EXPLORING
DIGITAL DATA MARKETPLACES

Researching data sharing principles in aviation maintenance context
An outline

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EXAMPLES OF DATA SHARING RELEVANT TO OUR INDUSTRY

Improve **passenger experience** at airports

Improve **efficiencies** across multi modal logistic chains

Increase **fleet availability** by improving maintenance scheduling by estimating maintenance credits from aircraft data.

Research efforts also consider use-cases in Healthcare, Agriculture, Smart Cities, Public Safety, Cybersecurity, ..
Given a common benefit:
How can data be shared amongst *data suppliers* and *data consumers* 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 monopoly. Open marketplace mechanisms will enable trade, innovation and fair competition.

<table>
<thead>
<tr>
<th>Oil Economy</th>
<th>Concept</th>
<th>Data Economy</th>
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<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>
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<tr>
<td>Oil price</td>
<td>Value</td>
<td>Data price ?</td>
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<tr>
<td>Barrel, rail, pipeline, tanker ..</td>
<td>Transport</td>
<td>Future Internet ?</td>
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<td>Oil market</td>
<td>Trade</td>
<td>Data Market ?</td>
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<tr>
<td>Petrochemical industry</td>
<td>Value Creation</td>
<td>Data science algorithms</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)
MANAGING RISK AT DATA MARKETPLACE

2) MEANS TO REDUCE RISK: REQUIRES STEPS AT DIFFERENT LEVELS

- **COMMON BENEFIT**: Define and agree on a common benefit no single organization can achieve on its own.

- **GROUP RULES**: Define consortium rules considering data use, access, and benefit sharing.

- **ORGANIZE TRUST**: Organize power and trust as a means to reduce risk for participating members.

- **IMPLEMENT INFRASTRUCTURE**: Research operationalization of Digital Data Marketplace & Data Exchange concepts.
DIGITAL DATA MARKETPLACE ARCHITECTURE

ENABLING COMPETITIVE ALGORITHM DEVELOPMENT

DIGITAL DATA MARKETPLACE ARCHITECTURE

Market rules

Member admission

National Law & Regulations

Digital Data Marketplace Membership Organization

Agreement

Registry

Infrastructure Patterns

Deployment Specification

Dispute Resolution

Data suppliers

Future Internet Infrastructure:
Software Definable - No Bandwidth Limitations, On demand / transaction based

Algorithm Developers

Accounting & Auditing

Business & Legal Research

Computer Science Research

Blockchain/Finance Research

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INFRASTRUCTURE PATTERN RESEARCH

Traditional Model (raising data owner concerns)
INFRASTRUCTURE PATTERN RESEARCH:
One of several examples

Digital Marketplace (DMP) infrastructure supports creation of (temporary) slice across data centers, implementing a data science workflow based on a contract between customer and suppliers of data and algorithm.

Generic Infrastructure is supported by a Data Exchange.
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?

Email me: leon.gommans@klm.com