

Put the most complex logistics on autopilot.

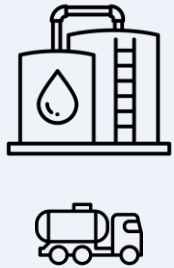


Operations Decision Intelligence

The Challenge

A Problem of Impossible Scale

The Daily Puzzle: Multi-Stop Routing



Tanker trucks: 1



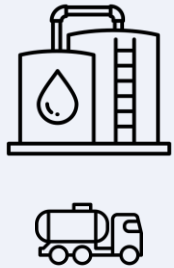
Stops: 5

Possible Routes: 120

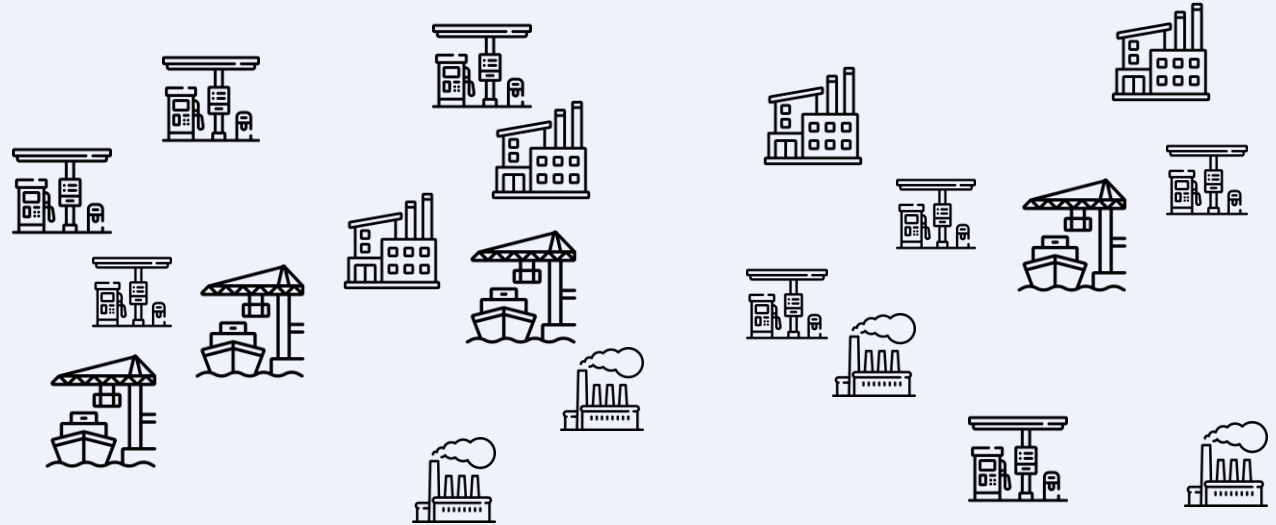
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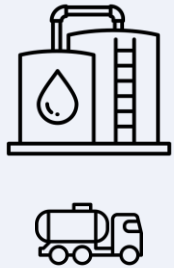
Stops: 20

Possible Routes: ?

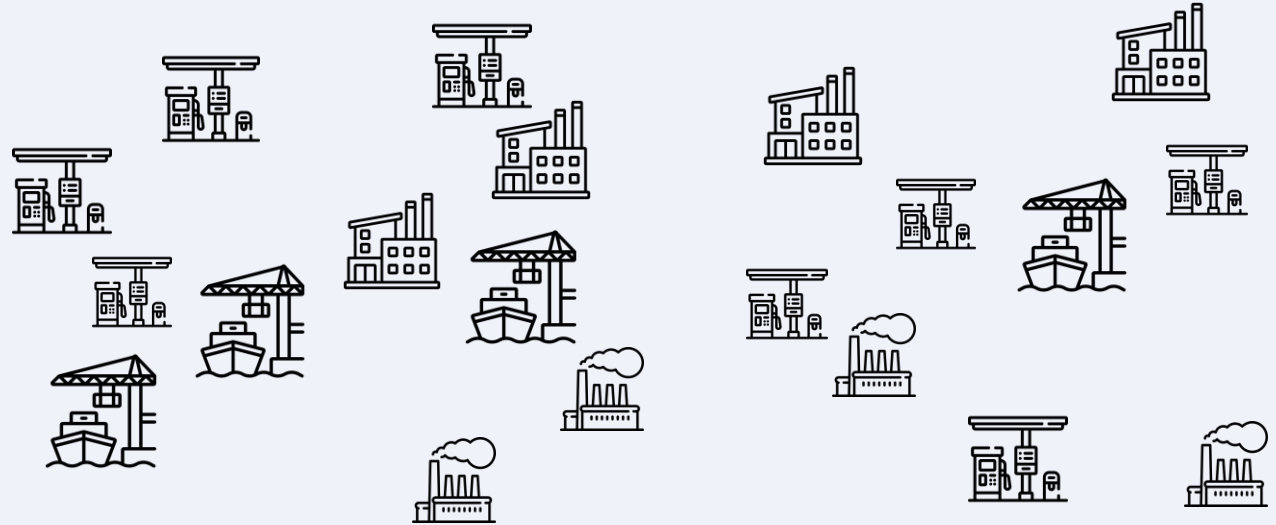
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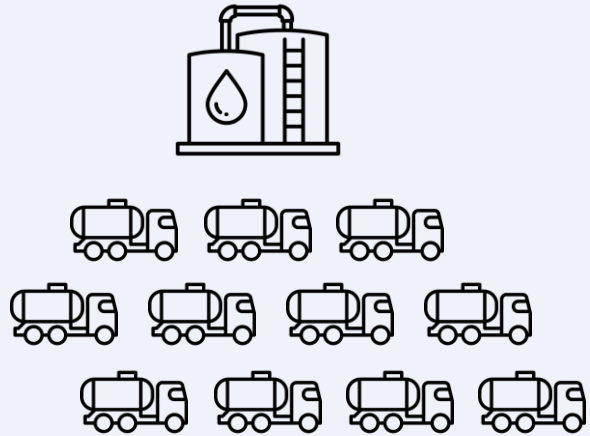
Stops: 20

Possible Routes: 2,432,902,008,176,640,000

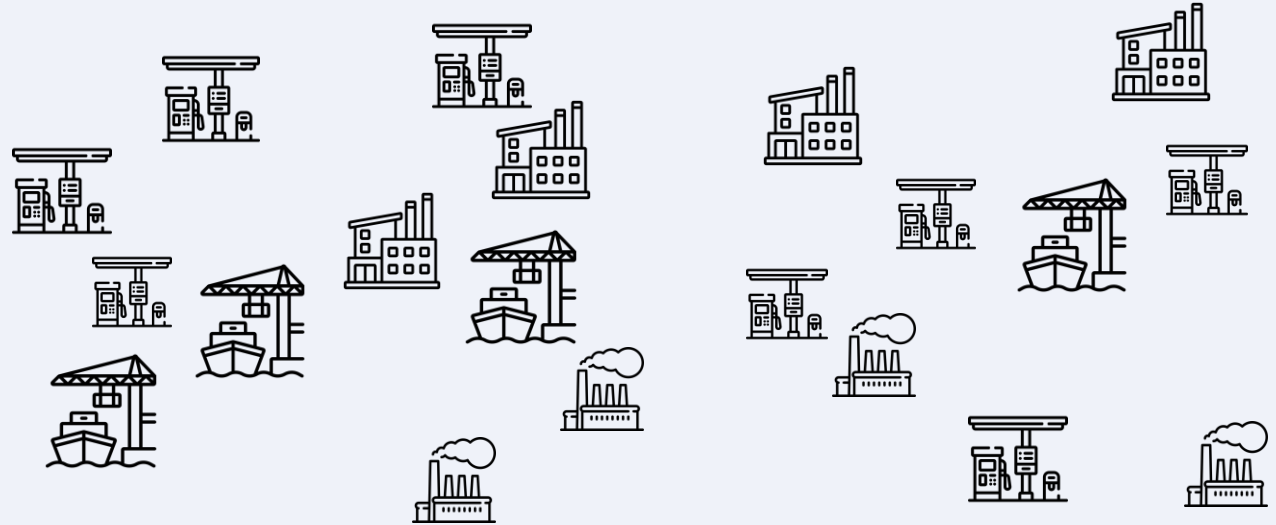
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Tanker trucks: 10



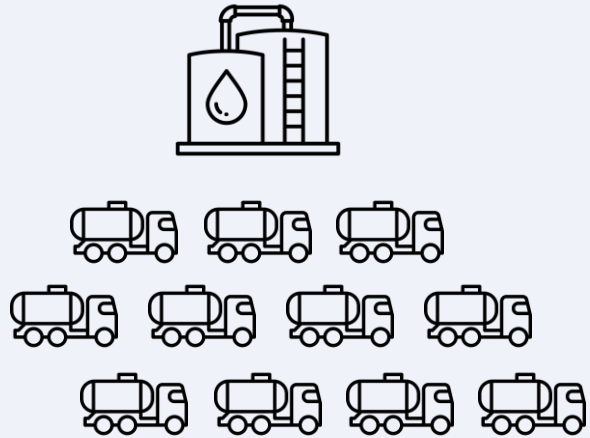
Stops: 20

Possible Routes: ?

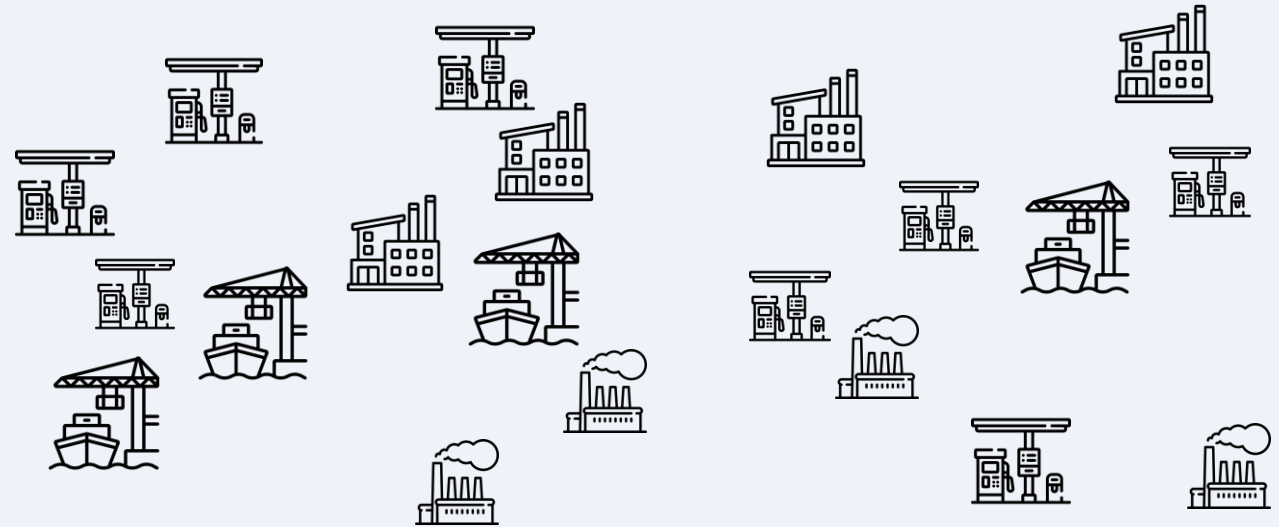
The Challenge

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The Daily Puzzle: Multi-Stop Routing



Tanker trucks: 10



Stops: 20

Possible Routes: 2,432,902,008,176,640,000,000,000,000,000,...

The Challenge

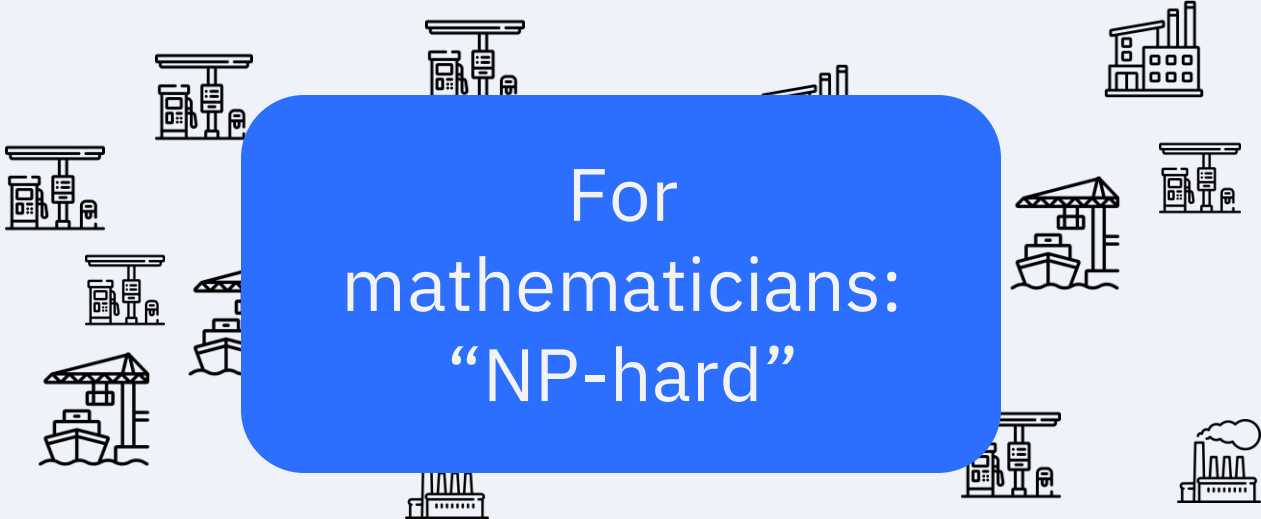
A Problem of Impossible Scale

The Daily Puzzle: Multi-Stop Routing



For operators:
“A casual Tuesday”

Tanker trucks: 10



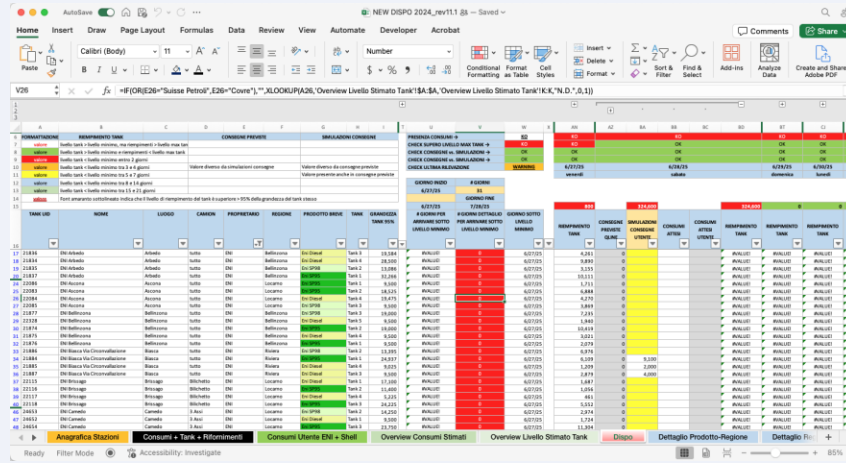
For
mathematicians:
“NP-hard”

Stops: 20

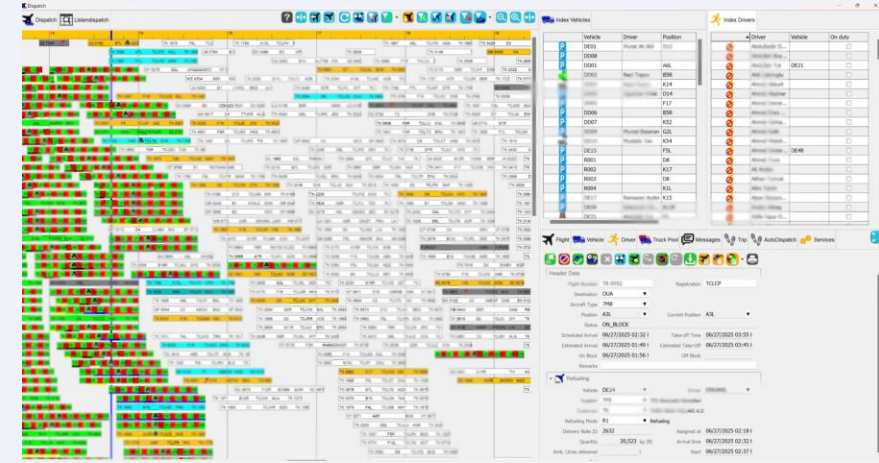
→ This problem scales beyond humans.

Status Quo

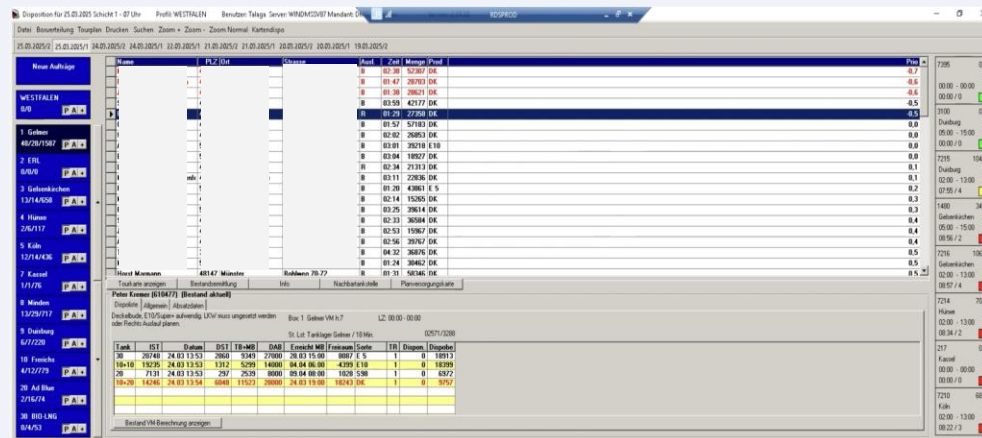
Manual Chaos and Rigid Tools



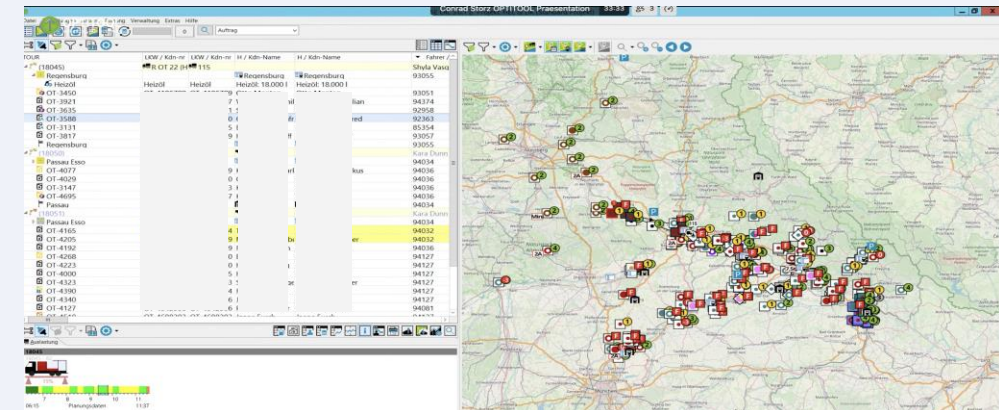
Excel



AFIS Aero



PDI-Technology



Status Quo

The Result Costs Millions

Day-to-Day
<14 days

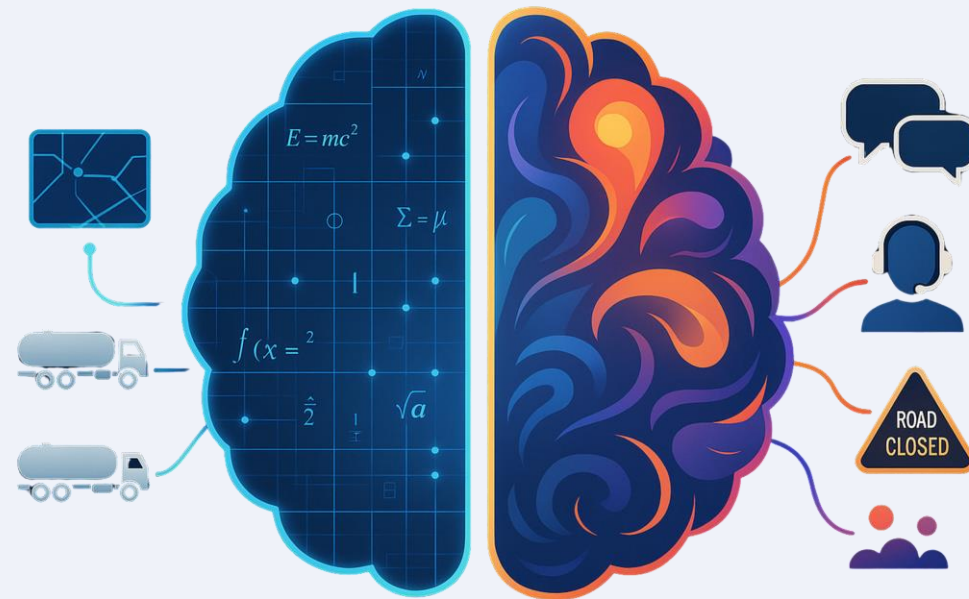
Unoptimized, manual short-term decisions; humans are great at context, not at large-scale number-crunching.

Strategic
1–12+ Months

Lack of long-term simulations creates strategic blind spots and risky CAPEX/contract choices.

A Real-World Solution...

...Requires Two Brains



Left Brain - Logic

- Near-optimal plans in seconds
- Models multi-day, multi-depot, ADR & constraints

Right Brain - Language

- Understands operational intent
- Explains & adjusts plans in plain English
- Human-in-the-loop control & learning

Two Examples

How This Brains Work in Tandem



Day-to-day task

"Customer x just called: they NEED 10'000l of product y by this evening."

01 Human problem



AI Command Tower

04 Flawless, instant, intuitive, explainable, adjustable solution

Day-to-day decision

"Truck Z08's route was adjusted in the dashboard; re-routing adds 80CHF"



Strategic blind spot

"Should I buy a 32kL or 44kL truck?"

02 Machine problem

03 Flawless, instant solution



Optimization Engine

Strategic decision

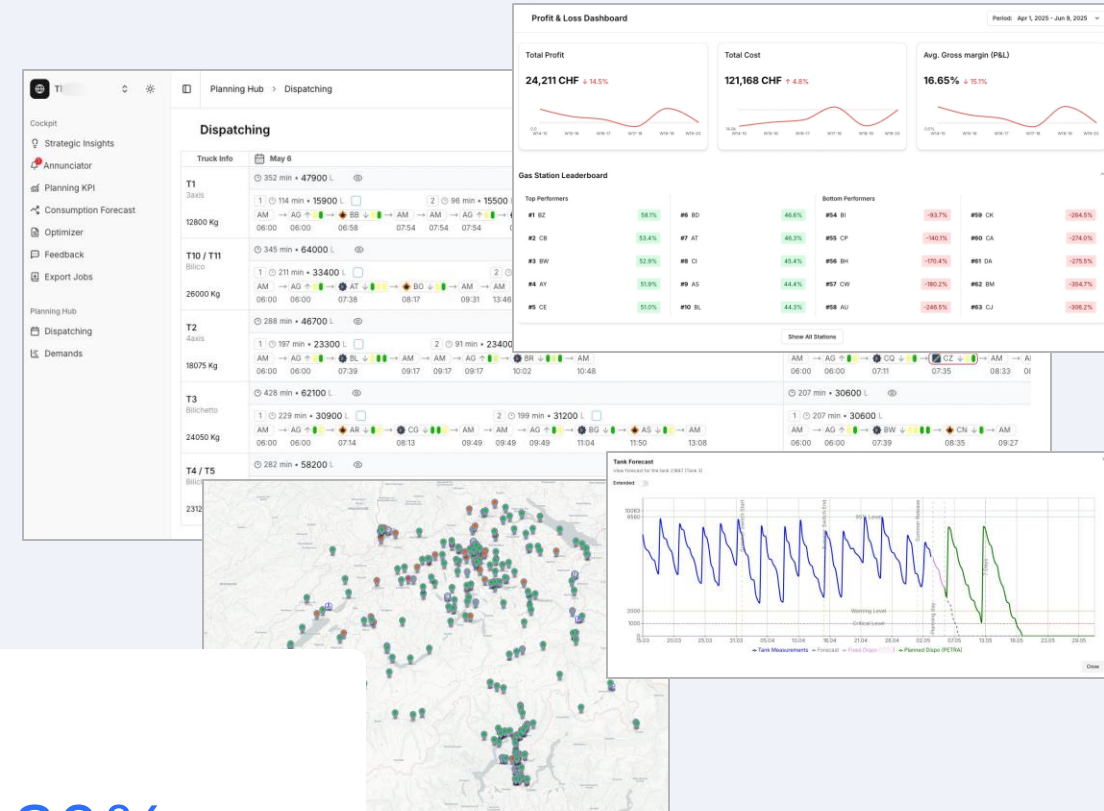
"44kL! On average you will drive 740km less & do 1003min less work, thus save 3 KCHF in OpEx per month."

Our Solution

A Holistic AI Command Tower

Arqh is an independent & data-driven planner that ...

- **Plans in minutes**, near-optimal and explainable.
- **Real-time re-planning** for traffic, late orders, and changing constraints.
- **What-if simulations** at scale; no Data Science team required.
- **Human-in-the-loop** control with manual fallback.
- And more 😊



From live deployments & modelled outcomes

10%+

Fleet OPEX reduction

>1.5 M\$

per year @50 trucks

80%

Less manual work

ROI from Live Deployments

Saving >1.5\$M @50 Trucks per Year

Day-to-Day Operations

**-10%
OPEX**

2.5-3 KCHF / truck / month
50 trucks: >1.2 MCHF / year

**-80%
manual planning**

50 trucks: -3 FTEs manual work

Strategic Decisions

**10'000+ "what-if"
Simulations**

Data-driven decisions by
simulating different scenarios
before you spend.



"Arqh's optimization algorithms are bringing our beverage logistics into a more load-balanced unit."

- Michael Maurer, Head of Digital Feldschlösschen



fueling the future

"Planning an efficient day used to take a lot of time and involve a lot of spreadsheet juggling; with Arqh we have a plan when arriving at the office at 7am, and the early savings are already easing our margin pressure."
- Gian-Andrea Conrad, CEO Conrad-Storz

Backed by Leading Research Institutions

EPFL

Prof. Daniel Kuhn, world-leading researcher
in optimization for operations management

ETH zürich

Prof. Dr. Torbjörn Netland, Human-AI-
interactions in logistics

Prof. Menna El-Assady, expert in agent-
driven human-in-the-loop decision-making



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Investors

 **Founderful**

 **MERANTIX
CAPITAL**

*We are at Booth
H2-S12
(next to Crêpes)*

What we're Looking for



-  Strategic partners within
 - Last-mile B2B logistics (palletized, bulk, ...)
 - 40-1000+ trucks
-  Industry experts and sparring partners
-  Smart people obsessed with advancing logistics

*Come find us at Booth
(next to Crêpes)*

H2-S12

Or reach out to me via...
antonia.unger@arqh.ch

Thank you.



Operations Decision Intelligence

Our approach is verticalized and human-first; built for B2B last-mile

Vertical Blueprints

Our constraint libraries and config-as-code templates capture the needs per sub-vertical.

“Customization at Scale”

Live Steering Wheel

We don't re-plan nightly; we re-plan continuously, with dispatch in the loop. Trust: show binding constraints & “why.”

“AI + Human > AI”

The Old Way vs. The Arqh Way

The Manual / Spreadsheets Way



A team of skilled planners (e.g. **1 per 10 trucks**), each working in a silo. Their time = major expense.



Planners work with disconnected spreadsheets and rely on **gut-feeling**. Constant mails + phone calls to connect.



It takes **hours to days** to build a comprehensive plan or react to a disruption.



Margin bleed: Hours wasted on manual tasks & sub-optimal reactions to disruptions.



Costly strategic risk: Long-term decisions based on "instincts" & simple spreadsheet models.



Sub-linear value

Costs scale below 1:1 with operational growth.

The Arqh way

Same team now manages **4x the scale**, working from a single source of truth.

Planners use natural language to steer the AI. Decisions are **data-backed and transparent**.

Generate a near-optimal plan or find the best response to a disruption in **minutes**.

Tactical ROI: 80%+ of manual planning time is automated. Real-time optimization turn disruptions into wins and protects profits.

Strategic ROI: De-risk your strategy by running thousands of "what-if" simulations. Model the true impact of any major decision.

Compounding value & ROI

Protect margins & cut costs (5-15%+), unlock growth (manage 4x scale), de-risk strategy.

No-Risk Pilot to Prove Value (1 Month)

1

Data Export

Sample of your historical data (routes, orders, truck logs from Excel/TMS).

2

Arqh Simulates

Our proprietary optimization engine simulates your past operations.

3

Review Your ROI

We deliver quantified report with your OPEX and time savings; decide next steps.

Appendix

Arqh – Technology

Arqh communicates with systems and continuously optimizes as an independent dispatcher. Human is kept in the loop.

Data integrations



ERP System



Capacities, constraints, objectives, etc.

Two fold Impact

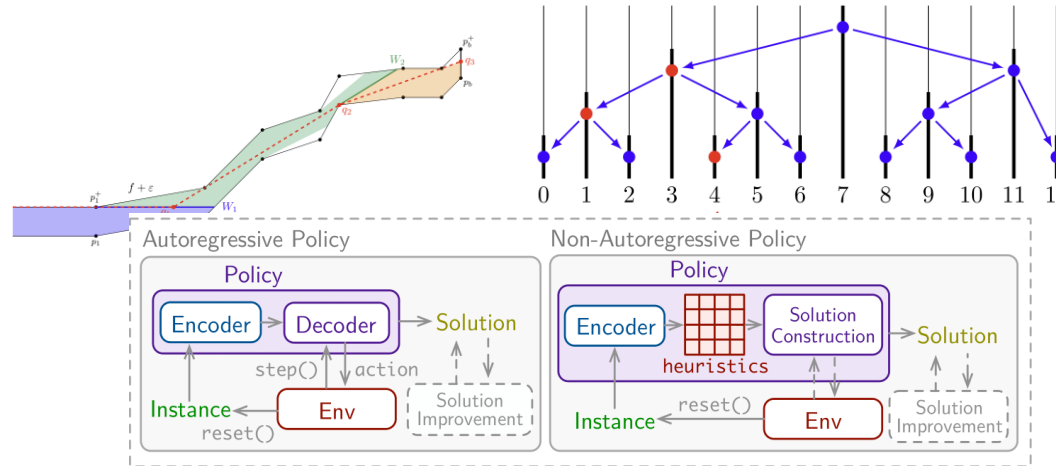
Arqh Ops

- Efficient plans (10+ % OPEX savings)
- Real-time changes

Arqh Strat

- "What-if" simulations of strategic questions

ARQH – Proprietary Optimization Engine



Objective Function

$$\max \sum_{i \in N} \sum_{v \in V} \sum_{k \in K} \sum_{c \in F} w_{ic} \cdot l_{ivkc}$$

Constraints

1. Demand Satisfaction

$$\sum_{v \in V} \sum_{k \in K} l_{ivkc} \leq d_i^c \quad \forall i \in N, \forall c \in F$$

2. Supply Constraints

$$\sum_{v \in V} \sum_{k \in K} p_{ivkc} \leq s_i^c \quad \forall i \in N, \forall c \in F$$

3. Vehicle Usage

$$\sum_{k \in K} \sum_{\substack{j \in N \\ j \neq \text{depot}}} x_{\text{depot},j,v,k} \geq 1 \quad \forall v \in V$$

4. Flow Conservation

$$\sum_{\substack{j \in N \\ j \neq i}} x_{ijvk} = \sum_{\substack{j \in N \\ j \neq i}} x_{jivk} \quad \forall v \in V, \forall k \in K, \forall i \in N \setminus \{\text{depot}\}$$

5. Load Dynamics

$$\begin{aligned} L_{jvkc} &\geq L_{ivkc} + p_{jvkc} - l_{jvkc} - M(1 - x_{ijvk}) \\ L_{jvkc} &\leq L_{ivkc} + p_{jvkc} - l_{jvkc} + M(1 - x_{ijvk}) \\ &\forall i, j \in N, i \neq j, \forall v \in V, \forall k \in K, \forall c \in F \end{aligned}$$

...

We play in B2B Multi-Stop Last Mile

Why?

B2B last-mile operations are inherently "messy" and unpredictable. Unlike stable, long-haul middle-mile journeys, they are exposed to a volatile set of real-world variables. Multiple stakeholders—drivers, dispatchers, and customers at each stop—must navigate a constantly changing environment of urban traffic, accidents, road closures, last-minute order changes, and unpredictable wait times at delivery locations.

Dimension	Options	Arqh Focus
Supply-chain stage	• First Mile • Middle Mile • Last Mile	Now: Last Mile Later: Middle Mile, Last Mile
Load Consolidation	• FTL (Full Truckload) • LTL (Less-Than-Truckload) • CEP (Courier, Express, Parcel)	Now: LTL Later: FTL, CEP
Loaded goods	• Bulk Goods • Palletized Goods • Non-unitized Freight • Parcels	Now: Bulk goods, palletized goods Later: Parcels
Transportation Operating Model	• Private/In-House fleet • 3PL • 4PL	Now: Private/In-House fleet, 3PL Later: 4PL
Inventory-Replenishment Trigger	• CMI (Customer-Managed-Inventory) • VMI (Vendor-Managed-Inventory)	Now: CMI, VMI
Origin-Destination Pattern	• 1-to-1: Point-to-Point • 1-to-Many: Milk-run • Many-to-1: Pick-up loop • Many-to-Many: Delivery network	Now: 1-to-1, 1-to-Many, Many-to-1, Many-to-Many

Where we play first (12-month focus)

Where *Multi-Stop Routes and Time Critical Deliveries* meet *Dynamic Orders and Continuous Disruptions*



Blueprint A: Fuels & Lubricant; Industrial Gas & LPG Distribution

- Tank-level triggers (VMI) + CMI
- ADR/hazmat constraints; access/permit rules; bulk & compartment logic, etc.
- Objective blend: minimize stockouts & miles; uphold safety constraints 100%.



Blueprint B – Direct-Store-Delivery (Food & Beverage)

- Multi-temp & compartment constraints; palletized, strict time windows; store blackout windows, etc.
- Objective blend: OTW $\geq 95\%$, minimize overtime minutes, shelf-life protected.

Guardrail (first 12 months): CEP/parcel, ad-hoc brokerage, long-haul optimization.