



Blockchain Application in Ad Tech

A Guide to Evaluating Blockchain Solutions
in Ad Tech

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About IAB Tech Lab

The IAB Technology Laboratory is an independent, international, research and development consortium charged with producing and helping companies implement global industry technical standards. Comprised of digital publishers and ad technology firms, as well as marketers, agencies, and other companies with interests in the interactive marketing arena, the IAB Tech Lab's goal is to reduce friction associated with the digital advertising and marketing supply chain, while contributing to the safe and secure growth of the industry.

Learn more about IAB Tech Lab here: <https://www.iabtechlab.com/>

Introduction

In July 2018, the Blockchain Working Group with IAB Tech Lab first published a [technology primer on Blockchain](#), which provided an overview of the technology and its possible application in ad tech. This document provides guidance on what to consider when exploring options for using blockchain in advertising technology.

As growth in digital advertising continues to rise, the inherent challenges such as operational efficiency, transparency, and validation become more complex. Existing tools are constantly having to adapt while new challengers with increasingly sophisticated solutions are always on their heels. With each new solution comes a period of uncertainty, skepticism, and self-proclaimed experts. Such a phase in innovation and adoption is one of chaos and risk, but also necessary for growth and improvement.

Blockchain is among some of the latest innovations in ad tech in which early adopters are claiming new benefits and solutions to old problems. To interested parties, the claims may seem unrealistic and overhyped. Without understanding the technology or the applications of it, embarking on the search for a blockchain solution can be intimidating.

A guide to blockchain technology and its application in ad tech offers an informed starting point for exploring and using solutions. When you know what problems blockchain can actually solve, how it addresses those problems, and what variables are involved, you can begin to formalize a strategic approach to either working with the technology yourself, or working with partners who participate in the use of blockchain.

Use this guide to help you consider your needs and evaluate the options. Blockchain operations, reported metrics, and data formats vary from solution to solution. Eventually, a protocol will emerge for exchanging data in ad tech using blockchain. Until then, businesses across digital advertising must first realize the value that blockchain offers. Advertisers and publishers can utilize bespoke blockchain-based solutions to help solve some of their most common and painful issues. As more companies move toward implementing solutions, the need for a formal protocol becomes more defined.

Audience

While the purpose of this guide is to orient ad tech professionals to blockchain solutions, we assume the reader has some general understanding of blockchain and how it works. If not, review the [IAB Tech Lab Blockchain Technology Primer](#) for an introduction. You can also browse the [Blockchain Wiki](#).

With the expectation that readers have some understanding of blockchain, this document is intended for any professional with a role in the ad supply chain who is evaluating blockchain solutions or working with partners using blockchain.

Specifically, publishers, ad verification and ad operations, agencies, and brands can benefit from the content in this document in the following ways:

Publishers: Publishers who understand blockchain are signaling to buyers that they're doing their research and looking for options to help them be more transparent.

Ad quality vendors: Blockchain improves ad verification and measurement, streamlining operations for ad quality vendors.

Ad operations: Ad tech vendors responsible for setting up campaigns and ensuring proper delivery can use blockchain to improve operations.

Agencies: As an agent in campaign strategy and implementation, this document offers insight into how blockchain can improve performance and enhanced offerings for the brands they represent.

Brands: Blockchain offers brands the ability to access full transparency across an entire campaign without having to ask individual agency partners. More immediate and unified results from a single source enables improved insights and simplifies fully compliant data sharing. Use this document to explore to evaluate solutions geared toward these benefits.

Resources

[Blockchain Technology Primer](#): a document developed by the IAB Tech Lab Blockchain Working Group as an introduction to blockchain and a perspective on its applications specific to advertising technology

[IAB Tech Lab Wiki](#): a general overview of blockchain and relevant concepts along with a list of resources

Getting Started

A good strategy begins with a goal. You can achieve the results you need with any number of ad tech solutions. However, without blockchain, results are delayed and distributed across partner systems. Blockchain helps all parties to achieve the same results more immediately in an automated, secure, and fully auditable way.

Before getting started, explore the benefits and features of blockchain outlined in this document, and match them to identified needs in your business operations. Defining goals in this way makes your approach to evaluating solutions more effective.

Why Use Blockchain

In the most simple form, blockchain is a network of records managed by multiple parties. Since all parties must agree to any change, blockchain is by nature resistant to modification and fully transparent. This sets up a framework for fully auditable reporting.

Since all records are signed, authenticated, and validated per transaction, almost all operational inefficiencies become nominal because errors that could only be found post-transaction in previous models are flagged in near real time. In addition to authenticated data, computations for pre-defined rules prevent transactions that shouldn't occur from happening.

Let's take a look at how some of these features benefit businesses in the ad supply chain that participate in a blockchain ledger.

Transparency and control: As an open record across multiple parties, manipulating data is impossible. While the details are openly recorded, options for creating a tier of access makes the data secure and only available to authorized parties.

Contract consensus: Consensus on material instructions and payment terms pre-delivery is baked into blockchain. This results in automatic delivery reconciliation for finance teams and frees up Operations teams from having to do manual reporting. The need for contract auditing post-flight is eliminated.

Troubleshooting: The distributed and near real-time nature of the data alerts operations teams when discrepancies arise between delivery systems and media plans. In fact, most technical issues can be identified and resolved more quickly when a shared ledger is making the data readily available.

Scale: Initially, scale was a limiting factor in blockchain solution, but recent developments have changed the way a shared ledger processes transactions. Earlier models used for popular cryptocurrencies such as Bitcoin and Ether could take several minutes to process a transaction. Today's solutions for recording transactions in ad tech can take as little as a few seconds.

Validation: Working with vendors on validating ad delivery and performance becomes more streamlined. Blockchain offers powerful tools for validation vendors that enhance their services.

How It Works

A blockchain is simply a chain of transaction data stored in blocks of information across several systems. Participating systems confirm the transaction, which is then added to the shared ledger. If the chain is public, it can be accessed by anyone with a key, in a private chain, the ledger is shared with appropriate parties in the consortium.

An important component of the blockchain is a shared set of rules about how to process the signals it receives. For example, a smart contract can be designed to determine ahead of time whether an ad should be shown based on audience rules, target campaign goals, or other details. Additionally, rules governing access to the data can detail authentication requirements for all or parts of the data. This fine-grain control enables a secure network of information to flow to relevant parties while also maintaining the details for comprehensive auditable reporting.

General Ad Tech Example

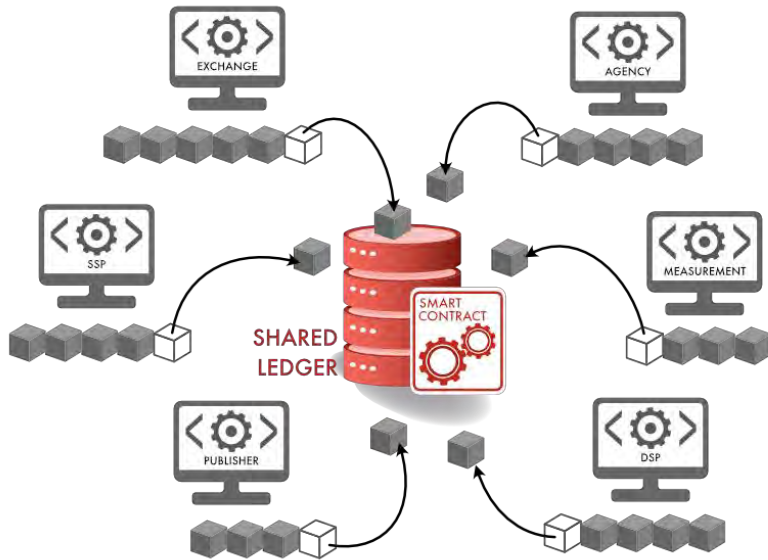
Let's look at how blockchain works in a simple example. You can start anywhere in the lifecycle of an ad placement, but we'll start at the moment an exchange happens between two servers, such as when an ad is being served to a targeted placement on a website. Follow the diagram on the next page.

1

Participants send signals, each digitally signed using ads.cert, to the shared ledger.

Each participant maintains a copy of the data they contribute.

This key feature of blockchain keeps the data stored in multiple locations, making it immutable.

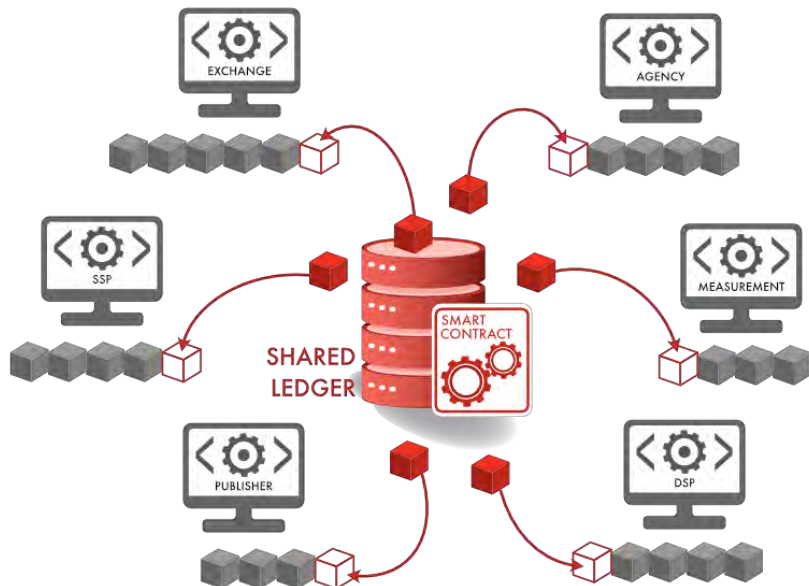


2

The shared ledger, the engine of blockchain technology, authenticates and processes contributed signals based on rules pre-defined by its participants.

3

The shared ledger then returns tracked and computed results to participants, along with cryptographic proofs (receipts) of the consensus-driven transaction.



Private Marketplace (PMP) Example

A verified record of general transactions in digital marketing is useful, but how can these records be used to run digital advertising programs? Let's look at an example for how a private marketplace environment might rely on blockchain records.

An example process is presented in steps 1-5 of the following example:

1. A buyer develops a digital insertion order (IO) where CPMs and a publisher list are established, along with the criteria for successful delivery.
2. This digital insertion order is the basis for the smart contract terms used in an order reconciliation platform where details are verified on a blockchain. Depending on how the buy is set up, the campaign is delivered according to the terms set and managed in the smart contract.
3. A third-party measurement provider measures the ads delivered using defined criteria such as viewability, brand safety, and invalid traffic as metrics for a successful campaign as listed in the order contract. This measurement data is shared with the reconciliation platform.
4. The reconciliation platform uses measurement data, hashes it on a blockchain, and calculates the billable impressions based on measurement data and the smart contract terms.
5. The buyer and seller both have access to the smart contract, measurement data, and billing reconciliation data associated with their order and the hashes on the blockchain. Any party can re-create a hash for the order and verify the new hash matches the time-stamped hash on the blockchain.

In this private marketplace example, there is a near real-time feedback loop with every party in the chain having on-demand access to the information they need on the order reconciliation between the buyers and the sellers.

Guaranteed Direct Example

Direct insertion orders can benefit from blockchain automation resulting in a more efficient and timely reconciliation process. Similar to the PMP example where reconciliation is automated in a private network of specified buyers and sellers, guaranteed direct is an agreement made directly between two parties in which the inventory is guaranteed directly to one buyer. This automated direct contract can benefit from the use of blockchain records.

An example process is presented in steps 1-5 of the following example:

1. A buyer and seller agree directly on the buy and create a digital insertion order.
2. As in the PMP example, this IO is used to create a smart contract to establish the ad units, CPMs, flight dates, targeting criteria and other order terms, along with the criteria for successful delivery and most importantly the billable count of record. The smart contract is created on an order reconciliation platform and verified on a blockchain. The seller automates delivery according to the terms.
3. A measurement provider measures the ads delivered using defined criteria. The reconciliation platform uses the data, which is hashed on a blockchain and used to calculate billable impressions based on measurement data and the smart contract.

4. The buyer and seller both have access to the smart contract, measurement data, and billing reconciliation data associated with the order along with all the hashes on the blockchain. Any party can re-create hashes for the order and verify that the new hash matches the time-stamped hash on the blockchain.
5. The buyer and seller may revise the order contract at any time, in which case a time-stamped history of changes will be verified on the blockchain.

Both the buyer and seller receive near real-time measurement and performance data on the campaign, without any discrepancies. Rather than wait until both parties have confirmed calculations at the end of a campaign period as done in traditional operations, the use of blockchain and a reconciliation platform enables the parties to optimize during the campaign. Visibility into campaign performance is maintained throughout the campaign based on the verified transaction history.

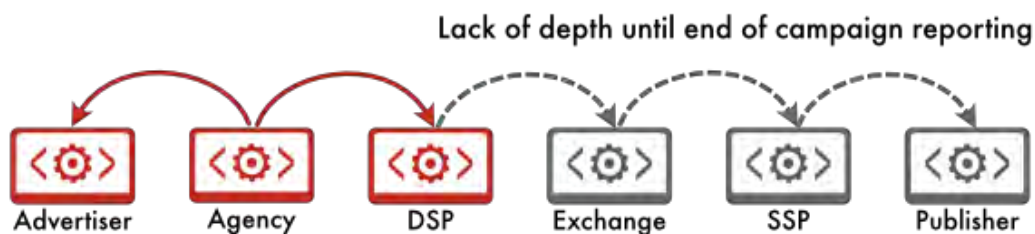
How It Applies In Practice

Blockchain is already being evaluated and implemented for a number of applications in ad tech.

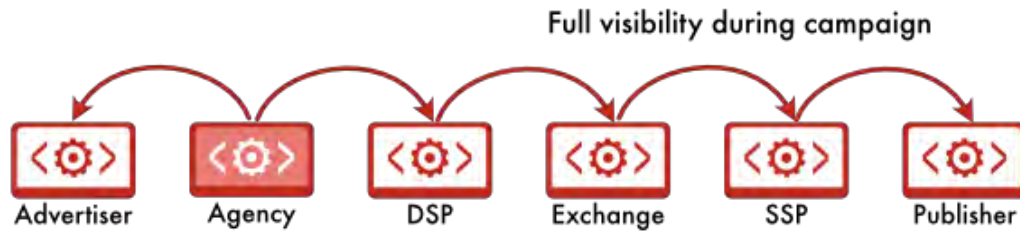
Ads.cert: A digital signature solution developed by IAB Tech Lab, uses cryptographic keys, or public/private key pairs, to sign participants' inventory. Fundamentally, ads.cert is a cryptographic key-pair, compatible with popular blockchains and used for authentication.

Shared ledger: Using validated signals from multiple participants enables the ability to define acceptable bidding and ad exchange behavior before a campaign goes live. This pre-defined behavior is often termed a smart contract. With a smart contract in place, a participant that fails to interact with the shared ledger or submits data that cannot be confirmed with other signals' inventory is deemed invalid and disregarded.

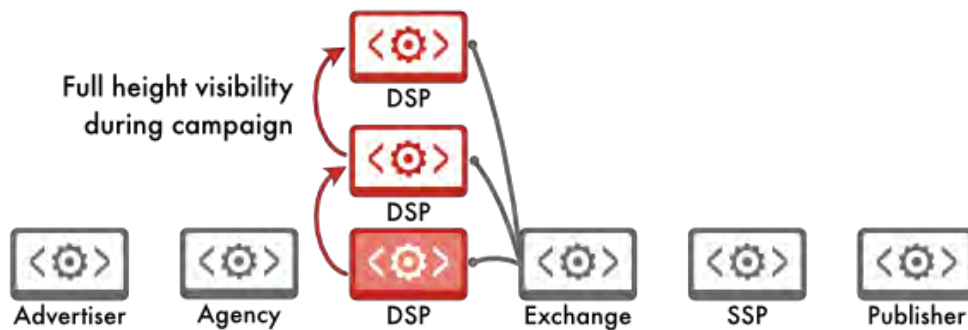
Transparency Depth: Without a shared ledger, any parties in the programmatic supply chain can only see direct connections. For example, an agency connected with a DSP on one side and communicating with an advertiser on the other side is only aware of those two parties. Any parties further down the chain from the DSP, such as an exchange and all of its connections, are out of range until reports can be drawn later.



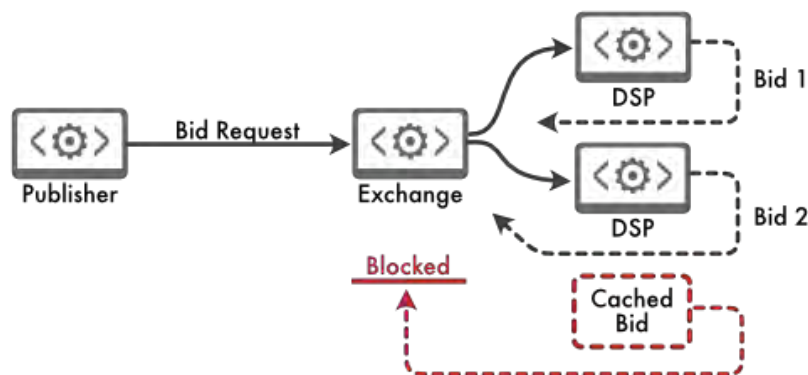
However, with the real-time nature of a shared ledger, the agency in our example could see that the DSP is connected to an exchange that is connected to an SSP, which is subsequently connected to the publisher. The supply chain becomes more transparent and controlled with the addition of sellers.json, technology developed by IAB Tech Lab to expose participants in the ad supply chain and limit participation to only approved vendors included in sellers.json.



Transparency Height: In addition to limited depth perception along the supply chain, a shared ledger also enables limited visibility into the height of the transaction, meaning that the DSP could be allowed to see other DSPs connected to the exchange or to the agency.



One benefit to this sort of transparency height is the ability to monitor certain signal processing such as in auction mechanics. For example, bid caching in ad placement auctioning is frowned upon in the ad supply chain. In the example below, a bid caching attempt is rejected because the ledger has visibility into post-transaction signals from the DSPs from where the bids originated. By using signals from multiple participants, auction mechanics can be better measured and enforced.



Controlled Access to Data: The records kept in a shared ledger specify which details can be shared and with whom. The DSPs in our example might not be allowed to access any data on which DSP won the bid and why, but they might be allowed to at least see which other DSPs are placing bids. The records kept on such details are controlled by the party that stores them. Each participant in the shared ledger defines what they will share. For example, participants might send signals with a device or user id. The ledger would match the signal details with other participant details, but participants don't know what matched.

Smart Contracts (pre-flight consensus): Because consensus between parties is defined pre-flight, a smart contract uses real time records to track compliance to the terms outlined in the contract. For example, a smart contract can identify whether a transaction is valid, what was actually delivered, and if the rules were followed. Such near real-time management of delivery results in faster yield optimization and makes post-flight audits simple and straightforward.

What To Look For

While the general function for using blockchain technologies is the same across the board, several options exist, each with a unique set of features. Whether you're looking for blockchain technology to use in your company's operations, or you're looking for a company that offers blockchain as part of their services, you will need to evaluate the options for a solution that fits your needs.

The following list offers some details to consider when looking for a blockchain solution or working with a company that uses blockchain.

Privacy

Personally Identifiable Information (PII) is heavily protected in today's market. Signals sent to the shared ledger should never contain any PII. In addition to policies concerning PII, you need to know about any other sensitive data that might be stored in the public blockchain, such as company details or private contract information. What information is shared and with whom? Certain data that participants share to the ledger may not be shared with other participants. How is this unshared data protected?

Private Blockchain

Some blockchain operations operate privately or in a consortium. A private blockchain is operated by a single company that determines the rules of operation, and a private consortium is operated by multiple companies who share the decision-making process. Whether private under one company or a consortium, an invitation is required to participate, and only invited participants are given access to the shared ledger. In either case, you need to know who is operating the chain, under what rules, and how the decision-making process is managed.

Publisher Participation

Publisher participation may vary across different blockchain operations. You may need to know which publishers are participating ahead of time. If you plan to work with specific publishers, find out the details on how they participate and what you might need to know in advance.

Metrics

While a shared ledger keeps records that include certain metadata, you'll want to know what metrics are included in that metadata and what insights you can expect to gain from the data.

Third-Party Integration

Some blockchains may choose to integrate verification vendors. One of the top use cases for this is on-demand validation, a process in which credentials are uploaded to a central location where all participants can access. This process enables more reading and less writing, reducing the processing load. In any case, all participants in the blockchain should have full transparency into who the participants are and what roles they play.

Supply Chain Setup Transparency

A blockchain can be set up to support any ad supply environment, but you need to know which technologies and offerings are supported. Feature support to consider might include OpenRTB, PMP, Programmatic Guaranteed, or Direct IO. Check with your partners to see what's supported.

Record Format

The format, storage, and access of records generated from blockchain operations is an important consideration. Some technologies work with cryptographic receipts and may or may not be supported across different operations. Check with your partners on what support is required.

Revision Support

While blockchain offers immutable transaction records, an insertion order may need to be revised either before or during delivery. One way to handle this is to create additional transactions that revise previously agreed upon terms, prices, or volumes in the insertion order. These transactions can serve as a change log. In any case, you may want to explore how a solution supports revisions.

Payment

In most cases, payment for services in blockchain operations are handled the same way as in any other operation. However, in some cases, cryptocurrency may be required. Check with your partners ahead of time on how payment is handled.

Next Steps

Despite all the hype, blockchain has real implications for increasing transparency, improving verification and measurement, and streamlining operations. Proponents and early adopters of the technology are beginning to see results, but the need for a defined protocol is becoming apparent. Before such a protocol can be developed, blockchain technology must be more widely used and requested by all parties in the industry.

This document is a guide to encourage more parties to participate. It offers enough detail to help professionals develop a strategy and make informed decisions. As blockchain becomes more integrated in operations, the details for a defined protocol will begin to become apparent.

Until then, professionals should consider how blockchain can improve their operations and encourage others to consider the possibilities. Together we can move blockchain from a hyped solution to a protocol that enables new possibilities for innovation.