"What you see is what I see"

# TAG DLT Pilot Report

September 2020

# INTRODUCTION

## Evaluating the benefits of an Industry Consortium Network using Distributed Ledger Technology as an **always-on industry solution** driving trust, transparency & business efficiency

Digital advertising has been a fast growth market since its inception over 25 years ago and transparency in digital advertising's supply chain is critical to its sustainable future. Much has already been done to achieve that, not least through the work of TAG and JICWEBS around their brand safety and fraud standards. The merger of TAG and JICWEBS in September 2020, makes it easier for every company in the supply chain to adopt the high standards necessary to protect themselves and their customers across the globe. However, there is still work to be done - The recent PwC study commissioned by ISBA and AOP highlighted the complexity of the programmatic supply chain and the need for industry consistency around data sharing and formatting, and we are all aware of the growing pressure from regulators to prove the compliance and accountability of digital advertising.

TAG's remit is to address the trust and transparency challenges the industry is facing. This includes assessing how new technologies can help the industry continue to self-regulate through standards, certifications and best practices and to ensure they are enforced at all times, consistently and by all industry participants across the supply chain.

To address cross-industry challenges, TAG helps create a collaborative environment for companies to share new ideas, exchange information, and set common standards. While DLT is still in its early stages, TAG believes this pilot not only highlights the potential for this type of technology but also the importance of working with stakeholders across industry to evaluate and find consensus on common standards. To this end, TAG has agreed to take on the work that JICWEBS has been doing for the past year on evaluating the benefits of an Industry Consortium Network using Distributed Ledger Technology (DLT) as an "always on" solution.

JICWEBS ran a 12-month pilot from July 2019 to July 2020, jointly with its related trade associations ISBA, IPA, IAB UK and AOP, and a number of major industry players to validate the use of DLT for digital advertising and the pilot results are promising.

With a DLT platform able to address the specific digital advertising industry needs in terms of throughput - the required speed and scale – security, privacy and costs, the pilot has demonstrated the ability to come up with a Shared Truth, the data in a unified reconciled format that everyone recognises as the truth across the supply chain and guarantees that "what you see, is what I see".

Share Truth requires:
- **Data Availability & Consistency** - For all participants to share impression log level data in unified formats.
- **Data Validation & Reconciliation** - For DLT to act as a unified point of data access, ensuring data authenticity, accountability and cross-verification over a consensus mechanism and the recording of reconciled data in a secured immutable ledger.
- **Data Privacy & Security** – For data recorded in the ledger to only get accessed on a need-to know basis over encryption keys under the control of the data provider.

The Pilot has demonstrated that Shared Truth can be used in several ways to drive significant benefits at a reasonable cost:
- **Benefits for the industry as a whole**, by eliminating poor practices and ensuring live compliance with measurable industry standards, certifications and regulations.
- **Benefits for individual network participants**, by reducing business risk, growing revenue, reducing operating costs and working capital.

The next step is for TAG to launch an industry wide Industry Consultation to share detailed information about the initiative and give the industry the opportunity to give their input in order to better define how we move forward with this initiative. I hope to see you involved in the consultation and look forward to your thoughts and feedback.

**Jules Kendrick**
MD UK & Europe, TAG
September 2020

## Need for industry consistency around data sharing and formatting

The recently released **ISBA Programmatic Supply Chain Transparency Study** in association with AOP and carried out by PwC revealed the depth of the supply chain's lack of organisation and complexity. From 267 million impressions served from study advertisers to study publishers, 31 million (12%) were successfully matched. The rest could not be mapped due to low data quality.

Challenges with contracts, permissioning, data and technology meant it took more than a year to obtain the required data. **A critical conclusion of the study is the need for industry consistency around data sharing and formatting.**

"It is the first time anywhere in the world that an attempt has been made to map a system which is not capable of being audited."
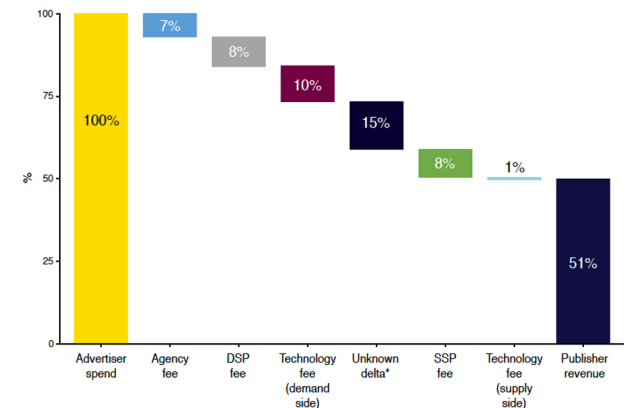
Phil Smith
Director General of ISBA

Challenges to be urgently resolved:

- **Data Access**
  A lack of understanding and consistency among the ad tech suppliers as to how they could legally share data and what permissions were needed

- **Data Formats**
  A lack of uniformity on data storage and formatting

- **Data Matching**
  Data captured by a DSP for an impression is not equally captured by SSPs which hinders impression matching

- **Data Gaps**
  Part of the supply chain costs cannot get attributed

Source: ISBA Programmatic Supply Chain Transparency Study, May 2020

**31m**
Matched impressions

**50+**
Companies involved

**290**
Unique supply chains matched

← **15 months study duration** →

**2.2bn**
Lines of data reviewed

**267m**
Total impressions observed



Waterfall chart:
- Advertiser spend: 100%
- Agency fee: 7%
- DSP fee: 8%
- Technology fee (demand side): 10%
- Unknown delta*: 15%
- SSP fee: 8%
- Technology fee (supply side): 1%
- Publisher revenue: 51%

# SOLUTION

**Shared Truth** is an enabler driving significant benefits at a reasonable cost, setting a robust foundation for the industry to regain trust and continue to grow

## Shared Truth  "What you see is what I see"

Shared Truth requires a collaborative environment - a **Shared Network** - with common rules and technology that allows to enforce the rules consistently at all times. This can be achieved with the implementation of a Distributed Ledger Technology (DLT) platform over a Permissioned Industry Consortium Network.

To become a Trusted Business Partner as a "permissioned" network member, supply chain participants need to adhere to the network minimum requirements, including the "always on" access to impression log level data - the **Shared Data** - based on the standards defined by the network governance entity.

The DLT platform can take it from there, ensuring data authenticity, accountability, cross-verification and recording in an immutable ledger over a consensus mechanism, providing a truth every network participant recognises as the **Shared Truth**.

Data recorded in the ledger can only get accessed on a need-to know basis over encryption keys under the control of the data provider.

The DLT platform allows participants to define **Shared Business Logic** for the automated processing of Smart Contracts among multiple parties, with reconciliation of data over a consensus mechanism, and the recording of validated transaction data in the immutable ledger.

**Shared Truth is acting as an enabler driving significant benefits at a reasonable cost** for the industry as a whole, eliminating poor practices and ensuring live compliance with measurable industry standards, certifications and regulations; and for individual participants, by reducing business risk, growing revenue and reducing operating costs.
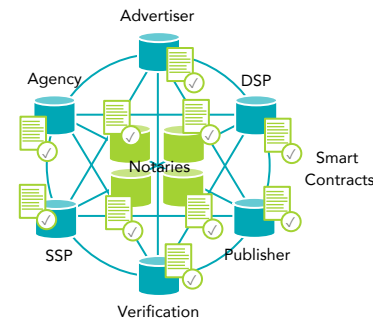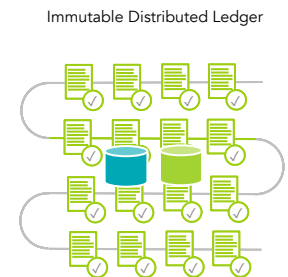
## Shared Network



## Shared Data



## Shared Business Logic



## Shared Truth



Immutable Distributed Ledger
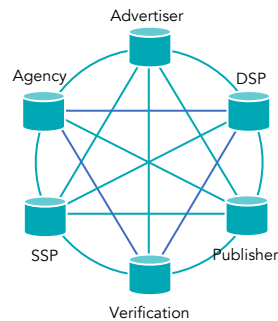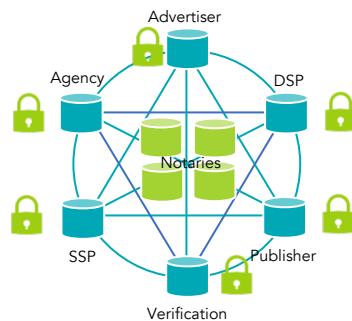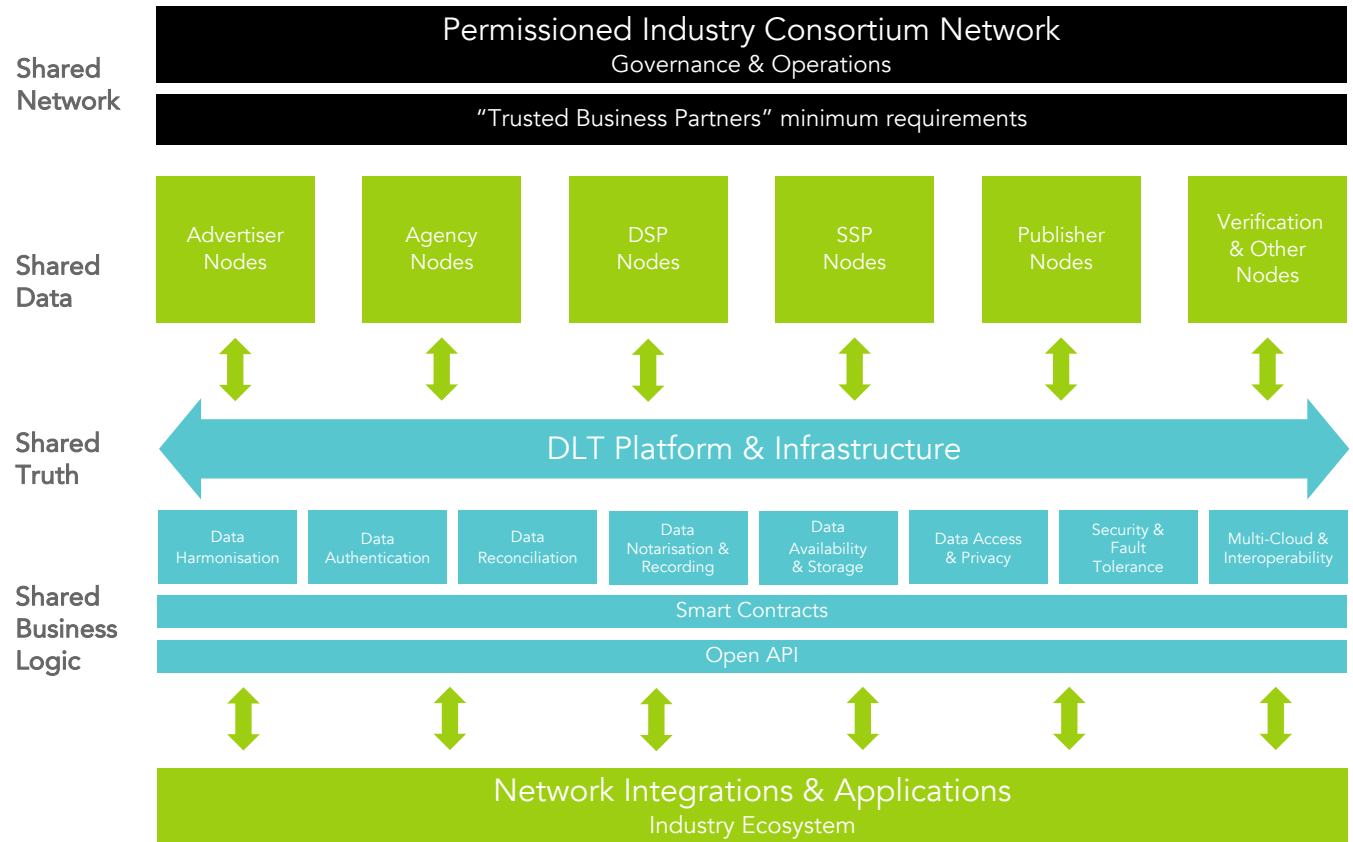
# Permissioned DLT Industry Consortium Network

The **Industry Consortium Network** is to be governed and operated by trade associations as independent entities defining the rules under which the network operates and the minimum requirements to join the network as a Trusted Business Partner. Regarding impression log data feeds this includes:

- **Data Consent** - The consent for data to be shared with specific third parties for valid purposes defined by the governing entity or contractually.
- **Data Fields** - A set of minimum required data fields to be populated for every impression providing qualitative and financial information.
- **Event IDs** - The use of common event IDs among all Trusted Partners.
- **Data Availability** – The ongoing availability of data feeds as specified by the governing entity.

These minimum requirements allow the **DLT Platform** to record each impression running through the network in the immutable ledger, providing the Shared Truth. This automated always-on process provides a view of the supply chain waterfall for every campaign from a qualitative, quantitative and financial standpoint.

The DLT Platform provides a single open API allowing Trusted Business Parties to report and access data, integrate with existing systems and applications, or develop new applications and build an **industry ecosystem** based on Shared Truth.

**Shared Network**

| Permissioned Industry Consortium Network |
| :---: |
| Governance & Operations |

| "Trusted Business Partners" minimum requirements |
| :---: |

**Shared Data**

| Advertiser Nodes | Agency Nodes | DSP Nodes | SSP Nodes | Publisher Nodes | Verification & Other Nodes |
| :---: | :---: | :---: | :---: | :---: | :---: |

**Shared Truth**

DLT Platform & Infrastructure

**Shared Business Logic**

| Data Harmonisation | Data Authentication | Data Reconciliation | Data Notarisation & Recording | Data Availability & Storage | Data Access & Privacy | Security & Fault Tolerance | Multi-Cloud & Interoperability |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

| Smart Contracts |
| :---: |

| Open API |
| :---: |

| Network Integrations & Applications |
| :---: |
| Industry Ecosystem |

**Shared Truth** is acting as an enabler driving significant benefits at a reasonable cost

# BENEFITS

## Driving direct and indirect benefits for Trusted Partners

### Shared Truth
providing accountability and compliance across the supply chain, while enabling significant business value and efficiency gains



| | Trusted Advertisers | Trusted Agencies | Trusted Tech Vendors | Trusted Publishers |
|---|---|---|---|---|
| **REDUCE BUSINESS RISK** — Live Compliance, Trusted Business Partners, Reduce Fraud & Poor Practices | ● | ● | ● | ● |
| **INCREASE VALUE** — Supply Path Optimisation, Performance Optimisation | ● | ● | | ● |
| **INCREASE REVENUE** — Demand Path Optimisation, Additional Ad Spend, Increased CPMs | | | ● | ● |
| **REDUCE COSTS** — Reduce Operating Costs, Reduce Admin & Legal Costs | ● | ● | ● | ● |
| **REDUCE WORKING CAPITAL** — Reduce Payment Times, Reduce Financial Costs | | | ● | ● |

Trusted Business Partners, accepting to join the Network and to comply with minimum requirements, can gain multiple benefits that can be divided in two categorise:

- **Direct Benefits**, the benefits provided directly by the platform such as the automation of impression log data reconciliation, reducing operating costs, or Live Compliance, validating data against a set of metrics defined as part of a standard, certification or regulation.
- **Indirect Benefits**, the benefits provided indirectly by the DLT Platform as an "enabler", using Shared Truth as a unified source of reconciled impression data to be integrated over the platform APIs with existing optimisation, business intelligence, analytics, billing, financial, auditing, administrative or any other solutions.

Compared to alternative solutions DLT provides multiple advantages:

- **Automation** - DLT requires lower tech vendor investments into log level data reporting due to automatic data harmonisation, reconciliation and access control.
- **Unified Data** - DLT requires lower investment for data access and analysis, as it is accessed via a single API in a unified format.
- **Accountability** - DLT provides the foundation for accountability and synchronous data visibility for trading parties, that is not guaranteed with traditional log file reporting methods.

# JICWEBS DLT PILOT

## From the TAG DLT Pilot to a Minimum Viable Ecosystem to a possible 2021 market launch

Initial discussions about the possible launch of a DLT Industry Consortium Network took place in August 2018 with ISBA, IPA, IAB UK and AOP who suggested for this initiative to be conducted under JICWEBS, their joint industry committed overseeing the independent development of Good Practice and Standards for digital ad trading, rebranded as TAG after its merger. In March 2019 the initiative was unanimously approved by the JICWEBS board of directors formed by the four associations.

The official launch of the Pilot was announced on July 16, 2019 with participants representing a large share of the industry. Their interest was to evaluate the benefits of DLT from an **accountability and compliance** standpoint, over enhanced transparency, and from a **business value and operational efficiency** standpoint, by gaining a better understanding of their supply chain and reducing administrative task over the automation of impression reconciliations.
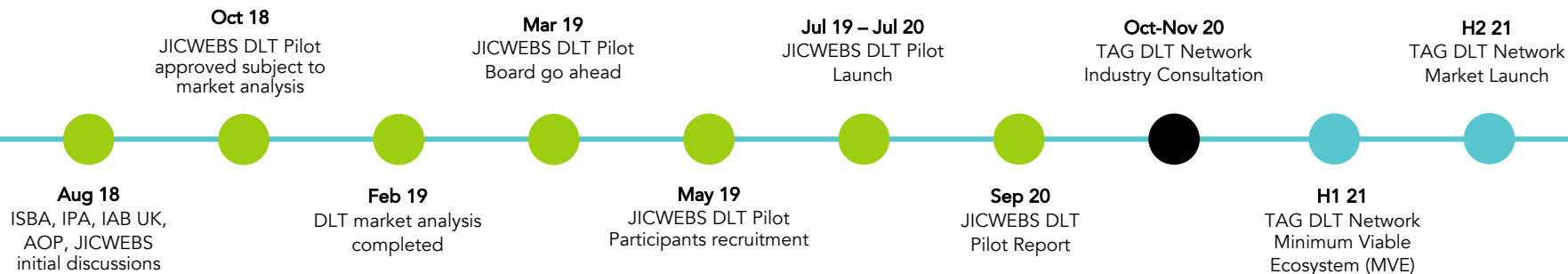
As part of the Pilot, JICWEBS created an independent **DLT Evaluation Committee**, bringing together representatives from across the industry, from each of the trade associations, and a number of DLT experts. The Committee had the opportunity to follow each stage of the Pilot and to come up with its own independent assessment of the benefits of DLT.

The Committee formed a Technical Sub-Committee to evaluate different DLT providers and their ability to respond to the specific requirements of an industry consortium network.

The timeline incorporates efforts to answer concerns expressed by the the Department for Digital, Culture, Media and Sport (DCMS), the Competition and Markets Authority (CMA) and the Information Commissioner's Office (ICO), to which the industry is expected to provide a response in 2020.

Following the Pilot, the next step is for TAG jointly with the UK trade associations to conduct an **Industry Consultation**, before setting up a Minimum Viable Ecosystem (MVE) to run in H1 2021, with a view to launch the TAG DLT Industry Consortium Network in H2 2021.

**Oct 18**
JICWEBS DLT Pilot approved subject to market analysis

**Mar 19**
JICWEBS DLT Pilot Board go ahead

**Jul 19 – Jul 20**
JICWEBS DLT Pilot Launch

**Oct-Nov 20**
TAG DLT Network Industry Consultation

**H2 21**
TAG DLT Network Market Launch

**Aug 18**
ISBA, IPA, IAB UK, AOP, JICWEBS initial discussions

**Feb 19**
DLT market analysis completed

**May 19**
JICWEBS DLT Pilot Participants recruitment

**Sep 20**
JICWEBS DLT Pilot Report

**H1 21**
TAG DLT Network Minimum Viable Ecosystem (MVE)

Next step is to conduct an **industry consultation** to decide on the launch of a small scale always-on DLT network in preparation for a possible 2021 market launch

# PILOT PARTICIPANTS

## The Pilot integrated 20 data feeds across DSPs, CV tools, SSPs, Publishers and Ad servers

| Agencies | Zenith The ROI agency | havas | Manning Gottlieb OMD | OMD | groupm | IPG | ALTAIR |
| Brands | Nestlé | O2 A Telefónica company | Virgin media | McDonald's | Unilever | J&J | National Theatre |

| Adservers | Verification | DSPs - Direct | DSP - Via Agency | SSPs - Direct | SSP - Via Publishers | Publishers |
|---|---|---|---|---|---|---|
| Google Marketing Platform | IAS Integral Ad Science | xandr | Google Marketing Platform | xandr | | netmums.com |
| smart | ORACLE | CRIMTAN | | gumgum | INDEX EXCHANGE | sky |
| flashtalking | | adform | | rubicon PROJECT | | rightmove |

The recruitment phase led to the identification of key agencies and brands who had an interest in the added accountability, transparency and operational efficiencies that a Permissioned DLT Industry Consortium Network offers. Each participant brought their own unique industry partnerships, strategies, and business requirements to the initiative.

After reviewing and mapping the programmatic supply chains, including Ad servers, Demand Side Platform (DSP), Supply Side Platforms (SSP), Content Verification Tools (CVT) and Publishers, the Pilot embarked on an outreach and data integration program which allowed to onboard data from participants.

The Pilot integrated 20 data feeds across DSPs, CV providers, SSPs, Publishers and Ad servers including the use of data dictionaries to map data fields and identities. It analysed 112 million impressions amounting to £1.4M of programmatic ad spend across 127 placements. The pilot deterministically matched 31% of impressions between two or more data sources.

Only part of the participating advertiser supply chains have resulted in data feeds from all suppliers involved in some of their campaigns and as a result prevented to make end-to-end reconciliations in the context of the Pilot.

| 6 brands | 6 agencies | 20 integrations | 127 placements | 112m impressions | £1.4 analysed |
|---|---|---|---|---|---|

# PILOT VALIDATIONS

**The Pilot successfully validated the use of a DLT platform to streamline the access to supply chain reconciled impression log level data via a single API**

**The Pilot showed opportunities representing up to £680M that could get spent more efficiently with Trusted Business Partners using the DLT Network**

## Supply Chain Transparency

The TAG DLT Pilot allowed to successfully validate - despite log level data availability and inconsistency issues - the use of a DLT platform as a unified data and reporting layer for the industry. DLT harmonises impression log level data to a common format, automates data access management, ensures data security and streamlines the **access to supply chain reconciled log level data via a single API.**

## Supply Chain Optimisation

The Network allowed to use Shared Truth to validate the execution of campaigns against a set of metrics reconciled among multiple vendors including discrepancies, measurability, viewability, brand safety or fraud prevention metrics. The focus of the Pilot was more on the validation and reconciliation of impressions against qualitative and quantitative metrics and less on the financial values. For DLT reconciled impressions 34% were categorised as non-qualified and/or non-viewable,

which in a £2B addressable market, provide opportunities representing **up to £680M that could get spent more efficiently with Trusted Business Partners using the DLT Network.** The Pilot showed that 45% of publisher domains delivered qualified impression rates of over 90% and 20% of domains delivered impression rates below 40%, considered as non-qualified. A large sample of 30 AOP domains exhibited qualified impression rates of between 83 and 94%

## Operational Efficiencies

The DLT platform successfully tested how smart contracts can automate business processes between ad buyers and sellers providing significant operational efficiencies. Research conducted with agencies indicated that **programmatic teams spend 60% of their time downloading, formatting and reconciling data**, compared with just 20% analysing it. 59% of respondents thought campaign reporting and reconciliation would benefit most from automation.

## Key findings based on compounded Pilot data



Total Impressions — 100%
Qualified — 80% / Non-Qualified — 20%
Viewable — 74% / Non-Viewable — 26%
Qualified + Viewable — 66% / Non-Qualified + Non-Viewable — 34%

Total Domains — 100%
Qualified Impression rating above 90% — 45%
35%
Qualified Impression rating below 40% — 20%

Total Time — 100%
Analytics — 20%
Data collection, formatting, reconciliation — 60%
Other — 20%

"What you see is what I see"

# TAG DLT
# Pilot Results

# PILOT HYPOTHESES

TAG approached the Pilot seeking to validate a set hypotheses, each key in delivering a successful Pilot proof-of-concept (POC), but also in helping to shape the requirements for a successful Minimum Viable Ecosystem (MVE) and a full DLT Industry Consortium Network launch at a later date.

The Pilot working hypotheses were that Shared Truth can drive benefits for network participants and the industry as a whole in a number of different ways, some of which are beyond the scope of this Pilot. In the context of a live DLT supported Industry Consortium network, **Shared Truth is to act as an enabler** for industry participants to drive business value and efficiencies over their own integrations and network application developments.

Here are the hypotheses the Pilot is seeking to validate:

1. **Industry Readiness**
   There is a willingness of supply chain participants to implement Shared Truth by providing access to their supply chain and related data feeds

2. **Supply Chain Transparency**
   Data feeds can get reconciled across the supply chain to enable Shared Truth

3. **Supply Chain Optimisation**
   Shared Truth can provide a significant increase in value over supply chain optimisation

4. **Operational Efficiency Gains**
   Shared Truth can drive significant reduction in operating costs by automating the reconciliation of impressions

5. **Live Compliance**
   Shared Truth can reduce business risk over accountability and compliance, and open additional business opportunities for supply chain participants

6. **DLT Suitability**
   A DLT platform can meet industry specific requirements, with the potential to deliver Shared Truth at scale for a reasonable cost in a data secure environment

**Shared Truth** is to act as an enabler for industry participants to drive value over their own integrations and network application developments

# METHODOLOGY

## How the TAG DLT Pilot was approached

The Pilot was divided into 3 phases and an 8 stage process to validate the Pilot hypotheses. Each phase was critical in delivering reconciled delivery data at an impression level within the supply chain.

| | | |
|---|---|---|
| Stage 1 | Onboard buy-side, sell-side and technology vendors | The pilot relies upon the successful and collective involvement of industry participants. Onboarding and integrating key vendors in the supply chain, including Ad servers, Content Verification tools, DSPs, SSPs and Publishers are essential in delivering the pilot validations. |
| Stage 2 | Gather consents and update contracts | In a complex supply chain, the requirement to obtain consent for both the provisioning and processing of data is fundamental. Also, many advertising technology relationships, logs are provided based on a contractual arrangement to provide certain types, fields or format of data. We examine if current business practices and contracts can support the pilot. |
| Stage 3 | Extract and integrate impression-level data feeds | Every transaction in the supply chain must be logged within the DLT to generate value. Many vendors offer data logs or unique records that can be used to evidence a transaction. During the Pilot the suitability of current feeds and infrastructure to support an industry DLT network get analysed. |
| Stage 4 | Reconcile impression-level data feeds | The reconciliation, or matching of unique impression and event records underpins the proposed TAG DLT Network. To what extent can supply chain data be matched on an impression by impression basis through common IDs to be executed against a Smart contract. |
| Stage 5 | Supply Chain Optimisation | Show how supply paths can be better optimised to increased working media and performance. |
| Stage 6 | Operational Efficiency Gains | Show where DLT can drive basic operational efficiencies, whether in the fields of secure data management, reduction of time and costs, or more efficient data storage and access. |
| Stage 7 | DLT Platform | Demonstrate how participants can use DLT-based cryptographic proofs around ad delivery data in audits and the enforcement of contractual agreements. Demonstrate how participant identities can be managed within the DLT network and how smart contracts between them can be signed, executed and used to enforce compliance with agreed principles and contractual agreements for ad campaigns delivery and reconciliation. Validate technical suitability of purpose built DLT network for programmatic ads marketplace impression-level data processing, including throughput and security requirements. |
| Stage 8 | Live Compliance | Compliant data is at the foundation of value driving DLT networks. The Pilot validates how compliant, reconciled data underpins many of the network benefits. |

# INDUSTRY READINESS

For most pilot participants impression log level data feeds were available and provided the data depth to match key metrics across vendors

In a permissioned industry consortium DLT network participants are permitted to join the network by TAG as the operating entity delivering authentication of their corporate identities on behalf of the governance entity. Specific data requirements and governance principles will have been agreed and met, and participants will have approved or launched a node to ensure readiness for launch where each and every transaction is only with another network **Trusted Business Partner**.

## Industry Readiness Key Findings

The early stage of the pilot was spent engaging with participants, reviewing technical documentation, data schemas, legal relationships and understanding what processes needed to be followed to ensure we could extract the required data assets for later phases. Here are our summarised findings.

- **Positive Overall Response** - The overall response to the DLT Pilot has been positive. Many participants who are striving to deliver greater levels of transparency to their partners have been keen to participate.

- **Data Feeds** - While speaking to +150 industry players we have been able to work with over 30 different participants from across the ecosystem whose data has been critical to this initiative.

- **Buy Side Data Access** - In most cases the advertiser or agency already owns the DSP data. In some cases the advertisers runs the seat directly. Parties have data stored locally, or have been able to share direct data bucket access directly. This process has been relatively straightforward.

- **Integrated DSP & CV tools** - DSP and CV tools are well integrated, and have well advanced technical relationships. The setup of log level data and passing of impression tracking IDs and macros has been technically straightforward. In many cases this happens natively when content verification scripts are generated or added to a DSP.

- **DSP & SSP matching** - All participating DSPs and SSPs have existing log file feeds. However, not all feeds contain the required fields to match impressions which requires attention.

- **SSP Data Access** - SSP were also able to provide largely compliant log level data. Participating SSPs welcomed the chance to engage as it aligns with their trust and transparency goals, and offers a platform to deliver transparent data to their customers.

- **Required Consent -** In all but one case, SSP's needed the specific consent from both publishers (for financial related fields) and the buying DSP and Client to provide their impression-level data feed. This can lead to significant delays in accessing data.

- **Reconciliation SDK** - There are instances where unique IDs are not supported due to different reasons. In cases were feeds were not present, or the relevant fields were not available, selected participants were open to installing a custom-built Reconciliation SDK.

- **Reconciled Data Feeds -** The pilot successfully reconciled parts of 20 different data feeds using commonly provided log level IDs and custom generated IDs depending on the supply chain structure.

- **Supply Side Data Access -** The majority of the approached publishers use Google Ad Manager (GAM) as their publisher ad-server. Premium publisher generally had access to GAM DT log files. A charge is levied for access to this data, although not all publishers subscribe. ~80% of approached top tier publishers confirmed they had access to DT logs. This figure is expected to diminish across the long tail where feeds are not used or required.

# SUPPLY CHAIN TRANSPARENCY

A secured collaborative DLT environment delivering Shared Truth acts as an **enabler** for enhanced accountability, supply chain optimisation and operational efficiency gains

The DLT network will further automate the reconciliation work achieved with the Pilot. It will simplify the process for tech vendors to make their data securely available to supply chain participants in a unified format in an **"always on"** fashion. That data can then be reconciled against a set of pre-defined requirements as defined by regulations, standards or commercial contracts.

## Reconciling Impressions across the Supply Chain

The Supply Chain Transparency phase of the pilot required the **end-to-end matching** of participants impressions through log-level data reconciliation. It also allowed the pilot to explore solution for instances that data cannot be reconciled.

The process **qualified and mapped** the key participants identified during the industry readiness stage then integrated each data feed into the DLT platform.

During this proof of concept, the network ran as a centralised database as we did not request that participants integrated directly into the DLT network through any software deployment or node integration. Data was extracted using traditional means directly to TAG and committed to the DLT network on behalf of the participants, simulating a decentralised deployment.

We choose specifically to use only log-level data during the Transparency phase, as a reconciled log-level impression provides the foundation for any other cost, delivery or meta data analysis required by any industry participant.
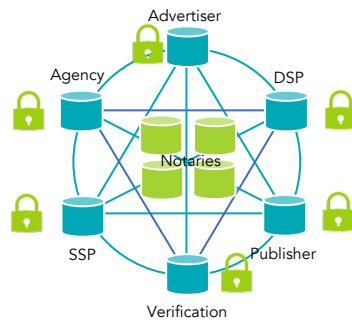
Customised adaptors were built for each participant and data feeds to harmonise custom data formats, identity maps and data dictionaries into a unified format, with a unified identity map used for data access and reconciliation in the DLT network.

From this point onwards, it was possible to execute reconciliation across live campaigns to gain transparency and accountability on impressions and click data, content verification metrics and, depending on finance data availability, the supply chain costs, though this was not the focus of the initiative.
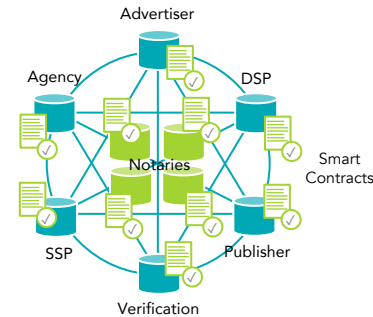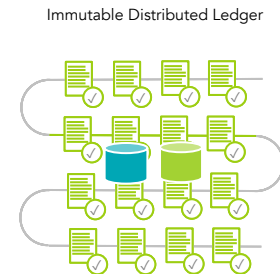
It should be noted that **in a live DLT network there will be no requirement to provide data access to the network operator or DLT platform**. Data access is only to be provided by the data provider over encryption keys on a need-to-know basis in accordance with network governance requirements, vendor policies and consents.

## Shared Data



## Shared Business Logic



## Shared Truth



Immutable Distributed Ledger

# SUPPLY CHAIN TRANSPARENCY

The platform data harmonisation solution allowed the DLT to match most of the data fields from different providers

The implementation of a purpose built Reconciliation SDK achieved a ~98% match rate across platforms for impressions where AuctionIDs were obfuscated

## Supply Chain Transparency Key Findings

It took 6 months of work covering data onboarding from a technical, legal and operational perspective until we were able to formulate the following assertions relating to the Supply Chain Transparency phase.

- **Legal -** There are no standardised procedures to gain access to log level data if participants do not have contracts in place. Legal teams are required to review specific contract points between parties in order to deliver consent.

- **Common IDs -** The obfuscation of auction and impression ID in data feeds does not allow for native impression-to-impression reconciliation between sellers and buyers to agree on a single 'source of truth'.

- **Reconciliation SDK -** The TAG DLT network requires all participants to provide impression tracking identifiers in their data feed to track and run impression-to-impression reconciliation of data between all parties. A custom built JavaScript SDK, developed in a consumer privacy-preserving way by generating random IDs for each call was successfully deployed on both the publisher side and buy-side for a selected buying path where 98% of obfuscated impressions were successfully joined.

- **Data Formats & Fields -** Every vendor has their own data feed formats and data fields. Work needs to be undertaken to align and harmonise these fields.

- **Mapping -** The mapping of entities between vendors is not standardised and requires manual work (eg, identification of publishers, advertisers, campaigns, Insertion Orders within data on impressions delivery provided by vendors across supply chain)

- **Traceability** - In some cases <1% of anonymous inventory is bought which cannot be traced back to a legal business entity.

- **Authenticity and Integrity -** Usually there is no cryptography in place around log files reporting to ensure data authenticity and integrity, in theory data can be spoofed by malicious actors sitting between the reporting entity and data "consumer" (eg, by cloud hosting provider, by rogue employees, or data processing software, etc.)

- **Data Misrepresentation -** Data may be misrepresented by vendors due to misconfiguration of tags or for some other reason. By reconciling data between different vendors this has been detected via discrepancies (eg, if the recognised publisher domain name is different in A and B it may be a sign of spoofing or misconfiguration).

- **Consent -** Processes for distributing and managing consent between entities are complex and time-consuming to navigate for all involved parties. There is little or no standardisation. Success can be achieved, though this area remains in need of improvement.

# SUPPLY CHAIN OPTIMISATION

## Live Campaigns and DLT Smart Contracts

The next step was to run live campaigns monitored over the DLT platform. Smart contracts were used to execute and reconcile delivery data and to show the incremental value supply chain participants can get from the use of DLT, by optimising the supply chain or gaining operational efficiencies.
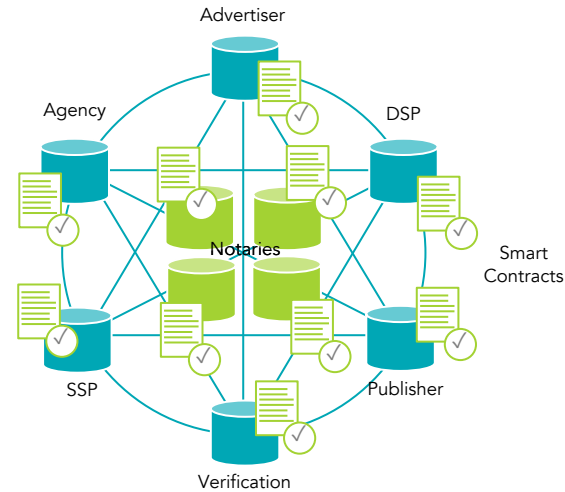
This was done in 2 distinct phases:

**For the Pilot test Smart Contracts were run over real data inputs against the qualified impression criteria**

**Phase 1 – Data Templates**
Based on the available supply chain data sources templates were produced per pilot participant defining the data criteria that an impression can be reconciled against. A template can serve as a mechanism to perform a variety of functions, from improving optimisation decision making, to providing a reconciled financial figure for billing and invoicing purposes.

**Phase 2 – Smart Contracts**
The chosen criteria were written in code and registered to the network as Smart Contracts between registered parties. The Smart Contracts are cryptographically signed by its parties and notarised in the DLT network, ensuring contract enforceability. The contract is distributed to those registered supply chain nodes and executed on a ongoing basis depending on the availability of updated data feeds. For the Pilot test smart contracts were run over real data inputs against the qualified impression criteria.

The DLT network automates the smart contracting process. Participants have tools to define and build smart contracts that govern all supply chain participants. Where enabled, the network will automatically reconcile impression-level delivery data against these contractual stipulations making this harmonised data available via a suite of API's. Only **Trusted Business Partners** who have agreed contractual relations to access the data may do so.

## Supply Chain Optimisation Key Findings

Over the course of monitoring live campaigns the results can be summarised as follows:

On average ~20% of the spend was attributed to "non-qualified" impressions

AOP domains exhibit qualified impression rates of between 83-94%

Viewability figures from different vendors showed an average difference of 15%

Ongoing analysis of unified ad delivery data over DLT is capable of improving brand/agency ROIs by +20%

- **Qualified Impressions Rate** - On average ~20% of analysed ad spend is attributed to "non-qualified" impressions, i.e. impressions which do not meet the minimum quality requirements for discrepancies, measurability, brand safety and fraud prevention. The criteria did not include whether an impressions was viewable by industry standards. This was measured and analysed as a separate metric.

- **Unqualified impression breakdown -** Out of the 20%, ~10% is attributable to discrepancies in impression confirmations by the ad server, DSP, SSP and content verification provider, ~6% to brand unsafe impressions, ~3% to non measurable impressions, ~1% to invalid traffic. Analysis of CTR for qualified and non-qualified impressions demonstrated that qualified impressions have a ~2x higher CTR.

- **Two party match rates -** The average match rate between two buy side parties is between 90-95% threshold due to natural latency of tracking calls in client-side browsers. Lower rates will require investigation, as they may highlight technical issues, page rendering latencies, or some form of fraudulent activity.

- **Three party match rates -** The average match rate between three sources; DSP, CV tool and Ad server is between 86% - 90%. These levels will need to be closely monitored and understood. Acceptable thresholds will need to be documented, to allow investigations to be conducted where appropriate.

- **Buy and Sell side match rates:** The average match rate between DSP and SSP where common record IDs are available is 94%.

- **Publisher logs** could only be matched in a supply chain where the Reconciliation SDK is used, as there are no common record IDs that can be matched using existing fields.

- **Tag Updates -** Impression-level reconciliation generally requires the upgrade of verification tags to pass unique IDs to content verification vendors.

- **Ensuring Coverage -** The implementation process must be carefully implemented to achieve 100% coverage. In one campaign only 25% of the impressions were related to ad creatives with proper verification tags after initial verification deployment. Care must be taken to understand what sites and partners you can extract accurate data from.

- **Brand Safety -** In monitored insertion orders, the % of unsafe impressions range from 0% - 28%. Some insertion orders contained >20% of non brand safe impressions

- **Technology -** Deployment of technology is not standardised, particularly amongst verification tools. It was surprising how many different approaches to blocking were applied. Some campaigns ran with blocking tags, some ran pre-bid filtering, some implemented keywords lists and whitelists, some all three and yet 'brand safety' still remained a key driver of non-qualified impressions, suggesting not all participants are aligned with KPIs or reporting.

- **Domain Coverage -** OMP campaigns are typically delivered across 10,000+ publisher domains, although~80% of all impressions analysed are accounted for by the top 250 domains.

- **Lower Qualified Impression Rates in the Long Tail -** In the analysed open marketplace campaigns ad spend was distributed across thousands of publisher domains. 80% of the ad spend went to 70% of the publisher domains, including all premium ones, which delivered impressions with a qualification rate of >80%, while 20% of ad spend went to 30% of the publishers with an impression qualification rate below 60%.

- **AOP Qualified Impression Rates** - A large sample of 30 AOP domains exhibited qualified impression rates of between 83-94%

- **Robust Processes -** This highlights the importance of establishing processes for ongoing data audit to detect ad misconfigurations, supply chain inefficiencies and verification and delivery issues.

- **Viewability Discrepancy Rate** - Among qualified ad spend on average ~14% is attributed to non-viewable impressions according to a measurement platform of choice. Reconciliation of impression level viewability results between different measurement platforms demonstrated ~15% average discrepancy between them indicating there is still work to be done for verification tools to align methodologies to produce similar results.

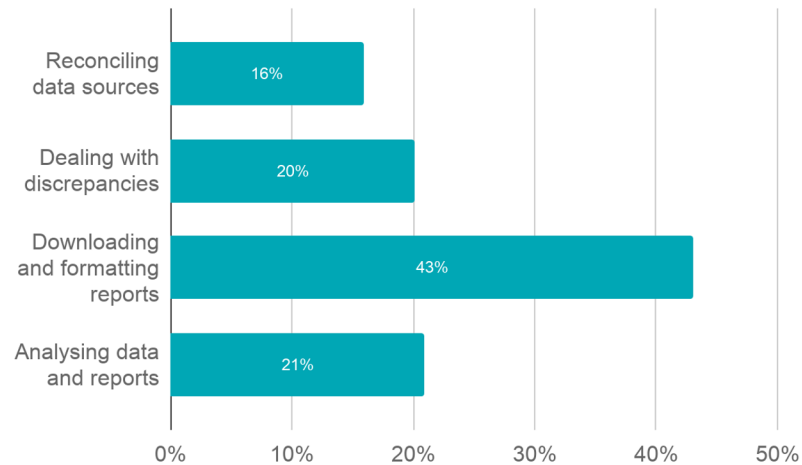# OPERATIONAL EFFICIENCIES

## Market Research

At this stage in the Pilot we undertook two pieces of market research to help us answer some key questions.

- **What** are the key area that would benefit from operational efficiency gains
- Where are **operational** inefficiencies most keenly felt in the marketplace
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We then used our findings from Supply Chain Transparency and Optimisation phases, plus our ongoing discussions and interactions with our pilot participants to summarise the main areas of opportunity.

Some agency programmatic specialists spend close to 60% of their time downloading, formatting and reconciling data, compared with just 20% of their time analysing it.

52% of respondents thought campaign reporting and reconciliation would benefit most from automation



To better understand and quantify some of the current operational inefficiencies in the marketplace we asked several key questions to 40 programmatic analysts, campaign managers and technical managers across several agencies

**Question 1** - How many hours per month do you spend downloading and formatting reports and data?

**Question 2** - How many hours do you spend performing data reconciliation for reporting or billing purposes per month?

**Question 3** - How much is spent investigating and resolving data discrepancies?

**Question 4** - How much time is spent analysing data and reports per month?
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**Question 5** - Which key task or processes would benefit most from automation and improved efficiency?
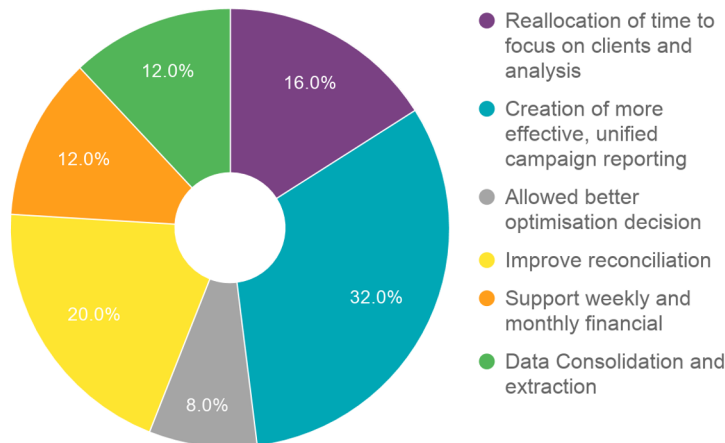
# OPERATIONAL EFFICIENCIES

Data and reporting integrations are timely and costly to build and maintain. Investment into a shared DLT infrastructure can unlock cost saving for all parties

"We have better control of pacing and performance against key 3rd party generated KPIs and the ability to see cross-source data comparisons without the manual manipulation"

Key 'real-time' compliance data can reside in the DLT infrastructure providing all parties who require instant access to key supplier and buyer compliance metrics, heavily optimising current processes

## Operational Efficiency Key Findings

The operation efficiencies phase bought together all of our learnings from the previous pilot phases coupled with input from our pilot participants around their workflows, processes and challenges.

- **Validation and reconciliation automation -** Large amounts of time are spent performing manual extractions, reconciliations and related data tasks. DLT can restore a better balance through automated, harmonised data as provided to our pilot clients.

- **Cost -** Our research showed that some single client side integrations with a 3rd party data source can incur a cost of up to £10,000 + recurring fees that are passed on to the end data user.

- **Integration Time -** Integrations can take each single business upwards of 12 weeks to integrate. There are generally numerous partners to integrate. These operating costs and timings can be reduced, as can ongoing maintenance and related technical costs by using a single point of data entry.

- **Data access over an open API** - Having the ability to access an immutable ledger of reconciled, log-level data via an open API allowing integration with existing systems or to develop new applications. This can enhance existing solutions and improve data coverage.

- **Enhanced business intelligence** - The automated reconciliation of data sources helped pilot clients in several ways;

  - Harmonised data enabled "always on" business intelligence to reduce the number of non-qualified / non-viewable impression rates and achieve +10% ROI's.

  - Deeper analysis of how different vendors are reporting on the same or similar metrics. This has led to different forms of outreach to both 3rd parties and internal teams to ask data accountability questions, for example, where CV tools mis-align or where timestamps between matched impression do not tally.

- **Data Filtering** - In the observed use-cases SSP logs are generated at a seat level. This hierarchy often means that logs for many advertisers are provided in single feeds. These data feeds require large amounts of time and effort to process, filter, map, associate dictionaries and extract in order to make it useful at an advertiser campaign level. In many cases feeds are being under-utilised, or at worse not integrated due to the costs incurred. The harmonisation of this data by default can lead to significant savings.

- **Information flow** - The same campaign data (Brand KPIs, verification targets or settings) were not always delivered or understood by all participants in a given supply chain. A DLT infrastructure, particularly a Smart Contracts can be also be used to deliver critical information to all participants securely and equally, which can drive significant operational benefits and improve transparency.

- **Live Compliance -** The proposed Live Compliance Program can greatly reduce time spent on managing supplier compliance. According to our research, it can provide an authenticated corporate identity, compliance to key industry standards, and a window into key signatory metrics all held within the DLT infrastructure.

# LIVE COMPLIANCE

The Pilot revealed stronger than anticipated interest in the broad accountability and compliance potential of DLT and its ability to **differentiate Trusted Business Partners over Live Compliance**

## Building a compliance framework

The Pilot wanted to explore the benefits DLT could offer in areas such as compliance, including existing certifications defined by TAG, but also the ongoing compliance with any other measurable rule, such as a specification, policy, standard or regulation that the industry requires.

Much of the original hypotheses and goals of the pilot had been focused on the supply chain transparency and DLT efficiency gains. A larger part of this is because these gains would be more immediately quantifiable over the comparatively short life of the study than benefits associated with ecosystem wide compliance improvements. However, during the course of the pilot, qualitative research and interviews with multiple participants revealed a much stronger than anticipated **interest in the broad accountability and compliance potential of DLT technology, and its ability to differentiate trusted business partners.**

Today there is no single industry database of compliance status and the information required to validate a participant's compliance is disparate and managed by multiple different organisations. As a result, considerable headcount is required on both the buy and sell sides of the industry to simply carry out basic checks on content, use of standardised industry technologies (ads.txt, etc.), applicable certificates, correct use of consent management platforms or even the legal entity of buyers and, especially, sellers involved in transactions. Together this represents a substantial, un-glamourous and often forgotten pain point the industry must go through to suitably avoid reputational and commercial risks.

Furthermore, little to no independently audited data is available on consistent delivery of viewable, low fraud and brand safe impressions. Where it is available, it does not always reach the required supply chain entities and such data seems to exist in a fragmented state behind closed doors. Today, the industry still relies almost entirely on traditional low frequency offline audits for independent verification of best practice which can only describe business process not compliance outcomes. Despite being a pioneering sector as far as the use of data to drive commercial outcomes, the industry has so far left the improved standards potential of such log level information "on the table".

In response to this finding we devised a new TAG product concept: **Live Compliance** which we could test with industry stakeholders involved in the Pilot to validate interest before considering a build-out.

The Live Compliance concept is simple: each organisation on the DLT network is represented in a public dashboard which displays everything that is known about the organisation's compliance status in real-time: adherence to standards, current certifications and even their own independently audited performance against targets the participants themselves have set to hit key industry metrics around Fraud, Viewability and Brand safety. As soon as there is a change to this status (a certificate expires, brand safety data is not on target, etc.) the page updates. Crucially Live Compliance also provides the compliance metrics history over an immutable audit trail, providing good reasons to remain compliant at all times!

Live Compliance is to be further specified and validated in the MVE phase.

# DLT
# SUITABILITY

**TAG/JICWEBS came to the conclusion that DLT is the technology to provide an always-on solution to the trust and transparency problems the industry is facing**

## Always-on trust, transparency, efficiency industry solution

As part of the Pilot, TAG/JICWEBS drafted a **Pilot Charter** describing the Pilot objectives, roadmap and timeline, and the key questions TAG wanted to see answered as part of the Pilot before moving to the MVE phase.

TAG also created an independent evaluation committee – the **DLT Pilot Evaluation Committee** - formed by representatives from the trades and selected DLT experts. The Committee followed the entire Pilot process over a number of workshops, meetings, calls and emails centred around the Pilot.

A **Technology Sub-Committee** was created to define DLT platform requirements and to conduct an evaluation comparing the offering of different providers over an RFI process for the possible launch of a DLT industry consortium network.

In line with the validations provided by the Pilot and the views expressed by the Committee, TAG came to the conclusion that, in the context of an industry consortium network, governed and operated by the trade associations as independent entities, **DLT is the technology to provide an "always on" solution to the trust and transparency problems the industry is facing**.

The DLT platform used for the Pilot, that was developed since January 2017 as a solution entirely dedicated to support an industry wide digital advertising industry consortium network, was also evaluated to offer the best suited technology and value proposition for the industry compared to alternative offerings.

The Platform, in particular, met the following key requirements:
- **Data Throughput** - Ability to handle data volumes inherent to the programmatic advertising marketplace;
- **Data Accountability** - Cryptographic evidence of data authenticity, integrity and immutability;
- **Need-to-know Data Access** - Data access control with end-to-end cryptographic encryption, ensuring data is only accessed by given parties based on their contractual agreements;
- **Cost Effectiveness** - Network usage fees not to exceed 1% of the ad spend.

This platform will be deployed in the MVE phase to validate its ability to support a fully functional live DLT industry network.

As part of the joint industry committee overseeing the independent development of Good Practice and Standards for digital ad trading, the trade associations also confirmed the role of TAG/JICWEBS as the best suited entity to continue to oversee this cross-industry initiative and to act as the independent network operator, for the possible network launch, under a governance structure that remains to be defined as part of the MVE.

Besides the technology challenge, the successful launch of a Permissioned DLT industry consortium network, with all the value it can unlock at scale, will largely depend on the broad participation across the industry from which everyone can benefit as a **Trusted Business Partner**.

**The successful launch of a DLT industry consortium network, will largely depend on a wide participation from which everyone can benefit as a Trusted Business Partner**

# EVALUATION COMMITTEE

TAG/JICWBES created an independent evaluation committee – the **DLT Pilot Evaluation Committee** - formed by representatives from the trades and selected DLT experts who followed the entire Pilot process

**JIC WEBS**

ISBA        IPA        iab UK        aop

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