Marintec Innovation webinars:

Chapter 4

Smarter Maritime Logistics

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AGENDA

1. Smarter maritime logistics – the challenge
2. Smarter maritime logistics – the cargo transport operation
3. Smarter maritime logistics – the documentation
4. Smarter maritime logistics - the security

Part 1: Smarter maritime logistics - the challenge

World trade is very diverse and integrating international transport systems is easier for some cargoes than others

Smart Maritime Logistics challenge – better systems for cargoes & clients

Bulk shipping handles less than 200,000 parcels a year, but liner shipping handles over 200 million – a big difference

RAW MATERIALS & AGRICULTURE

1. Cargo Producers

ENERGY
- Oil, Gas, coal, bio fuel

MINING
- Iron ore,
- Scrap steel
- Manganese ore
- Bauxite, Alumina
- NFM Ores

AGRICULTURE
Grain, Oilseeds
Rubber, Skins
Refrigerated
- Fruit & vegetables
- Oils, Wine, Fruit juices
- Molasses

FORESTRY
- Logs, Lumber

Primary Logistics

WET & DRY BULK CARGO SUPPLY CHAIN

Liquid Bulk crude oil & Gas

Industrial Bulk Metal ores, metal scrap, coal, fertilizers, salt

Agribulk Agricultural materials and forest products shipped to consuming markets

SPECIALISED UNIT LOAD CARGOES

Liquid Vegetable oils, fats

Unit cargo Logs, lumber, paper, pulp

INTERMEDIATE PROCESSERS MANUFACTURERS

2. Processing

- OIL REFINING
- CHEMICALS
- STEEL
- MOTOR VEHICLES
- LIGHT ENGINEERING
- FOOD PROCESSING
- TEXTILES & CLOTHING
- WOOD & PAPER

Secondary Logistics

Bulk Cargo
Dry & wet products of oil refining, chemicals, steel etc. Many parcel sizes

MINOR BULK CARGOE LOGISTICS

CONTAINERIASED CARGO

Liner Cargo
250 mill units pa?
Manufactured products of all types shipped to companies and private end users

3. Cargo Importers

POWER GENERATION
Power stations are major users of oil, coal and gas, often dealing directly with the primary suppliers

TRANSPORT
Major user of energy (Cars, trucks, rail & air travel, ships)

CONSTRUCTION
Uses steel, timber products, NFMs residential, commercial etc.

COMPANIES & SERVICES
energy, buildings, capital goods, hospitals, admin services and business consumables

CONSUMERS
final market, mainly via large retail organisationsbut shipping industry has little direct contact today

Smarter transport logistics – three variables

Smart logistics systems should optimize three key variable sets:-

1. Cost, reliability and risk
2. Emissions & environmental impact
3. Journey time & complexity

Management information for each of these is essential to monitor system performance

Part 2: Smarter maritime logistics - cargo transport

- Through transport involves many operations.
- Inevitably the timeline is constantly changing.
- Real time information is needed

Smarter logistics systems must share *real time* information

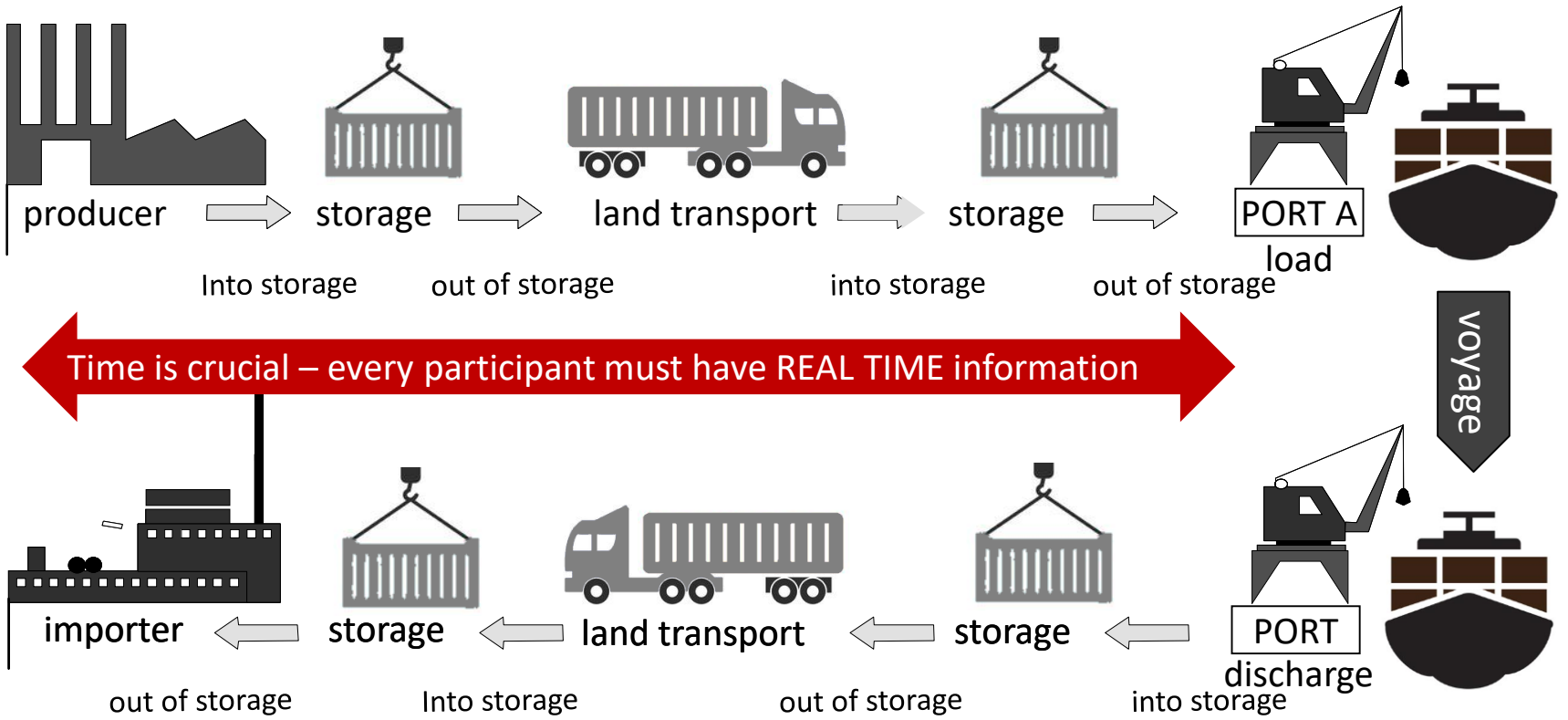
1. EXPORTER
   - Mine
   - Refinery
   - Farm
   - Manufacturer

2. LAND TRANSPORT
   - Lorry
   - Train
   - Conveyor
   - Pipeline

3. STORAGE
   - Open
   - Warehouse
   - Tank
   - Specialised

4. CARGO HANDLING
   - Crane/grab
   - Gantry crane
   - Continuous loader

5. SEA VOYAGE
   - Loading port
   - Sea voyage
   - Discharge port
   - Feeder service



17 transport "operations"

- 1 sea voyage
- 8 movements to/from storage
- 1 ship loading operation
- 1 ship discharge
- 2 land journeys
- 2 land loadings
- 2 land unloadings

Objective 1: use biggest ship possible

Objective 2: efficient cargo handling

Objective 3: make systems compatible

Objective 4: keep stocks small

Smarter Maritime Logistics for containers requires accurate REAL TIME information

IMPORTER

1. Road
2. Rail
3. Feeder

PORTS & CUSTOMS

12 TYPES OF TRANSPORT INFORMATION

PORT & TERMINAL INFORMATION

1. Bills of lading, for all cargo carried
2. Port & berth booking, billing
3. Transport bay planning
4. Cargo handling, stevedores etc.
5. Storage, inspection, gate processes
6. Goods Release, Local Transport

CARGO & COMMERCIAL INFORMATION

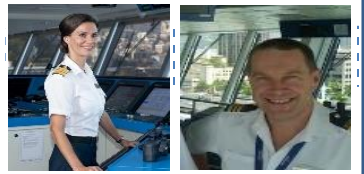
1. Cargo Manifest,
2. Containership bay plan,
3. Container Declarations
4. Packaging Declarations
5. Container Instructions
6. Ship's Papers

EXPORTER

1. Road
2. Rail
3. Feeder

PORTs & CUSTOMS

LOGISTICS TEAM



Logistic Management

1. Voyage planning
2. Vessel tracking
3. Voyage management
4. Cargo management
5. Weather routing
6. Through transport

MANAGEMENT

TECH-TEAMS

1. Technical support
2. Maintenance
3. Regulatory
4. Fleet performance
5. Human resources

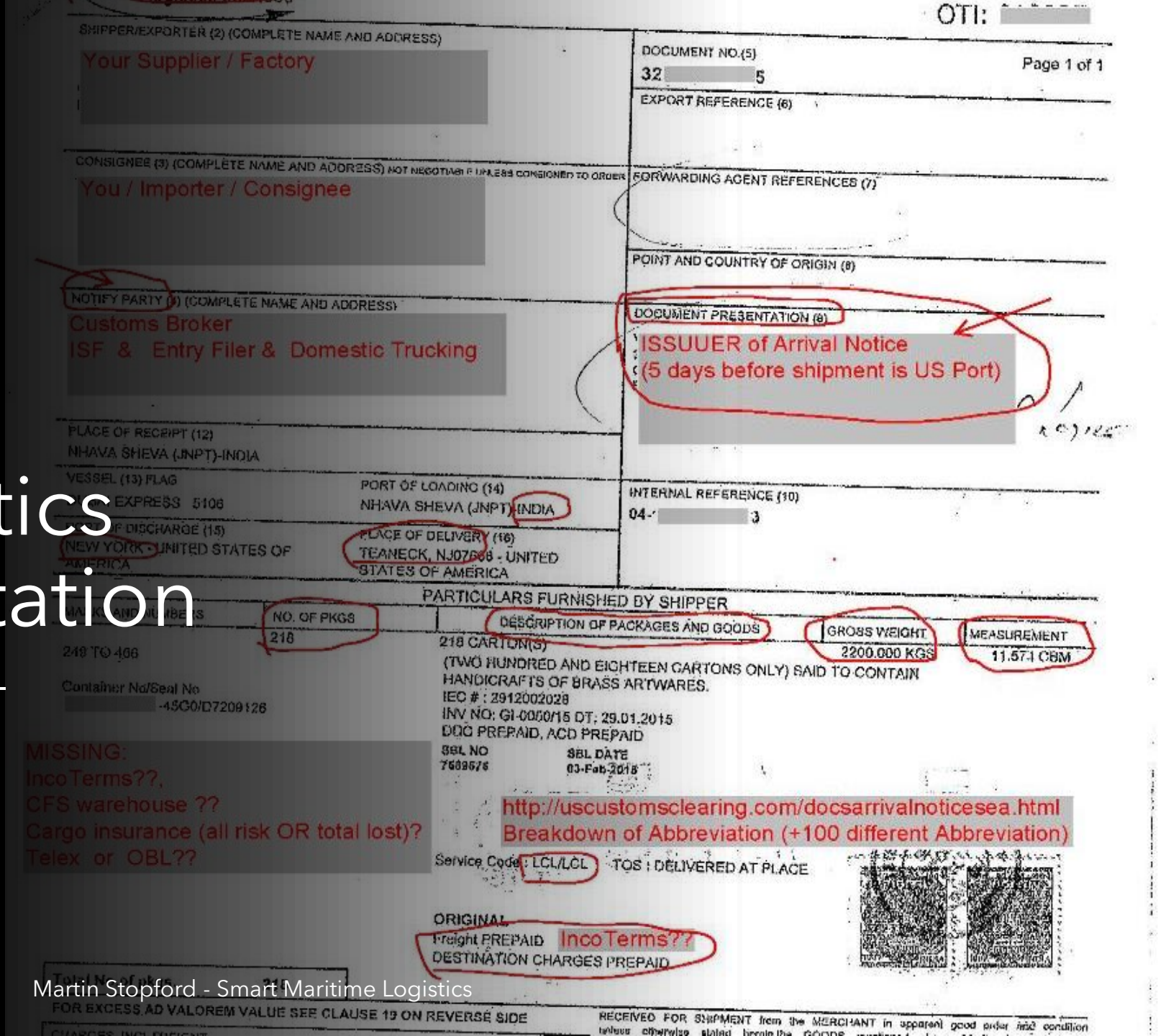
SYSTEMS. TEAMS

1. Support systems
2. Process data
3. Automation
4. Build apps
5. Manage stats

- When transporting UP TO 15,000 CONTAINERS in a ship, between up to 12 ports on a voyage, change is continuous.
- Participating companies must have accurate REAL TIME DATA about changes. This is too complex to do on spreadsheets!
- PROVIDING THIS DATA IS THE JOB OF SMARTER MARITIME LOGISTICS

Part 3: Smarter Maritime Logistics - the documentation

Ensuring that each cargo consignment has the DOCUMENTATION needed for through transport is just as important as physical transport



Documentation must be streamlined if the "Maritime Transport Factory" is to work efficiently

Transport managers

1. Vessel Owning Common Carriers (VOCC)
1. Manages fleet of ships
2. Cargo transport
3. Docs & Comms
4. Quality control

2. Non-Vessel Owning Common Carrier (NVOCC)
1. Provides freight service
2. Buys space from VOCC
3. Issues bills of lading

3. Freight Forwarder
1. Organise cargo through transport.
2. Book cargo with carriers
3. Process all relevant shipping documents

*Non Vessel Owning Common Carrier

EXPORTER

1. Truck
2. Rail
3. Feeder
4. Air
5. Short sea
6. Deep sea

Digital

Paper

EXPORT PORT

Single Window

REQUIRED COMMERCIAL, CUSTOMS, REGULATORY & FINANCE DOCUMENTS

COMMERCIAL DOCUMENTS
1. Bill of lading
2. Commercial Invoice
3. Packing list
4. Certificate of origin
5. Freight invoice
6. Booking note
7. Forwarders cargo receipt
8. Cargo manifest

CUSTOMS DOCUMENTS
1. Bill of lading
2. Invoice & packing list
3. Customs documents
4. Certificate of origin

REGULATORY DOCUMENTS
1. Hazardous declaration
2. Production standards cert. etc.

TRADE FINANCE
1. LCs
2. Guarantees
3. Open account

IMPORTER

1. Truck
2. Rail
3. Feeder
4. Air
5. Short sea
6. Deep sea

Digital

Paper

IMPORT PORT

Single Window

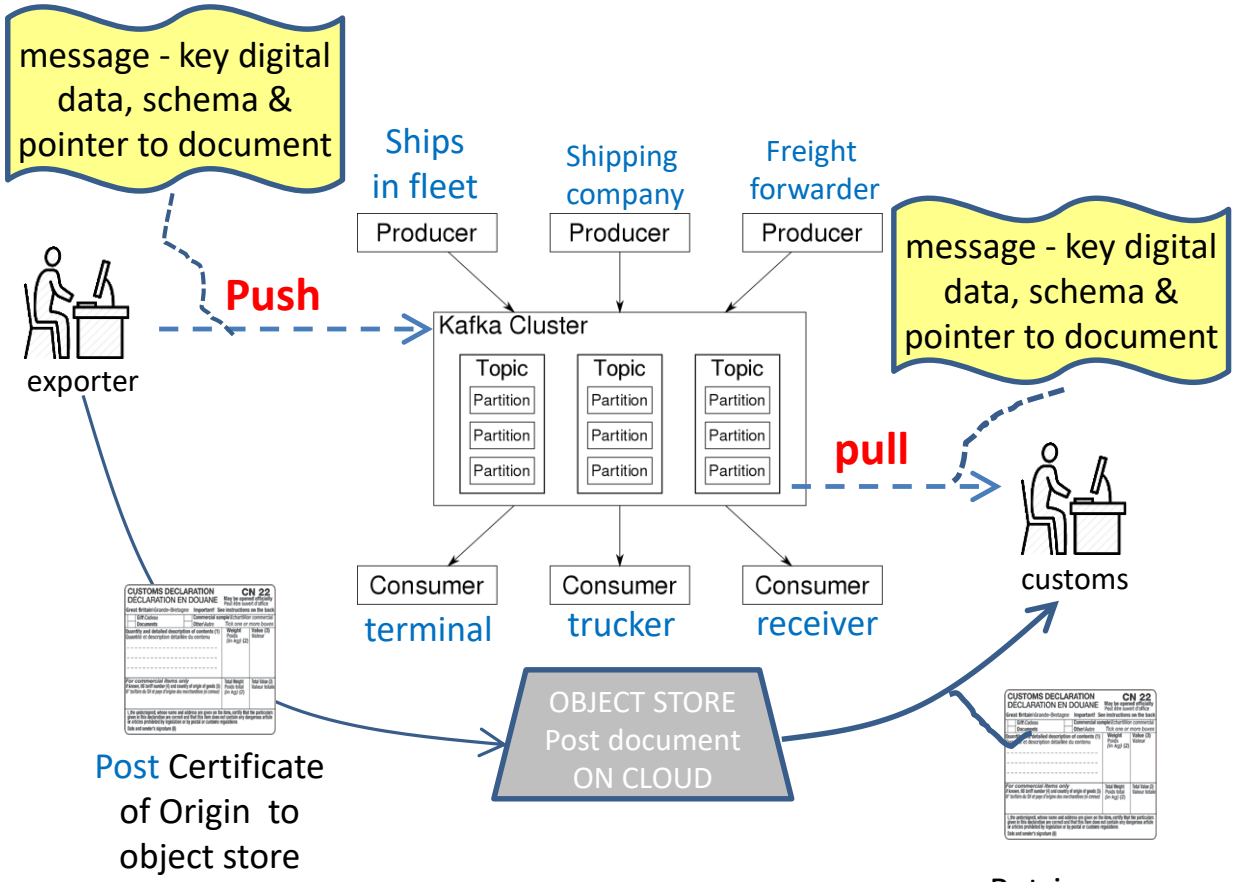
Project to bring together all documentation into a "single window"

Distributed messaging - the ROUTE TO REAL TIME logistics info

- The trade documentation is a mix of digital & paper.
- Company databases not designed to communicate.
- Distributed messaging systems like Apache Kafka, solve this problem by streaming *data* from company databases to a Kafka cluster. Users can "pull it out".

EXAMPLE : to use messaging to transfer a paper *certificate of origin* and its *data in digital format* to the customs office (and anyone else who needs it), do the following:-

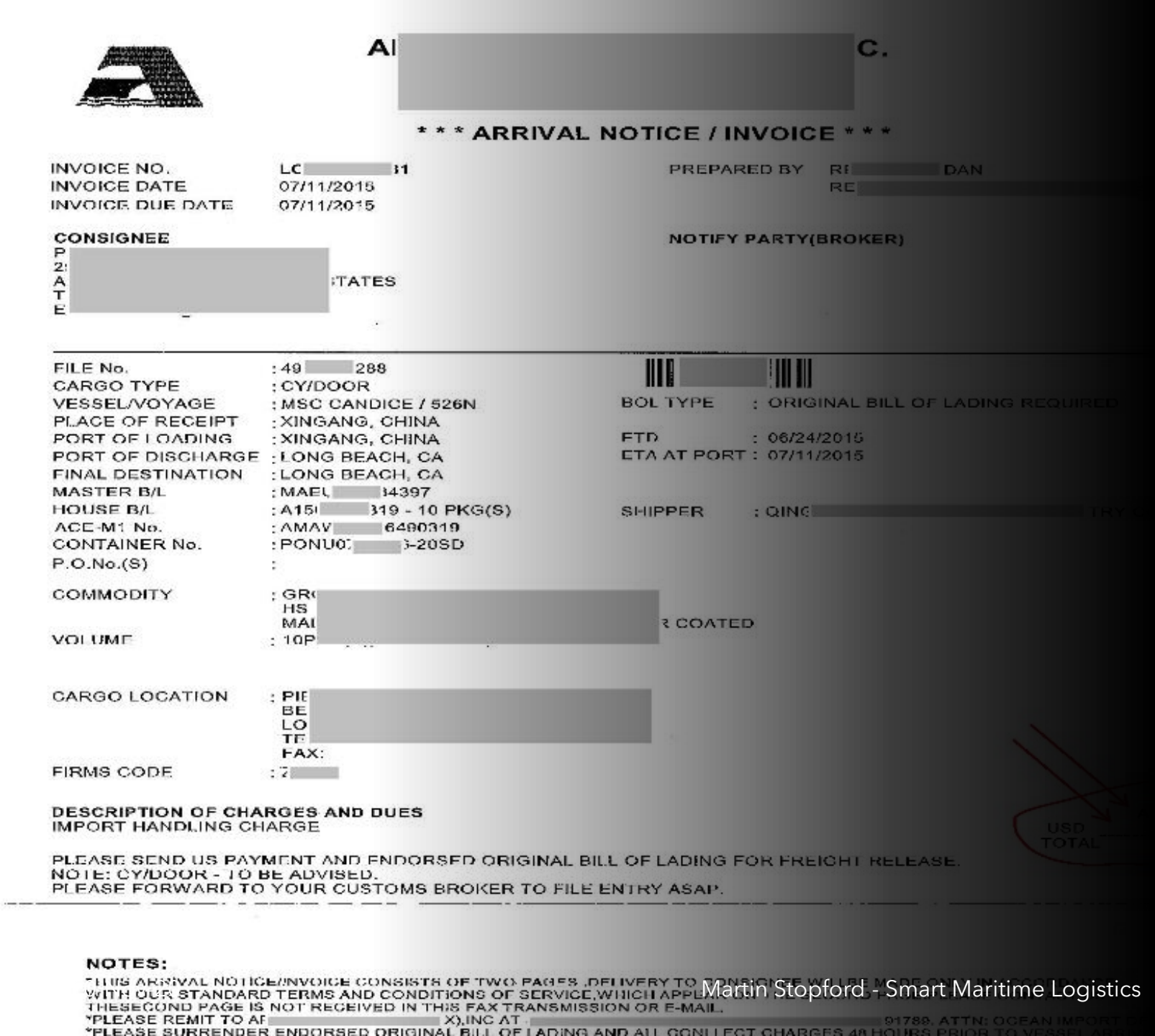
A. Scan the Certificate of Origin and post the file to a secure *object store* in cloud.
B. Send a message to Kafka Cluster containing key digital data (e.g. from sender's SQL data table)
C. The message contains a pointer to the Certificate of Origin stored in the *object store* & a schema (like a template) to interpret the data in the message.
D. Customs computer pulls the message from Kafka Cluster; processes the digital data in the message; & downloads the Certificate of Origin.
E. Others in the chain can access the message through the Kafka cluster



Why use messaging? Because it's a real-time, secure & scalable way to pass data between legacy & modern database systems.

Part 4: Smarter maritime logistics - data security

The security and reliability of documents and data is an issue smarter digital technology must address



AI [redacted] C.

* * * ARRIVAL NOTICE / INVOICE * * *

INVOICE NO. LC[redacted]1
INVOICE DATE 07/11/2015
INVOICE DUE DATE 07/11/2015

PREPARED BY RI[redacted] DAN
RE[redacted]

CONSIGNEE
P[redacted]
2[redacted]
A[redacted]TATES
T[redacted]
E[redacted]

NOTIFY PARTY(BROKER)

FILE No. : 49[redacted]288
CARGO TYPE : CY/DOOR
VESSEL/VOYAGE : MSC CANDICE / 526N
PLACE OF RECEIPT : XINGANG, CHINA
PORT OF LOADING : XINGANG, CHINA
PORT OF DISCHARGE : LONG BEACH, CA
FINAL DESTINATION : LONG BEACH, CA
MASTER B/L : MAEL[redacted]4397
HOUSE B/L : A15[redacted]319 - 10 PKG(S)
ACE-M1 No. : AMAV[redacted]6490319
CONTAINER No. : PONU0[redacted]-20SD
P.O.No.(S) :

BOL TYPE : ORIGINAL BILL OF LADING REQUIRED
ETD : 06/24/2015
ETA AT PORT : 07/11/2015
SHIPPER : QING[redacted]TRY

COMMODITY : GR[redacted]
HS
MA[redacted]R COATED
VOLUME : 10P[redacted]

CARGO LOCATION : PI[redacted]
BE
LO
TE
FAX:
FIRMS CODE : 7[redacted]

DESCRIPTION OF CHARGES AND DUES
IMPORT HANDLING CHARGE

USD
TOTAL

PLEASE SEND US PAYMENT AND ENDORSED ORIGINAL BILL OF LADING FOR FREIGHT RELEASE.
NOTE: CY/DOOR - TO BE ADVISED.
PLEASE FORWARD TO YOUR CUSTOMS BROKER TO FILE ENTRY ASAP.

NOTES:
*THIS ARRIVAL NOTICE/INVOICE CONSISTS OF TWO PAGES ,DELIVERY TO CONSIGNEE WILL BE MADE SUBJECT TO
WITH OUR STANDARD TERMS AND CONDITIONS OF SERVICE,WHICH APPEAR ON THE REVERSE OF THIS
THESECOND PAGE IS NOT RECEIVED IN THIS FAX TRANSMISSION OR E-MAIL.
*PLEASE REMIT TO AF[redacted]X),INC AT [redacted]91789, ATTN: OCEAN IMPORT
*PLEASE SURRENDER ENDORSED ORIGINAL BILL OF LADING AND ALL CONLLECT CHARGES 48 HOURS PRIOR TO VESSEL ARR

Data compatibility & security issues

- Validation by agencies issuing documents & data
- Preventing fraud on key documents like bill of lading
- Security systems (Blockchain etc.) an essential part of Smarter Maritime Logistics systems

4. Conclusions

- Smart Maritime Logistics is tough because it involves many companies, institutions & data management setups.
- Solutions including the Single Window & Mona Lisa 2 (Sea Traffic Management) are valuable, but difficult to involve everyone in the transport chain
- Distributed messaging solutions like Apache Kafka etc can deliver real time data and documents through the whole supply chain
- Because messaging systems are scalable they can be used by small companies as well as big corporations
- Diverse supply chains can tailor messaging to provide the data transfers they need for their specific operations

The
message is
“messaging!