

› **Moving towards practical implication
of self-organizing logistics –
Making small steps in realizing the PI vision by raising
awareness**

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‘INNOVATION FOR LIFE’



› TNO INNOVATION PROCESS

DEVELOPING
FUNDAMENTAL
KNOWLEDGE



Together with
universities

DEVELOPING
KNOWLEDGE



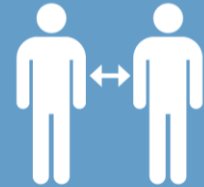
In public-private
collaboration with
partners

APPLYING
KNOWLEDGE

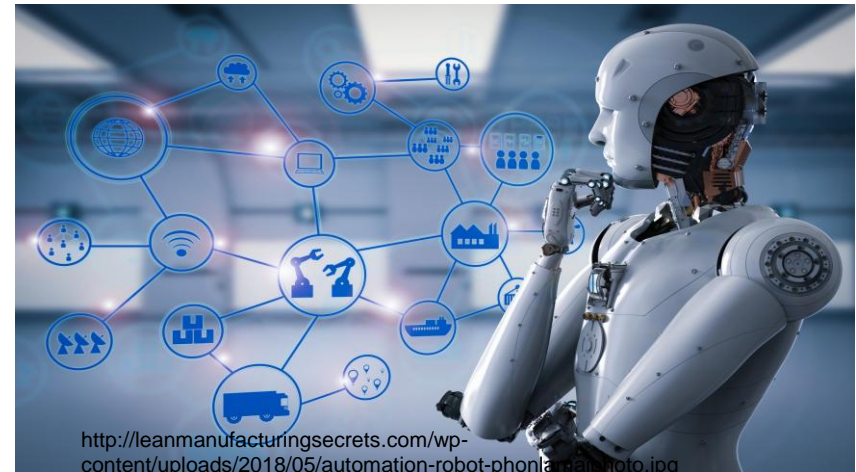


Contract research for
and with customers

TRANSFERRING
KNOWLEDGE



Exploiting knowledge
through spin-offs,
licences, etc together
with other companies



OBJECTIVE

- › Logistics system will / need to change considerably
- › For practitioners transition towards PI or SOL seems to be in the far future

- › **“Examine with logistics practitioners what the practical value of the PI-vision, and a more self-organizing logistics system, could be in real life logistics operations today already”**

PI AND SOL

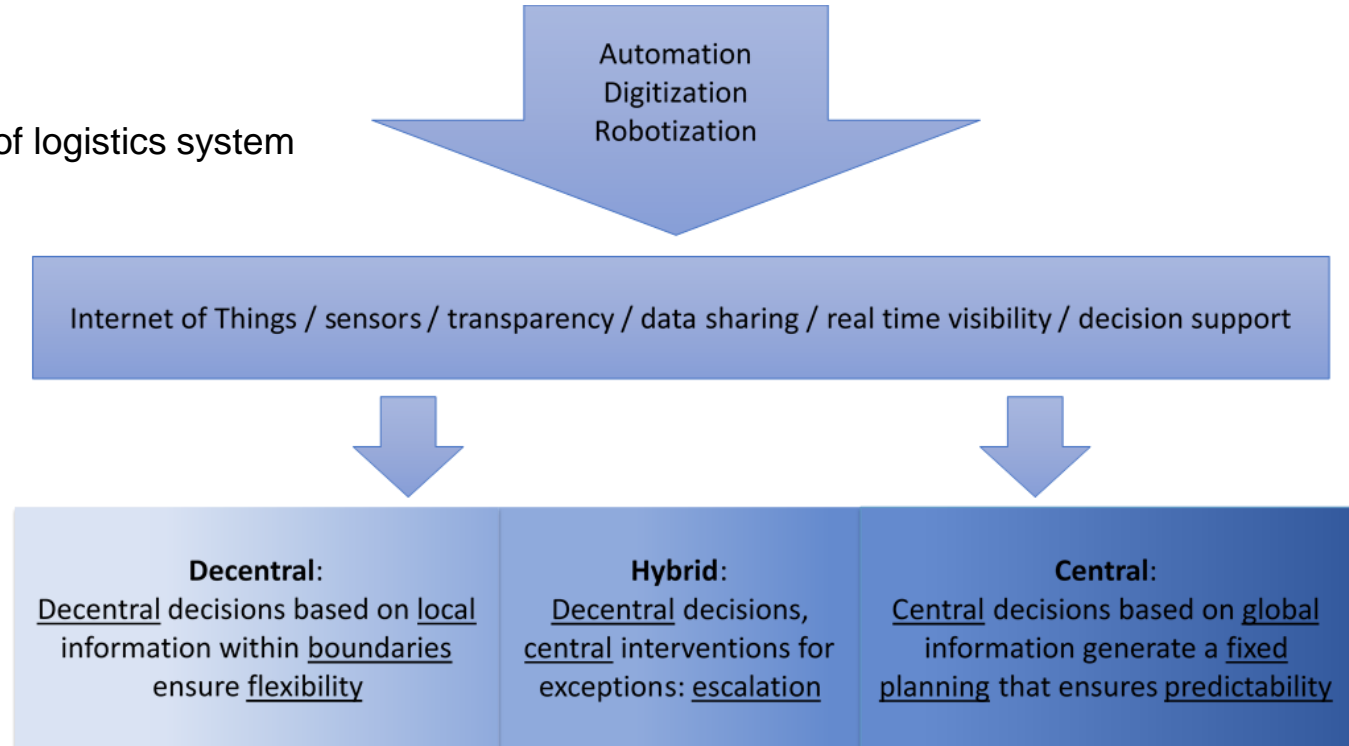
- › Physical Internet as an application of a Self-Organizing Logistics (SOL) System (Pan et al., 2017)

- › Self-Organization : more autonomy at a decentral level in the system and local intelligence (Wysick et al., 2008)
 - › Openness: connectivity, reconfiguration, adaptation
 - › Intelligence
 - › Decentralised control (Pan et al., 2017)

- › Next to benefits of SOL (flexible, adaptive, autonomous) also more critical stances in the literature on whether SOL indeed improves flexibility and efficiency (e.g. Sternberg & Andersson, 2014; Sternberg & Norrman, 2017)

PI AND SOL

- › First steps in transition of logistics system



SERIOUS GAMING

- › Main purpose Serious Gaming: learn and generate changes in behaviour (Lebesque et al., 2017).



Raise awareness

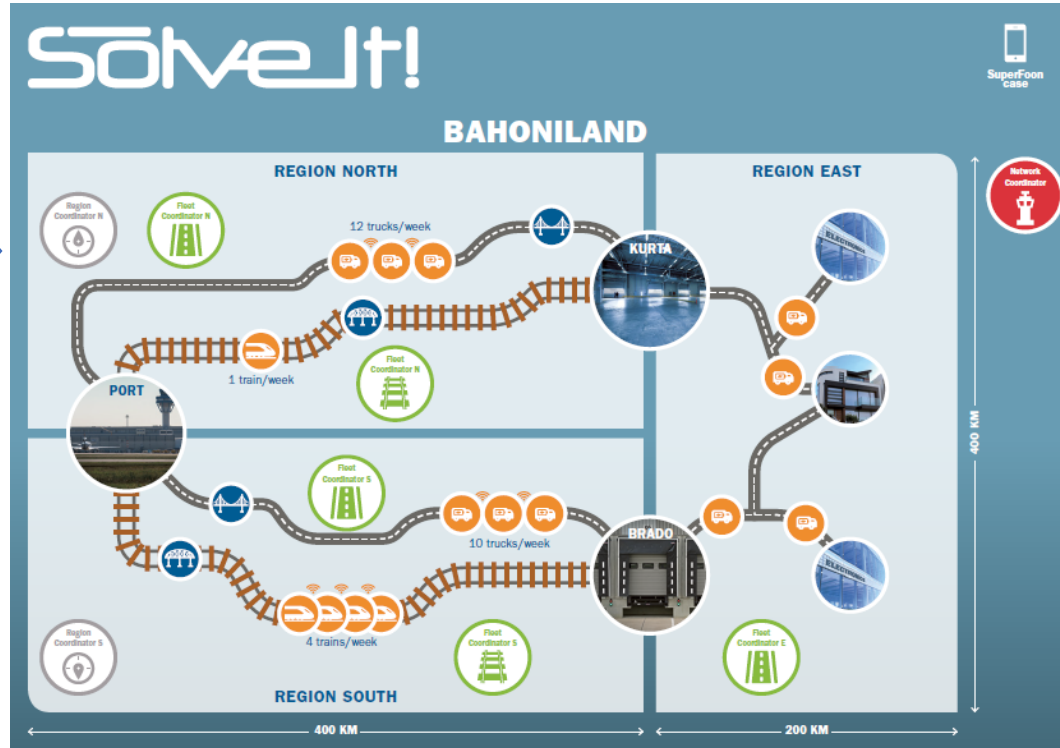
Generate new ideas

*Experiment in
a safe environment*



SOLVE IT!

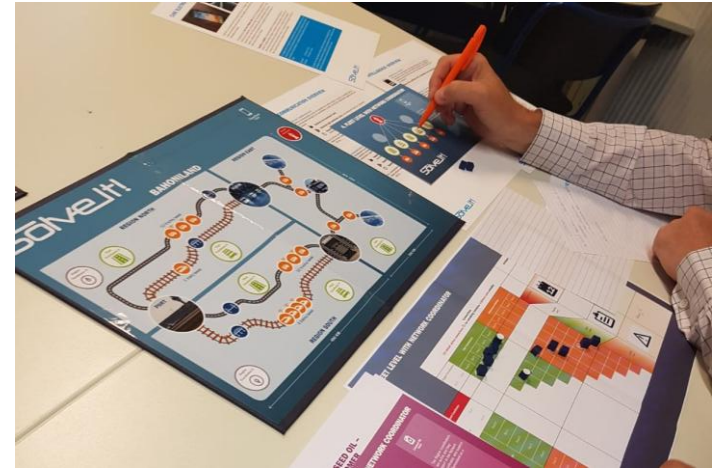
1. Enter into the world of Solve it!



5. Discussion to translate findings to current logistics practice

SOLVE IT!

“The workshop is a good conversation starter and makes me reconsider the choices we make in our company.”



“Your basic assumptions and views are challenged. You experience the level of resilience of your organization design and in the discussion you learn from the other players as well, based on the choices they made.”

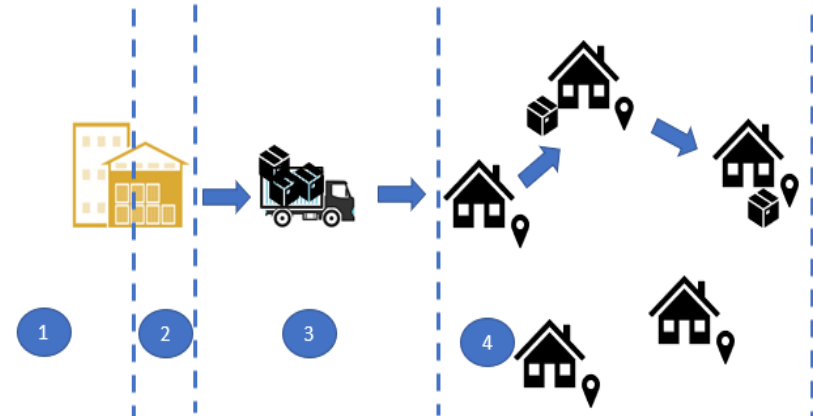
SOLiD REAL-LIFE EXPERIMENTS

- › Raising awareness by experimenting and demonstrating in practice that a more self-organizing logistics system can have advantages already.
- › **SOLiD**: 2.5 year research project (partly funded by Dutch Topsector Logistics (TKI Dinalog) and NWO).
 - › Experimental environment
 - › Perspective to SOL
 - › Feasible in practice
 - › Logical motive
- › **Purpose**: Proof-of-concept that shows how logistics systems can be prepared for the Physical Internet.



SOLID REAL-LIFE EXPERIMENTS

- 1) More dynamically planning delivery areas based local information
 - 2) Adding local intelligence in order to reduce handling activities
 - 3) Continuous replanning of delivery routes based on receiver feedback
 - 4) Making local intelligence of good-performing drivers available
- › Simulation environment (complementing case 1+ 3)
 - › Learning environment for developing future steps



CONCLUSION

- › Make the idea of a self-organizing logistics system and the PI more concrete for practitioners
- › Two (more bottom up) approaches to contribute to growing conceptual contributions on the PI
 - › Serious gaming to raise awareness
 - › Real-life experiments as a first step towards transforming logistics



To be continued

THANK YOU FOR YOUR ATTENTION

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