Blockchain Implementation

Use Cases for *Singapore Airlines (SIA)*

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Scope

- Why Blockchain?
- Why Now?
- Proposed Applications
  - Use Case 1: Smart Payments
  - Use Case 2: Aircraft Maintenance
  - Use Case 3: Credentials Tracking
- Conclusion
- References

Why Blockchain?

Inherent Characteristics of Blockchain Make it Ideal for the Aviation Industry

Numerous entities in value-chain requiring trust

- Smart Contracts

Digital assets like vouchers and ‘miles’

- Tokenization

Valuable assets like cargo or aircraft parts

- Provenance

Need for trust in the credentials of individuals

- Digital ID

Licensing regulations for individuals/equipment

- Certification

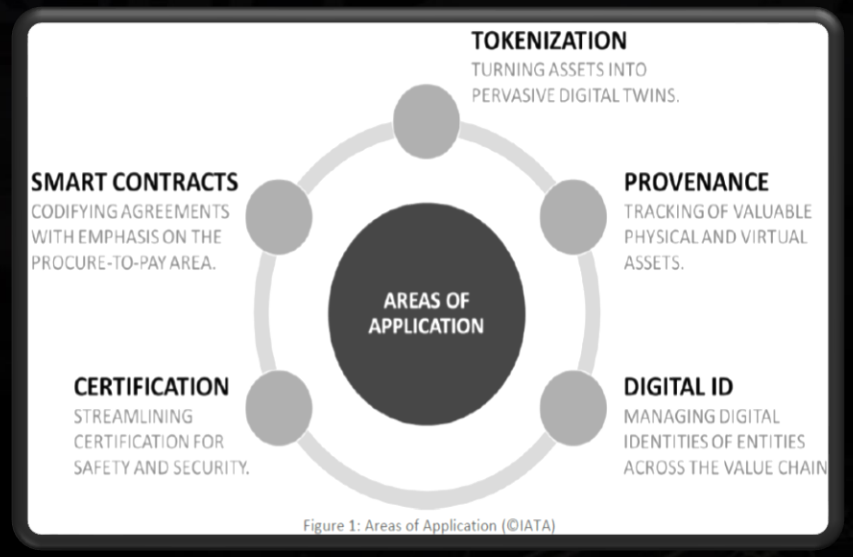


Figure 1: Areas of Application (©IATA)

Why Now?

Momentum from Similar Initiatives in SIA Group

KrisConnect

- New Distribution Capability (NDC) channel to reduce reliance on Global Distribution Systems (GDS)

KrisPay

- Streamlined redemption of KrisFlyer points using blockchain (tokenization)

Parxl

- Shipping with end-to-end package tracking using blockchain (provenance)

SIA can capitalize on this 'lull-period' caused by COVID-19 to accelerate digital transformation, which will help it to emerge stronger.

Use Case 1: Smart Payments

Pain Points

Payment reconciliation and revenue accounting are tedious

- Numerous parties to be transacted with
  - Travel Agents
  - Other Airlines
  - Travelers
  - GDS (lesser reliance now, with KrisConnect)
  - IATA (intermediary/clearing house)
- Settlement times can be up to 10 days!

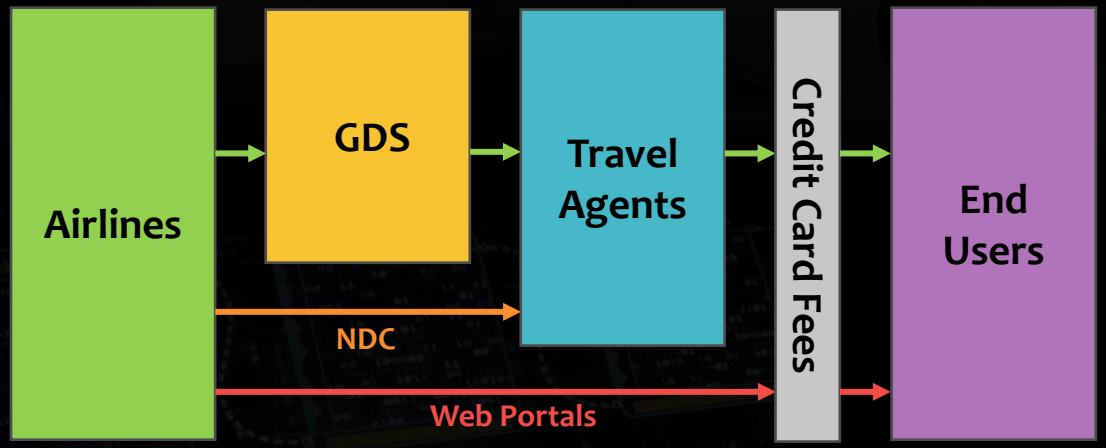
Additional charges (e.g. GDS fees, 1-3% by Visa and Mastercard)

Use Case 1: Smart Payments

Solution

[Tokenized Payment System]

- Blockchain token for payments (public ledger)
- Smart Contracts to automate transactions
- Similar feature to be rolled-out by S7 Airlines in Sept 2020



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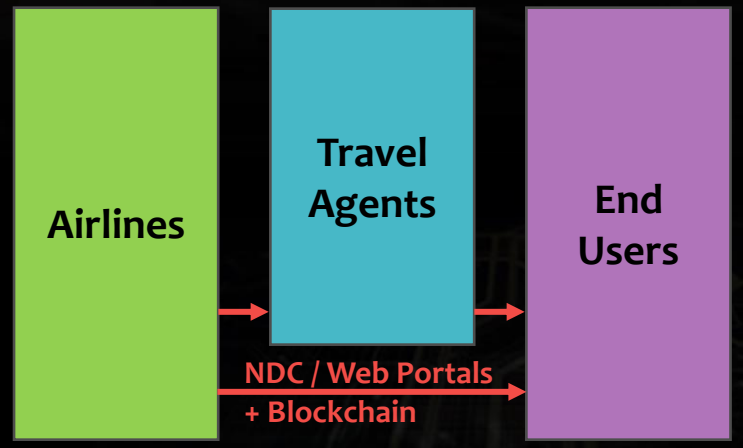


Proposed

Use Case 1: Smart Payments

Benefits

- Fewer intermediaries -> lower fees and costs
- Automation of numerous processes -> faster settlement times
- Enhanced security of bookings

Challenges

- Requires clients to adapt to new ecosystem
  - Harder for larger business clients (i.e. travel agencies)
- Restricted to single airline -> difficult for consumers to compare prices
- Partnership with banks to ‘tokenize money’ (like Sberbank did for S7)

Use Case 2: Aircraft Maintenance

Pain Points

Manual collection of aircraft health data (e.g. flight logbooks)

- Tedious and error-prone

Reactive instead of proactive maintenance

- More major repairs required

Mercenary parts resellers

- Higher cost of spare parts

Various manufacturers for parts (airframe, engine, avionics etc.)

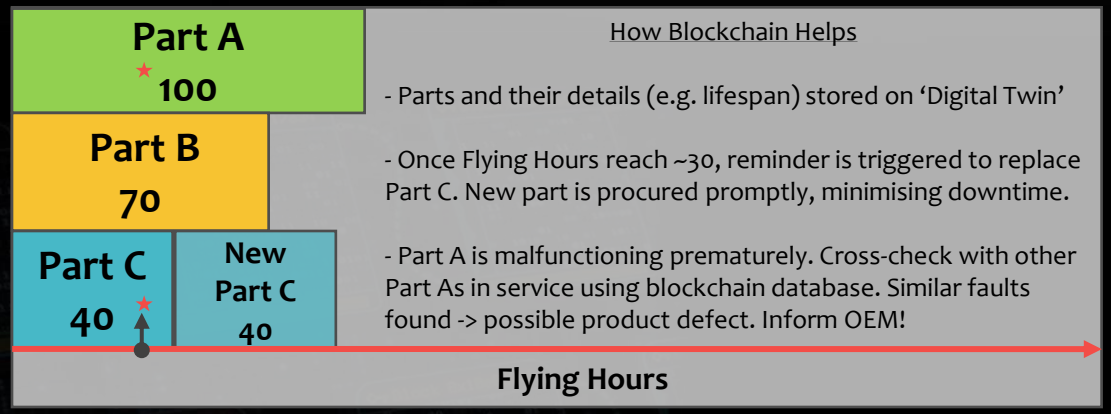
- Data is spread across multiple systems and stored in silos

Use Case 2: Aircraft Maintenance

Solution

['Digital Twin' of Aircraft]

- Blockchain 'birth certificates' issued for each part (private/permissioned ledger)
- Can be aggregated to provide real-time snapshot of aircraft (digital twin)
- Constantly updated with each flight/maintenance
- Part history is traceable thanks to provenance



Use Case 2: Aircraft Maintenance

Benefits

- Proactive maintenance -> less downtime and lower repair costs
- Reliable health info -> higher end-of-lease resale value of aircraft
- Accurate diagnostics -> improved productivity

Challenges

- Sheer quantity of parts to ‘tag’
- Standardizing the practices and compliance of various manufacturers
- Training maintenance crew to adopt the new system

Use Case 3: Credentials Tracking

Pain Points

Manual collection and monitoring of staff credentials

- Required by law to operate/maintain aircraft (type ratings, medical fitness etc.)
  - Many have expiry dates
- Tedious and error-prone tracking process
- Lapses may cause expensive delays or safety violations

Falsification of credentials

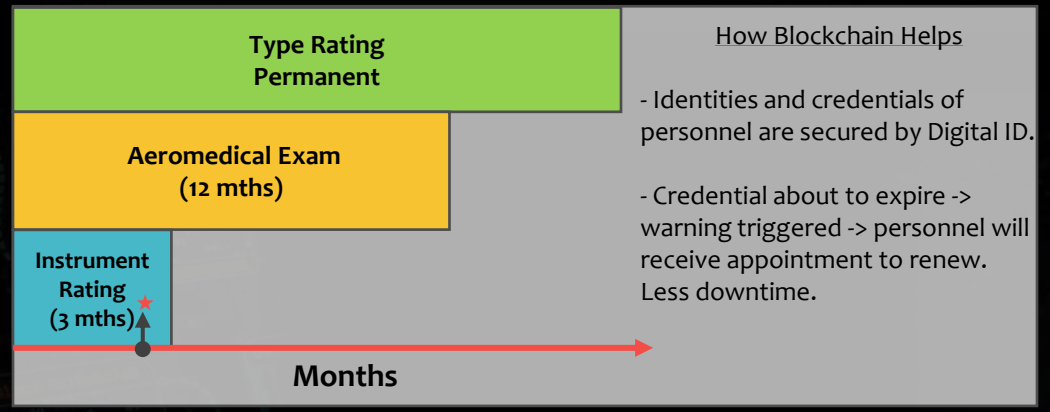
- Case of Pakistan Airlines grounding 150 pilots

Use Case 3: Credentials Tracking

Solution

[Digitized Credentials]

- Blockchain-enabled Digital ID for personnel (private/permissioned ledger)
- Digital snapshot of biometric identity and credentials
- Alert system for expiring credentials to facilitate renewal
- Immutable: credentials can only be modified by issuing authorities (e.g. CAAS)



Use Case 3: Credentials Tracking

Benefits

- Less downtime of staff/aircraft due to lapsed credentials
- Reliability of credentials -> better safety records
- Greater confidence in health of aircraft -> higher resale value

Challenges

- Standardizing Digital ID certification across issuing bodies and jurisdictions
- Automation required to digitize existing manual tracking systems
- Personal data protection concerns with storing of biometric data

Conclusion

Blockchain solutions serve to:

- Decrease back-office workload and costs
- Increase operational efficiency

Moving forward, SIA could partner with the IATA on its Blockchain Initiatives:

- IATA Coin, The Travel Grid etc.
- Define the new ‘Industry Standard’
- Lowers the barriers to industry-wide adoption

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