An Overview of the Hungarian Drone-Related National Initiatives

– DroneMotive and Hungarian Drone Coalition

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Drón koalíció

KTI Alapítva - Since 1938

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Introduction: Problem

Characteristics of the drone industry:

- The development of drones is **exponential.**
- Drone related services might generate **outstanding social and financial added values.**
- **Complex eco-system**: just the **marginal part is in focus** (mainly related to drones and on-board systems).
- The development of the industry is **limited due to numerous problems**: e.g. regulations, infrastructure, CNS, interoperability, security.
- The present **problems cannot be solved with the available systems,** tools and methods (due to e.g. their capacity, human involvement, price, development timeline).
- The complexity **requires an industry-level of cooperation.**
- A new approach with a **high content of innovation** is needed
- **Disruptive solutions, IT and digitalization** seems to be a must.

Introduction: Problem

Synergy and integration to related transportation systems:

- **No integrated development** related to autonomous transportation systems (while they share common problems).
- **Limited / no synergies** between the various transportation systems.
- **Unmanaged** overlapping intended **operational areas** (e.g. smart city).

Finance:

- **Non-existing supporting system** for the entire drone eco-system.
- **Ad-hoc development, no global solution.**
- **Collective-based approach is not typical.**
- **No structured, strategic approach.**
- The outstanding **potential of the industry is unexploited.**

DroneMotive: Objective and Results

Objective:

- establishment of a drone competence center to **support the R&D, certification, test, training and consulting activities**, in order to **link the autonomous ground and air transportation domains** at ZalaZone.

Result:

- Globally **unique, integrated approach** between the autonomous ground and air vehicles.
- **Technology transfer** between the various transportation systems.
- Exclusive drone **test and certification** infrastructure.
- Outstanding **supporting infrastructure** at airside and landside.
- Tailored **incubation and accelerator programmes.**
- Development of new concepts, systems and technologies with **breakthrough innovation potential.**

DroneMotive: Major Competences

Training / education

- Result: Development and service provision of ***academic and non-academic drone pilot training programmes*** (in collaboration of KTI, BME, NKE).
- Novelty: Regionally ***unique training programs*** for all general and special drone categories (e.g. infrastructure monitoring), with a DJI simulation & training center.

Certification / NOBO

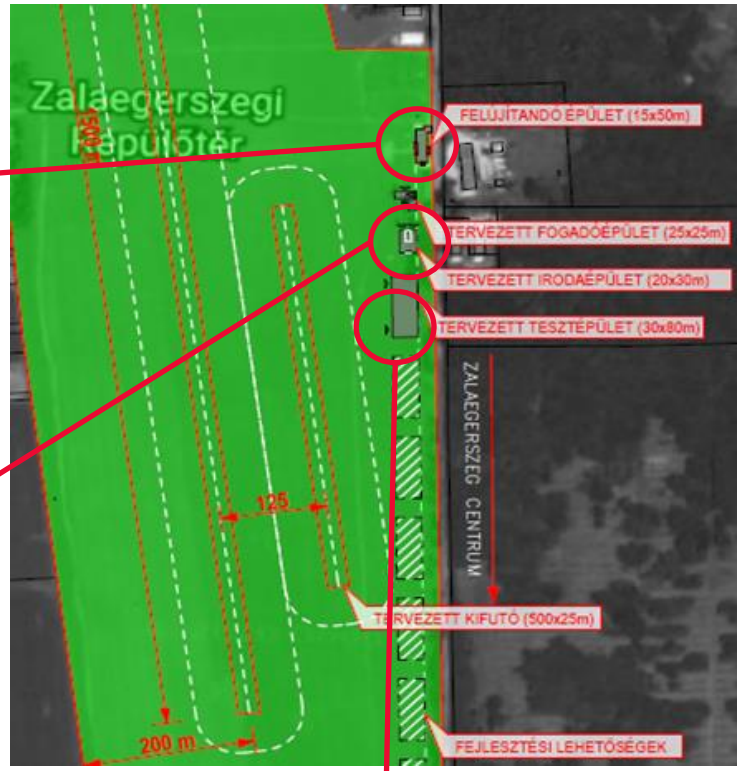
- Result: Development and service provision of the ***certification, test processes*** of the available and new drones, drone systems, subsystems.
- Novelty: Dedicated certification processes for drones, supporting systems, well beyond the EU certification requirements (that ***supports safe drone operations*** and thus ***permits to use drones*** even at operations high higher risk).

R&D

- Results: new drone related systems and subsystems, linking the autonomous ground and air transportation systems.
- Novelty: ***New drone development philosophy***, market and mission pull oriented approach.

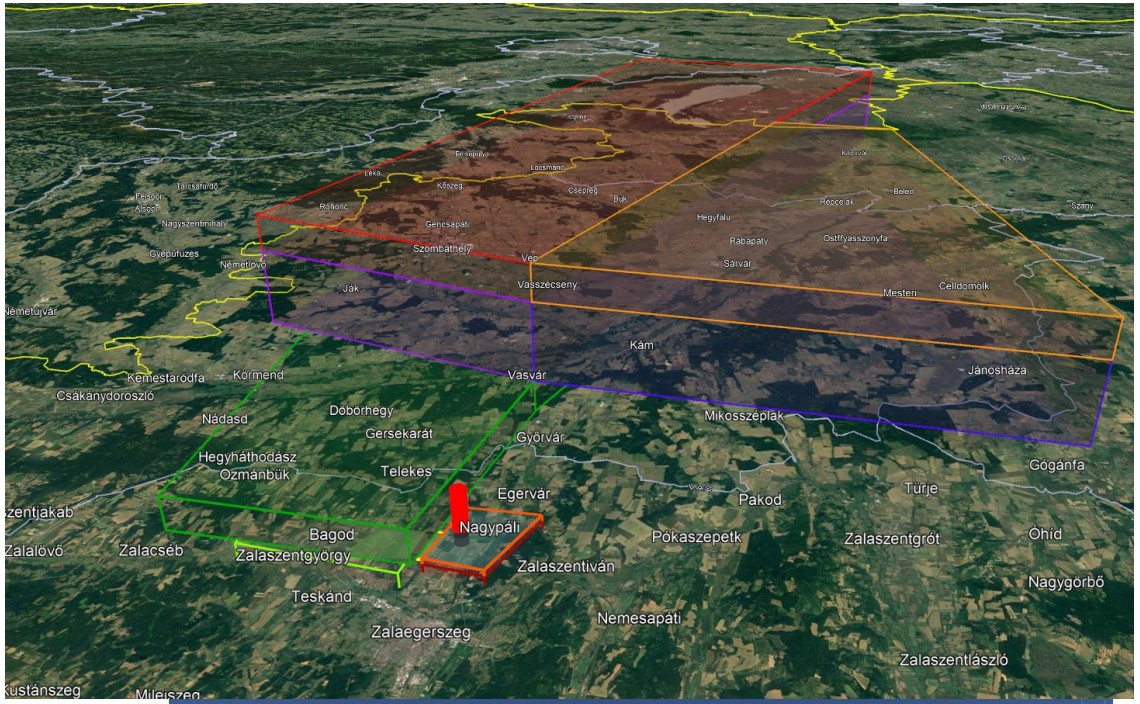
DroneMotive: Major Pillars: Airport & Hangar

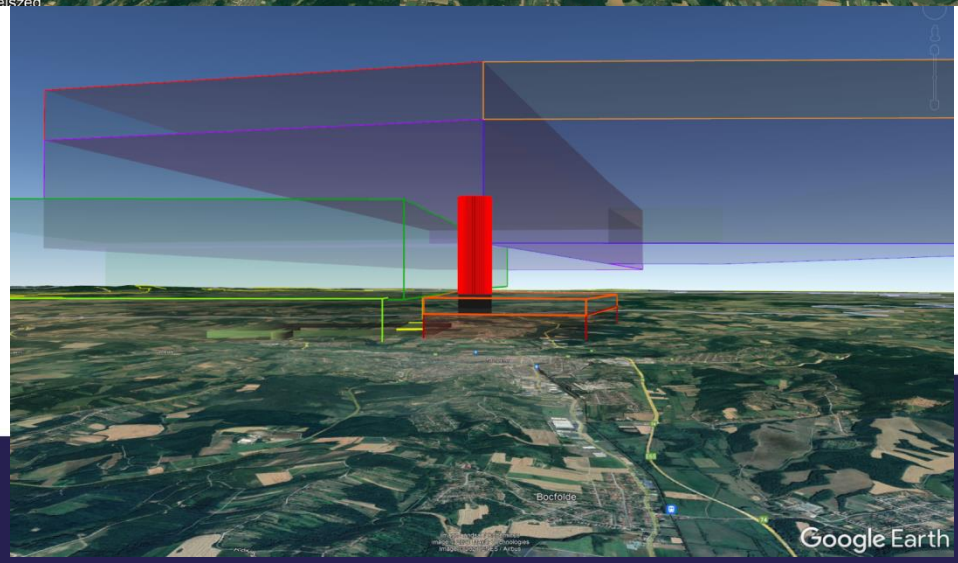
- **Objective**: dedicated drone airport and development area.
- **Site**: LHZA airport.
- **Layout**:
  - Renovated TWR and airport.
  - Host / conference site.
  - Office.
  - Incubator/accelerator program buildings.
  - Test hangar
    - For the drone test, certification, R&D and training duties
    - Dimensions: 30x80x12m,
    - Coupled with dedicated supporting systems (e.g. wind tunnel, rain simulator)



DroneMotive: Major Pillars: Airspace

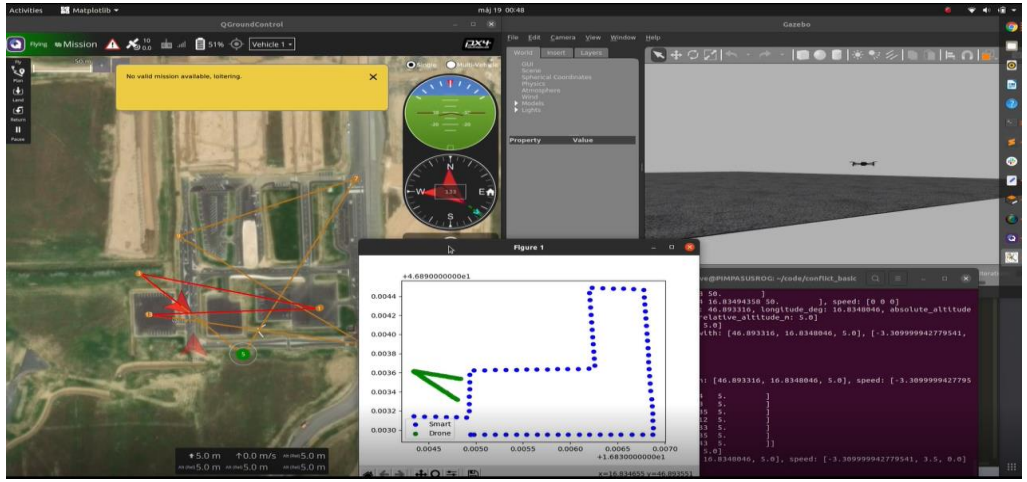
- **Objective**: dedicated drone airspace (DTA).
- **Site**: LHZA airport.
- **Layout**:
  - Complex airspace structure with 11 airspace elements.
  - Airspace supporting ZalaZONE tests.
  - Airspace above the airport for training, test.
  - Low, medium and high altitude airspace.
  - Airspace for MET measurements.
- **Status**: under legal coordination.





DroneMotive: results – basic and applied research

- **Centralized conflict management system for autonomous air and ground vehicles** (National Autonomous System Lab):
  - CONOPS definition related to a centralized conflict MGT system.
  - Experimental development of the central system.
  - Experimental development of the required communication systems.
  - Assessment of the potential conflict management techniques.
  - Development of a preliminary tactical conflict management algorythm.



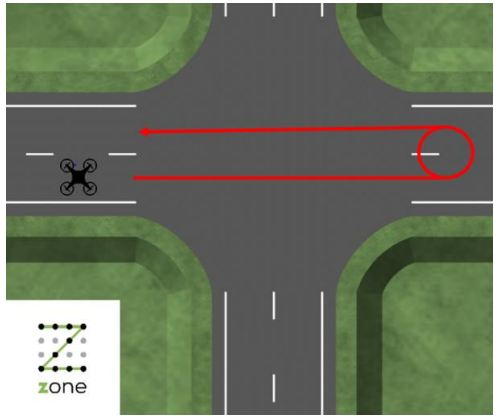
Central interface

Live demo

DroneMotive: results – experimental research

- **Assessment of autonomous air vehicles solutions** (GINOP-2.3.4-15-2020-00009):
  - CONOPS definition of novel services provided by drones.
  - CONOPS assessment.
  - Definition of potential use-cases.
  - Experimental development of the most promising use case (monitoring).

Delivering



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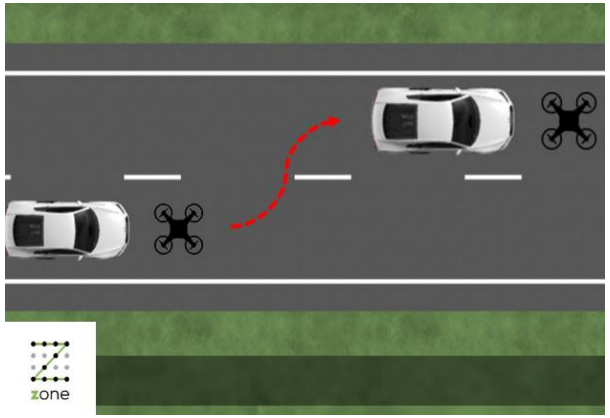
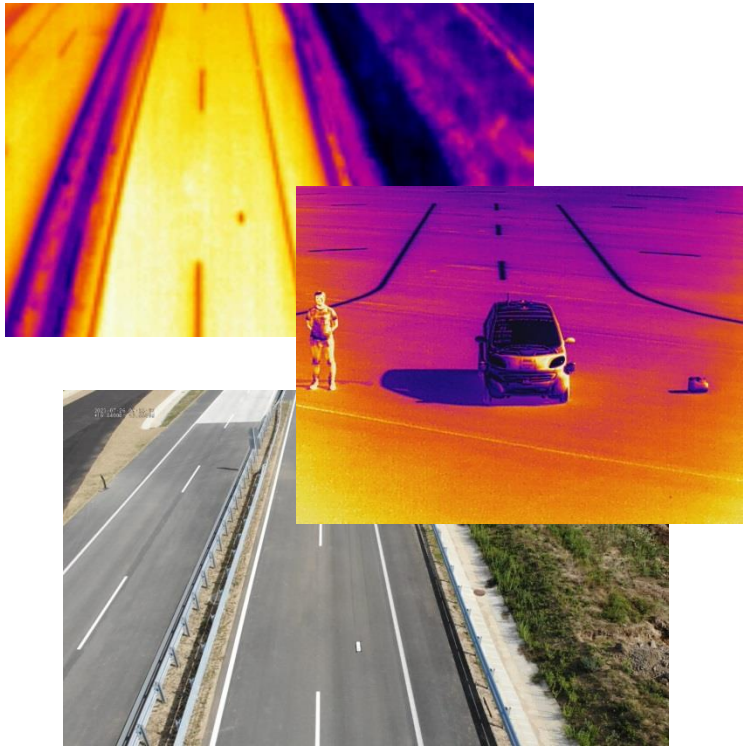


Supporting

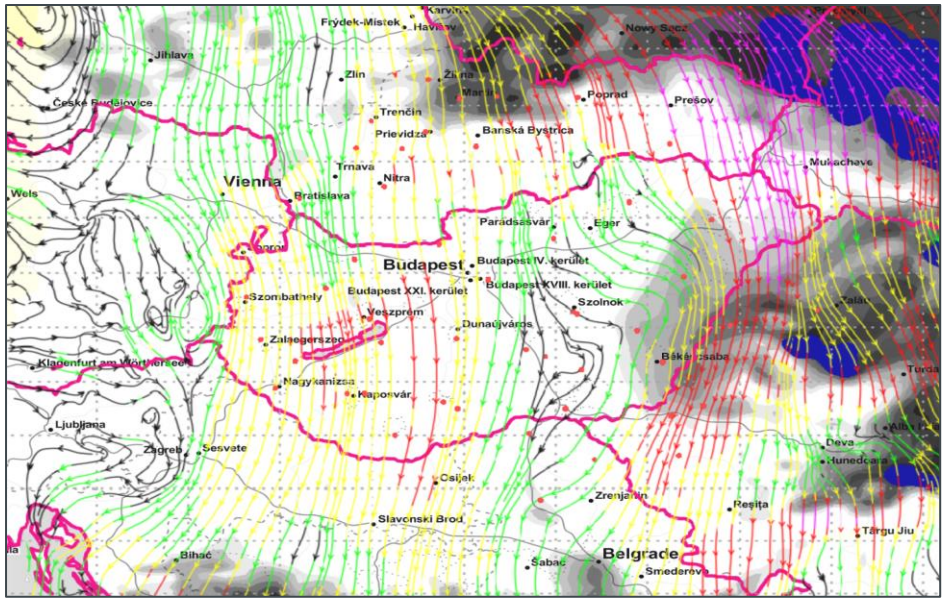


Monitoring

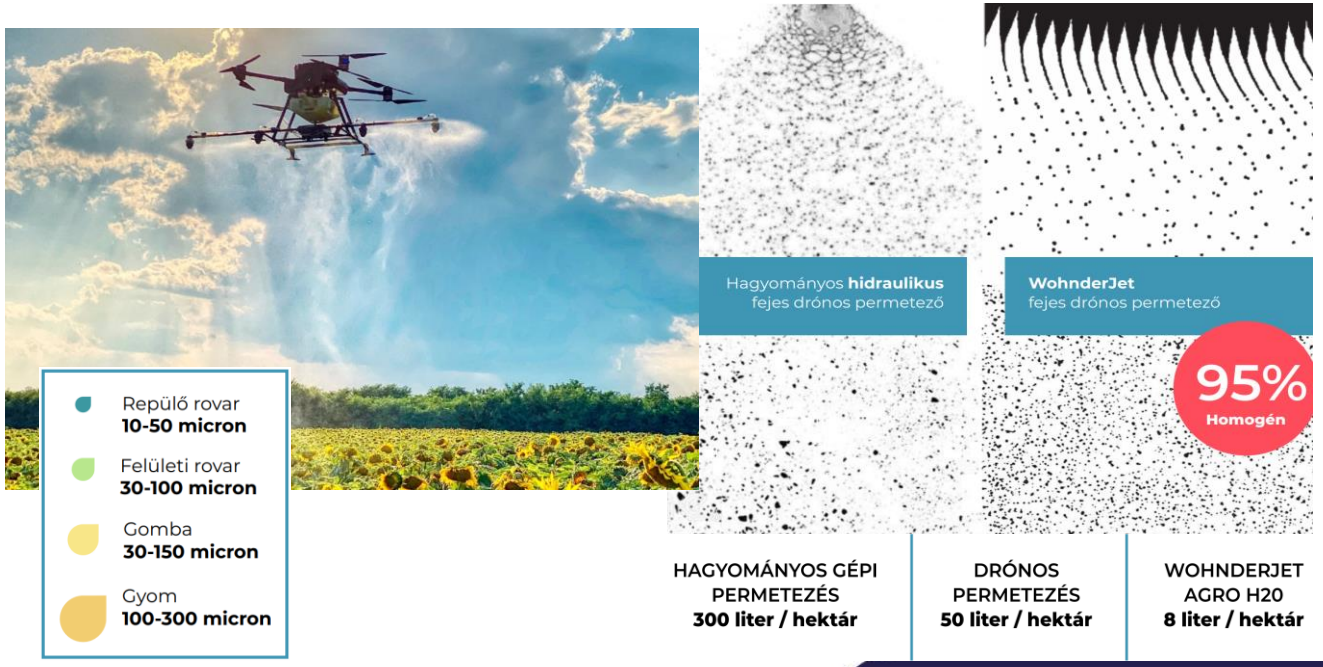
DroneMotive: results – service development

- **My Drone MET** (2021-2024, KTI Innovative Mobility Program)
  - Drone-based weather data provision, service development.
  - Provision of precise MET data and forecast for the drone and related other industries.

„MyDroneMet"



- **WonderJET** (MouldTech)
  - Special vaporizer for agricultural application.
  - Hungarian patented solution.
  - Special controlled vaporizer technique.
  - Size of the vapor: 5-100 microns.
  - Radically cuts and amount of water and chemical materials.



Hungarian Drone Coalition (HDC)

Objectives:

- Contribute to the development of a **supporting legal framework.**
- Catalyze the preparation of a **dedicated strategy for the entire eco-system.**
- **Support the domestic enterprises and industrial players,** in order to achieve a measurable **increase in the competitiveness** at the national economy level.

Results:

- **Hungarian Drone Coalition:**
  - established on the 4th of May, 2021 by ITM, BME, SZE, KTI, DJP, HungaroControl.
  - Collaboration agreement and **platform**
- Supports the development of adequate **legal framework** (related to the drone ecosystem), and a dedicated **Hungarian Drone Strategy.**
  - Coupled with a structured **action plan** to further support the drone industry.
- Boost competiveness and **internationally outstanding eco-system.**

HDC: workgroup structure

Defense
/Attila Németh/
internal security and defense aspects

UAV and supporting systems
/Norbert Perness/
design, manufacturing, standardization processes

Education and awareness
/Dr. Mátyás Palik/
drone pilot training, awareness raising, social awareness formation

Sport and recreation
/Péter Bársony/
drone sports, recreational drones

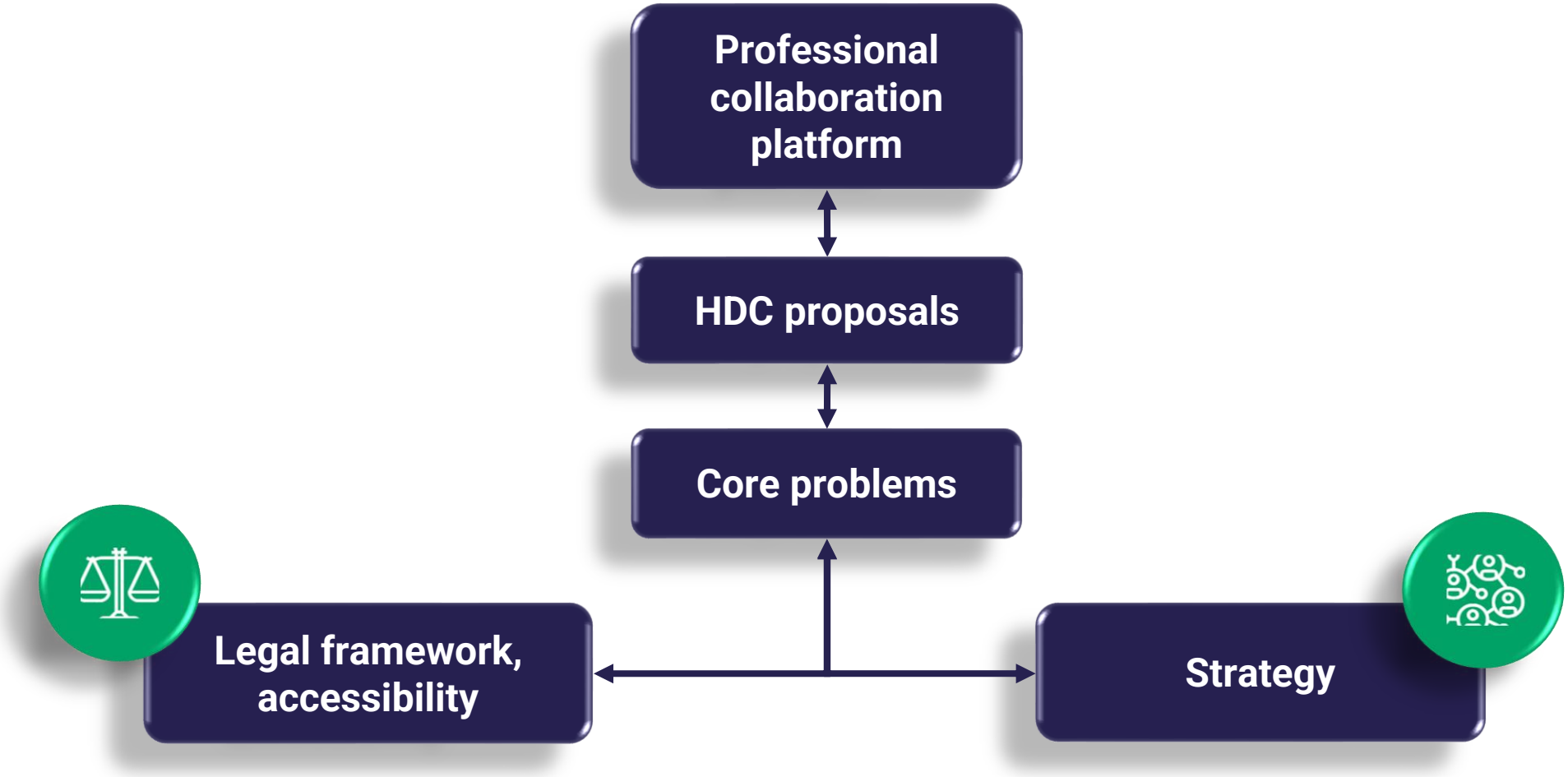
Test environments
/Norbert Kovács/
testing, certification methods, environments

Regulation
/dr. Balázs Szauer/
strategy-bound supporter regulatory framework

Drone strategy
/Szilárd Gombos/
Hungarian drone strategy support

UTM/U-SPACE
/Gábor Hetei/
UTM / U-SPACE ecosystem

HDC: collaboration based process



HDC: timeline

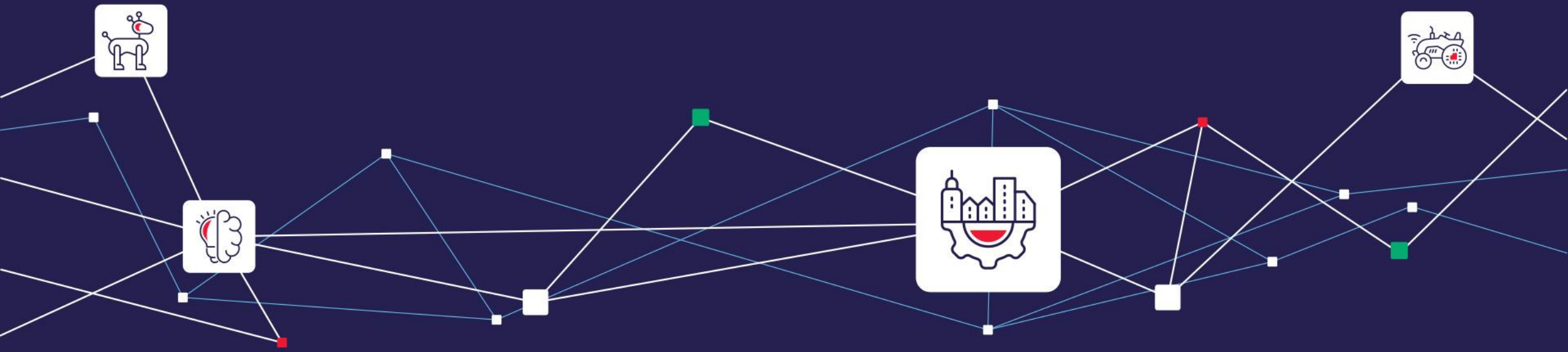
2021 Q2	2021 Q3	2021 Q4	2022
• Establishment (4th of May, 2021). • Joining of founding members. • Definition of the core organization structure & processes.	• Election of the Presidency, and WG leaders. • Organisation of the I. Plenary Session & Presidency Meeting • WG kick-off meetings.	• Organisation of the II Presidency meeting. • Legal problem mapping. • Conceptual document of the strategy. • Final strategy proposal, with action plan and regulation proposals.	• Acceptance of the strategy and regulatory framework. • Strategy implementation.

Synergies: with other related national initiatives

- **ZalaZONE**
  - Assessment of the **synergies** between the autonomous cars and drones.
  - Joint R&D activities (e.g. conflict detection).
  - Globally **unique approach** linking the two domains with similar core problems (e.g. CNS).
- **Hungarian AI and 5G Coalition**
  - **Support drone activities** with the opportunities powered by AI and 5G (e.g. V2V, V2G, V2X communication, object detection).

Summary

- Drones are to **develop exponentially.**
- The drone industry is a **complex eco-system.**
- The development of the industry is **limited** by numerous problems.
- Outstanding innovation and disruptive solutions are needed, **industry-wide cooperation.**
- DroneMotive:
  - aims to **support the R&D, certification, test, training and consulting activities related to drones,**
  - **link autonomous air and road segments.**
- HDC:
  - **cooperation platform**, forum aiming to catalyze the **Hungarian Drone Strategy** and the required legal framework to ensure higher national competiveness in the sector.
- Initiatives might provide **globally unique approach** and lead to acknowledged support of the industry.

Thank you for your attention.

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