Blockskye

A Blockskye Report

Blockchain and Offer **Innovation**

atpco

Presented in partnership with ATPCO

Introducing the Offer Blockchain
A proof of concept by Blockskye & ATPCO

2018

2020

> "
> Even when you book and price on the airline's own website, there are still a dozen-plus layers between the airline and the traveler — each with the potential for friction, cost, and fallibility.
>
> —Airline industry executive
> "

Blockchain is an undeniable and transformative force, with wide-reaching applications across many industries, including aviation.

As an airline-owned platform for content distribution, it is ATPCO's duty to return value to the industry through innovation, content, technology, and standards. As we explore the future of distribution, we will continue to seek new ways to enable smart connections between airlines, partners, and data.

In partnership with Blockskye, we wanted to ask the question, "How might blockchain shape the next generation of airline distribution, and how can ATPCO create and return value that would benefit the entire industry?" The concept of a persistent offer managed by a neutral authority addresses many of the coming challenges of direct distribution.

We hope this paper creates discussion on how blockchain might drive paradigm shifts so we can begin to unlock the value of this technology for airlines, channel partners, and consumers.

I believe ATPCO is at it's best when we bring the industry together. This proof of concept is associated with the ATPCO Partners in Innovation council, whose guidance directly influences ATPCO's R&D program. If you want to join our innovation council, drop me an email at gcataldo@atpco.net.

— Gianni Cataldo
    Head of R&D (ATPCO)

WHAT'S THE BIG DEAL?

As airlines embrace more sophistication in offer generation, beyond fares to dynamic products, blockchain can become an authority to ensure the validity of the product offered.

Enterprises like JPMorgan Chase, Walmart, Samsung, and Air France all embrace the value in the core innovations of blockchain: the shared ledger and smart contracts. The promises of blockchain's shared ledger and smart contracts are simple—enterprises spend less time struggling with data and more time generating value, and transaction data is universally formatted, secured, and verified.

Blockchain can be applied to the movement of any asset transferred between a seller and a buyer, and applications of blockchain in commercial aviation continue to expand. Blockchains can be both fully distributed (such as with cryptocurrency), or private/permission-based. Private blockchains are closed systems with credentialed participants, certified inventory, and human governance, jointly administered by industry stakeholders—with no cryptocurrency. This approach considers blockchain not as a fully distributed system like bitcoin, but as an enterprise solution governed by stakeholders and operated like SaaS, or Blockchain-as-a-Service (BaaS).

For commercial aviation, and the wider travel industry, 2019 will bring further PoCs, pilots, and in some instances, full production of blockchain solutions driven by startups, airlines, and airline industry leaders. Current PoCs include the Airlines Reporting Corporation (ARC), a major US carrier, a top global corporate travel buyer, and Blockskye. One use case for blockchain that deserves further investigation is supporting NDC and One Order implementations by providing a distributed and decentralized trust-based authority for offers and orders. In this use case, ATPCO, an airline-owned platform for content distribution and a global leader in pricing integrity, can act as a central authority to ensure the integrity of offers and orders.

WHAT IS
BLOCKCHAIN?

Blockchain & airline data work together

WHAT IS BLOCKCHAIN?

AT ITS ESSENCE, BLOCKCHAIN REFERS TO A METHOD OF FORMATTING, VERIFYING, & DISTRIBUTING DATA.

FORMATTING Where calendars view data as events in a timeline, and phone books view data as names and phone numbers, blockchain views data as transactions between multiple parties along a shared ledger. Most data entries stored in blockchain are transactions between two consenting parties. Other entries might be reference data like tax tables and regulations.

VERIFYING A transaction is posted in blockchain only when the transacting parties to a single transaction simultaneously consent to its accuracy. In this way, all blockchain data is consensus-driven and verified, offering transparency and provenance between the original supplier and the end buyer.

DISTRIBUTING Because the ledger, or blockchain, is shared, it is by definition also a means of distributing data. Alice doesn't need to ask Bob to distribute his data to her because Alice shares access to the relevant data store with Bob. Nevertheless, Alice and Bob do have partitioning and control over certain elements of their own data.

Blockchain data is not stored on a single server, but on a network of servers. Each server on a given blockchain network is referred to as a "node," and each node stores a relevant copy of all historical transactions in the network. The nodes are in live synchronization to ensure that they are all in consensus as to what transactions have taken place, and which transactions are valid. In this way, the consensus of a single transaction among the parties is mirrored on a larger level among the nodes.

BLOCKCHAIN IS IMPORTANT TO THE FUTURE OF AIR TRAVEL

At the moment, transacting enterprises each maintain their own records. This leads to a proliferation of records of various types and formats that are nearly impossible to reconcile within a given enterprise, much less among multiple enterprises or across an entire industry.

Amid this confusing and inefficient system, blockchain offers five key innovations that are germane to air travel and ticket pricing:

VERIFIED DATA A transaction is posted in blockchain only when both parties to the transaction consent to its accuracy. In this way, all blockchain data is verified at the moment of data entry.

SINGLE RECORD OF TRUTH Both parties to a transaction refer to a single ledger of historical transactions, or a single blockchain, rather than maintaining their own, independent, and potentially conflicting sets of records.

MULTI-PARTY DATA Because blockchain is designed to be the collective, shared, single record of the truth, it is the ideal format for storing transaction data between multiple parties, such as airlines, agencies, distributors, and settlement and data services, which can then create a transformative marketplace for content, or an industry network, as inventory becomes dynamic and programmable.

SECURITY The data is broken into blocks and distributed among multiple nodes, offering the highest level of cryptographic security. There is no single point of failure and no central admin with a hackable username and password combination.

IDENTITY & PROFILES In blockchain, a unit of value is never independent from a profile. Each ledger entry attests to a transaction that is itself a record of value and ownership.

SMART CONTRACTS: HOW BLOCKCHAIN HELPS IDENTIFY NEW OPPORTUNITIES

While blockchains store historical transactions, smart contracts allow actors to interact with blockchains. Smart contracts facilitate programmable inventory, offers, and if-then statements that generate and settle inventory. In essence, smart contracts are predetermined and customizable rule sets that govern timing, pricing, inventory generation, and settlement. Transacting parties create, modify, negotiate, and consent to smart contract terms before initiating a transaction or creating an offer.

MORE DATA, FASTER Smart contracts can incentivize parties that possess data about the need for travel to help airlines generate and push custom offers directly to shoppers, eliminating the current customer acquisition cost. Such parties include conference and event producers, calendar applications, and TMCs.

VERIFIED DATA Blockchain data is verified data. Verified data coupled with dynamic access and API integration could allow airlines to account for a wider dataset to animate offer creation and targeting.
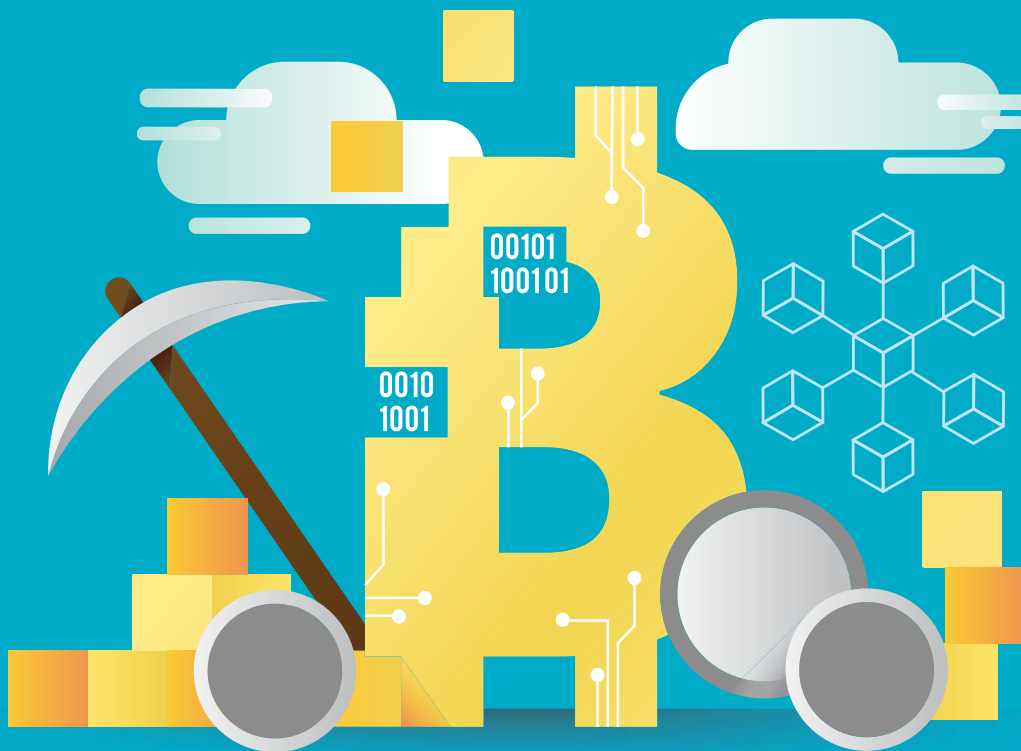
"When Alice sends a bitcoin to Bob, the bitcoin is only ever in either Alice's or Bob's account — the bitcoin is never in an intermediary state. By contrast, if Alice hands Bob a $100 bill on a windy day, and a gust of wind blows the bill to the ground, Charlie can claim the bill as his own. Ownership disputes can arise when value is independent from ownership/identity."

HOW PRIVATE & PERMISSION-BASED BLOCKCHAINS ARE GOVERNED & PARTITIONED

Partitioning private, or permission-based, blockchains is a question of governance: What multi-stakeholder governance organization oversees a given chain, and how is it made up? The right governance structure will be crucial to blockchain adoption, generating trust among vendors while allowing the right amount of cooperation (data standards), competition (shopping), and disintermediation.

In permission-based blockchains, administrators can flexibly map existing applications, data models, and workflows to separate private blockchains, while the main blockchain shares event triggers, system announcements, and common data.

A single ticket or pricing event could exist across multiple blockchains—main and private. All participants will have access to the main chain, while only limited participants will have access to any private chain. For example, if ATPCO, Airline 1, and Airline 2 are all members, all of them will have access to the main chain; however, there may be a private chain with only ATPCO and Airline 1, or another chain with ATPCO and Airline 2.

Confidential details can be stored on the private chain. For example, an order on Airline 1 is stored on the main chain, but all other details regarding the offer, customer, and payment would be stored on private chains. Because ATPCO has access to both the main and private chain, ATPCO would be able to query all the details on the order and offer, while other members could not.

ATPCO and its customers on the main blockchain can invite new members, handled via registry, permissioning, and governance smart contracts. Onboarding to the main chain can be handled by rules established in a smart contract. For example, a new member could be added based on majority voting, or by quorum with ATPCO. Only members on the main chain can form private chains via P2P messages with other members.

Blockskye & ATPCO

Proof of Concept:
Offer Blockchain

PROOF OF CONCEPT PROPOSAL: BLOCKCHAIN & SMART CONTRACTS, THE DECENTRALIZED OFFER

One of the profound changes that blockchain and smart contracts can have is to transform distribution from current fare publishing to Offer and Order Management. Because blockchain is a consensus-driven architecture, it can help develop technical solutions for NDC by unifying data presentation among various actors, through the life cycle of an offer.

NDC presents the opportunity to disintermediate the travel shopping and booking experience, allowing airlines and sellers to build deeper direct relationships, maintain control over their product and their data, and deliver more dynamic and targeted products to the consumers.

NDC operates well as a set of digital standards and guidelines to enable these interactions but falls short in the definition and subsequent management of the order. The assumption is that the airline follows a similar model to today's model, in that they have an order store (super PNR) that locally holds all data on the seller in their own secure infrastructure.

The opportunity for blockchain here is to provide a three-way consensus between the seller, the airline, and an authority, expanding to a four-way consensus for sophisticated consumers like corporate buyers.

The airline, as Offer Responsible Airline, publishes the offer on the chain, while ATPCO acts as the certifying authority for offer integrity. This PoC proposes that, as a neutral industry platform for content distribution, ATPCO can act as the authority for the integrity of the offer to ensure that all actions surrounding the offer are managed correctly, accurately, and in compliance with tax, industry governance, and any applicable interline agreements.

By having controlled access to the offer and order, all parties will have access to process changes, refunds, and cancellations in accordance with the original offer, thereby providing a seamless experience to the consumer.
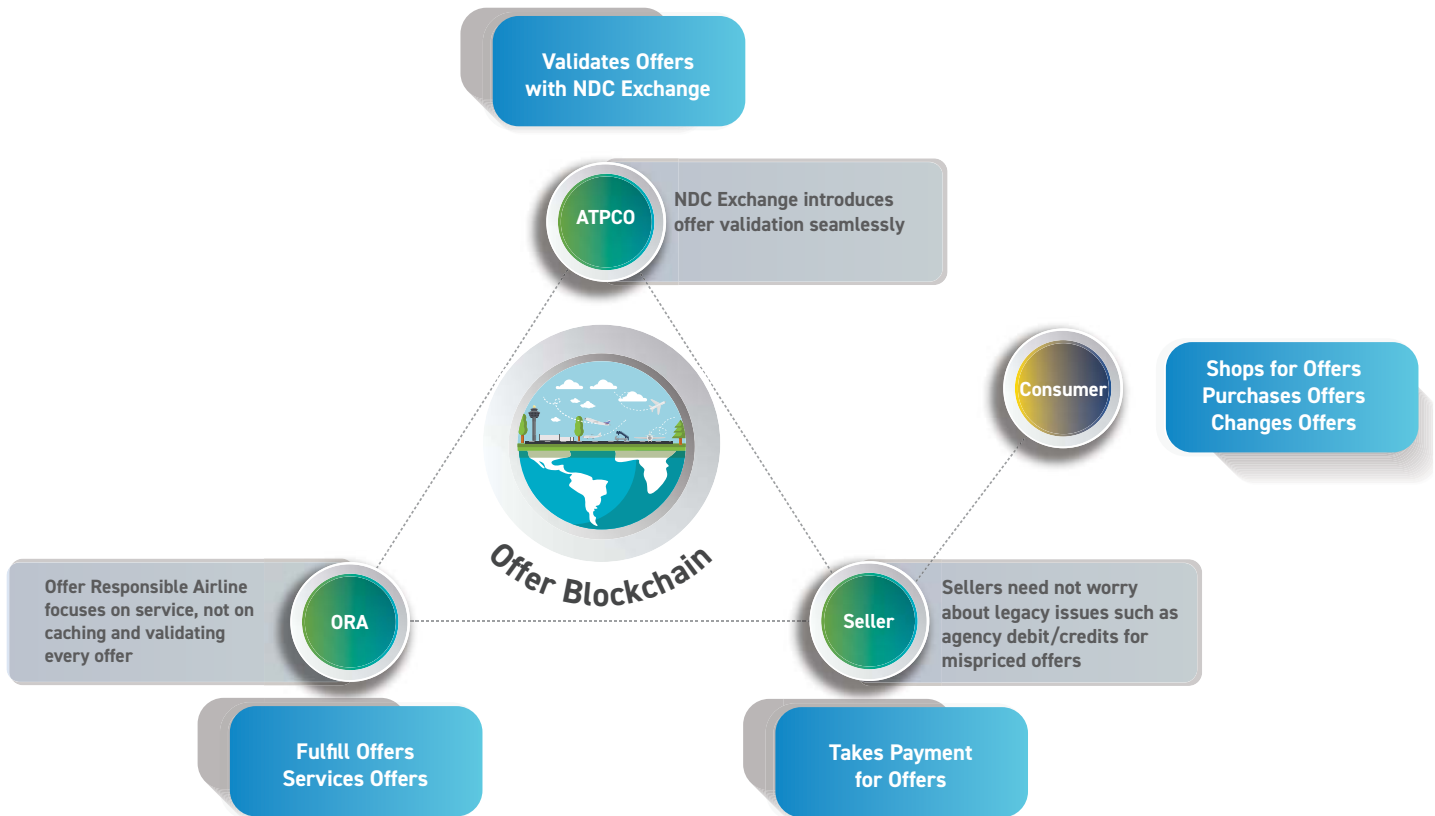
Blockchain can provide multi-point, secure, and accurate access for everyone involved in the offer and order.

VERIFIED DATA

A transaction is posted in blockchain only when all parties to a transaction consent to its accuracy. ATPCO and the airline must agree that the offer being requested by the seller is

- A valid offer—it meets ATPCO rules and is compliant.
- Available—inventory can be secured.

SINGLE RECORD OF TRUTH

Both parties to a transaction refer to a single ledger of historical transactions, or a single blockchain, rather than maintaining their own, independent, and potentially conflicting sets of records. The airline and seller need to have a single record of truth for the transaction.

From POC to Reality
Opportunities, Challenges, Next Steps

MULTI-PARTY DATA

Blockchain is designed to be the collective, shared, single record of the truth. Three-way consensus is required between the airline, seller, and ATPCO to confirm the transaction and subsequent changes.

SECURITY

The data is broken into blocks and distributed among multiple nodes, offering the highest level of cryptographic security. There is no single point of failure and no central admin with a hackable username and password combination.

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This white paper is a collaboration between Blockskye and ATPCO.

Blockskye provides inventory booking and transaction management solutions for the travel and entertainment industries using blockchain and the ethereum core framework. For more information, write info@blockskye.com.

For more information on the ATPCO Offer Blockchain, or to learn how you can get involved in the Partners in Innovation Council or other industry collaborations related to blockchain, please reach out to letsconnect@atpco.net.

WHAT PROMISE DOES BLOCKCHAIN HOLD FOR YOUR BUSINESS?

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