

# Digital Advertising, Blockchain(ed)

## Abstract

Digital ad spend has been steadily rising the world over, with the last decade buzzing with activity on this front. However, the digital advertising landscape is riddled with fraud and populated by intermediaries. For publishers, advertisers, and consumers, the current model of digital advertising is inefficient and fraud prevention measures are also not cost-effective.

Blockchain can disrupt the digital advertising ecosystem to introduce trust and transparency in the system. In addition, advertisers and publishers can create mutually beneficial revenue models by eliminating intermediaries. In this paper, we explore the possibilities blockchain technology offers in the digital advertising space.

## The Limitations of the Current Digital Advertising Model

IAB's recent Advertising Revenue Report reveals that the first quarter of 2017 saw the highest ever Q1 earnings for digital advertising in the US. At \$19.6 billion, the spend was a whopping 23% more than what it was an year ago during the same period.<sup>1</sup> However, despite the surge in spend, the existing digital advertising model is inefficient for the advertiser, publisher, and the consumer. Why is this so?

Digital advertising uses incentive models such as pay-per-click or pay-per-action, and involves several intermediaries between the brand owner or advertiser and consumers (see Figure 1). Now, this value chain works well when there are genuine users or consumers at the end of the chain. It also offers scope for quick wins in terms of positioning ad content using real-time bidding of available ad space on publisher websites. However, this model has serious shortcomings.

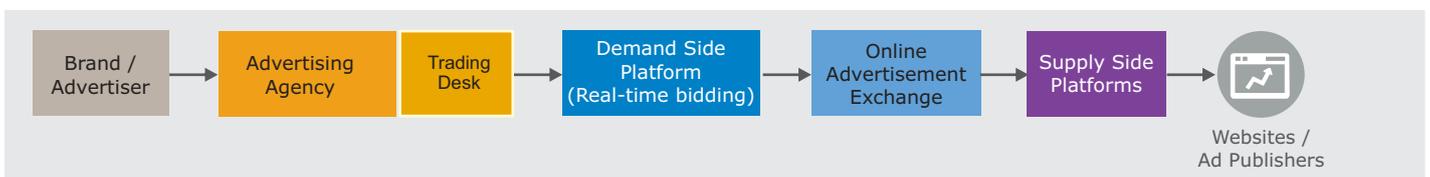


Figure 1: Intermediaries in the Digital Advertising Value Chain

There are no controls or regulatory bodies to oversee digital advertising. There is a lack of transparency into how the digital assets of an advertiser make their way through the chain. In addition, fraudulent activities to deceptively earn revenue by using bots, ghost sites, and inappropriate placements are becoming increasingly common. Typically, advertisers try to mitigate this problem by introducing auditors into the ecosystem. Although this helps reduce the issue of fraud to an extent, it impacts the bottom line of the advertiser. Advertising fraud also significantly impacts customer experience. This is because advertisers are unable to accurately measure the effectiveness of an ad due to the false feedback in the system. And, this could lead to a diametrically opposite result to what is intended.

## Using Blockchain to Transform Digital Advertising

Blockchain presents an opportunity to increase transparency in the digital advertising ecosystem by introducing smart contracts among advertisers and intermediaries (see Figure 2). How does the system work? First, the advertiser, intermediaries, and publishers form a blockchain consortium network. Thereafter, directly connected consortium members can create smart contracts among each other.

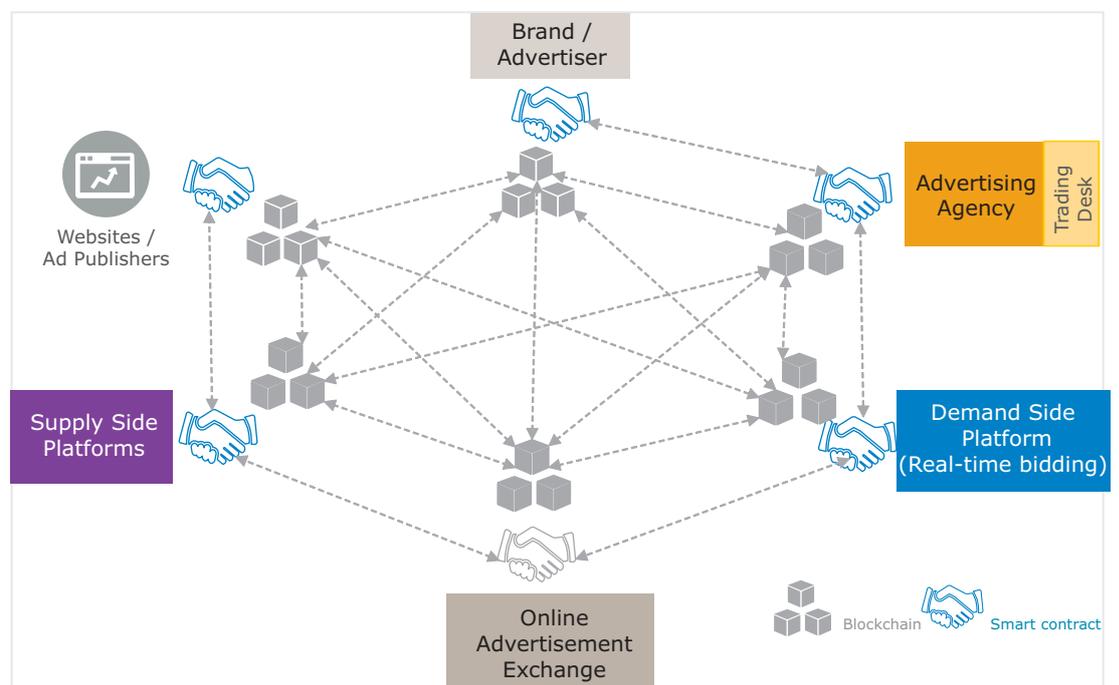


Figure 2: Blockchain-enabled Smart Contracts for Digital Advertising Ecosystem

Let's look at two ways in which blockchain can transform digital advertising.

### Eliminating online ad fraud

Each member of the consortium has a minimum of one node in the blockchain network. Each transaction connected to the advertiser's digital asset is verified at each of the nodes through smart contracts. The relevant transaction is stored on the blockchain and replicated on all the nodes - only if members form a consensus on the validity of the transaction across all the nodes. The validated block of transactions are then added to the blockchain in a linear, chronological order, and in a cryptographically protected block. New blocks of

validated transactions are connected to older blocks, making a chain of blocks that show every transaction in that blockchain's history. The entire chain is continually synchronized so that every ledger in the network is the same, giving each member the ability to prove who owns what type of transaction, at any given time.

A distributed blockchain ledger for digital advertising can hold the following details of the transactions for each digital ad or asset:

- Type of transaction, for example, online bids, approved bids, or type of action performed on the ad (click action or impression)
- Budget spent along the chain
- The location the ad is being directed to
- Demographic details of the event
- Proof of human activity (e.g. IP address, speed of navigation between mouse clicks, Captcha, and so on)
- Conversion rate

Using machine learning algorithms for advanced detection mechanisms such as detection by signature patterns, DNS traffic monitoring, or behavioral analysis, patterns of fraudulent transactions can be detected on a blockchain. Each digital asset is allocated an identification tag and advertisers can audit and proactively search each transaction by intermediaries, to avoid fraud.

## Establishing a direct link between advertiser and ad publisher

In the current digital advertising setup, intermediaries acquire relevance due to better marketing reach, market intelligence of publishers' network, and channelizing capabilities. However, the transparency provided by intermediaries is limited to their version of truth. Blockchain provides unprecedented levels of transparency as well as direct visibility into the marketing reach of ad exchanges and publishers. This presents an opportunity to optimize the number of intermediaries and evaluate ways to establish direct partnerships between advertisers and publishers (see Figure 3). By having the right set of platform capabilities based on blockchain and artificial intelligence, publishers can evaluate the possibility of establishing a direct link with advertisers. This leads to a

simplified digital advertising ecosystem, newer revenue and operating models, and cost savings for both the parties, while providing advertisers faster feedback for course corrections.

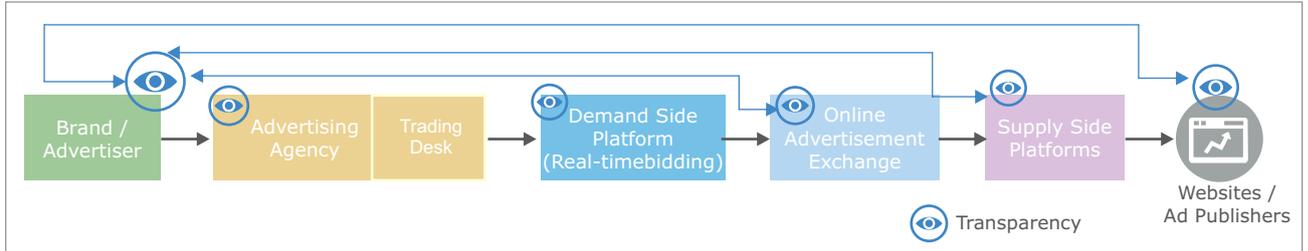


Figure 3: How Blockchain Renders Intermediaries Redundant

New revenue models can be visualized based on this model. For example, advertisers can provide incentives to publishers based on outcomes or customer actions, leading to definite revenue for the advertiser. Due to the presence of fewer intermediaries, parties can work out a mutually beneficial revenue sharing model to replace the current models. Here are some revenue models that can be explored:

- Qualified prospect generation: Incentive is paid for anonymous leads with proof of human activity
- Commission: A percentage of revenue is attributable to a publisher
- Hybrid revenue: Mix of cost-per-click and commission model

Figure 4 is a representative revenue model framework for an e-commerce sales funnel.

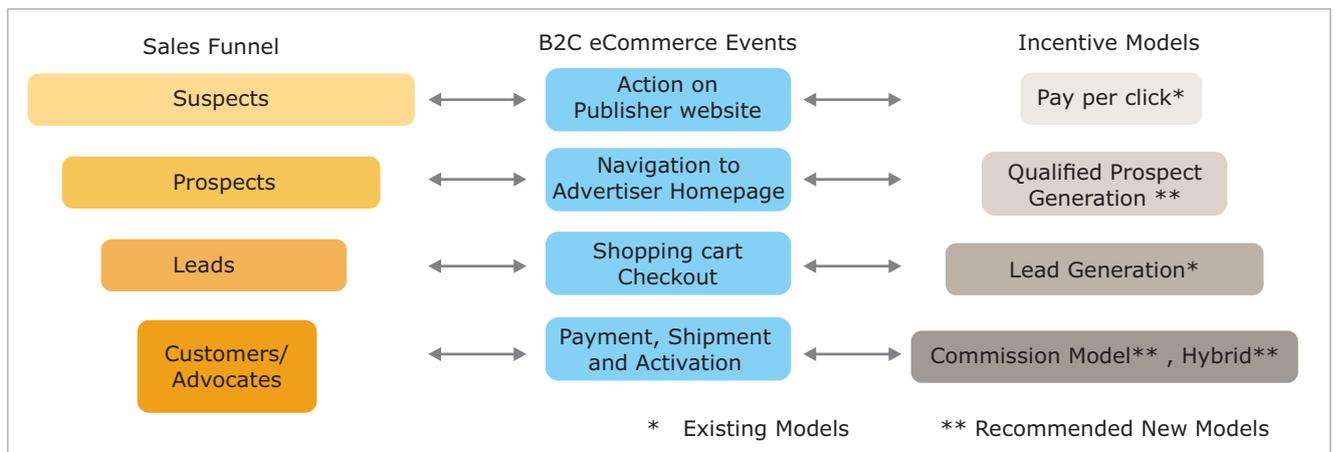


Figure 4: Representative Revenue Model Framework for E-commerce Sales Funnel

Publishers that provide such platform capabilities can act as disruptors, creating new business models and attracting the attention of major advertisers through their early-mover advantage.

## Creating Ad Exchanges: Enhancing Transparency in the Digital Advertising Ecosystem

Ad exchanges that provide a programmatic interface for online bidding of advertising content between demand and supply side platforms can popularize the use of blockchain. Using blockchain, they can act as change agents to create a transparent digital advertising ecosystem. A case in point is the blockchain-based ad exchange platform created by Nasdaq. Built on Nasdaq technology, the New York Interactive Advertising Exchange (NYIAX) provides a blockchain-powered electronic marketplace for publishers, advertisers, and media buyers to buy and sell future advertising inventory as guaranteed contracts.<sup>2</sup> NYIAX provides media buyers the advantage of a transparent and trusted market to buy and re-sell future advertising inventory. It provides publishers the capability to target higher revenue by holding higher CPMs and lowering fees. Advertisers benefit from a new way of discovering and purchasing inventory, and the ability to secure premium inventory in advance as a result of the higher transparency and forecasting capabilities enabled by blockchain.

## Smart Self-regulation is the Name of the Game

The interoperability between blockchain networks is one area that is yet to be explored and understood in entirety. If advertisers, ad exchanges, and publishers each have their own private blockchain network, it should support interoperability to avoid redundancy. However, integration might not be easy and protocols for recording shared transactions on blockchains that have their own cryptographic algorithms are yet to evolve. The important point for early movers to remember is the advantages of blockchain adoption overwhelm these challenges. In addition, with rapid advances in blockchain research, a solution for interoperability is likely to evolve sooner than later.

Blockchain can transform the digital advertising industry by infusing trust, security, and transparency into the entire value chain, to eliminate the inefficiencies in the current digital advertising model and drive higher value for publishers and advertisers. Even if governments or other global bodies are slow to regulate the digital advertising industry, blockchain can bring clarity with regard to regulations by enabling smart self-regulation in the ecosystem.

## References

1. IAB, Press Release: Revenues Mark the Highest Q1 Earnings on Record (June 2017), Accessed June 30, 2017, <https://www.iab.com/news/ad-revenues-hit-19-6b/>
2. NYIAX, The world's first exchange to trade advertising contracts, Accessed June 30, 2017, <http://www.nyiax.com>

### About The Author

Sohan Prabhu  
Senior Consultant

Sohan Prabhu is a Senior Consultant with TCS' HiTech business unit. With over 18 years of IT and consulting experience in customer relationship management, he has led large CRM programs and consulting engagements, and has extensively supported pre-sales teams. In addition, he brings vast domain knowledge in sales, marketing, and customer service. Prabhu holds a Bachelor of Technology degree in Computer Science from the Manipal Institute of Technology, Karnataka, India.

### Contact

Visit the [Communications, Media & Technology](#) page on [www.tcs.com](http://www.tcs.com)

Email: [HiTech.Marketing@tcs.com](mailto:HiTech.Marketing@tcs.com)

Subscribe to TCS White Papers

TCS.com RSS: [http://www.tcs.com/rss\\_feeds/Pages/feed.aspx?f=w](http://www.tcs.com/rss_feeds/Pages/feed.aspx?f=w)

Feedburner: <http://feeds2.feedburner.com/tcswhitepapers>

### About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled, infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

For more information, visit us at [www.tcs.com](http://www.tcs.com)