

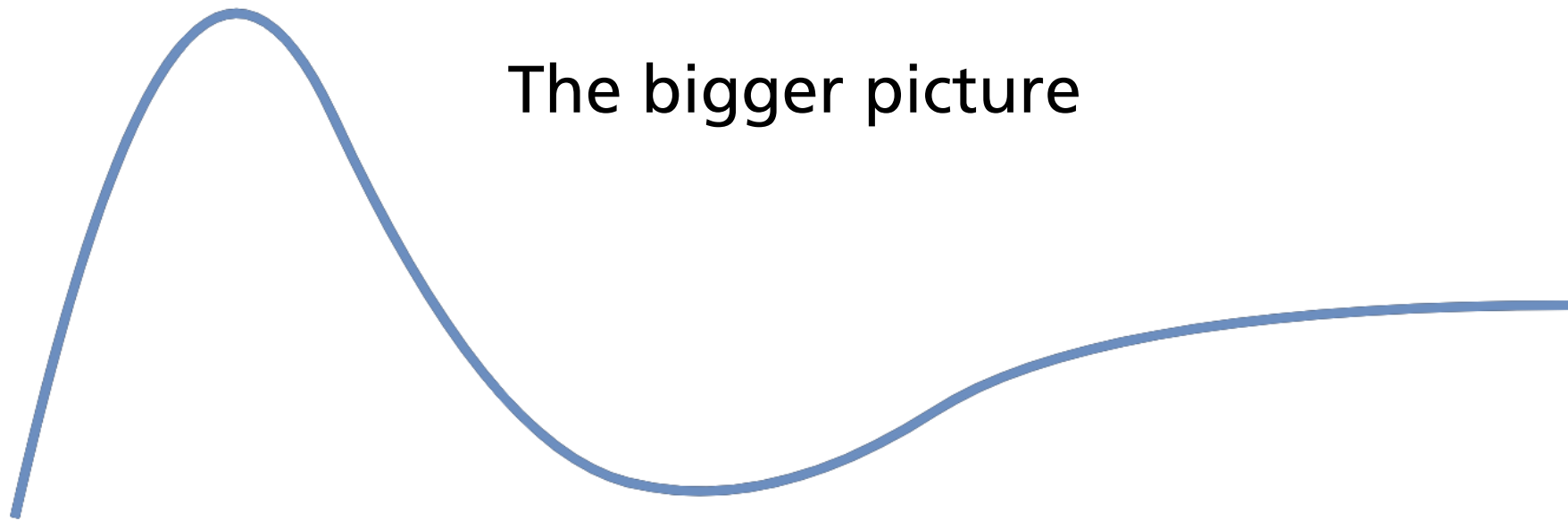


DRESDEN

helyOS® - Leitstandsoftware für automatisierte Fahrzeuge und Fahrzeugflotten

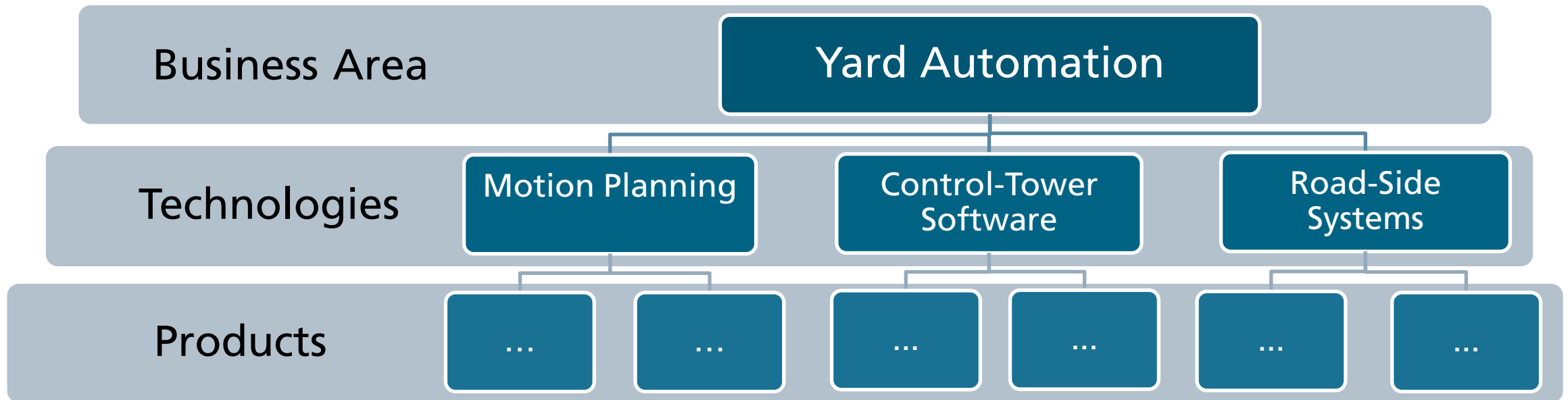
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Yard Automation at Fraunhofer IVI



Yard Automation Business Area at IVI

Core Topics



Yard Automation at Fraunhofer IVI



helyOS

Control Tower

Software Framework



What is helyOS?

helyOS is a control tower software framework for automated mobile machines.

- Create your own control tower software
- Connect, monitor, control and simulate your mobile machine fleet
→ robot orchestration with no headache
- Made for engineers, researchers and geeks - use existing planning and control algorithms or add your own

helyOS Framework

Application fields (1)

Create your own control tower software to automate

- logistics centers
- factory yards
- farming
- maritime ports
- airports
- municipal services

helyOS Framework

Application fields (2)

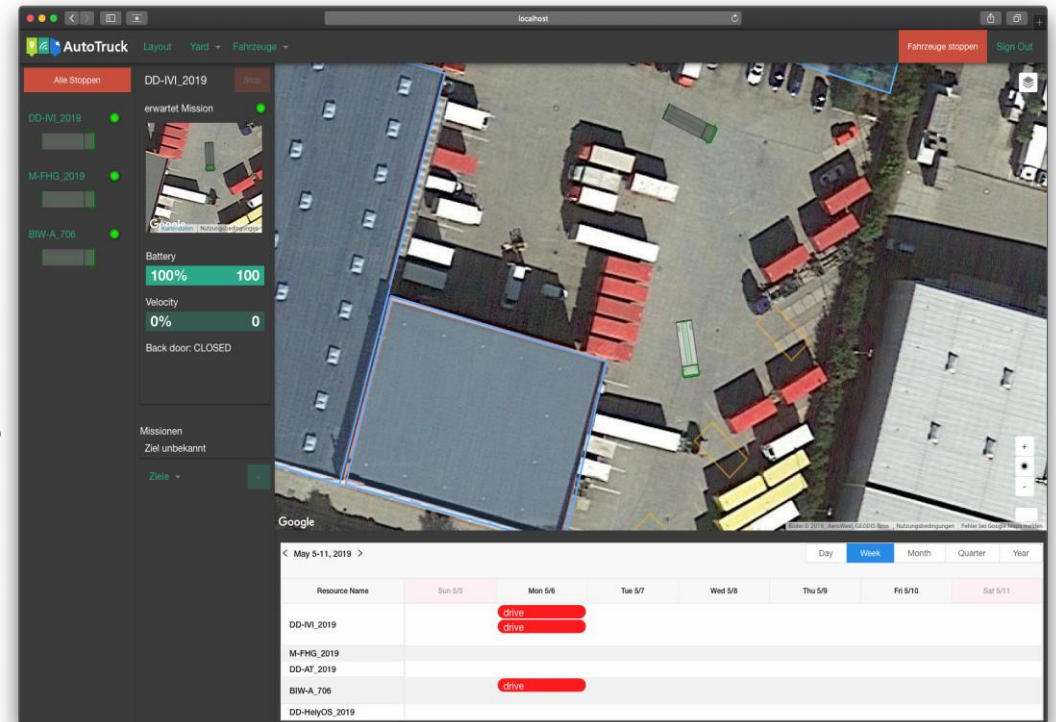
Create your own test-bench

- to create reproducible tests
- test and benchmark your autonomous driving algorithms

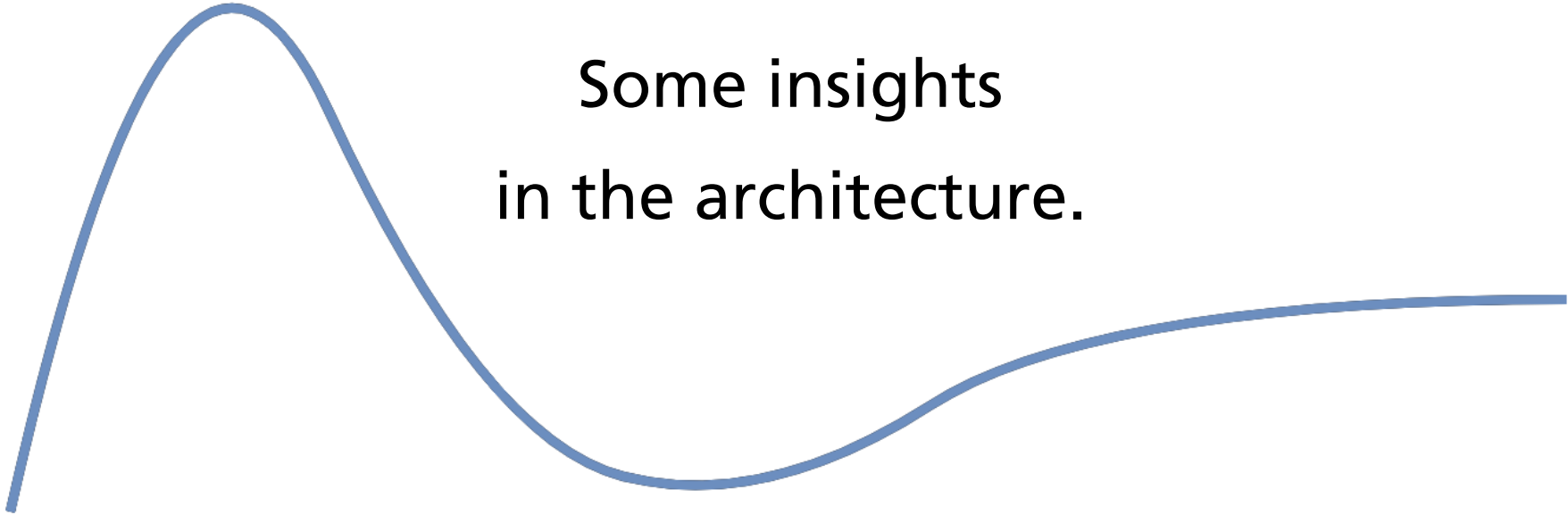
helyOS Framework

How does it look like?

- Like most plans/blueprints:
 - architectural diagrams (multi-domain, different layers, functional & interface descriptions)
 - textual descriptions
 - data models
 - APIs / SDK
 - “Hello World!” demo implementations
- By nature, it is know-how / knowledge.

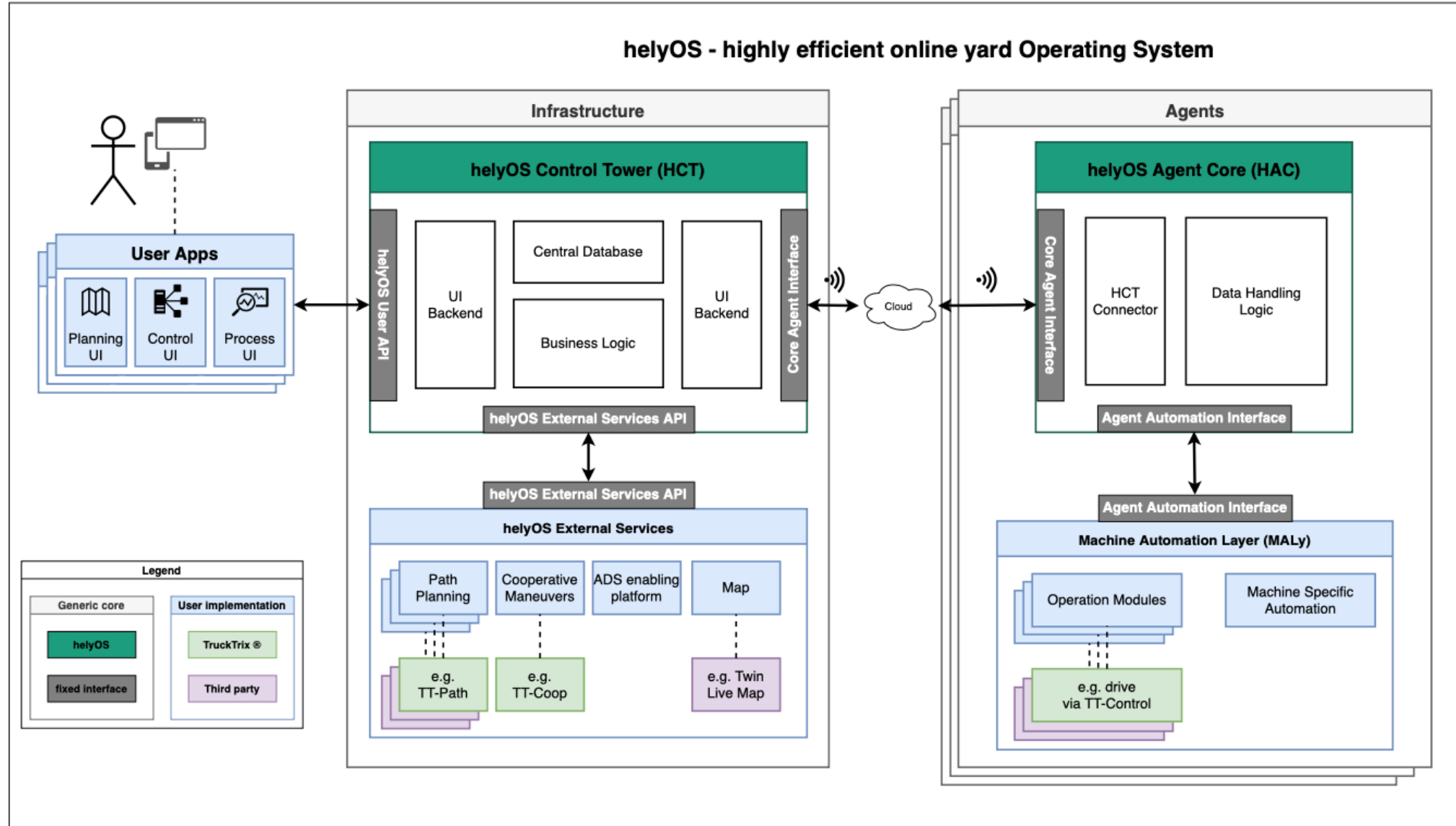


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Some insights
in the architecture.

Control Tower Software helyOS



Plugin for helyOS – TruckTrix Path

Live Path Planning even for complex vehicles

Example shows abnormal load road survey app (www.HeavyGoods.net)

The screenshot displays the 'Plan transports' interface on the HeavyGoods.net website. The interface is divided into several sections:

- Top Left:** Navigation and settings. Includes a 'Back to the transports map' button, a 'Print this version' button, and a 'Share' button. Below these are icons for information, print, share, and CAD.
- Left Panel:** Configuration options. Includes 'Transport: Example CAD', 'Route section: Wiler Straße - with CAD', 'Configure vehicle combination' (showing a truck icon), 'Steering: Forced steering', and an 'Edit route section' button.
- Bottom Left:** A list of variants. 'Variante #24' is highlighted with a '✓ Calculation successful' status. Below it, 'Variante #23' and 'Variante #21' are also listed with '✓ Calculation successful' status.
- Center:** A satellite map view showing a truck (orange) moving along a planned path (yellow line). A 'Traffic island' is labeled with a purple arrow. A 'Start position' is marked with a white arrow. A measurement of '9.9m' is shown on the path.
- Right Panel:** A settings menu with various toggles and sliders. The 'Opacity of the map' slider is set to a high value. The menu includes:
 - Google Maps satellite image (checked)
 - Google Maps satellite image with labels (unchecked)
 - Google Maps streets (unchecked)
 - Opacity of the map (slider)
 - CAD Drawing (unchecked)
 - Traversable area (checked)
 - Obstacle (checked)
 - Vehicle simulation (checked)
 - Tire tracks of tractor (checked)
 - Tire tracks of trailer (checked)
 - Area covered by vehicle combination (checked)
 - Area covered by cargo (unchecked)
 - Measures (checked)
 - Annotations (checked)
- Bottom:** A large orange banner with the text 'HeavyGoods.net Plan transports'.

Plugin for helyOS – TruckTrix Field

Key Features

- Automatic swath/seed row covering
- Cooperative planning for multiple robots
- Automatic subfield segmentation
- Optimizes machine utilization
- Compatible to helyOS control tower software



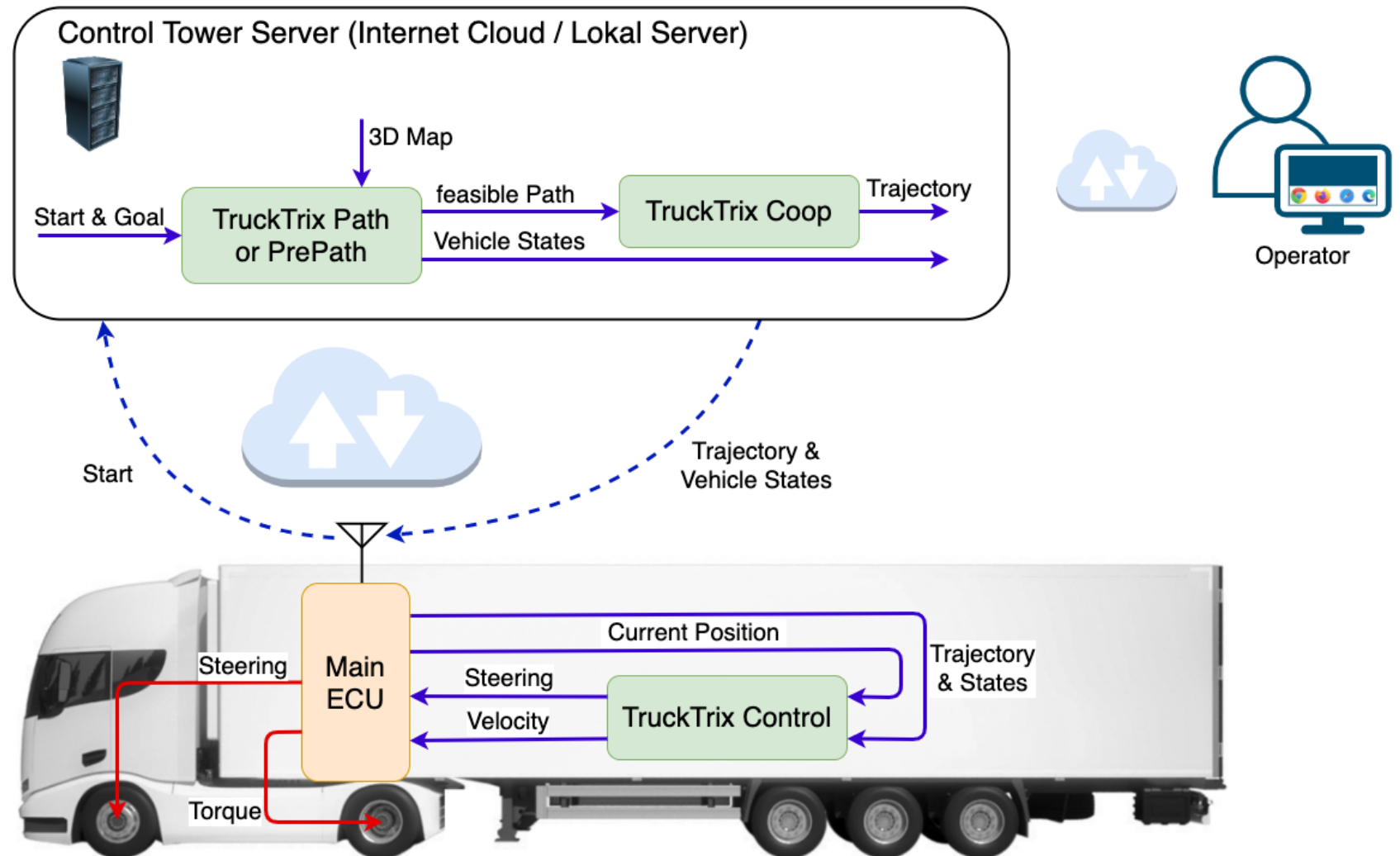
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Demo Implementations
of the architecture.

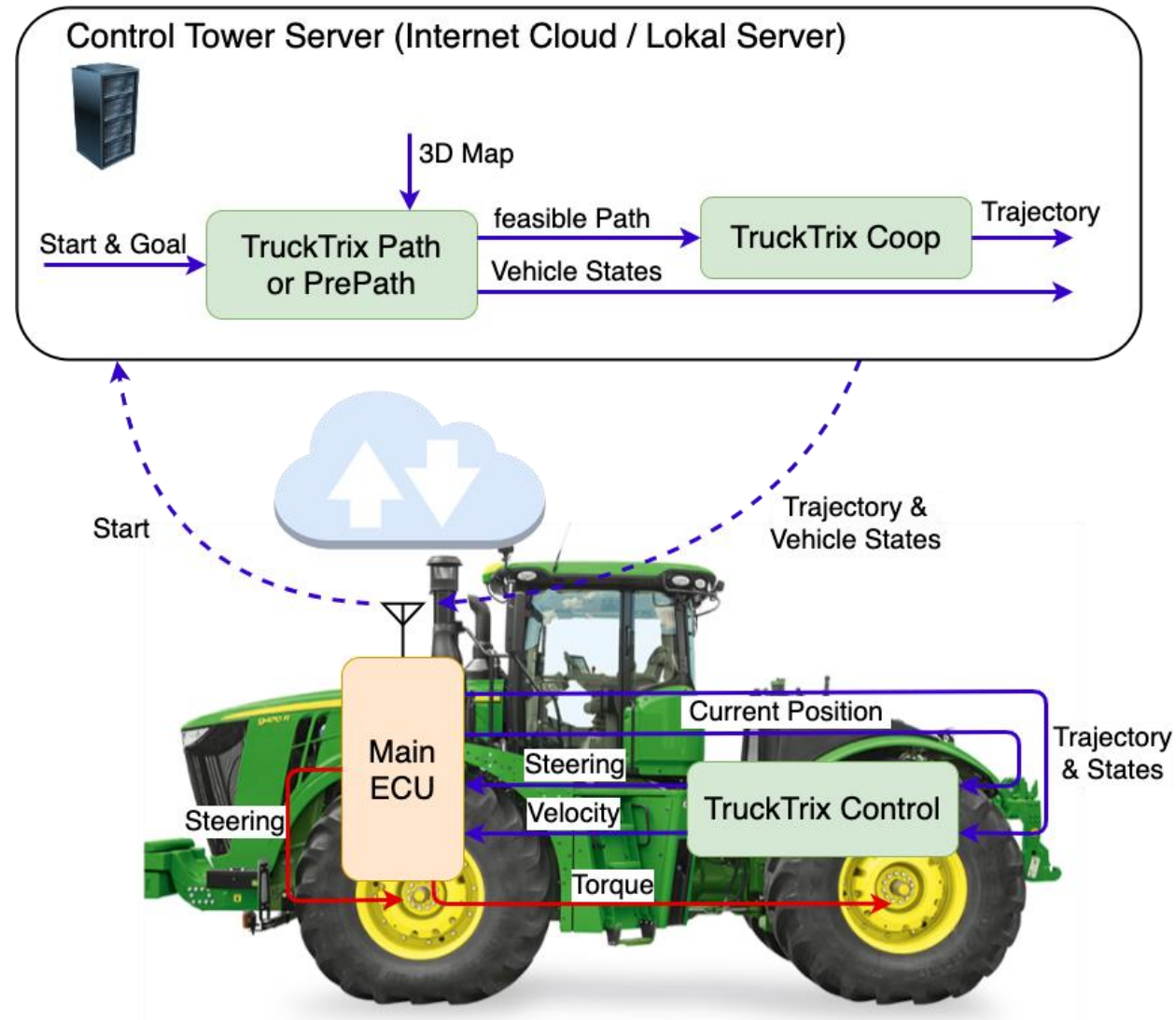
helyOS control tower for distribution center

Application Example I



helyOS control tower for agriculture applications

Application Example II



Motion Planning with TruckTriX®

Demonstration I



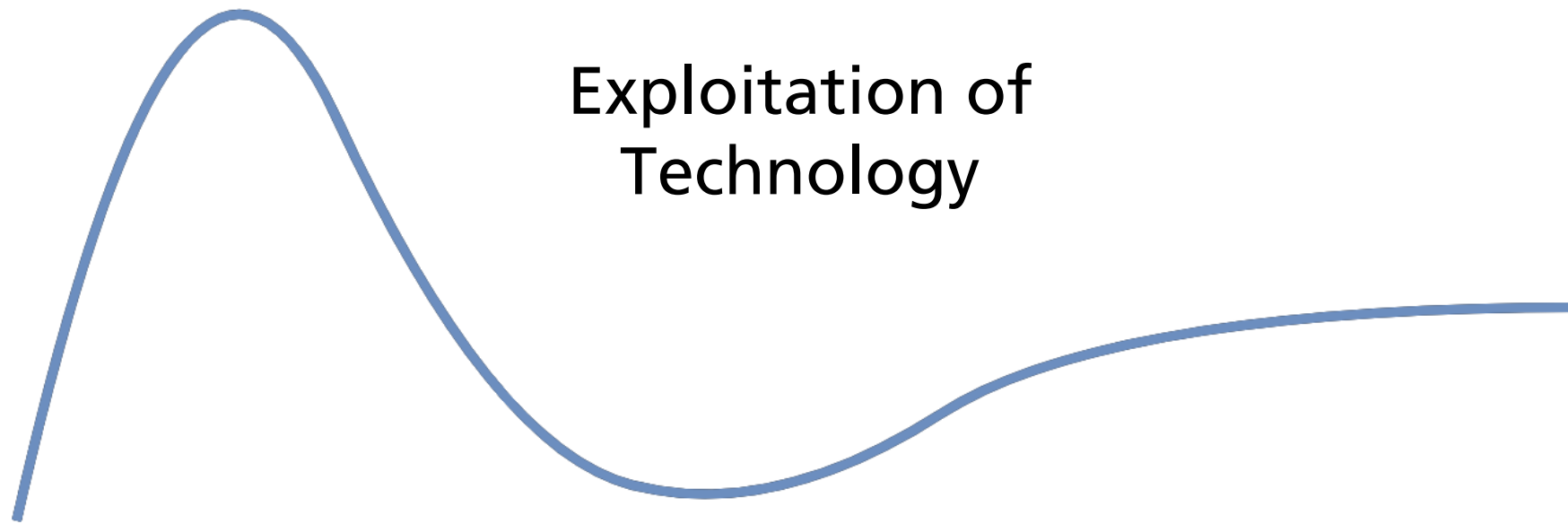
AutoTruck

Automated Truck Operation on Yards

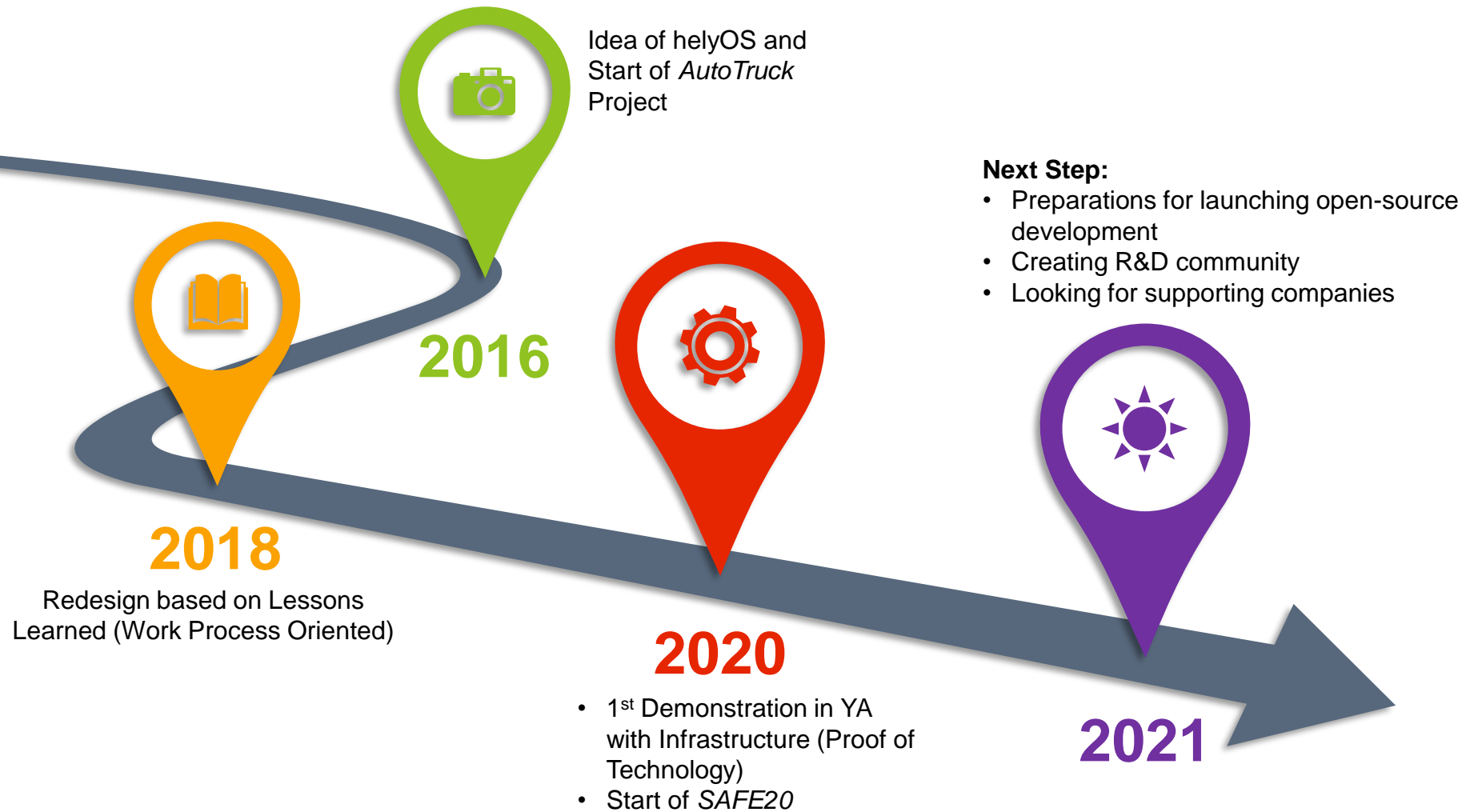
helyOS, TruckTrix and AutoTruck at Airport Frankfurt



What are the next Steps?



Roadmap helyOS



Questions or feedback? – Get in touch!

AutoTruck is available for R&D Projects

- Safe drive-by-wire e-Truck
- Safe steer-by-wire system
- Safe environment perception
- Many research options...

Kontakt

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Fragen zum Vortrag:

Der Open Source Ansatz klingt spannend:

1. Warum favorisieren sie diesen Weg gegenüber z.B. einem klassischen Technologietransfer?
2. Wie sehen die nächsten Schritte bei helyOS konkret aus?