Boosting supply chains through Machine Learning & AI

GPCA Supply Chain Conference
Jürgen Schulz – Siemens Digital Logistics
Dubai, 16th of April
What does Big Data, ML & AI mean for you?

“The only Big Data letters I care about are the four Ms — Make Me More Money!”
SUPPLY CHAIN MANAGEMENT

Every day's madness ...

... or madly easy

INTEGRATION SUCCEEDS - TRANSPARENCY AUGMENTS - PROCESSES FLOW

COMPLEXITY VANISHES - COSTS DECREASE - ENTHUSIASM GROWS

[Cartoon Illustration of supply chain management with various icons representing different stages of the supply chain, from production to delivery, with a central theme of integrating and streamlining processes for efficiency.]
AGENDA

1) Who we are?
2) How we support Chemical Industries in solving their supply chain pains
3) A concrete use case from Chemical Industries
Digital transformation is one of Siemens’ core strategies.

>$10 \text{ bil}$ invested in M&A

>$5 \text{ bil}$ investments on R&D for digital solutions

400 domain experts with more than 30 years of experience in Logistics and Supply Chain Management

Represented globally in more than 20 countries serving > 750 customers from over 20 industries

Dedicated and comprehensive cross-industry know-how

References in Chemical, Industry, Retail, LSP’s and many more
Key strategic topics in the context of Digitalization
In Chemical Industries

1. Process Smartification in Production, R&D, etc.
2. Digital Planning, Supply Chain & Logistics
3. Predictive Maintenance
4. Advanced Plant Automation
5. Digital Engineering & Asset Management
6. Digital Assistant Systems
7. Other Digital Applications
Use Case Supply Chain & Logistics

How to predict arrival time?

Challenge
- Mistrust in ordering times
- Behavior of pre-ordering
- Materials arriving too early
- Overstocking of warehouses
- Rise of OPEX

Leads to
- Increase in OPEX
- Unreliable ordering times
- No real-time prediction of arriving materials

How can we use AI or ML to solve this Use Case?

When you’re fundraising, it’s AI.
When you’re hiring, it’s ML.
When you’re implementing, it’s linear regression.
When you’re debugging, it’s printf().

Baron Schwartz
Predictive “Precise Time of Arrival (PTA)” adaptive learning model
Using Adaptive Learning and Optimization

**INPUTS**

- Logistics / Supply Chain Management Data
- Driving Patterns
- Routing Costs
- Maps / Traffic Data
- Weather Data
- Internet of Things Data / GPS data
  - Various relevant datasets from internal and external sources

**Adaptive Learning**

- Input: Various relevant datasets from internal and external sources
  - Logistics / Supply Chain Management Data
  - Driving Patterns
  - Routing Costs
  - Maps / Traffic Data
  - Weather Data
  - Internet of Things Data / GPS data

**Flow Optimizer**

**OUTPUTS**

**#1**
- Latest Dispatch Date/Time = Tue 16/12/2018 12:40

**#2**
- Predictions of travel time (with accuracy of days/hours) between the origin and destination locations for each individual legs of the journey
  - Leg 1 Time: 37 hrs
  - Leg 2 Time: 14 hrs
  - Leg 3 Time: 4,5 hrs

**#3**
- Overall end-to-end travel time for each shipment
  - Shipment Time: 55,5 hrs

**Business Rules Decision Management**

### Predicting Travel Time

Predictions of travel time (with accuracy of days/hours) between the origin and destination locations for each individual legs of the journey.
Predictive “Precise Time of Arrival (PTA)” adaptive learning model
Using Adaptive Learning and Optimization

- Forecast your goods **time of arrival** in a precision, that can be used to plan your inbound, warehouse and production processes

- Plan the **latest point of shipment**

- Track the shipment to support **last minute decisions** like change over to different transports or routes
• 3 Key take aways
  - don’t believe the hype
  - start with simple use case
  - measure and adapt!