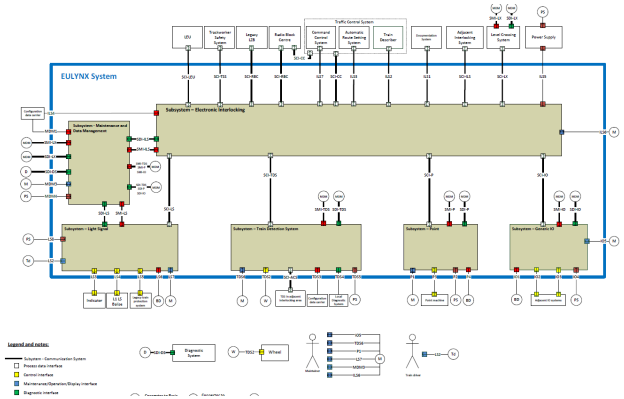


EULYNX

FOR ROBUST RAILWAYS

Subjects

What is EULYNX

- Why and who

What is EULYNX data prep

- and why should we care

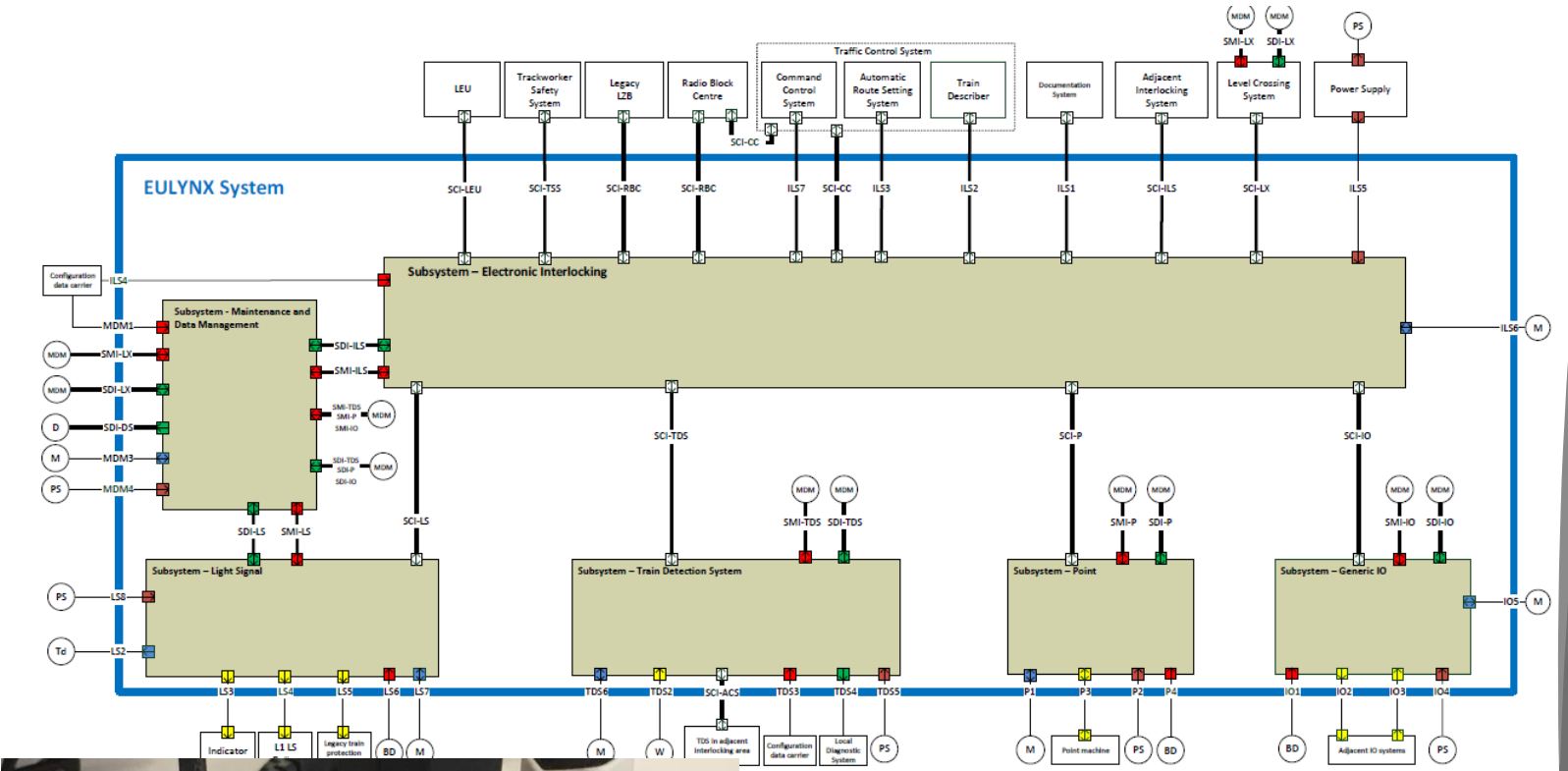
How does it work

- A peek under the bonnet

Who can benefit

- And why

EULYNX



converge

What is EULYNX

EULYNX standardises the interfaces in our Control, Command and Signalling architecture

Why – what are the benefits

Uncouple central safety system from fringe

- Contain obsolescence to subsystems
- Allow digitisation "USB-style"

Formal specification

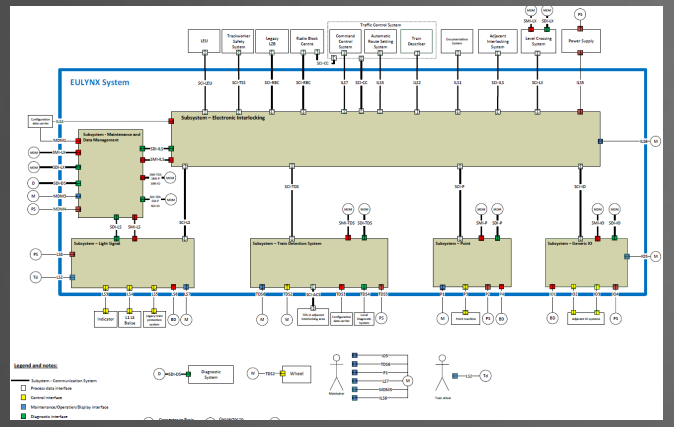
- Reduces ambiguity and wiggle space
- Improves quality and robustness

Create scale

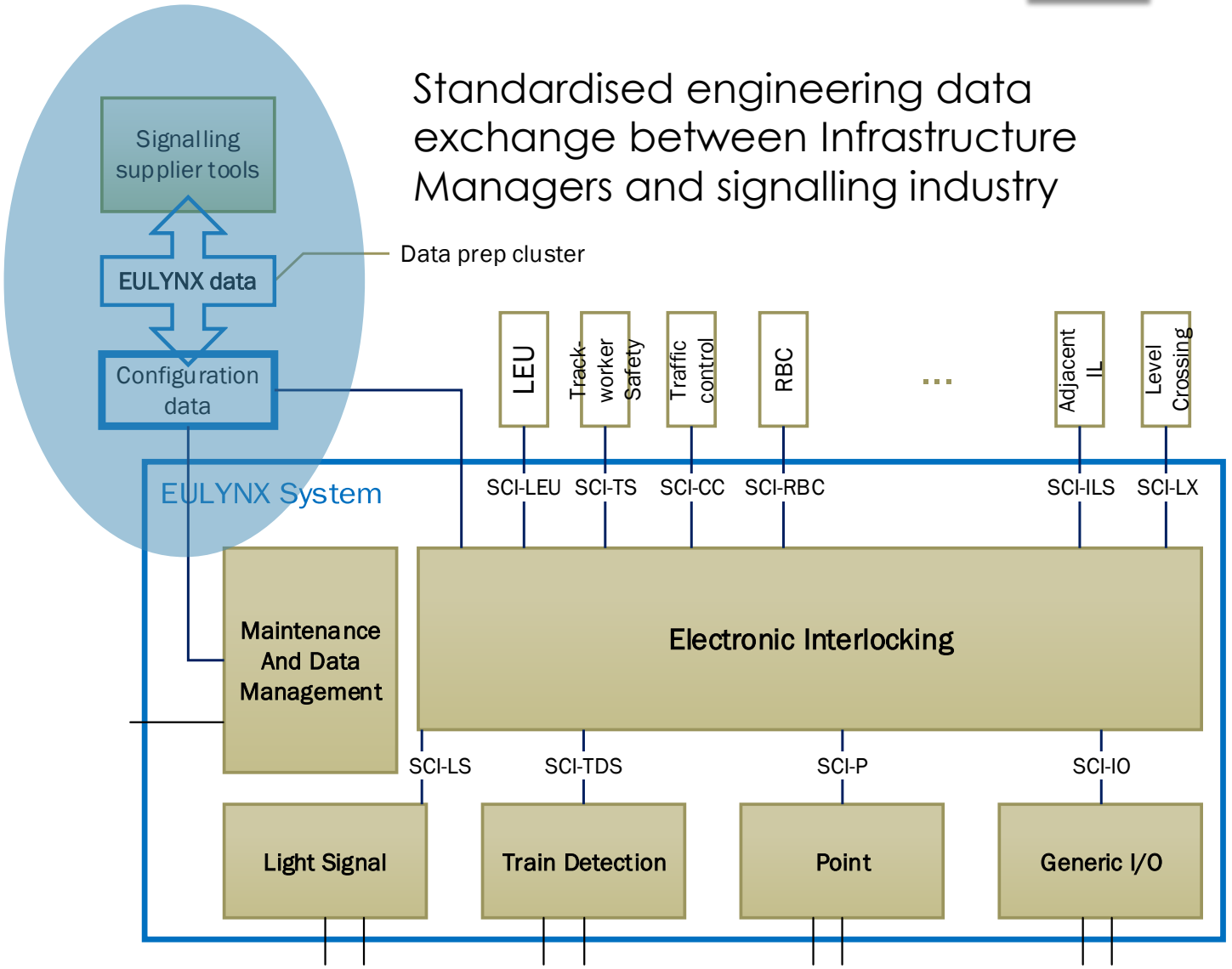
- Products for a big market replace custom-made kit
- Infrastructure managers get a wider choice of suppliers

ProRail NetworkRail DB SNCF ○○○○○○○ EULYNX

What is EULYNX data prep



Standardised engineering data exchange between Infrastructure Managers and signalling industry



What is EULYNX data prep

Guiding use case

- Provide all engineering data needed to build a signalling installation

Benefits

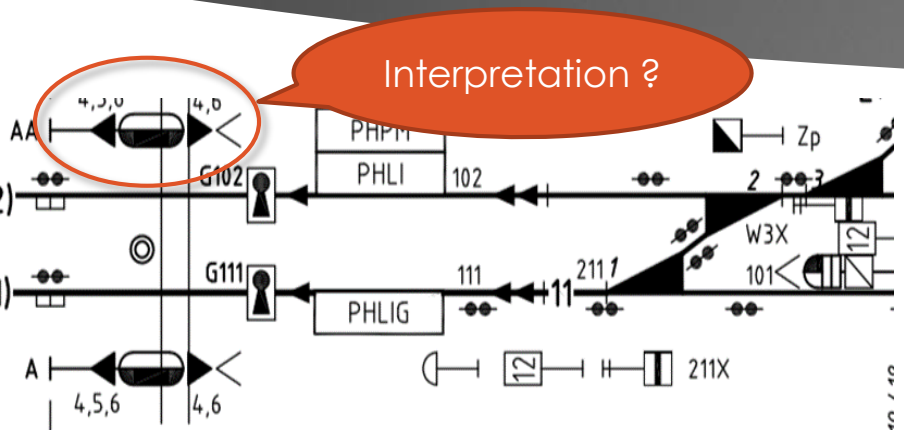
- Automate and accelerate the engineering process
- Cut waste
- No paper nor human intervention

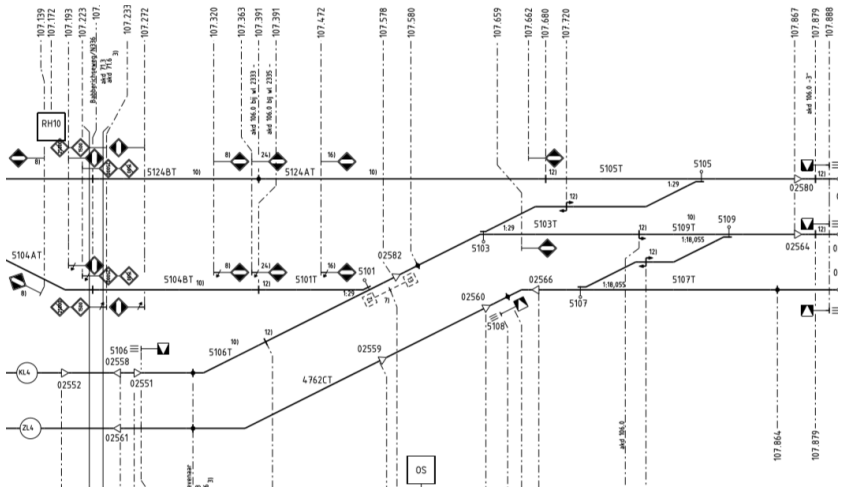
Other use cases

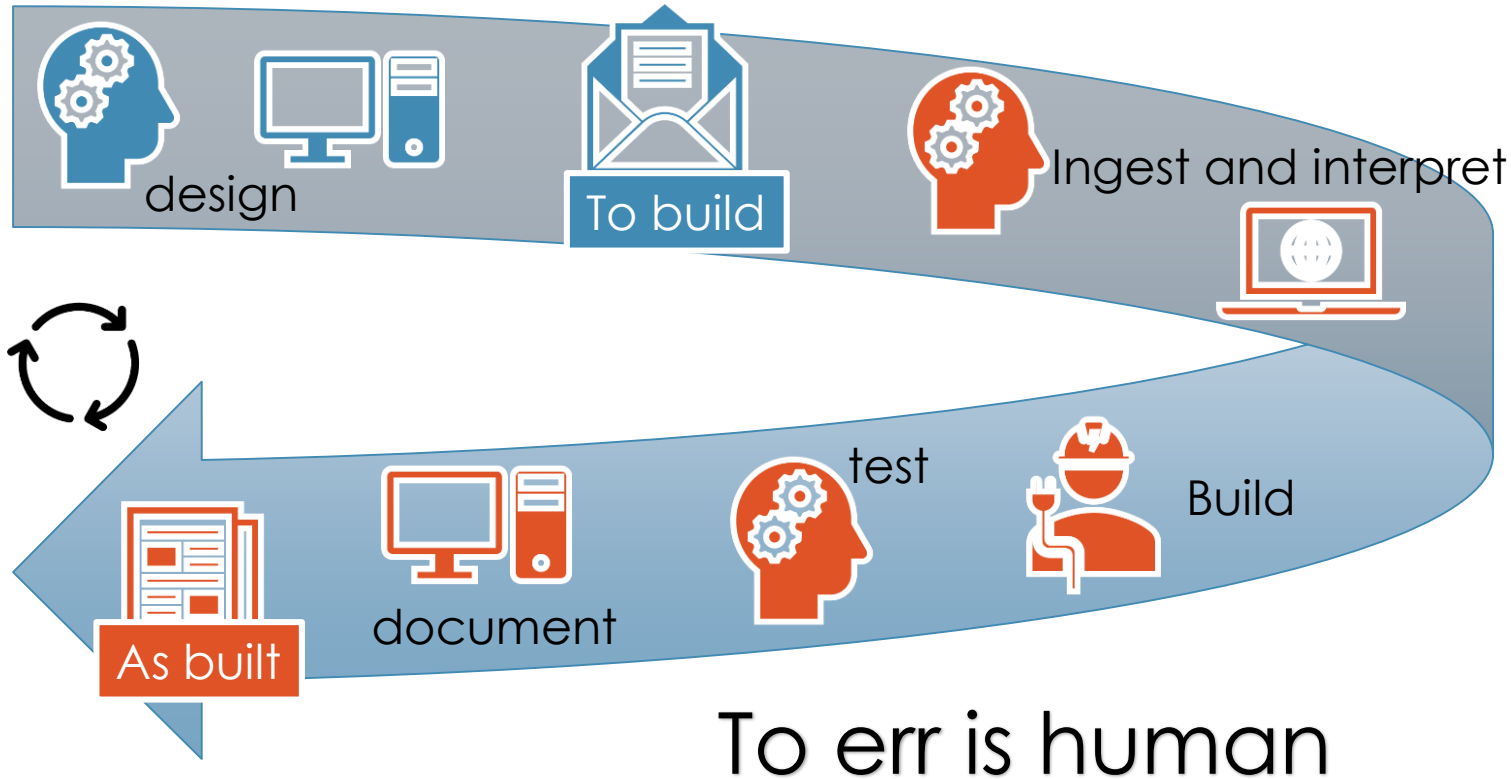
- Simulation
- Formal testing
- ATO
- Diagnostic data exchange
- Datasets are mostly a subset of the data prep use case

EULYNX

Today's process – spot the weak link





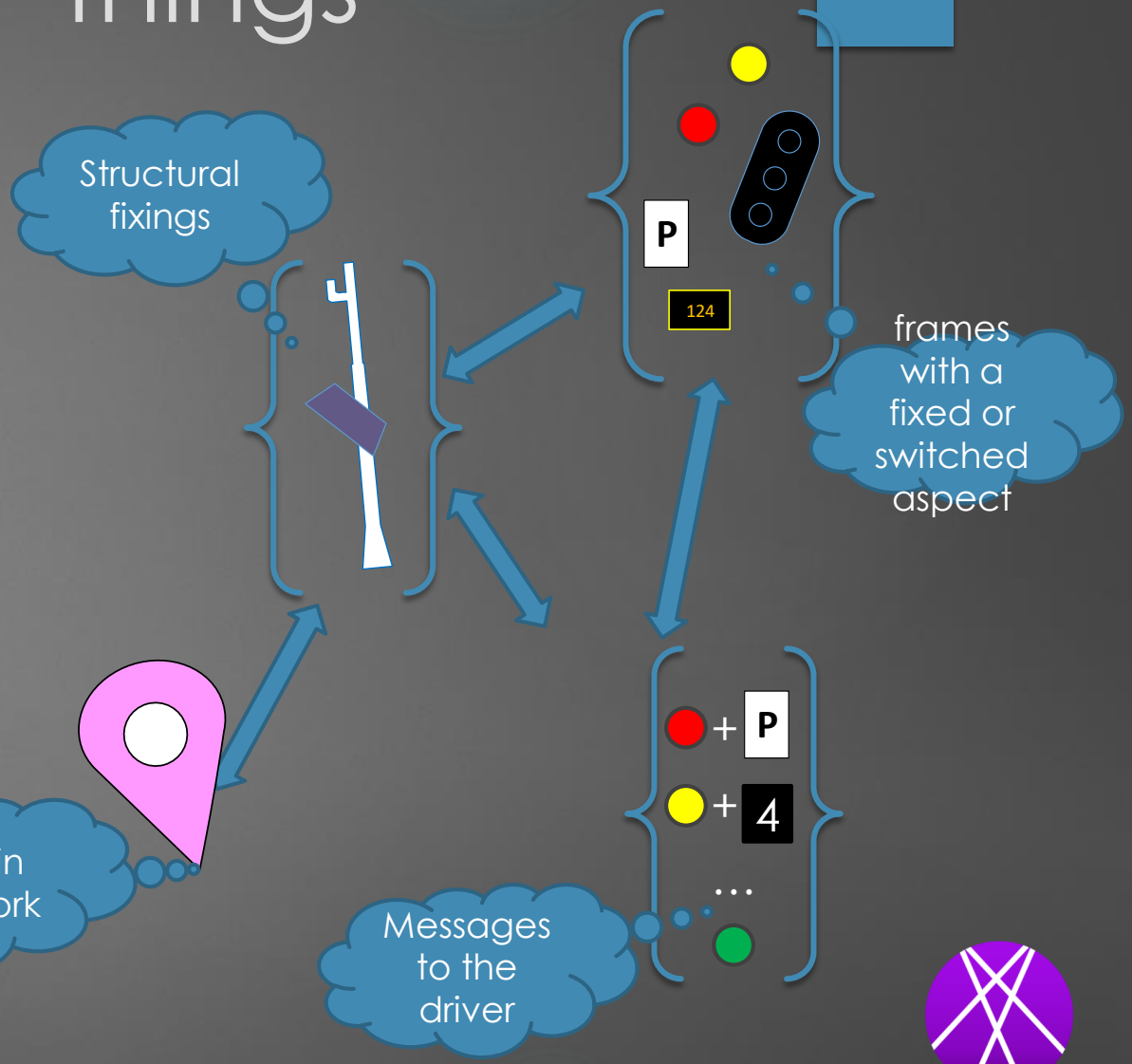


To err is human

How Data Prep views “things”

- A lamp on a stick
- Tells me to stop or proceed
- A thing that must stay clear of the track
- A set of components we must assemble, wire and erect at a given spot

- Driver
- Maintenance personnel
- Supplier
- Gauge engineer

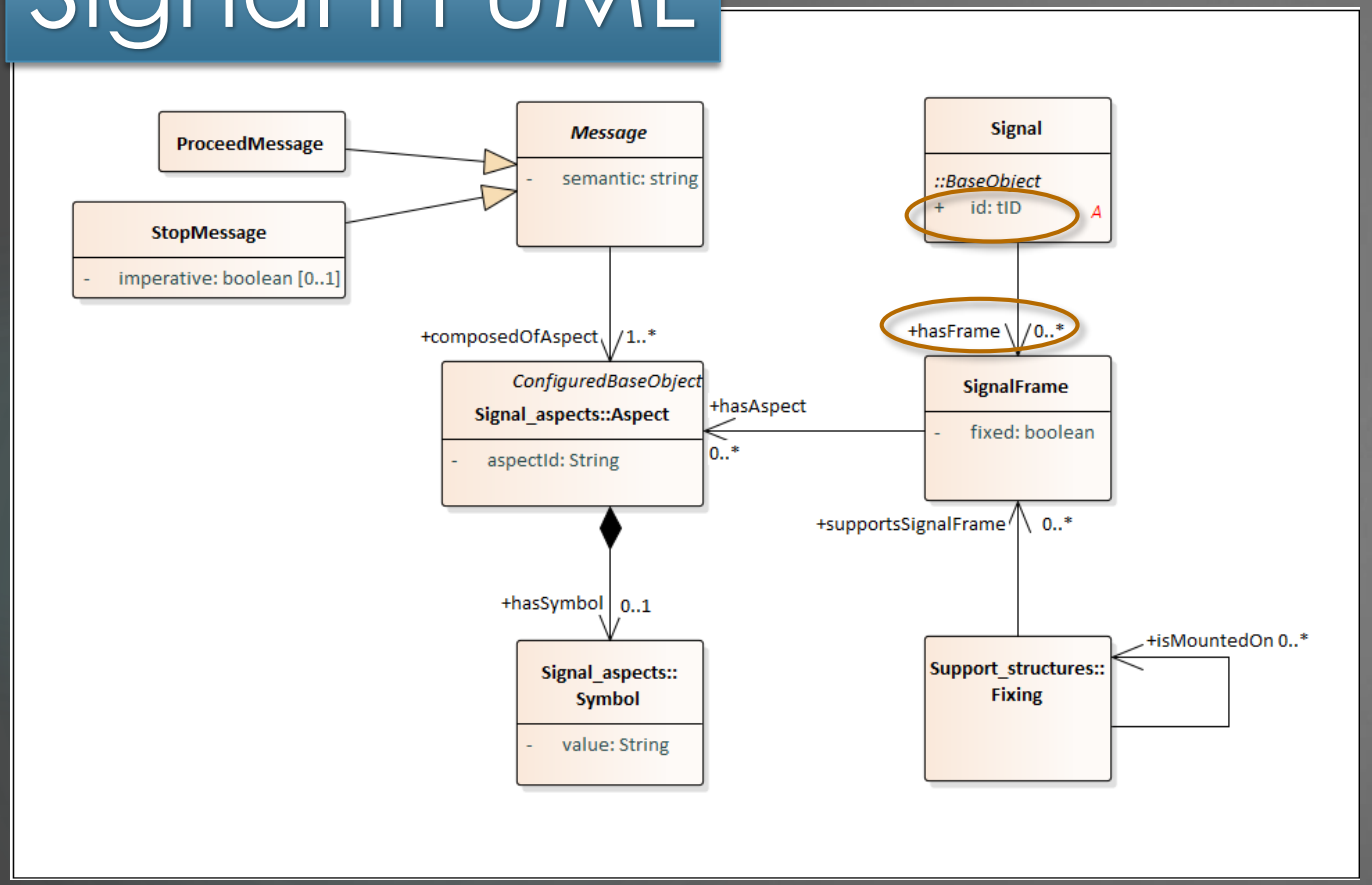


Note: EULYNX data prep describes much more than signals !
E.g. sections, routes and ETCS profiles

EULYNX

How Data prep describes things

Signal in UML



XML

```
<Abstand>
  <Wert>12631.594</Wert>
</Abstand>
<ID_TOP_Kante>
  <Wert>CE82E05A-D3F5-
</ID_TOP_Kante>
<Seitlicher_Abste
  <Wert>2.000</Wert
</Seitlicher_Abste
</Punkt_Objekt_TOP_Kan
<Bahnsteig_Zugang_Allg>
  <Bahnsteig_Zugang_Art>
    <Wert>Aufzug</Wert>
```

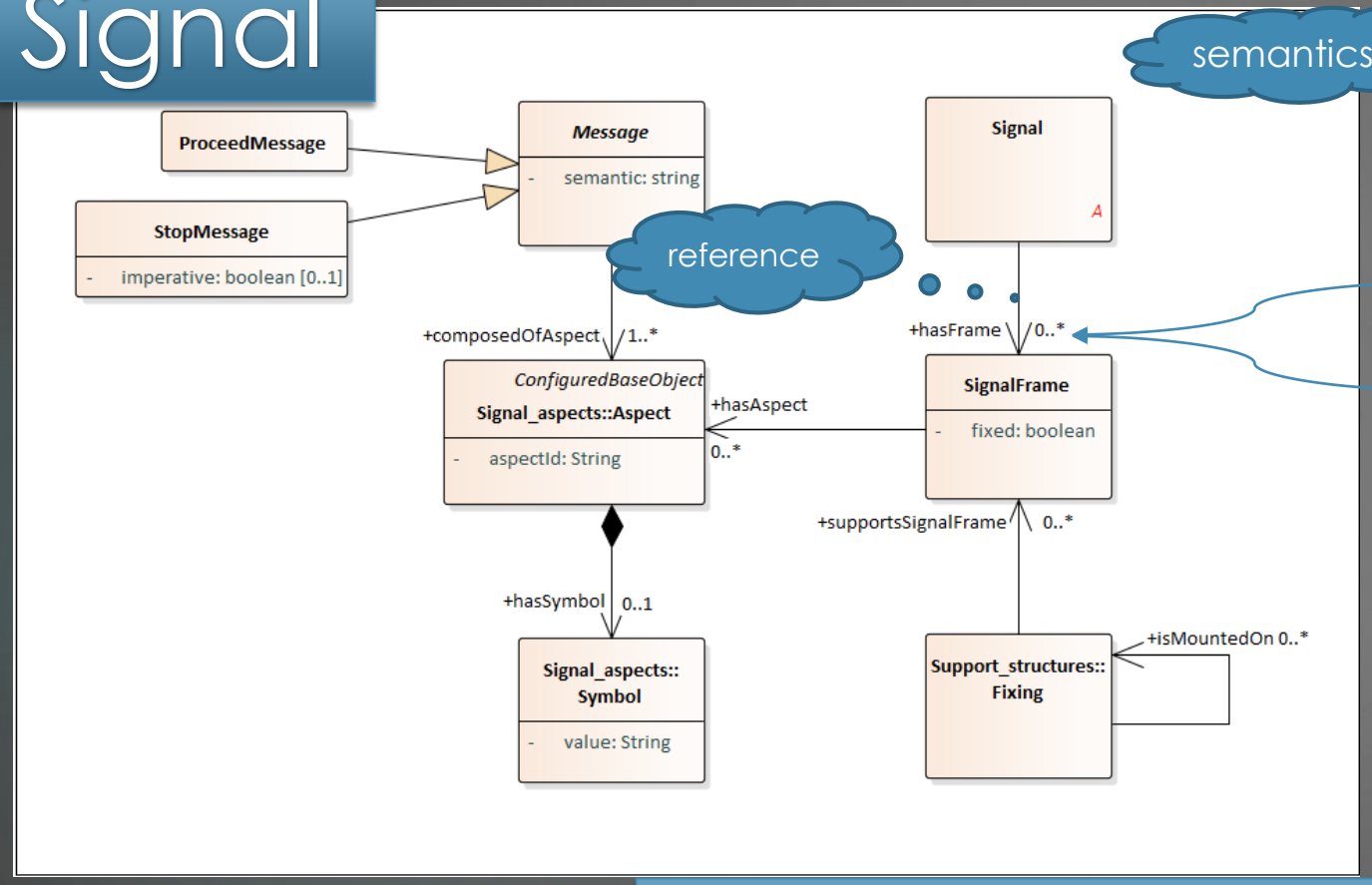
YAML

```
SignalType: lampsOnSticks
    appliesToSignal: *78f3dc90-1a49-486e-94bf-60e08d00ce38

Signal: sein124
    id: &78f3dc90-1a49-486e-94bf-60e08d00ce38
    - hasFrame:   *e3c69ffb-b981-4665-a591-492c7aa060a6  # nameplate124
    - hasFrame:   *0ec249ae-b171-44a7-b8f9-8c8ef7644ed9  # P-bord
    - hasFrame:   *8452289a-2c23-4285-9e59-2ff81cb8bb5d  # main lamp housing

Fixing: concreteBlocl124 #
    id: &201aff99-89a6-49bf-a545-5e10ae83d5bc
    isOfFixingType: foundation

Fixing: mast124
    id: &b041154b-54b2-4d35-b3c1-5bd07edafa84
    isOfFixingType: post
    hasReferenceDrawing: c28dc2a5-5ed0-4714-80af-ac
    isLocatedAt: 4bbc65ab-ff9c-4913-af23-094cfa1aeff7
    isMountedOn: 201aff99-89a6-49bf-a545-5e10ae83d5bc # concreteBlo
    - supports: *e3c69ffb-b981-4665-a591-492c7aa060a6 # nameplate124
    - supports: *0ec249ae-b171-44a7-b8f9-8c8ef7644ed9 # P-bord
    - supports: *8452289a-2c23-4285-9e59-2ff81cb8bb5d # main lamp housing

SignalFrame: nameplate124
    id: &e3c69ffb-b981-4665-a591-492c7aa060a6
    isOfFrameType: sign

SignalFrame: P-bord
    id: &0ec249ae-b171-44a7-b8f9-8c8ef7644ed9
    isOfFrameType: sign

SignalFrame: lampframe124
```

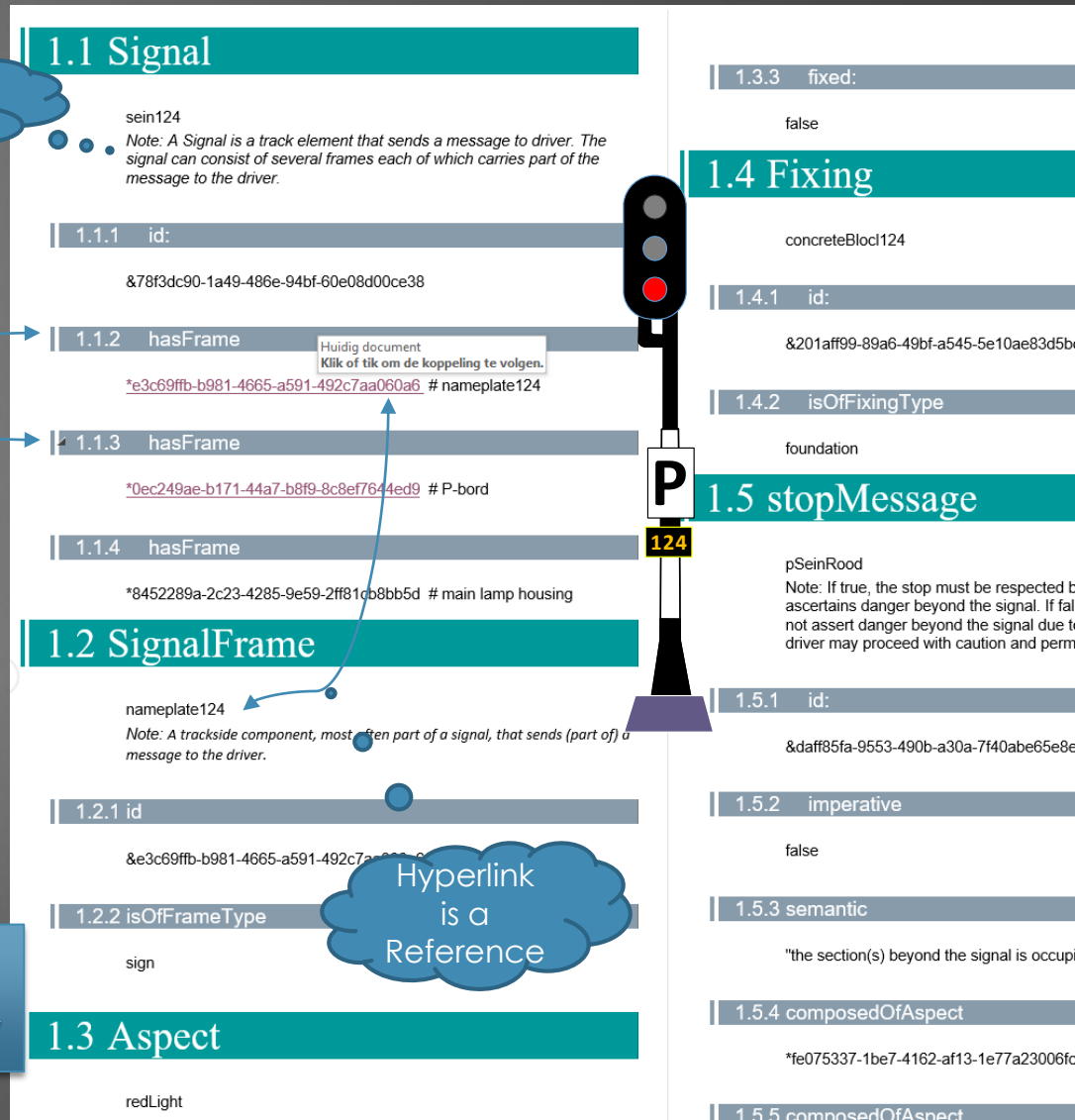
EULYNX

How Data prep describes things

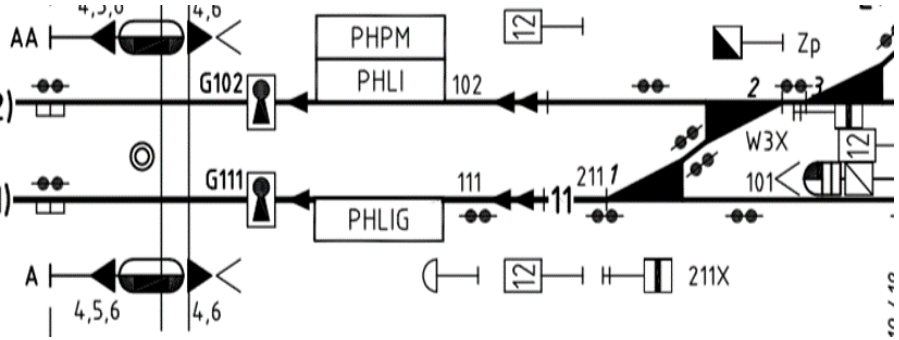
Signal

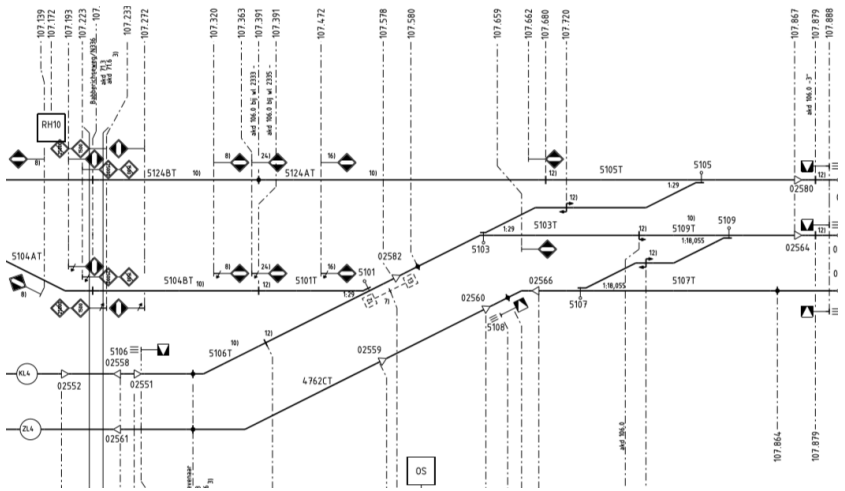


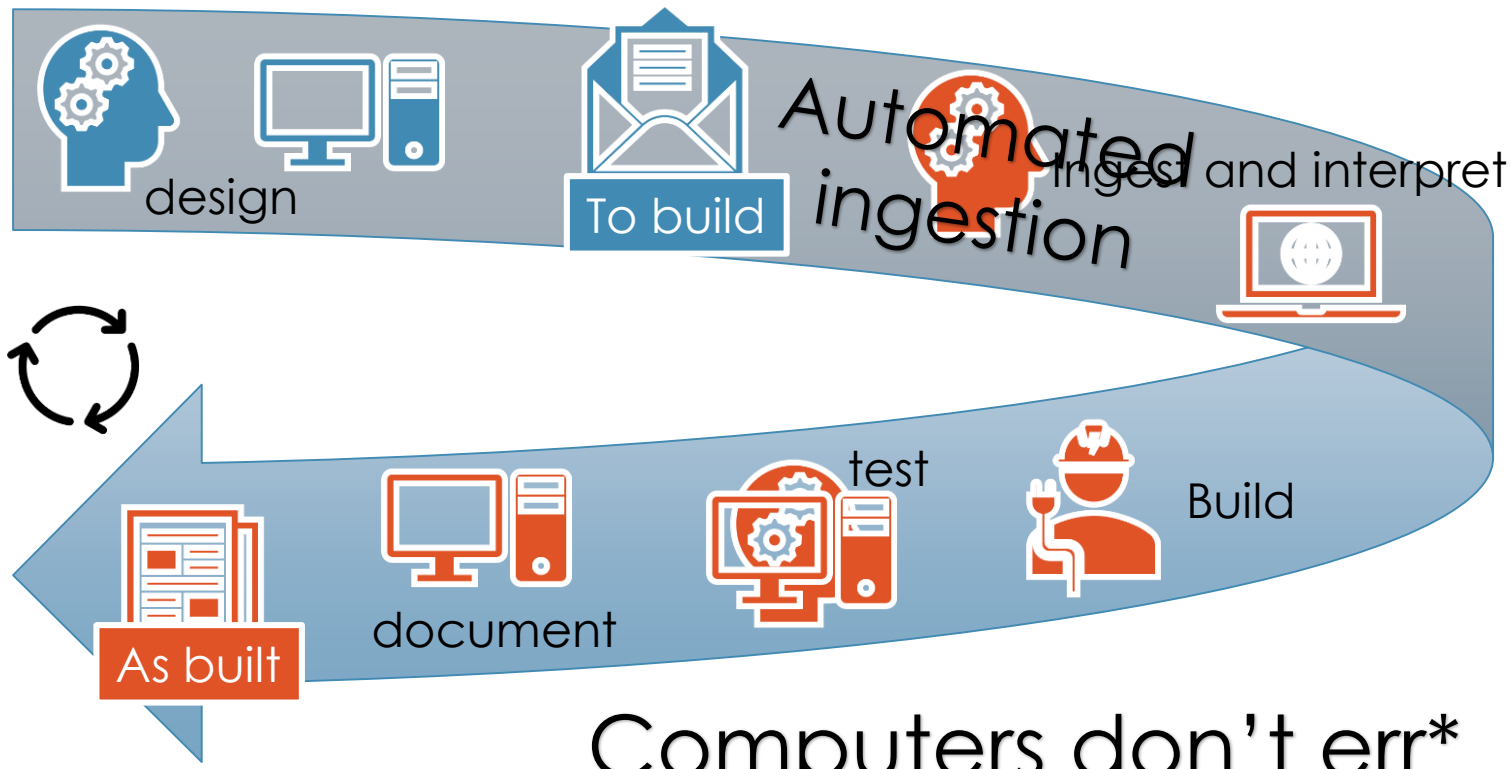
MS Word representation:
for human consumption only



Tomorrow's process







Computers don't err*

*Well, much less than we do.

Conclusion: the benefits

Robust production process

Automate tedious tasks

- From manual data picking to automated data ingestion
- From manual testing to auto-generated test scripts
- From hand-counting to auto-generated Bill-of-Quantity lowers supplier's costs

Liberate engineering capacity

- Let engineering experts focus on the interesting bits

Shorter production process

- Exchange information instead of paper
- From silos and waterfalls to agile engineering

Master complexity

- ETCS is all about IT and network configuration
- The semantics are included in the data – less wiggle space

EULYNX

Other use cases

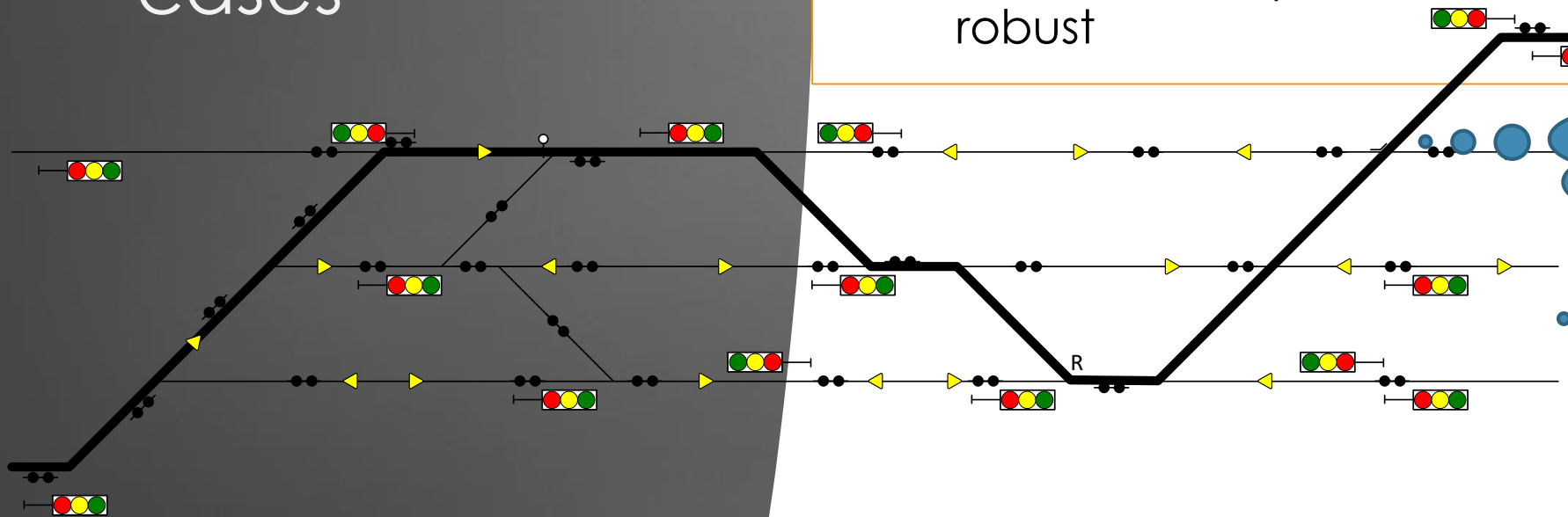
Market for third party software

Simulation

- Correct models need correct data
- Capacity modelling
- Traffic and conflict resolution modelling
- Testing impact of alternative designs in the lab

Algorithms exploit information

- All objects are networked (RailTopoModel.
- How do failures in this network propagate.
- Tackle weak spots to make the network more robust



which routes are knocked out when this point can't be used ?

which field elements have most effect on capacity ?