to a broader ecosystem framework many large organisations find themselves constrained by legacy technology, applications and infrastructure. These legacies tend to have formed a centrally developed and managed enterprise system that is difficult to replace and equally difficult to integrate with other systems or other organisations. With the increase in global distribution of content and collaboration projects, it is important that these enterprise systems have decentralised applications and data to reduce complexity; reduce cost to all and allow data to be available in real time.

As data and content workflows become increasingly digitised, there has been a huge increase in the demand for hybrid-cloud computing - an infrastructure architecture that connects public cloud services to private, local area, or on-premise cloud services. Many of the world's largest media organisations use hybrid-cloud as a way to benefit from the scalability and flexibility of the public cloud to store and stream media while maintaining the security and control of on-prem infrastructure.

Linux Spark XDM aws R

Google Cloud TensorFlow python

MySQL Red Hat Microsoft Azure APACHE kafka A distributed streaming platform

The cloud environment simplifies the development, deployment, and management of application development across disparate types of infrastructure that encompass 'edge' processing across identity, data, applications, platforms, security and management and this accelerates diversification and launch of products and services. And this will only accelerate with the roll out of 5G.

Compared to other industries, the media sector is one of the most advanced in its adoption of open-source software, microservices and event streaming to support development of new products and innovate business models. Open-source applications can have fast adoption and this virality also allows for open-source software to deliver a far more efficient technology backbone for systems to talk to each other – and due to the open nature of the platforms, they often allow for greater customisation to requirements than proprietary solutions.

The cloud environment simplifies the development, deployment, and management of application development across disparate types of infrastructure that encompasses the edge across identity, data, application platforms, security and management which can encourage the rapid diversification and launch of products and services. And this will only accelerate with the roll out of 5G

Enterprise media companies invest in technology, whether the software is open or closed, and they are more incentivised to use commercial software if they can understand the underpinning systems, know that the platforms are well supported and documented and include the ability to develop on top of the code. Open source is no longer seen as a fringe approach to software and the media industry is increasingly moving to have their core software systems be open source.

Micro-service Architecture

Software applications as suites of independently deployable services

Decentralised Governance

Developers responsible for all aspects of the software development and operations

Decentralised Data Management

Decentralise data storage decisions different instances of the same database technology

Infrastructure Automation

Putting components into services adds an opportunity for more granular release planning

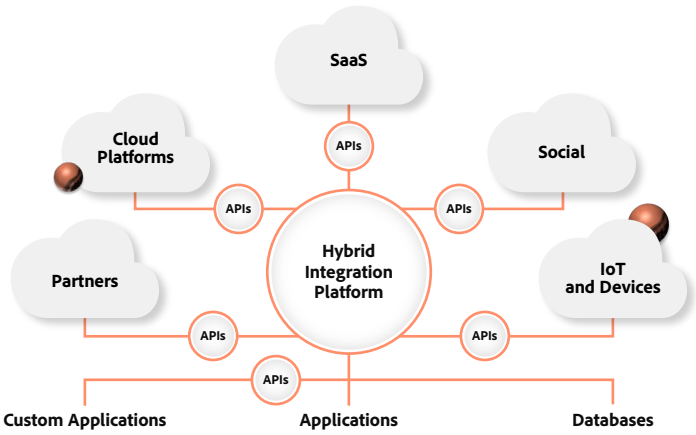
Decentralising Data Management

With the decentralisation of the systems and some applications being remotely hosted, it would appear to become more complex to provide a simple overview of the data and functionality without the need for expensive, lengthy integrations and data replication processes. This is where development best practices and micro-services can simplify things and ensure continuity of service without the lock-in inherited with enterprise applications or system integrations.

By splitting components out into services, developers can have a broader range of choices available.

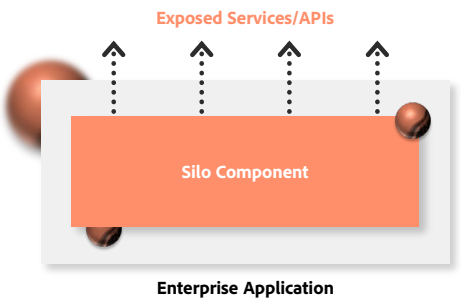
- Where is the data stored?
- What is the most appropriate way of retrieving the data?
- Which languages are most appropriate for the functionality?
- Is this application still the right choice?

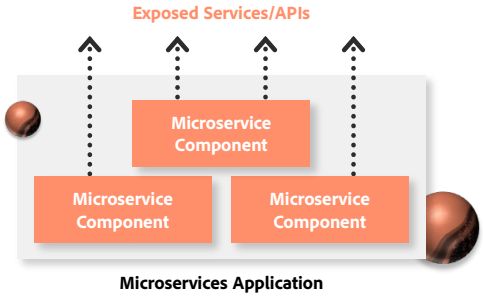
API's and hybrid clouds



APIs unlock the data and functionality of applications in the hybrid cloud environment.

In an enterprise architecture, you would have a lot of these decisions already made for you by the original developers, which makes sharing data or systems with other parts of the business, or external partners, that much more complex as data is unlikely to be standardised and creating new interfaces would require large changes to the system. By breaking the application up into smaller, network connected, components through a microservices framework, the data interactions can be managed more easily. Another integral part of these distributed platforms is the addition of event streaming platforms, which enables data to be sent or retrieved in real-time, allowing for real time responses to customer requests though personalisation, recommendations or promotions.





IT teams building microservices have a different approach to standards - rather than using a set of defined standards, they prefer the idea of producing useful tools that other developers can use to solve problems. Some of these solutions may be open source applications that have been adopted by other developers; others may be services created within the enterprise that can be modified to fit different requirements.

As organisations create microservices and data models to share information, it is important to design these in a standardised way that prevents being locked into legacy or proprietary systems. If each organisation creates their own data model for something like Customer profile information, it becomes just as difficult to coordinate sharing of data as remapping exercises need to occur, which introduces the risk of error and removes the ability to automate processes using cognitive tools. A good example of this was Goldman Sachs making all of their analytical tools open source to allow easier transmission of data with partner organisations and working to standardise communication methods for data within their industry. Prior to this, they were having to reformat every piece of data that came into them, or had to be supplied to a partner/customer. By helping their industry standardise, they can reduce business costs.

As organisations create microservices and data models to share information, it is important to design these in a standardised way that prevents being locked into legacy or proprietary systems

Microservices decentralise data storage requirements. While Enterprise applications prefer a single database for data, enterprises often require database instances across a range of applications. Microservices let each service manage its own unique database, either different instances of the same database, or an entirely different database based upon a set of unique requirements. Some systems will require relational storage of data; others the faster access of NoSQL systems. As we have seen modern data platforms reflect this shift and operate as a 'virtual' data layer allowing decentralisation of separate data systems and only pulling relevant data in real time based on triggers.

Using a devolved application set with microservice connectors eases upgrades or replacements that many organisations hit with enterprise systems. Because the overall system has been broken down into smaller sub-systems, each with microservices connecting them, one application can be replaced by another by simply updating the microservice so that it understands data from the new system and maps it to the expected service outputs for all of the other applications.

Increasingly media companies are using this decentralised approach to give development teams more responsibility to maintain and support each iteration of a product as it is developed, built, tested, packaged, and released. This is the concept behind a DevOps approach of continuous development, testing and integration and supported with automated testing and data management thereby streamlining how the business evolves with the rapidly changing landscape.

Customer Experience Architecture

Alongside the advancements in data platforms, cloud infrastructure and technologies mentioned, media companies are having to reinvent their CX architecture by evolving their culture and ways of working in order to fully exploit new capabilities and design customer centric strategies they are able to execute. This means moving away from the internal organisation siloes of channel, product or function and orienting around the customer's context, needs and preferences to drive hyper-personalisation at scale, while respecting consumer privacy..

A data led Media enterprise by design has an integrated CX architecture that connects Data, Platforms and Operations with intelligent workflows and agile ways of working to deliver hyper-personalised customer experiences at scale, while achieving business growth and operational efficiency.

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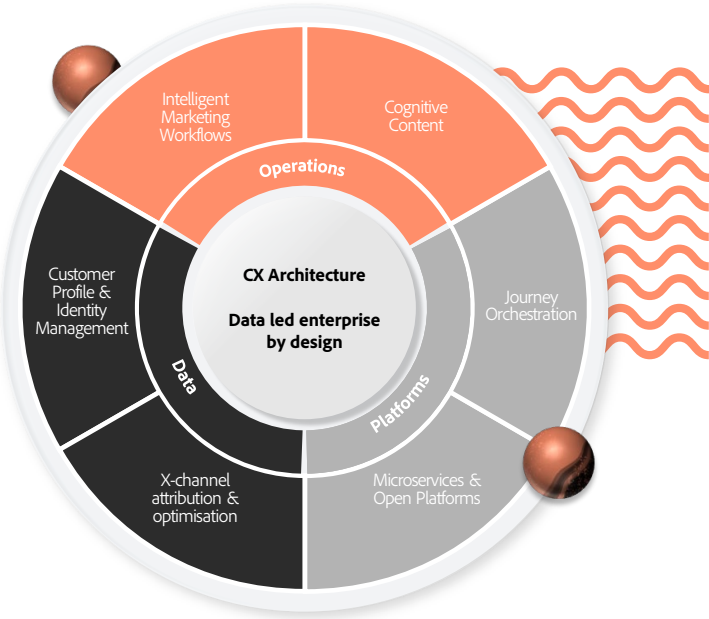


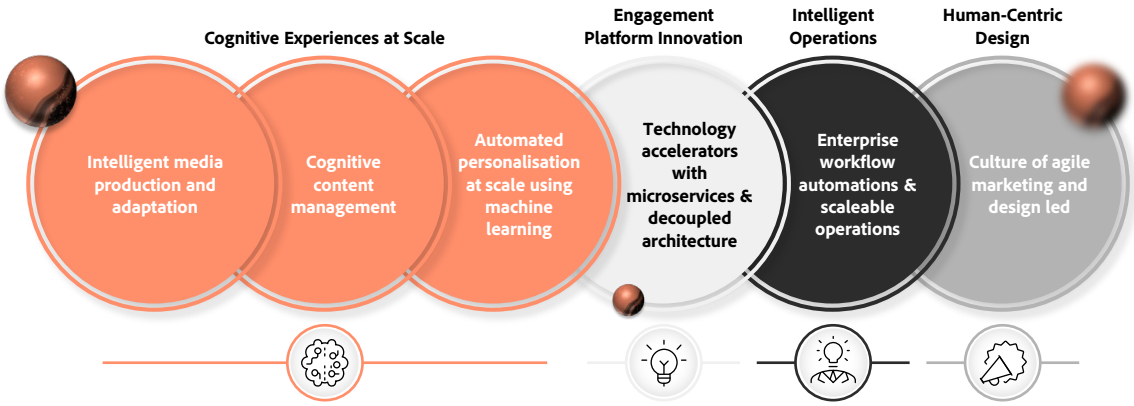
Source: IBM

Media companies that use data to create competitive advantage and new market opportunities tend to exhibit the following traits:

- A culture that embraces the power of data and insights to inform decision making across business functions and is not just nestled within the data and analytics teams. It needs to be ingrained in the fabric of the business.
- A clear data strategy and open source data model underpinned by a strong understanding of what data you have today, what is missing, what data is being utilised and what new data you need to collect, and how all of this is made available for decision making. Newer developments like ODI and standardised data models deliver the ability to stich data across all enterprise functions (Marketing, Sales, Service, Product & Finance).
- Is not constrained by internal silos of various functions leading to varying levels of customer experience depending on the touch point / channel but speaks with a single voice and is aware of customers context more holistically integrated across the enterprise. This enables customer journeys that are well orchestrated across every interaction irrespective of the channel and provides an enhanced customer experience.
- Respects the privacy of their consumer's data ensuring that business processes, platforms, staff and external agencies are fully trained.
- Is enabled by an ecosystem underpinned by an architecture allowing real-time data flows, intelligent components and microservices with open APIs that are more about configuration than customisation.
- Is able to operate through intelligent workflows exploiting the volumes of content available with an agile test and learn approach freeing up employees to take on more complex tasks and drive innovation initiatives.

All of this requires a top down commitment and sponsorship of the C-suite, coupled with enablement and training programmes that embed this approach into the fabric of the business.

This evolved operating model enables media companies to move from traditional personalisation with limited segment and content variation to a more dynamic segmentation based on contextual data that triggers automated workflows increasing content velocity, hence delivering hyper-personalisation at scale.



This evolved operating model with CX architecture and technological advancements is enabling media companies to move from traditional segmentation and limited content variation to a more dynamic segmentation triggering automated workflows and increases content velocity hence delivering hyper-personalisation at scale

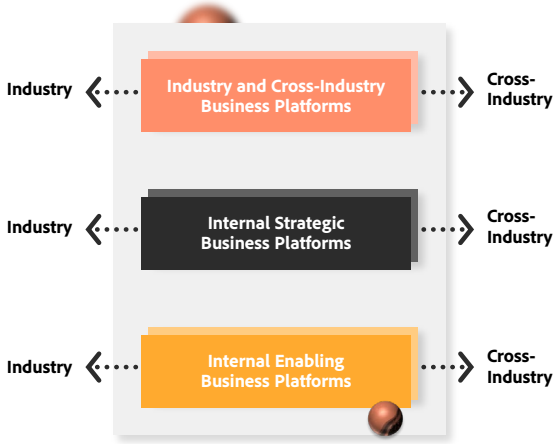
Platform Blueprint for the Cognitive Enterprise™

The media sector, faced with ongoing competitive disruption is embracing the next stage of digital transformation and the industry will see technology, data, infrastructure, operations and strategy further coalesce around a more customer-centric approach leading to business models and digital ecosystems become increasingly complex. As platforms connect broad categories of complementary products and services and extend into adjacent markets and as the number of applications proliferate then technology infrastructure will need to support not only owned and operated systems and platforms but also enable interoperability within the broader external ecosystem - thereby allowing each to interact and influence each other through both linear and non-linear relationships. Successful execution of business strategy will therefore be contingent on robust and scalable technologies with platforms able to be digitally connected from the outside-in and fully cognitively enabled from the inside-out.

These platforms take a number of forms and will refocus organisations on their respective core advantages with each layer interlocking to create cognitive capability:

- Internal Strategic Platforms. Embedding differentiated workflows that define the next instantiation of competitive advantage
- Internal Enabling Platforms. Dramatically more cost effective and flexible front-, middle-, and back-office processes
- Industry Platforms. Upon which multiple industry players can benefit from new digital, cognitive, and cloud capabilities
- Cross-Industry Platforms. New ecosystems that straddle industry boundaries in areas such as telecoms, media, entertainment, and more.

Cognitive Enterprise platform choices
Companies must make fundamental choices a they refocus on their core advantage



Source: IBM

Becoming digital was never the destination for most organisations but it is a stage in transformation and that journey starts with data and the supporting technologies that extract its full value to then create intelligence and synchronise data and content workflows. As media companies move increasingly towards becoming Cognitive Enterprise they will be composed of multiple business platforms interconnected by a series of microservices with one or more of them acting as the primary platform(s) to create differentiation for the business.

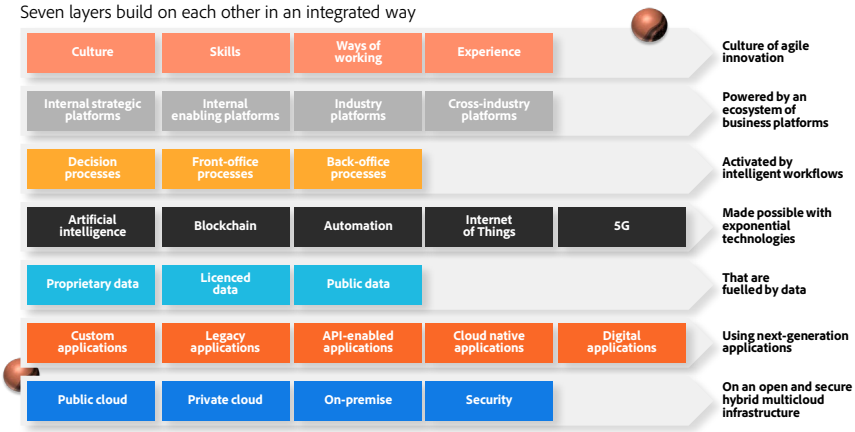
From a strategic perspective, these platforms will:

- Be the new instantiation of the strategy of an organisation.
- Act as a 'North Star' for change programs and investment priorities to help navigate from legacy capabilities to the future.
- Form the basis of and act as critical connective tissue with other ecosystem partners and networks.
- Continuously learn and keep getting smarter over time through AI and machine learning.

Organisations will also leverage secondary or supporting platforms such as decisioning and back-office processes, as well as underlying technology suites used to partner with other industry players and third parties to create multiple layers that extend through infrastructure, applications, data and workflows to shape the structure of the organisation:

Future business platforms are being built on new and dynamic intelligent workflows that connect front and back-office processes end-to-end. These workflows are transformed by exponential technologies – AI, blockchain and IoT, for example – that use permissioned sources of data to put situations in context and generate insights that improve processes and allow employees to make better and more timely decisions. As applications span new and legacy solutions then these will increasingly be supported by an open, secure and hybrid multi-cloud infrastructure allowing platforms, intelligent workflows and new technologies to accelerate application development cycles and support product diversification and time to market.

IBM – The Cognitive Enterprise
Seven layers build on each other in an integrated way



Source: IBM

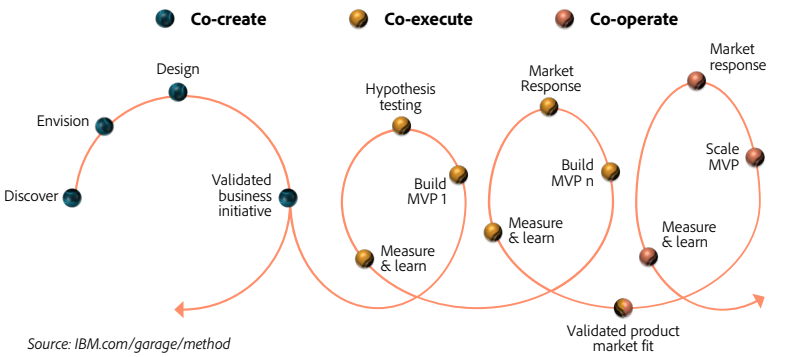
The ability for media companies to embark on this next wave of transformation requires a fresh approach to develop new skills and de-risk the transition from legacy environments to new platforms in a synchronised manner. As a result on an organisational and process level each of these capability layers need to be wrapped in an agile, skills-based culture that fosters new ways of working and drives new employee experiences.

As applications span new and legacy solutions then these will increasingly be supported by an open, secure and hybrid multi-cloud infrastructure allowing platforms, intelligent workflows and exponential technologies to accelerate application development cycles and support product diversification and time to market

In this environment cross functional teams can come together with strategic partners to co-create, co-execute, and co-operate on the new business platforms and such environments can jumpstart innovation by putting technology and architectural options into the context of customer journeys, critical workflows, pain points, and value potential and allow for early testing of ideas against customer feedback and thereby avoiding wasted activity.

Further digitisation within the industry will see rapid evolution in the dynamics of competition as media companies vie for differentiation and routes to build direct relationships with consumers with the regulatory environment expected to play a significant role in establishing what the future state will look like. In that context companies with the best chance of success will ensure clearer alignment between technology and business strategy in order to move at the speed of a start-up but at the scale of an enterprise.

The IBM Garage™ Methodology: How creativity and practicality come together to craft a new future



Source: IBM.com/garage/method

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