Online Methods
Challenges for OR
in a
Real Time World

Chairman
Prof.dr.ir. Jo van Nunen
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Deloitte.

So
Today..

Challenges

Real time world

Online methods

OR

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Joaquim Gromicho (ORTEC)

An overview of real-time online decision making in practice

Bo Chen (Warwick Business School, UK)

On-line algorithms and competitive analysis

D Lunch (Lunteren, GLD)

In-line waiting problems

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Peter van Tooren (Almende)

In theory, practice and theory are the same, in practice however

Klaas Jan van der Bent (ANWB/Ordina)

On-line methods for dispatching service vehicles at ANWB

S. Break (Lunteren, GLD)

Real time information exchange

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Ana Isabel Barros and Peter van Scheepstal
(TNO-FEL)

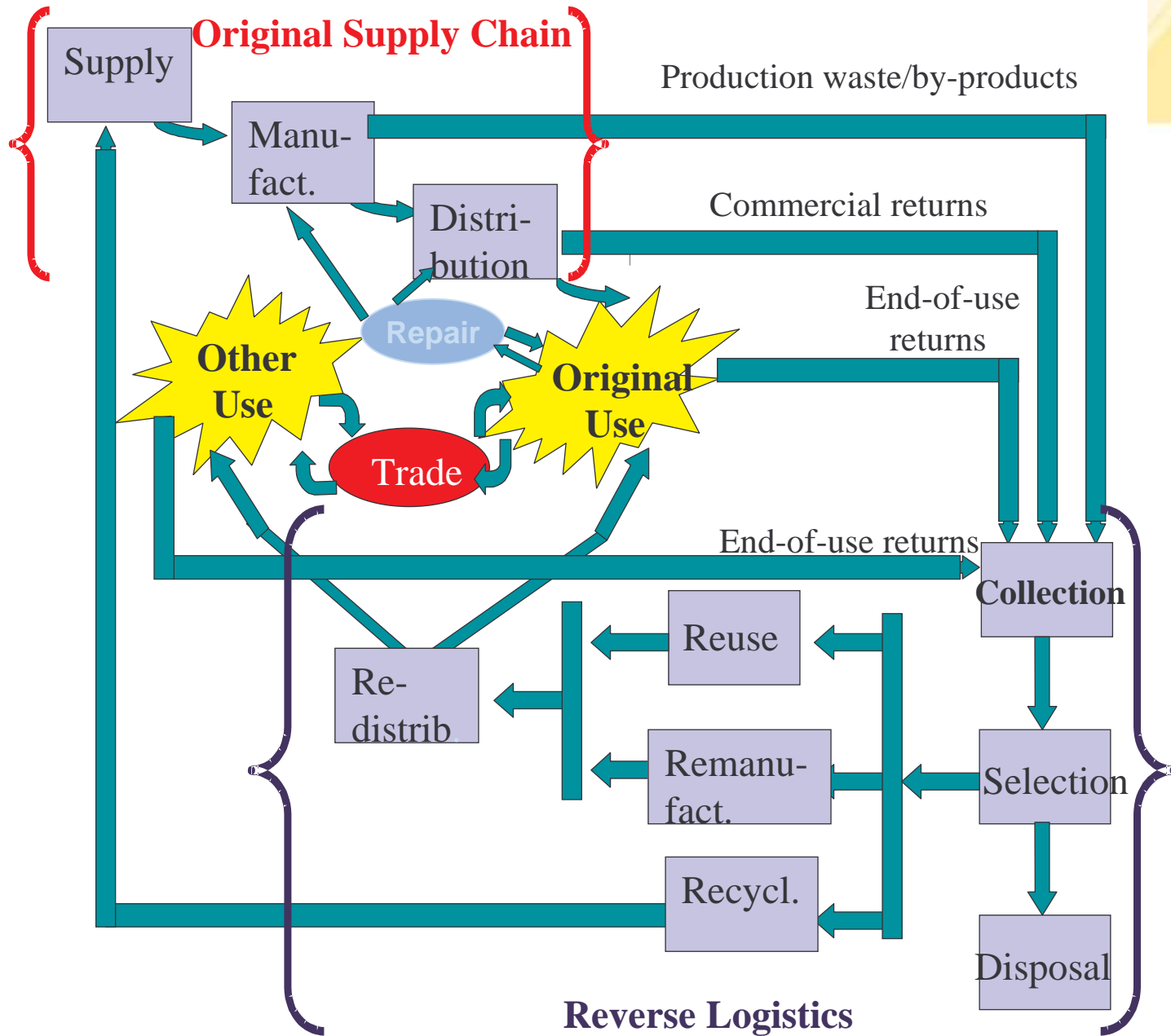*On-line decision making at TNO-FEL*

Panel discussion

Drinks

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Online Methods
Many Applications
in
Logistics

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An Example
On
Sustainability

Close Loop Supply Chains
Installed Base Management

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Original Supply Chain

Reverse Logistics

"Installed Base Management"

- Cars

- Computers

- Copiers

- Lamps

- Tires

- Etc.

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ICT Developments for Installed Base Management

- Web services

- Mobile communication

- Sensors

- RFID

- E-seal

- Agents

- APS

- Auctions

- Etc.

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The Technology
RFID tag

information	>>	barcode
sender	: :	activated
size	<	pinhead
cost	=	few cents

ICT Developments for Installed Base Management

- Tracking and tracing

- Remote control

- Communication on

  - product use

  - product place

  - product status

- Info on demand

- Etc.

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Monitoring the Installed Base

- Datamining on installed base
- DSS for data analyses
- Optimization return
- Feedback design
- New Product definitions
- New Markets
- New Creative Opportunities

- New

- Etc.

Wow!!!!!

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Optimization of Returns from Installed Base

- Commercial reasons

- Need of parts

- Extending life cycles

- repair capacity

- Improved services

- Etc.

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Installed Base
For
Logistic Companies

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Monitoring info
Logistic Companies

■ **Demand**

- suppliers

- consignees

- passengers

- etc.

■ **Cargo & Passengers**

- place

- status

- etc.

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Monitoring info
Logistic Companies

■ **Resources**

    - transport modes

    - cranes

    - agv's

    - etc.

■ **Products**

    - use

    - place

    - status

    - etc.

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Monitoring info
Logistic Companies

- **Infrastructure**

    - road

    - other terminals

    - docks

    - gates

    - network

    - Computers

    - etc.

- **Etc.**

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Monitoring the Installed Logistic Base

- Datamining on installed base

- DSS for data analyses

- Optimization operation

- Feedback to service

- New Service definitions

- New Creative Opportunities

- Etc.

Wow!!!!!

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Optimization Logistic Processes

- Commercial reasons
- Environmental reasons
- Safety procedure
- Road, train, vessel connection
- Use resources
- Improved services
- Etc.

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Solutions of tomorrow
Logistic companies in a virtual network

- **SIM** sustainable information model

- **RIM** real-time information model

- **NIM** networked information model

SLIM Sustainable Logistic Information Model

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Example
Online Cargo Navigation

- Given the destination
- Given the urgency
- Given financial restrictions
- Given available resources
- Given use infrastructure(s)
- Given security conditions
- Etc.

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Example Container Scan

- Customs parameters
- Customer parameters
- Process parameters
- Economic parameters
- Security risks
- Etc.

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Example Electronic Auctions on

- Cargo
- Production capacity
- Services
- Infrastructure
- Etc.

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Example
Using Transport Infrastructure

- Auctioning slots

- Combining shipments

- Optimizing transshipments

- Modularity in modes

- Etc.

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DEAL Intelligent Agents in Logistics

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Deal
An operational example

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A — The order as such (when, to-where, what, type of customer)

(N)

A new order (N) arrives

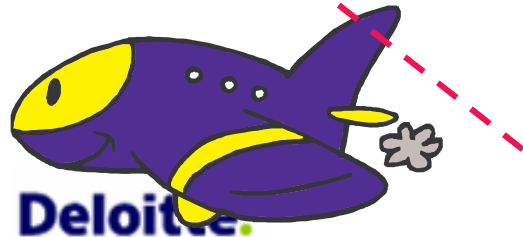**Which truck?**
A, B or C?

What do we need to know?

Other orders in the same area

C

More info about trucks, drivers, external environment (place, road network, etc.)

B — Time-frame (next week, tomorrow, or today)

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From
Tracking & Tracing
to
Sensing & Pacing

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A
Multidisciplinary
Research Approach
is required

Research Questions

The engineering approach
given all the technological possibilities

How to design?
How to control?

"The new logistic processes"
given installed base information

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Research Questions

Can we develop theory and models

that help in

design and control

problems

and create

New business opportunities

for the logistic sector

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Research Questions

Can we develop theory and models

that help in

evaluating

Economic and Social

Consequences

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Research Challenge

**Can we together
Work
on
online methods
for
sustainable solutions
for
logistic organizations**

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This Research
is
done in

TRANSUMO

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TRANSUMO

Transition to Sustainable Mobility

universities

private ———— public

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T ransport and Logistics

R esearch in OR

A nd

N ew concepts for online

S ustainable supply chains offer an

U nique opportunity to

M ake the

O ptimal future for Holland

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