Enforcing accountability in media

How blockchain technology can work for media and entertainment

IBM Institute for Business Value

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In this report

Getting a step ahead

The media and entertainment (M&E) industry stands to garner significant benefits from blockchain technology. The core attributes of blockchain's shared ledger approach can help provide transparency, trust, efficiency, speed, security and control across the media supply chain for all points in a transaction process. This is particularly important in the delivery, consumption and payment for media content and in advertising. Moreover, blockchain can help curtail ad fraud – such as clicks made by bots, instead of humans – and copyright infringement. Those M&E companies that begin creating a blockchain solution now have the potential to get a step ahead of competitors.

Time for a change

Companies in many industries – from finance and healthcare, to automotive and retail – have been exploring blockchain technology for its possible benefits. But what's in it for media and entertainment? What positive impact will blockchain have on existing media value chains, processes and costs? Will it help create opportunities to generate more revenue and develop new services?

Blockchain creates the potential to transform how media content – such as music, video and other types of entertainment – is delivered, consumed and paid for. Current systems were not designed to manage complex, personalized content and service bundles. It is extremely difficult in today's digital ecosystems to manage the digital rights, royalty collections and the transactions among a large number of intermediaries. Blockchain, with its shared ledger approach, can help to improve the media supply chain and decrease copyright infringements by adding transparency, security and control. As an example, it may decrease copyright infringements in music streaming where publishers and songwriters are regularly accusing music streaming providers – such as Spotify, Napster and Pandora – of not paying all they are entitled to, missing as much as 25 percent of streaming royalties.[1]

30%

of surveyed M&E executives say they believe blockchain could support their enterprise strategies by reducing transaction costs through elimination of intermediaries

62%

of surveyed M&E executives say partnering with media supply chain partners is “somewhat” to “very important” to move forward with blockchain technology at commercial scale

73%

of surveyed M&E executives see partnering with technology providers as “somewhat” to “very important” for developing and delivering real and relevant solutions to the industry

Greater transaction transparency in advertising helps eliminate waste by better identifying which intermediaries are taking a cut of the advertiser’s budget at every step in the process. Currently, only 38 to 46 cents of each advertising dollar spend ultimately reaches the intended media outlet.[2] Blockchain helps target the right people with more timely and relevant ads, reducing advertising load and optimizing advertising revenue. In addition, blockchain can counter ad fraud techniques, such as bot networks and domain spoofing, that create impressions and clicks not triggered by humans. A report from Juniper Research indicates that advertisers are likely to lose an estimated USD 19 billion to ad fraud in 2018, and that this will continue to rise, reaching USD 44 billion by 2022.[3]

Some large media players have already started the journey with blockchain. For example, in 2018, Comcast announced the Blockchain Insights Platform with NBC Universal, Disney, Channel 4 and others to match audience datasets — without sharing data — to better plan, target, execute and measure advertising.[4] In music, Spotify acquired the blockchain start up Mediachain Labs to work on developing better technology for connecting artists and other rights holders with the tracks hosted on Spotify’s service.[5]

Thinking blockchain in media and entertainment

The different segments of the M&E industry, such as publishing, advertising, music, and television, are characterized by dynamic and evolving ecosystems that have become increasingly complex. The digital transformation of the industry opened the path for new players that brought in new business models. Google and Facebook, for example, showed how to succeed with digital advertising. Content apps provided music streaming, such as Spotify and Pandora, while other companies focused on streaming video services, such as Netflix and Hulu. Many smaller players found a spot in the new value chains, providing specific products and benefits to their clients. Nonetheless, the context of these value chains is under constant change, and their final shape will be defined by those players that can innovate and compete better.

The relationships among the participants in M&E business networks with cross geographic and regulatory boundaries – such as advertisers, publishers and agencies – have become increasingly complex. Value is generated by an exponentially growing flow of transactions and contracts for products and services across these networks. The volume of activity creates an overarching need for improved transparency and trust so that new standards can be set for how data is exposed and shared and how costs and benefits are measured.

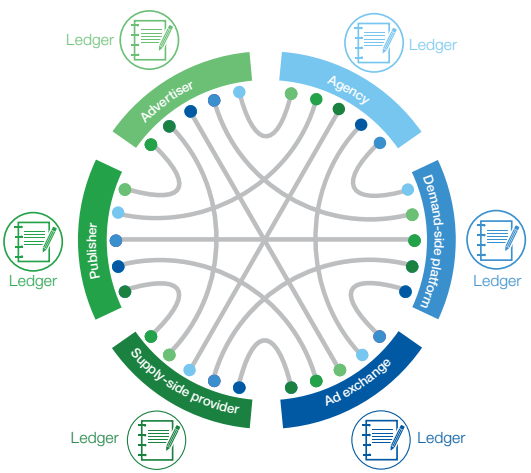
The business network operates by transferring assets between parties. Anything capable of being owned or controlled to produce value is an asset. Two fundamental types of assets exist: tangible (a mobile phone, for example) and intangible (advertising inventory or a copyright, for example). Shared ledgers are the key to successfully managing assets across the network (see sidebar: *"The key components of blockchains"*). Businesses have multiple ledgers for the multiple business networks in which they participate. Ledgers include transactions (an asset transfer on or off the ledger) and contracts (conditions for a transaction to occur).

The key components of blockchains

Blockchain technology includes the following components:

- *Shared ledger* – An append-only distributed system of records shared across the business network that provides transaction visibility to all involved participants.
- *Smart contract* – Business terms embedded in the transaction database and executed with transactions for which they apply
- *Privacy* – Transactions are reliable, authenticated and verifiable.
- *Trust* – Transactions are endorsed by relevant participants.
- *Transparency* – All participants in the network are aware of all transactions that impact them.

Figure 1
Managing assets across the business network is challenging without blockchain



Source: IBM Institute for Business Value analysis.

The simple example of how advertising messages are delivered to consumers provides some insight as to how blockchain can benefit all parties. Consider a simplified digital advertising value chain composed of an advertiser, an ad agency, a demand-side provider, an ad-exchange, a supply-side provider and a publisher (see Figure 1).

Each participant keeps one or more ledgers that are updated to represent business transactions as they occur. This is not cost-effective nor efficient due to duplication of effort and contracts, and intermediaries that add costs for services. This system is also vulnerable. A central system compromised due to an incident – such as fraud or mistakes that create inconsistencies – could affect the entire business network.

Consider the same network using blockchain, as depicted in Figure 2.

The blockchain architecture enables participants to share a ledger that is updated every time a transaction occurs through peer-to-peer replication. Cryptography is used to help make sure that network participants see only the parts of the ledger relevant to them and that the transactions are reliable, authenticated and verifiable. Blockchain also allows the contract for asset transfer to be embedded in the transaction database, determining the conditions under which the transaction can occur. Network participants agree how transactions are verified through consensus or similar mechanisms. Oversight, compliance and audit can be part of the same network. A full blockchain deployment can eliminate unnecessary participants or transactions.

The key characteristics of blockchains

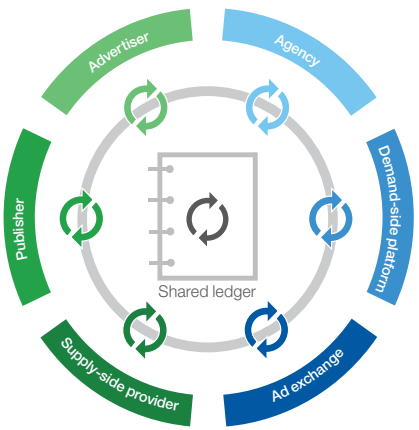
The blockchain provides the following:

- *Consensus* – All participants agree that a transaction is valid.
- *Provenance* – Participants know where the asset came from and how its ownership has changed over time.
- *Immutability* – No participant can tamper with a transaction once it is complete. If a transaction is in error, a new transaction must be used to reverse the error.
- *Finality* – There is one place to determine the ownership of an asset or completion of a transaction. This is the role of the shared ledger.

The ability to track and align truth through a standardized "smart contract" has major implications for business models. For example, if the delivery of advertising impressions and viewability is trustworthy and can be tracked, automated reconciliation and payments may be triggered according to clear terms. Similarly, if performance and publishing rights can be tracked through a trusted system of record, automated reconciliation and payments can be triggered according to the smart contract.

Blockchains can help M&E companies operate much more effectively within their business networks because they support consensus, provenance, immutability and finality (see sidebar: "*The key characteristics of blockchain*"). Potential benefits for M&E companies include time savings (reduction of transaction time), cost removal (reduction of administrative overhead and intermediaries) and reduced tampering and fraud. It also contributes to enhanced data quality, increased trust and reduction or elimination of disputes.

Figure 2
Blockchain facilitates asset management across the business network



Source: IBM Institute for Business Value analysis.

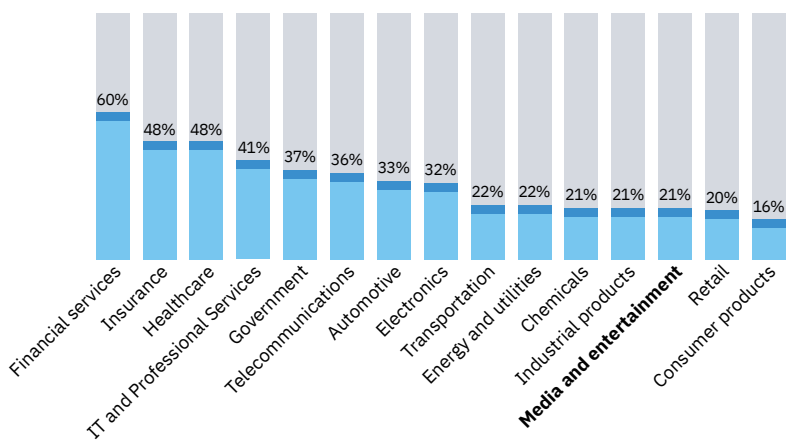
M&E executives' views on blockchain

To learn more about M&E executives' perspectives on blockchain, we looked at data from the 2017 IBM Institute for Business Value (IBV) C-suite survey of almost 3,000 global C-suite executives from 20 industries, including 147 from M&E organizations.[6]

Blockchain is clearly a potential game changer for an industry in which the number of ecosystem partners has grown enormously and where advertising fraud, piracy and illegal use of content have emerged as top challenges. Still, only 21 percent of the M&E respondents in our survey stated that they are already considering blockchains. Indeed, the M&E industry is a slow mover compared to many other industries (see Figure 3).

Figure 3

Industries that are already considering or actively engaged with blockchains



Source: IBM Institute for Business Value analysis.

Although none of the M&E respondents were piloting or implementing blockchain technology at the time the survey was conducted, they recognize blockchains can be important for reducing transaction costs and increasing data integrity. Thirty percent of them say they expect blockchain to help eliminate intermediaries and to help maintain data quality and accuracy. Another 28 percent said they expect blockchain to help them by improving the transparency that is so important to increase trust in transaction reliability, which was identified as a key blockchain benefit by 26 percent of respondents.

Twenty-nine percent said blockchain technology could support them in their enterprise strategies by improving security against fraud and cybercrime. Digital ad fraud remains a top concern for advertisers and publishers.[7] In the first quarter of 2018, for example, mobile app marketers were exposed to over USD 700 million in ad fraud.[8]

To move forward with blockchain technology, partnering is crucial. To make blockchain implementations commercially successful, it is essential to coordinate with the media supply chain partners, which was seen as "somewhat" to "very important" by 62 percent of respondents (see Figure 4). And 71 percent find it "somewhat" to "very important" to collaborate in industry consortia along with others that need to agree on standards.

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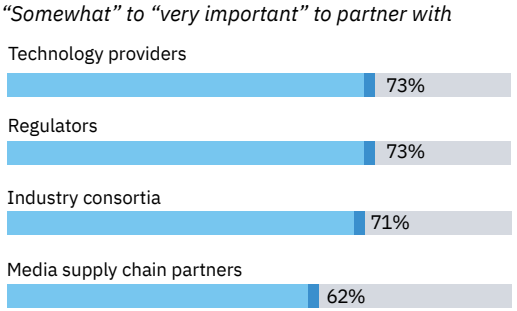
Figure 4
M&E companies recognize the importance of partnering to move forward with blockchain technology



Source: IBM Institute for Business Value analysis.

Seventy-three percent of all M&E executives surveyed said that partnering with technology providers is “somewhat” to “very important” for their organizations to move forward with blockchain technology at commercial scale. They understand that to be successful in developing and delivering real and relevant solutions to the industry, it is crucial to work with industry-leading blockchain providers. And of course, involving regulators is important as well, among others as privacy and data protection rules are involved.

Early familiarity with opportunities and challenges associated with blockchains will help position M&E companies to gain advantages in cost savings, revenue growth and new business models. We believe these companies will see the greatest impact from blockchain in the following three areas:

– *Improving processes in the media supply chain:* Employing blockchain primarily for efficiency improvement in the supply chain, both internally and with external players.
– *Creating blockchain-enabled services and revenue opportunities:* Enabling new functionality and value-added digital services based on blockchain
– *Developing a blockchain-based digital advertising platform:* Establishing an optimized advertising exchange and partner federation.

Improving processes in the media supply chain

With the digitization of the M&E industry, the traditional media supply chains transitioned into complex ecosystems with many new players. This new environment has introduced challenges in trust, transparency, efficiency, performance, quality control and security.

For content creators, for instance, it has become very difficult to see whether the royalties are fairly settled. And they might have to wait months or years for the payments to be received. It is also difficult for brands and advertisers to determine whether financial transactions have been fair and accurate, whether the advertising budget has leaked through fraud, or whether their paid advertisements have appeared in only reputable places.

The modularity provided by blockchain's smart contracts enables various aspects of M&E companies' operations to be streamlined, which helps make them more cost-efficient and faster, as well as more reliable, scalable and transparent. Blockchain cryptography protects information and creates a fully recorded transaction audit trail.

There are various opportunities for blockchains to streamline processes in the media supply chain. It will likely have the greatest impact on the industry foundation processes, such as audit, payment settlements, discrepancy management, tax rules, campaign-level reporting, fraud mitigation, rights clearance and royalty management (see sidebar: *"Royalty collection agencies apply blockchain for digital rights tracking"*).

Royalty collection agencies apply blockchain for digital rights tracking[9]

Three royalty collection agencies (ASCAP, PRS, SACEM) built a blockchain network to manage authoritative music copyright information.

The solution allows the companies to:

- Easily and more accurately track content life cycle and royalty payments.
- Automate costly reconciliation processes.
- Increase digital rights agency contractual power
- Solve disputes by using governance rules
- Facilitate engagement with digital music users.

Key success factors of the blockchain project:

- Driven by lead players in the industry
- Based on agile methods to iterate and improve incrementally
- Managed as a governance project among blockchain members, not as a technology project.

Another obvious area for significant efficiency improvement with blockchain is the digital advertising supply chain.

Improving transparency and efficiency in digital advertising
Improvements in programmatic advertising (impressions) can be established in two key aspects: financial transparency, which tracks a media buy from a media insertion order through delivery to reduce discrepancies; and supply chain transparency, which tracks an impression's delivery path from bid to fulfilment, including each vendor, charge and impact on performance.

The current process is inefficient because of:

- Complexity of the value chain: a variety of participants are involved, each one intermediating a task and getting a cut of the budget
- Lack of a single system of records: every player has a siloed system that does not communicate consistently with the others
- Lack of evidence of value-add: it is not always possible to demonstrate the added value of each participant and the actual completion of the intended activity
- Lack of auditability: the fragmentation of systems and records and the lack of evidence make auditability difficult or, in some cases, impossible
- "Walled gardens" of the large online social networks and search engines: these walled gardens are characterized by non-transparent and proprietary measurement processes
- Evolving ad fraud: the complexity and lack of control encourages fraudulent practices.

Brands and advertisers increasingly demand better transparency, performance measurements and accountability in the digital ecosystem (see sidebar: *"Unilever aims to force more digital ad transparency"*). With blockchain, a single source of truth exists to compare delivery against standards set in media plans, including error checking across impression data. It should result in faster transaction times and in less overhead, fewer intermediaries and reduced loss through tampering and fraud.

Blockchain technology promotes trust and consensus among peers. It also helps facilitate compliance with regulations, increased efficiency in the auditing process while allowing auditors to see only the information relevant to them.

Unilever aims to force more digital ad transparency[10]

Unilever wants more transparency for its digital ad buying. Unilever has threatened to pull its advertising from Facebook and Google because of fake news and other misinformation and has started a pilot program that tracks the digital ad buying ecosystem via blockchain. Unilever executives say they believe the technology is a natural fit for the digital advertising supply chain – potentially enabling increased efficiencies and a more trustworthy supply chain, as well as reducing cost and fraud.

The blockchain project has already begun to bear fruit by identifying discrepancies along the media supply chain while a campaign is in action. Running historical ad data through the system, the company found discrepancies immediately, rather than having to wait the duration of a campaign. Now, the blockchain finds discrepancies daily, which Unilever demands to be fixed before an ad buy can go through.

Leveraging the synergies of blockchain and AI

Optimizing campaign delivery is a good example where synergies of blockchain and AI can be leveraged to get the best campaign outcome.

Approach:

- Use blockchains to capture data related to the identity and charges by each vendor at the impression-level
- Use artificial intelligence to rank the delivery paths that align best with desired campaign outcomes and shift budgets to those methods that optimize ROI.

Benefits:

- Costs and impact on performance are known
- Supply chain is tuned to favor vendors that provide measurable gains in performance
- Avoidance of ineffective or (in some cases) malicious bad actors.

Creating blockchain-enabled services and revenue opportunities

In addition to process improvements for establishing more trust, efficiency and security into existing media supply chains, blockchain can also be used to develop new functionality and differentiating value-added digital services that meet the rising expectations of both clients (such as content creators and advertisers) and consumers.

For example, blockchain-enabled micropayments can boost revenue from low-priced content – such as individual song tracks, articles or pictures – as consumers don't have to pay disproportional transaction fees to third-party payment applications like PayPal.

In another area, blockchain enables targeting audiences better by delivering fewer, but more timely and relevant, content and ads to the consumer, thus enhancing the customer experience – in particular when leveraging artificial intelligence. It can also help in optimizing the cost of the campaign outcome (see sidebar *"Leveraging the synergies of Blockchain and AI"*).

Other potential areas include content distribution, content revenue assurance and handling of customer personal data. With respect to the latter, blockchain becomes increasingly needed in data protection, in particular in the light of the far-reaching personal data privacy regulation introduced by GDPR.

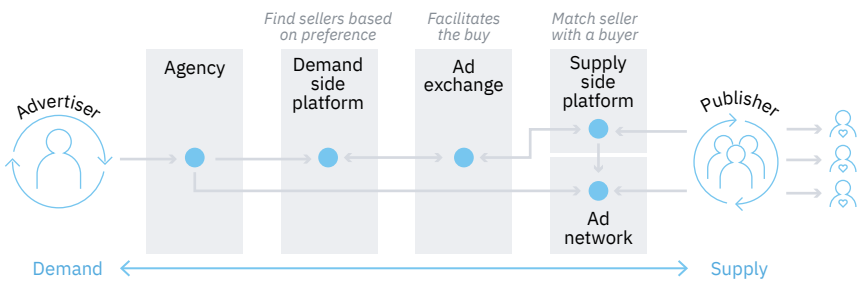
From transparent programmatic media buying to performance-based payments

Programmatic advertising shows similar pain points to the rest of the digital advertising market: a complex value chain, lack of transparency on the transaction trail and lack of clarity on the advertising dollar return on investment. These issues are particularly relevant because programmatic advertising is the fastest growing segment in the digital advertising market. Improving the targeting accuracy and return on investment of this segment will improve the overall marketing spend performance for advertisers.

The programmatic advertising ecosystem includes multiple players, such as advertisers, media agencies, publishers, ad-exchanges and others (see Figure 5). These players exchange different kinds of information, such as media plans, target audiences, number of impressions and relative cost.

Blockchain helps improve the transparency and accuracy of this information through a shared ledger among the different players. Relevant information – the number of impressions delivered against a specific campaign and the quality of the target audience of those impressions, for example – is registered and validated on the blockchain by the different participants.

Figure 5
The programmatic advertising ecosystem includes multiple players (a simplified scheme)



Source: IBM Institute for Business Value analysis.

Each player has access to information relevant to its particular business (for example, an advertiser sees campaign results across different publishers, a publisher sees results of its inventory delivered to different advertisers or agencies). This information is consistent and approved according to governance rules established and shared by the participants in the ecosystem.

All players enjoy immediate benefits. Advertisers can audit the impressions delivered against their media plans. Publishers and advertisers can measure how effectively the target audience was selected. And innovative publishers can outperform the competition, providing advertisers with better targeting and a higher ROI.

The application of blockchain for impression traceability lays the foundation for higher-value use cases, such as performance-based pricing. The scope of this use case is to improve the performance of advertising campaigns through a system of incentives enforced by smart contracts. The main idea is to price impressions almost in real time based on the effectiveness they are delivering against a specific campaign. This capability generates higher return on the advertising investment and allows publishers to optimize the revenues of each impression.

Developing a blockchain-based digital advertising platform

Today's advertising supply chains are dominated by many middlemen, at the expense of brands, advertisers and the publishers. The middlemen take a significant cut of the ad spending, and, for some, their value add might be questionable. But lack of transparency and performance measurements for all transactions in the supply chain make it difficult to estimate their value.

This is particularly true for large internet players with their supremacy in the digital advertising industry. Specifically, Google and Facebook form a duopoly that accounted for 73 percent of the U.S. digital advertising market last year.[11] These platforms have an unparalleled ability to target users on a variety of devices, but have also built walled gardens that hold non-transparent media supply chains and closed measurement systems.

It is time for advertisers, brands and publishers to push back on the hegemony of the internet giants and the abundance of middlemen in the digital advertising space.[12] In fact, they can band together to develop an alternative digital advertising platform that uses blockchain as a blind trust to do audience sharing and to let the advertisers decide how to spend their ad dollars across the participants. Some players in the ad space are already exploring such initiatives. (see sidebar: *"Advertisers and publishers are pushing for digital advertising transformation"*).

Advertisers and publishers are pushing for digital advertising transformation

Publishers and, in particular, advertisers are increasingly pushing for transformation of the advertising supply chain because of dissatisfaction with the current situation. For instance, Procter & Gamble and Unilever decided recently to re-evaluate their budgets for digital advertising due to lack of visibility on the effectiveness of current ad spendings.[13]

One of initiatives to bring transparency and data security to the ad tech supply chain by harnessing a blockchain-backed peer-to-peer network is AdLedger.[14] AdLedger is a consortium made up primarily of publishers, advertisers and other industry stakeholders. Its mission is to help participants compete for ad dollars and reduce waste in the supply chain by facilitating a programmatic ad market. AdLedger will be able to harness data from disparate sources and provide transparency, brand safety and data security by locking up data with cryptographic keys.

In this environment, the media companies could have the role of trusted federator and use blockchains to create trust, data security and secure impression tracking in the advertising supply chain. Based on new business models, media companies can create additional revenue streams. For example, blockchain could play a role in process optimizations, such as dynamic audience targeting, audience yield optimization and targeting of federate audience data.

“Blind match” real time bidding exchange

Blockchain acts as an enabler of such a platform play because, unlike the current dominant platforms, it provides transparency, data privacy and trust across the ecosystem: the different parties involved in the platform (advertisers, agencies, ad tech providers, publishers) have access to relevant and certified data. Without blockchains, they are reluctant to share this data for fear of ceding competitive advantage or revealing high-value audiences.

Blockchain offers the ability to encrypt data that machines can “see” and optimize across, while contributors have access only to what they are permitted to view. Personally identifiable information, such as an IP address, can be masked. The result is that a broad ecosystem of advertisers, publishers and second- and third-party data contributors have gained the performance outcomes of a walled garden without the need to share data that could be used to poach customers. This approach could provide the performance outside the control of dominant intermediaries, which currently impose both burdens and control in exchange for that performance.

In many use cases, the industry would benefit from a wider range of premium campaigns – if data could be combined in a blind exchange and huge volumes of supply and demand could be optimized across federated data. A blockchain-enabled exchange platform can solve the problem as follows:

- Advertisers submit demand and media plans and publishers submit supply with identities of consumers hidden
- Data is pooled into a collective exchange in which AI clusters audiences based on predictive models. In-flight campaigns are optimized using combined data sets without individual actors seeing proprietary data contributed by each party
- Smart contracts compensate participants according to agreed-upon terms (for example, Publisher A pays Publisher B to deliver premium audience without knowing the individual reached).

The solution is a win-win for every participant. Advertisers get access to a suitable, measurable and effective audience for their campaigns. Agencies reduce the complexity of the media plan implementation. And publishers are not excluded by media plans for lack of audience volumes, but can profitably bid to parts of larger media plans

Are you ready for blockchain?

The following questions can help determine if you are ready to move forward with blockchain:

- How much cost could you save if you realized a broad reduction of intermediaries?
- How effective are you in copyright tracking, and what is the complexity of copyright dispute resolution?
- What service or revenue opportunities could blockchain open for you?
- How much is the value add of each player in the supply chain and their cut of the ad budget?
- How much ad budget is lost due to ad fraud? How do you detect and mitigate fraudulent activities?

The way forward

To move toward reaping the benefits of blockchains, we recommend the following first steps:

- Spend time with a lead partner in blockchain to understand the business models and technologies, as well as understand the early use cases, proof points and emerging solutions.
- Evaluate where the technology stands today, the various blockchain providers and differences between their technology and policy approaches, and the extent to which standards and regulations are – or will become – effective across countries and types of business operations.
- Invest in ideation on potential opportunities such to uncover areas where blockchain could offer an advantage.

Blockchain technology has a bright future and the potential to change the way M&E companies transact with their partners and execute core business processes. The time is now to get started. A first step is to target real use cases and applications, as this is still an emerging area and the business advantage of early movers will be lost if they spend years evaluating technology.

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Related publications

Berman, Saul, Steve Canepa, Daniel Toole, and Rob van den Dam. "Becoming a "living" media partner for your consumers – A cognitive future for media and entertainment." IBM Institute for Business Value. September 2017.

IBM Institute for Business Value. "Incumbents strike back – Insights from the Global C-suite study." February 2018.

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