EXPLORING
DIGITAL DATA MARKETPLACES

Researching data sharing principles in aviation maintenance context
An outline

ARINC INDUSTRY ACTIVITIES
Avionics Maintenance Conference
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EXAMPLE EPIC
UNLOCKING VALUE THAT I CAN NOT CREATE ON MY OWN

• As Airline MRO, I must be able to use Aircraft Health Monitoring data from as many aircraft as possible;

• so that I can develop the most valuable and competitive algorithms, which I cannot develop if I use only data from the fleet I operate.

• The goal is to create value together.
RESEARCH QUESTION
RECOGNIZING DATA IS AN ECONOMIC ASSET THAT CAN BE TRADED

Given a common benefit:
How can Aircraft Health Monitoring data be shared amongst Airline Operators and Algorithm Developers in a 1) FAIR and ECONOMIC way, whilst providing adequate 2) means to REDUCE RISK?
PROBLEM WITH MARKET DEVELOPMENT

1) FAIR AND ECONOMIC WAY: MONOPOLISM VS OPEN MARKET DEVELOPMENT

As in seen in the beginning of the oil industry: control of the transport platform enabled monopolism. Open marketplace mechanisms will enable trade, innovation and fair competition.

<table>
<thead>
<tr>
<th>Oil Economy</th>
<th>Concept</th>
<th>Data Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil</td>
<td>Resource</td>
<td>Raw Data</td>
</tr>
<tr>
<td>Land / well owner</td>
<td>Ownership</td>
<td>Operator of data generator ?</td>
</tr>
<tr>
<td>Oil price</td>
<td>Value</td>
<td>Data price ?</td>
</tr>
<tr>
<td>Barrel, rail, pipeline, tanker ..</td>
<td>Transport</td>
<td>Future Internet ?</td>
</tr>
<tr>
<td>Petrochemical industry</td>
<td>Value Creation</td>
<td>Data Market ?</td>
</tr>
<tr>
<td>Fuel, lubricants, plastics, detergents,..</td>
<td>Products</td>
<td>Efficiency, predictions, planning, recognition, behavior,..</td>
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# Digital Data Marketplace Concepts

## Area Considered by Our Research Effort

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## Flagship Research Effort
Amsterdam Economic Board and University of Amsterdam coordinate a multi-disciplinary research effort, involving multiple disciplines:

- Law,
- Computer Science,
- Business School,
- Economics,
- Social Sciences

Amsterdam houses one of the largest Internet Exchanges (AMS-IX):

Can it house a Data Exchange that facilitates Data Marketplaces (AMS-DX)?
CONSEQUENCES OF MAINTAINING A MONOPOLY
SOCIETY WILL OBJECT DISPROPORTIONATE VALUE CREATION AND ENTANGLEMENT

Standard Oil got named *The Octopus*, with many of its tentacles in society.

US government created antitrust law to protect the public from the failure of the market where unfair conduct tends to destroy competition itself.

(Sherman Act - 1890)
2) MEANS TO REDUCE RISK: REQUIRES STEPS AT DIFFERENT LEVELS

<table>
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<tr>
<th>COMMON BENEFIT</th>
<th>GROUP RULES</th>
<th>ORGANIZE TRUST</th>
<th>IMPLEMENT INFRASTRUCTURE</th>
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<td>Define and agree common benefit no single organization can achieve on its own.</td>
<td>Define consortium rules considering data use, access and benefit sharing</td>
<td>Organize power and trust as a means to reduce risk for participating members</td>
<td>Research operationalization of Digital Data Marketplace &amp; Data Exchange concepts</td>
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EXAMPLE AIRCRAFT MAINTENANCE USE CASE
DEVELOP A DIGITAL TWIN TO ESTIMATE MAINTENANCE CREDITS

Competitiveness enabled by specific maintenance knowledge

RESEARCH USE CASE:
How can Aircraft Health Monitoring data be shared amongst Airline Operators and Algorithm Developers in a fair and economic way, whilst providing adequate means to reduce risk allowing competition.
DIGITAL DATA MARKETPLACE ARCHITECTURE

ENABLING COMPETITIVE ALGORITHM DEVELOPMENT

- National Law & Regulations
- Market rules
- Member admission
- Digital Data Marketplace Membership Organization
- Agreement
- Registry
- Infrastructure Patterns
- Deployment Specification
- Dispute Resolution
- Algorithm Developers
- Accounting & Auditing
- Future Internet Infrastructure: Software Definable - No Bandwidth Limitations, On demand / transaction based

- Data suppliers

- Business & Legal Research
- Computer Science Research
- Blockchain/Finance Research
RESEARCH INFRASTRUCTURE
RESEARCH WORKING ALONGSIDE IT INDUSTRY

NETWORK RESEARCH INFRASTRUCTURES

Data Sharing Infrastructure Model
Research using Future Internet capabilities

COMMERCIAL DATACENTER INFRASTRUCTURE AS NEUTRAL GROUND

Goal: How to create a Digital Marketplace Ecosystem

AM3 and AM4 Datacenters
Science Park Amsterdam
SV10 Datacenter Silicon Valley

Data Transfer Node at KLM fieldlab with 100 gb/s link to enable SDMP research thanks to UvA, SURFnet and Ciena

As foundation of the National Research Platform

prp.ucsd.edu
CONCLUSION

A DIGITAL MARKET PLACE:

- Is created and governed by an industry membership organization as a means to reduce risk.

- Serves a common benefit no single organization can achieve on its own.

- Connects data suppliers and algorithm developers via a software definable, membership organization owned, infrastructure.

- Arranges processing as an on-demand infrastructure transactions, where the infrastructure is guaranteed to be cleaned up after execution.

- Infrastructure itself is delivered by neutral Data Exchanges across the world, in the same way neutral Internet Exchanges interconnect Internet Service Providers.
THANK YOU

Want to help our research?

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