Big Data Alliance

Big Data in Smart Ports

Rommert Dekker,

Econometric Institute
Erasmus School of Economics
Contents

• Big data at terminals
• Big data about ships
• Big data about trucks
• Big data about goods
Erasmus School of Economics

- Programs: MSc Econometrics & Management Science, Transport Economics, Maritime Economics & Logistics
  Post Graduate Education in Data Science

- Student project options
  6-9 months MSc projects, 2-3 months BSc trainee

- PhD options internal / external
  several spend 1 day / week at a company
  one: for 2 days at ESE, 3 days at ECT
  an external one: 5 days at Samsung, nights at ESE
Big data about terminals

• Automated container terminals
  All equipment moves and events are logged. At some terminals this data is stored in a Data warehouse for further analysis.

• This gives the opportunity to challenge the scheduling rules in the Terminal Operating System.
Big data about terminals - example

- AGVs load a container and bring it to the quay crane. The scheduling algorithm plans that a containers should be there at 14h05 m.

- On average it takes 3 min. to collect a 40 ft container and move it to the quay crane.

- Analysis of data however, shows that in case of twin loading of 2 20ft containers it takes 5 min.

(MSc thesis Niels Hendriks)
Big data on Ships

Handling of ships in ports involves several parties: boatsman (roeiers), pilots, terminal longshore man, tugs, surveyors and port traffic control.

Exact planning of arrivals and departures is so far not possible because of a lack of information sharing (and standardisation). Carriers do not have incentives to share plans, as these may change and they want the other parties to be ready.

As a result very inefficient planning occurs (e.g. pilots only pilot few ships / day, combinations of outbound and inbound guidance of ships are not always possible) (Pronto study, MSc thesis Eva Barendse ESPR study)
AIS data on ships

How can we make more use of all this standardized data?
Big data on truck routing

• Any computerized vehicle routing planning needs parameters indicating loading / unloading time.

• Typically fixed parameters are stored in those systems, inserted during initialisation.

• Analysing many (comparable) trips yields info on when there are substantial deviations and then either planning is changed or customer is charged more.

• Idea – integrate truck arrivals with warehouse manpower planning (with Samsung El)
Big data on goods – some ideas

• Exact information on contents of containers, is lacking with many parties.

• Even the weight of a container is not always known! Recently: IMO states that all containers need to be weighted (weegplicht)

• Exact contents is very important for customs, but also in case of accidents.

• Incorporating pipeline inventories in supply chain planning is hardly done in a systematic way.


**Ideas for new projects**

- Dynamic pricing / discount in case of correct data sharing on truck / barge / ship arrivals.

- Discounts in case of allowing flexibility in transport (e.g. at other days).

- Scheduling barges & ships in case of multiple terminal visits

- Integrating truck arrivals and terminal handling (but this needs to be long ahead in time).

- Road pricing.