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Introduction

1. Problem

2. Functional requirements

3. Non-functional requirements

4. Application interface

5. Next step

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Driving is unsafe due to human factors

Root causes:

1. Distraction
2. Fatigue
3. Influence of alcohol/drug
4. Strong emotions
5. Fever

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A global problem

20%

caused by fatigue

70%

involved observable distraction

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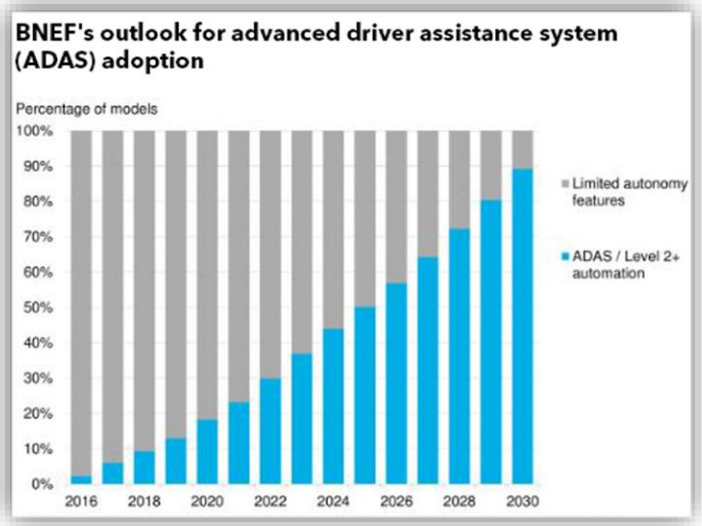
A customer problem

Increasing demand for Advanced Driver Assistance Systems

EU regulation mandates every newly sold car to be fitted with a Driver Monitoring System

74% of all fatal passenger vehicle cases involve a large truck



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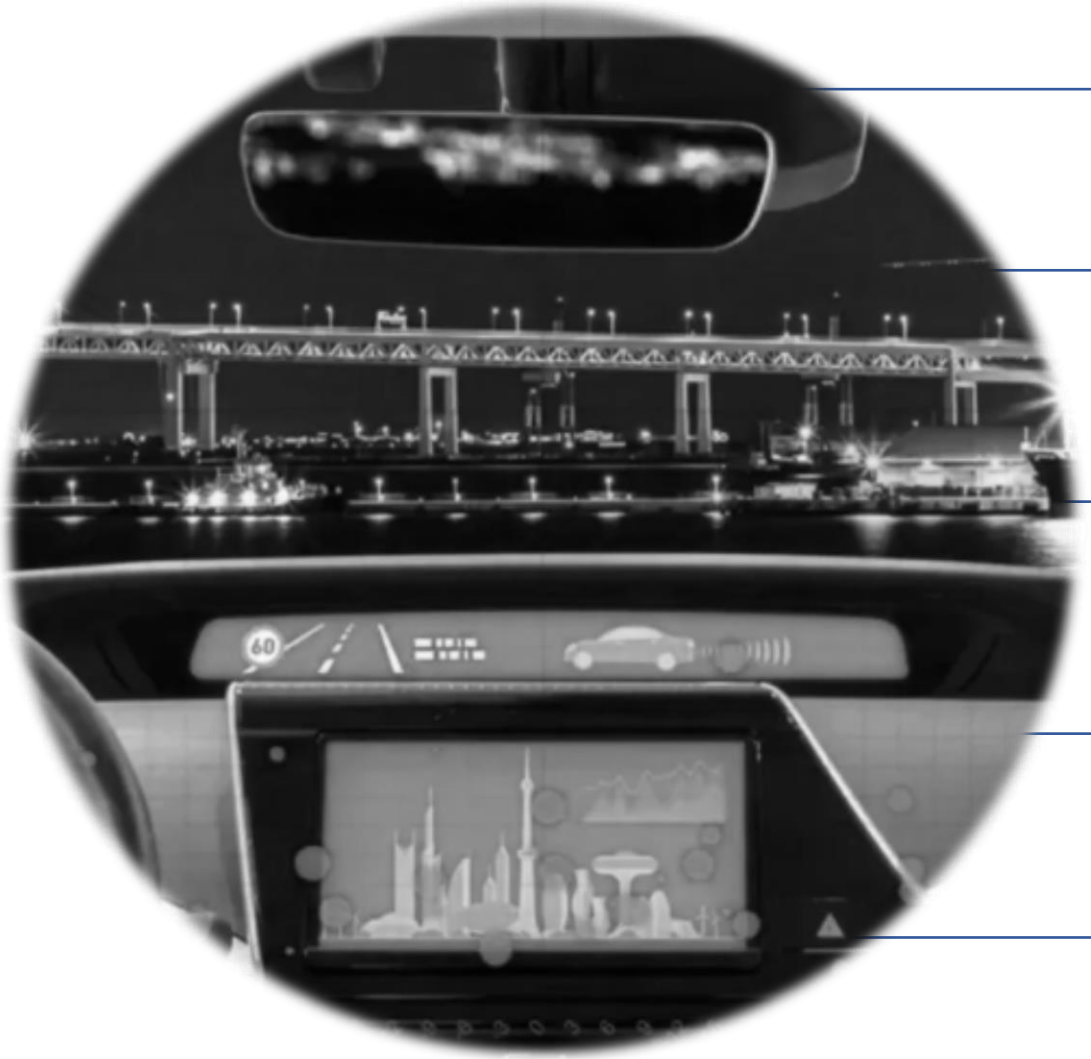


FACE RECOGNITION
real-time, 99,33% accuracy, uses Machine Learning algorithms

MONITOR DRIVER FATIGUE
eye-focused analysis, head and upper body inclination

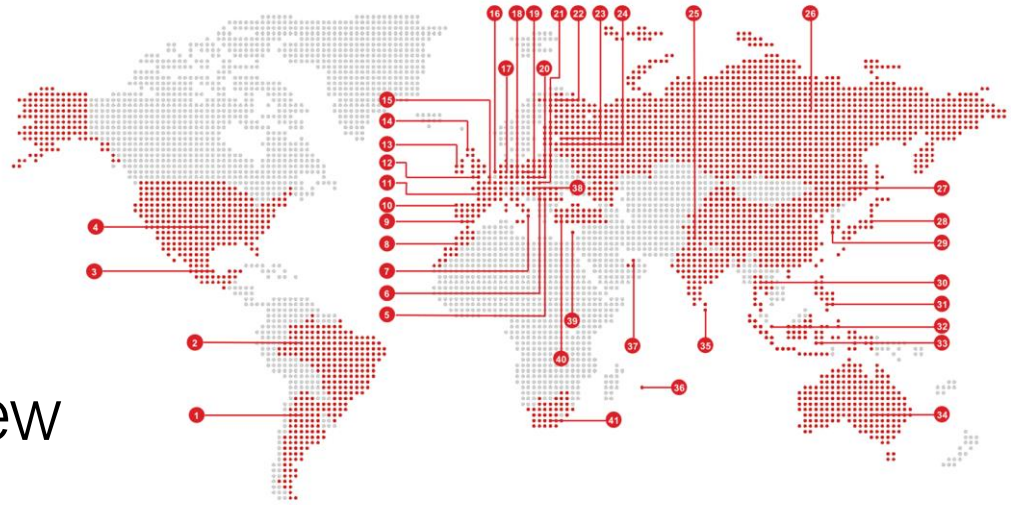
DRIVER ALERTNESS TRACKING
hands on wheel: measures the ratio of single-handed driving; eyes on the road: constantly tracks driver's focus areas

IRRESPONSIBLE DRIVER BEHAVIOR DETECTION
safety belt, mobile usage, eating/drinking

REMOTE MONITORING PLATFORM FOR OPERATORS
trend analysis, real-time operator warning, customized analysis report

The Motherson Group

- One of the world's largest manufacturers of components for the automotive industry
- A global network of 300 manufacturing facilities, engineering, logistic and design centres in 41 countries
- SMR Automotive is one of Hungary's leading employers and its premier rear-view mirror manufacturer



01 Wiring Harness

- Electrical distribution systems (EDS)
- Power modules
- Electrical cabinets and power packs
- Components for vertical integration

02 Vision Systems

- Exterior mirrors
- Interior mirrors
- Camera monitoring systems
- Components for vertical integration

03 Modules & Polymer Products

- Fully-assembled interior and exterior modules
- Decorative parts and small assemblies
- Tooling

04 Elastomers

- Rubber injection moulded parts
- Rubber to metal bonded parts
- Extrusions – Reinforced Hoses, profiles beading with metal carrier, etc.

05 Lighting & Electronics

- Lighting systems
- Shock absorbers & air intake manifold
- Paint coating solutions & air compressors
- Clutch for car AC compressors & body control modules

06 Precision Metals & Modules

- Precision machining and cutting tools
- Sheet metal parts
- Process equipment
- HVAC for off-highway vehicles, commercial vehicles, buses and driver cabin modules

07 Technology & Industrial Solutions

- Information Technology and software
- Telematics
- Cyber security
- Cloud services

08 Logistics Solutions

- Logistics solutions for finished vehicles and components
- Integrated packaging solutions

09 Aerospace

- Soft/hard metal machining
- Surface treatment
- Interior polymer parts

10 Health & Medical

- Re-Timer
- Blood Analyser
- In-Vitro medical devices
- IT solutions for healthcare

11 Services

- Industrial park
- Automotive engineering services

Functional requirements

DMS Validation Procedures and Requirements: Drowsiness

- Establish requirements of a reference dataset.
- Define objective, science-backed method to create reference dataset.
- Include eye openness, blink rate, and yawning frequency in validation procedures.
- Establish thresholds for drowsiness warnings.

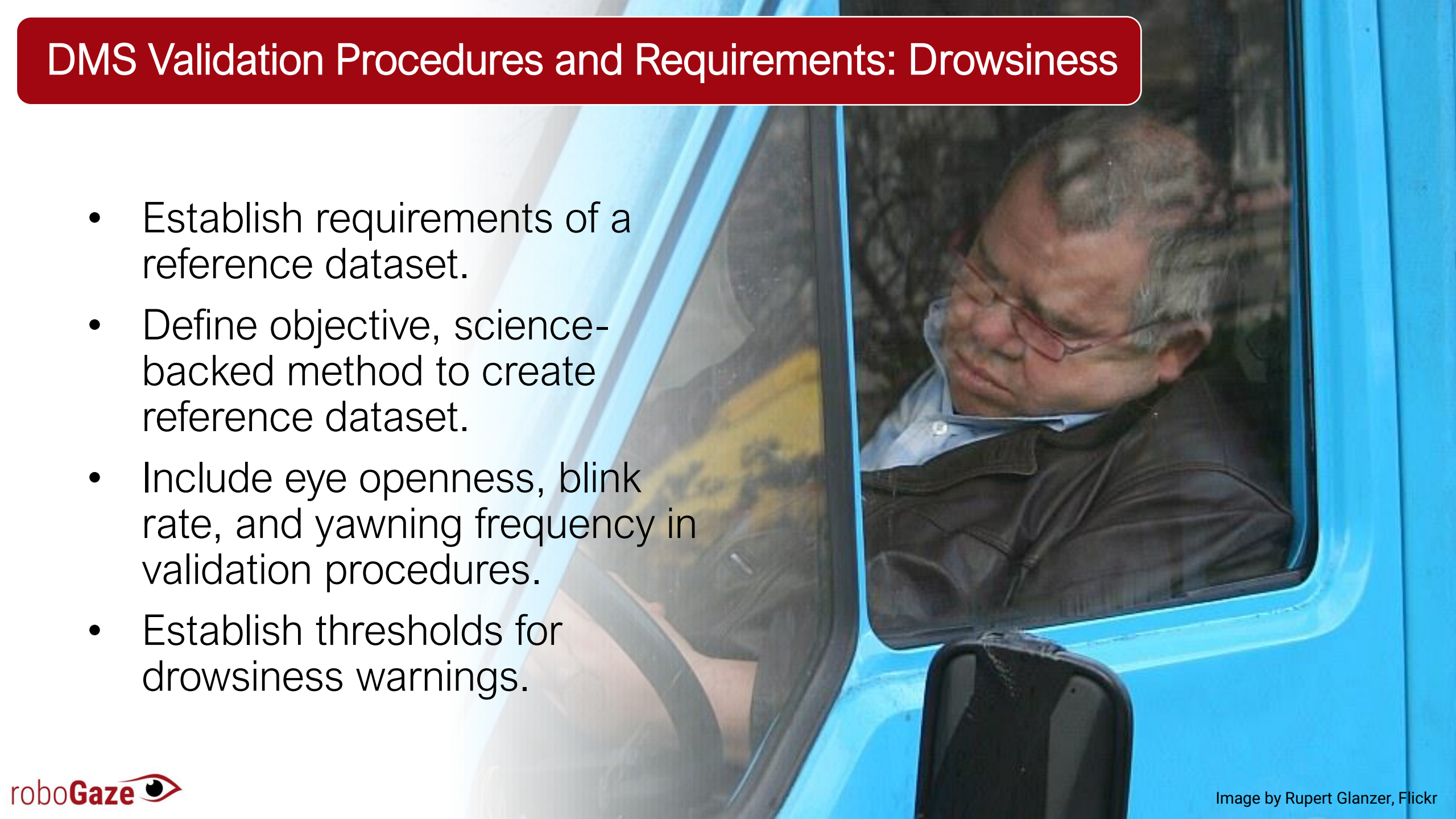


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Image by Rupert Glanzer, Flickr

DMS Validation Procedures and Requirements: Distraction

- Establish requirements of a reference dataset.
- Include eye movement tracking in validation procedures.
- Consider applying Euro NCAP testing procedures.
- Establish thresholds for distraction warnings, consider Euro NCAP definitions for short and long distractions.

Demographic variability

Include diverse demographic profiles in testing protocols – sex, age, skin colour, hairstyle etc. – to ensure system accuracy across a wide range of drivers.

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Vehicle categories

Consider different vehicle categories when setting up validation criteria and procedures

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Non-functional requirements

DMS Performance

- Define performance testing methodology.
- Define key performance indicators, i.e. response time, detection accuracy, latency.
- Include maximum memory usage in performance metrics.
- Establish standardized performance categories.

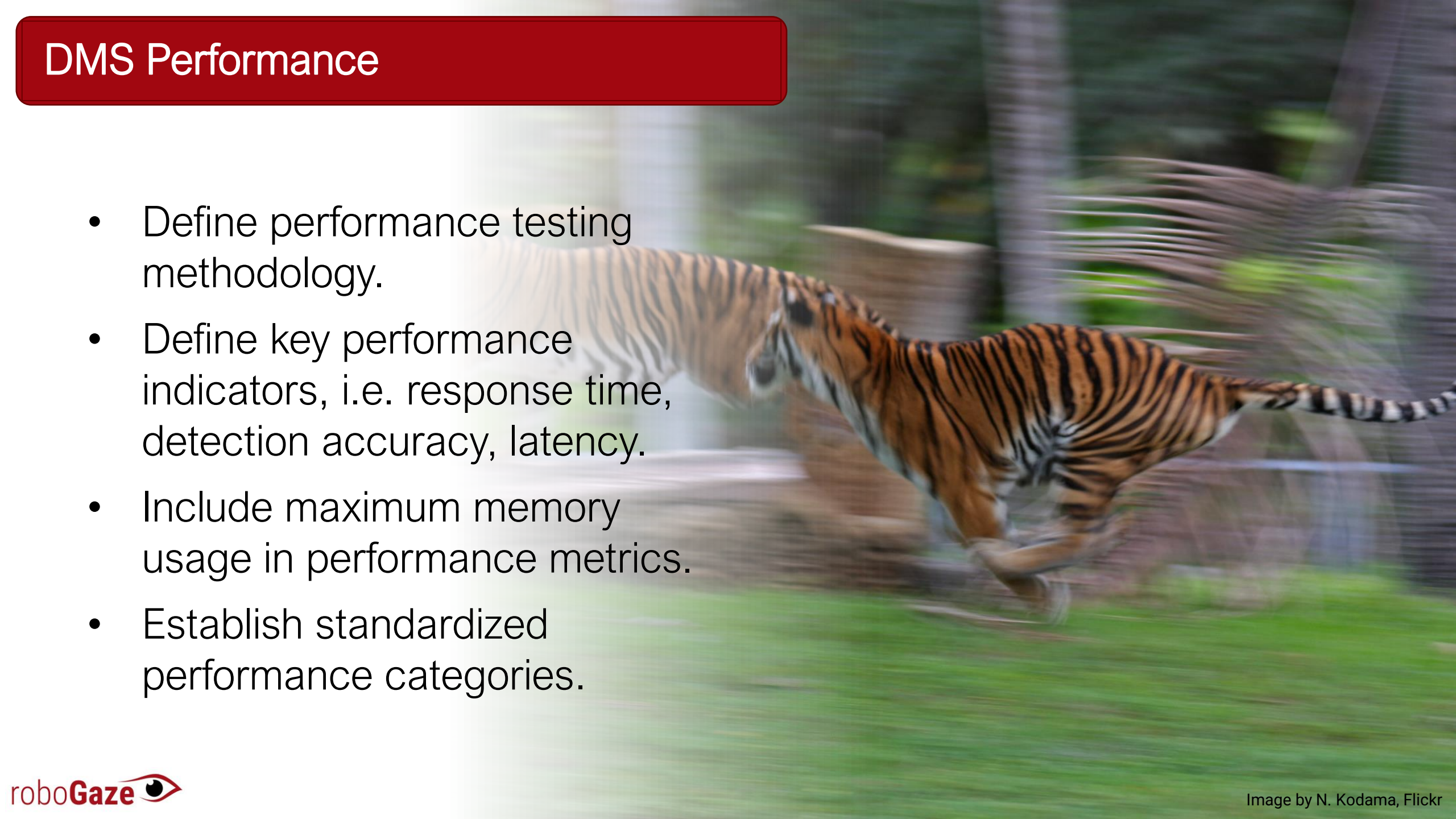

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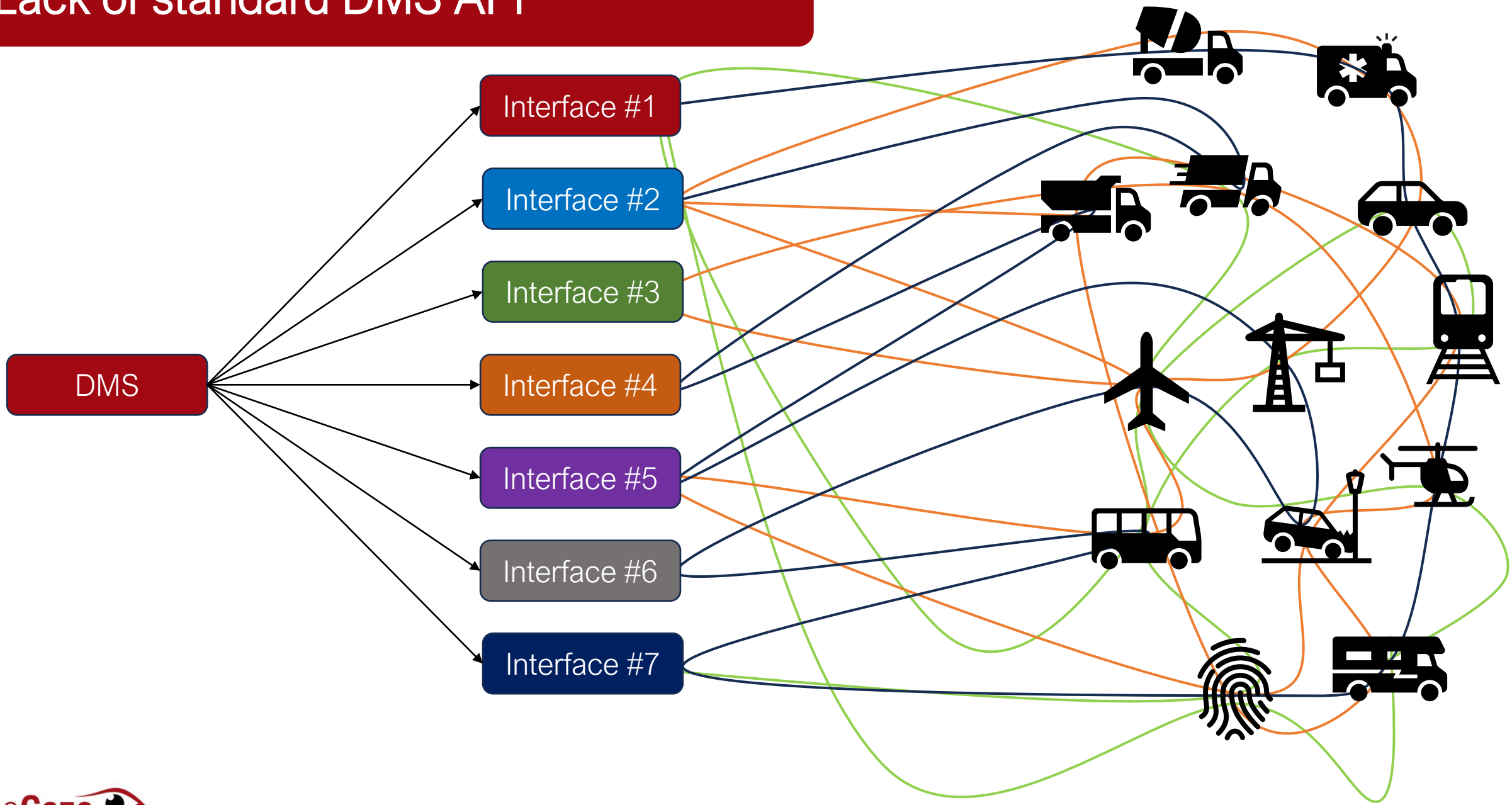
Image by N. Kodama, Flickr

Application interface

Lack of standard DMS API



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DMS API Standardization

Harmonizing communication across OEMs

Benefit for providers

Standard interfaces allow faster development, reducing development time and cost

Benefit for OEMs/Tier1s

Facilitates easier integration and maintenance of DMS applications

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Photo by Remy Lovesy on Unsplash

Next steps

Call to action

- Ideation workshop in May, 2024
- Project proposal to create a new standard for DMS applications.

Join us for the ideation workshop!

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Thank you for your attention

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