

Japan UTM project update and Towards a large-scale UTM System deployment

(Presented by Terra Drone)

International Civil Aviation Organization
Second Meeting of the Asia/Pacific Unmanned Aircraft Systems Task Force
(APUAS/TF/2)

Bangkok, Thailand, 05 – 08 March 2018

Agenda

- 1.About Us
- 2.Japan UTM Project Update
- 3.UTM w/ telecommunication
(Japan KDDI/ South Korea LGU+)
- 4.UTM system development for
CAA and ANSP(Unifly)

Company Outline

Name : Terra Motors Corporation

Establishment : 4/2010

Head Quarter : 5-53-67,Jinguumae,Shibuya-Ku,Tokyo,Japan

Factory : Factory of two-wheeler: Vietnam(Ho Chi Minh)
Factory of three-wheeler: India(Delhi)
Bangladesh(Decca)

Domestic
Subsidiary : Terra Drone Corporation

Overseas
Subsidiary : Vietnam, India and Bangladesh

Capital : 1,606,760,000 yen(Including a capital reserve)

Content of
Business : Electric Bike/ Developing, designing and selling of three-
wheeler/Service of an industrial drone

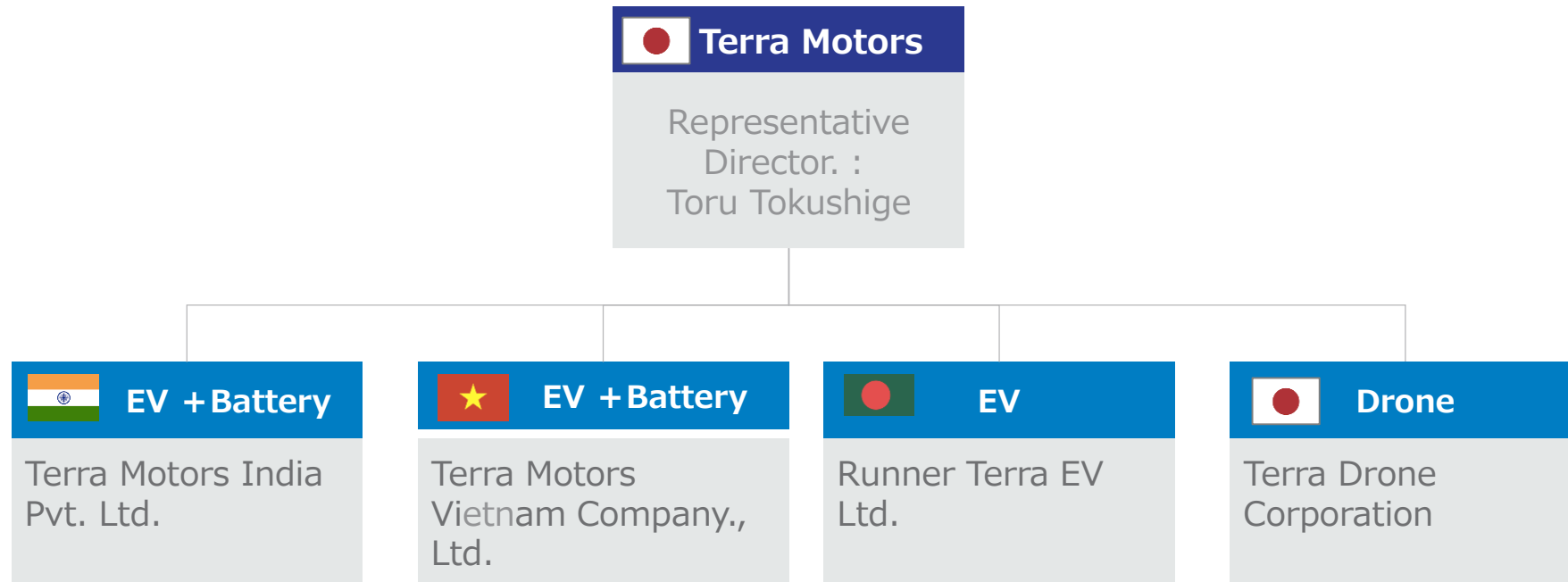


TERRA DRONE



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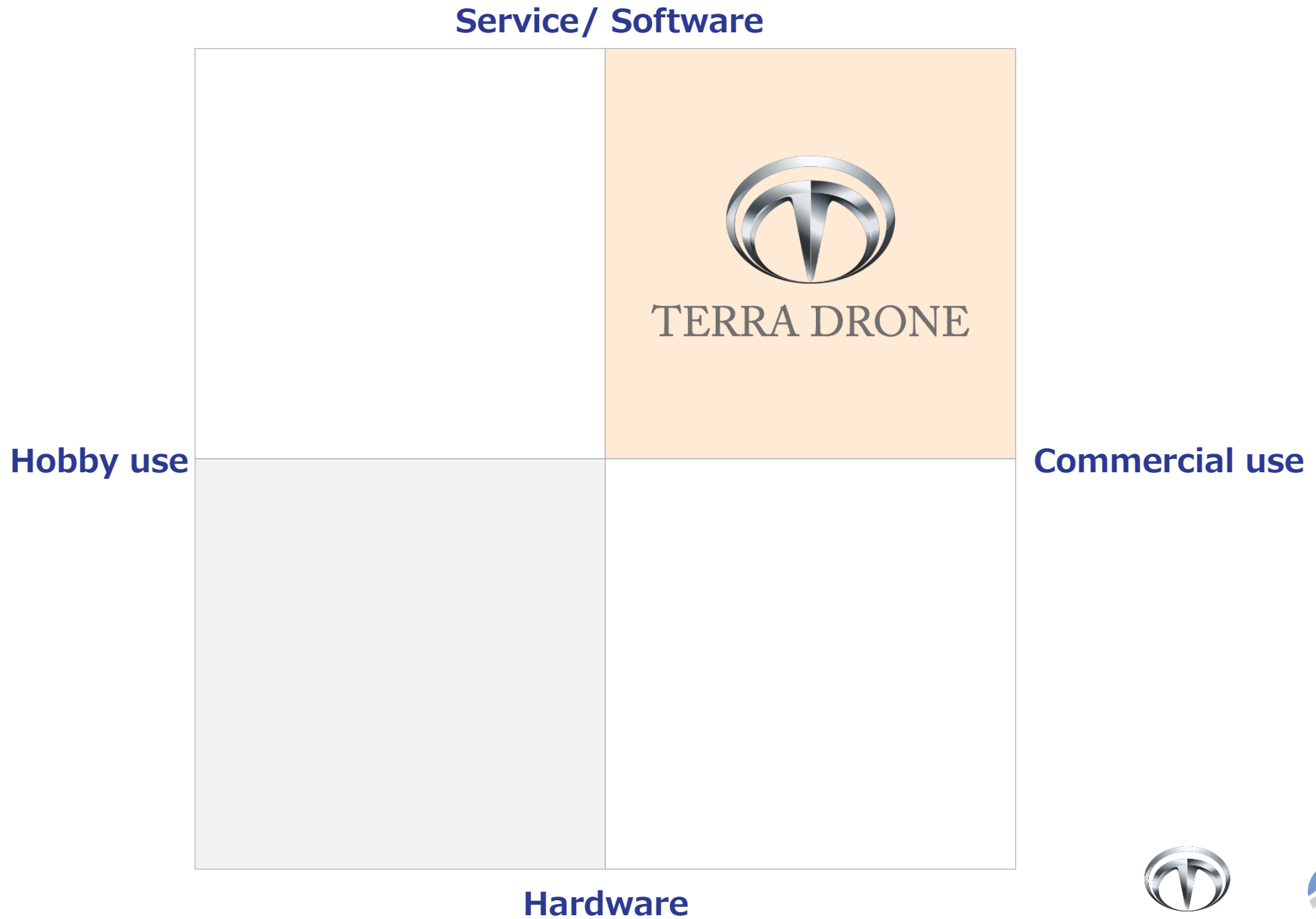
Relation of Capital



“The Best Venture Award” we received



Businnes Area



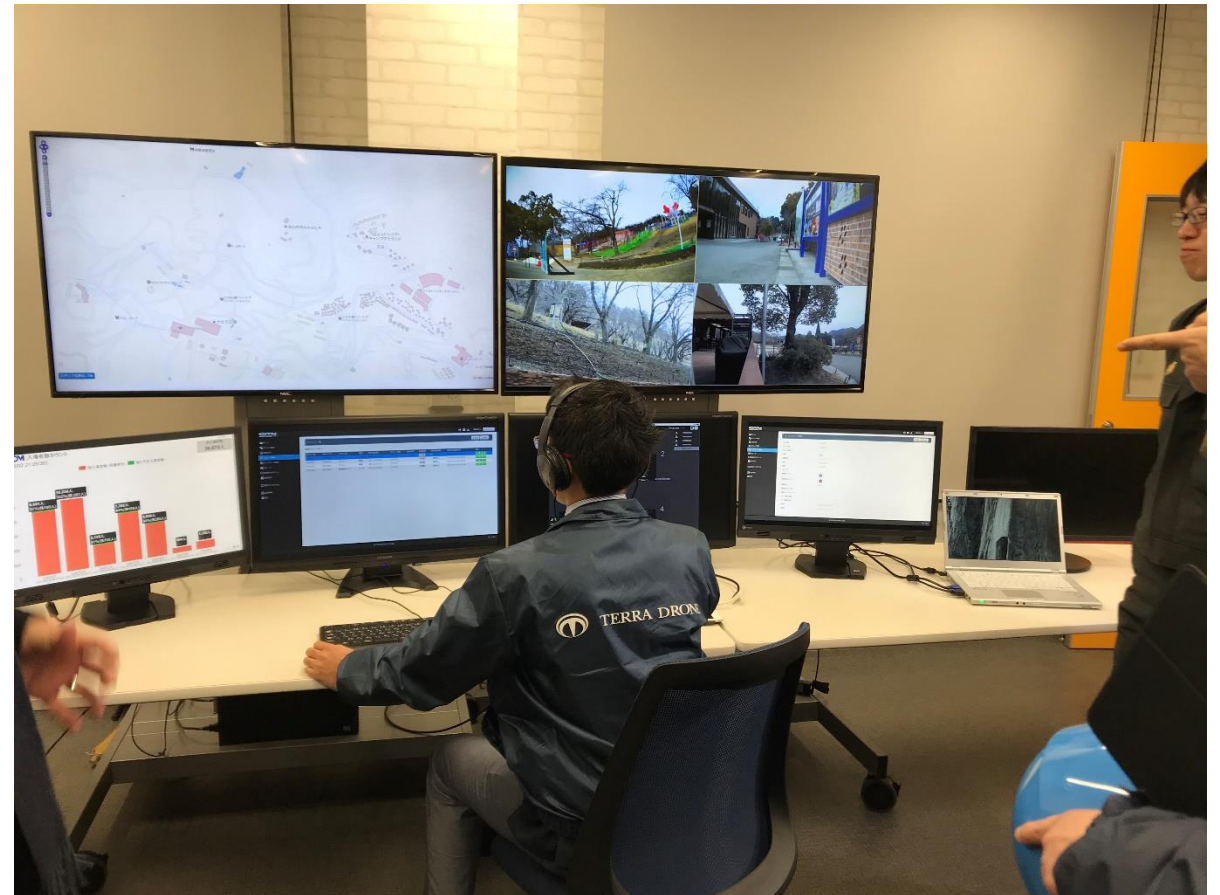
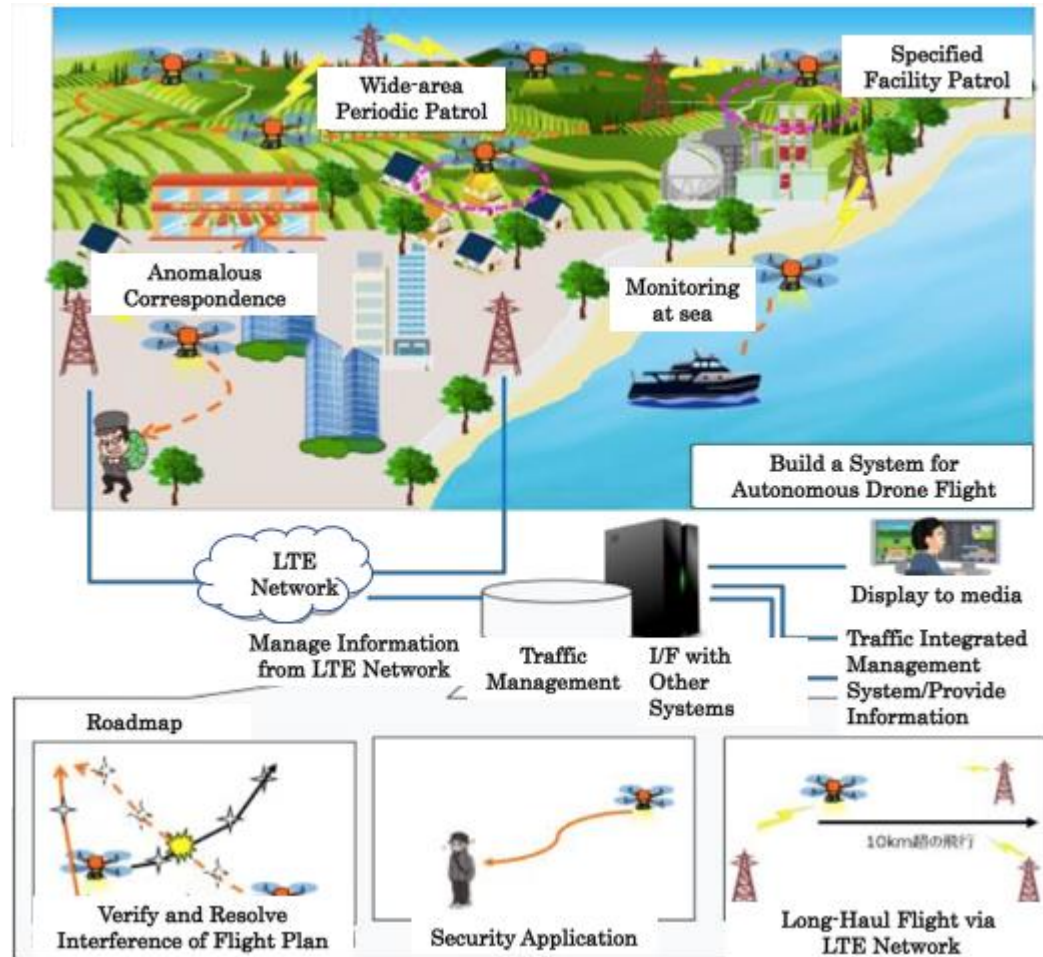
UAV solution for Construction Industry



Over 500 times we provided as UAV servicer last year

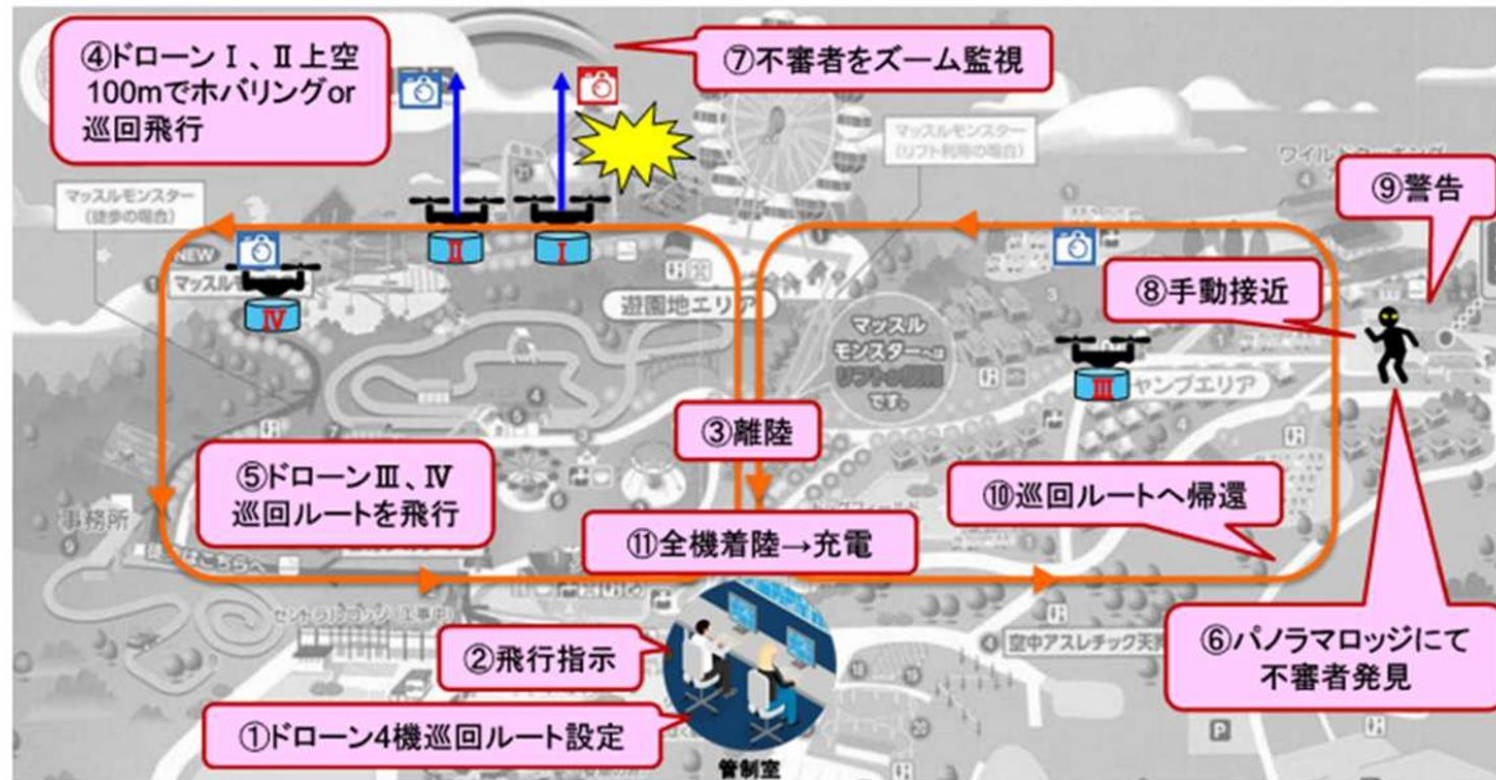
NEDO PJT

- Develop UTM for the security system



NEDO PJT

- Separating Airspace by 2 elevation for each purpose



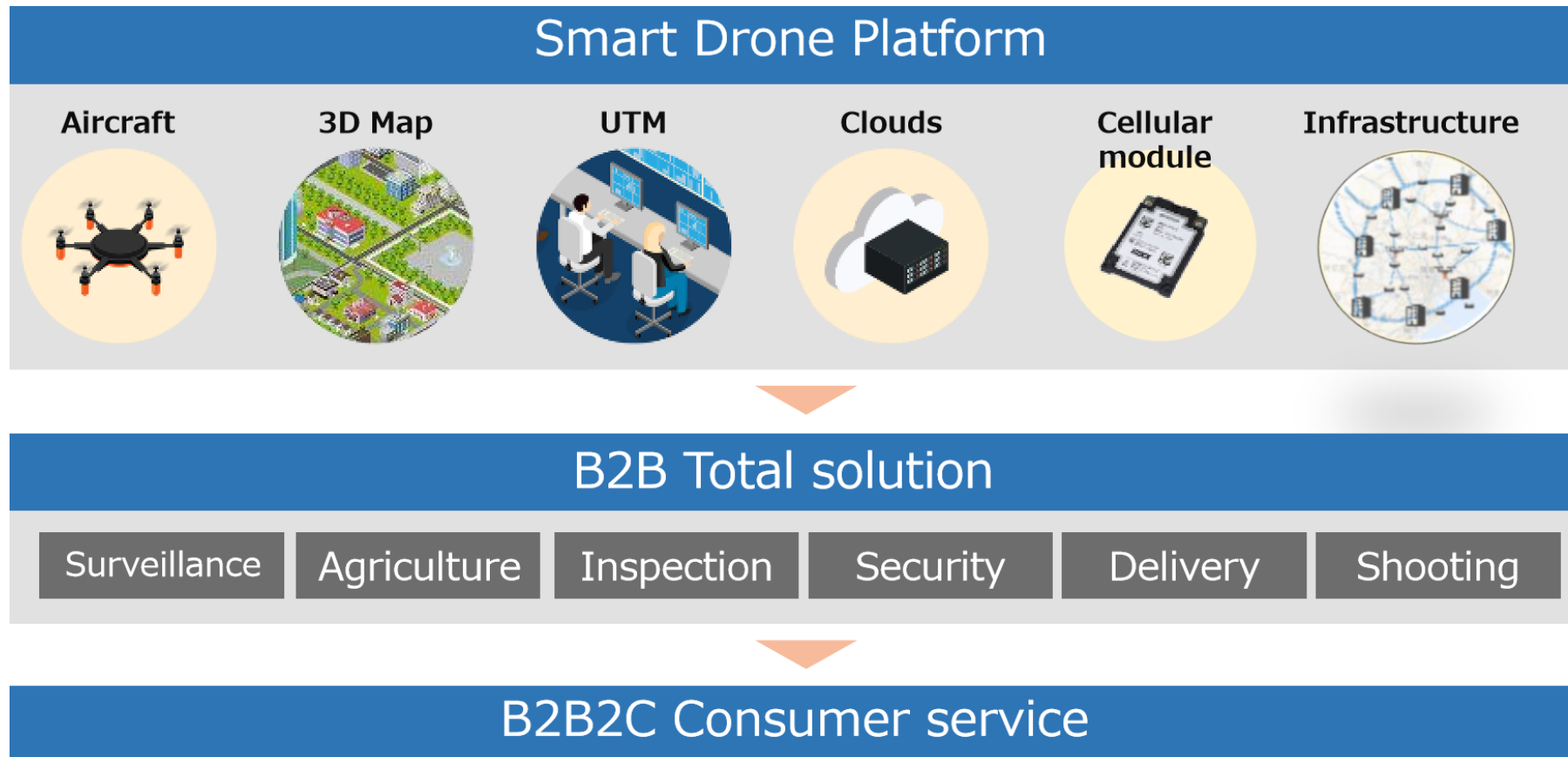
- 親ドローン 100m程度の高さから全体俯瞰して監視する事を担当
- 子ドローン 30m程度の高さから詳細監視する事を担当

- Smart Drone platform using LTE and connecting IoT sensor



- Drone for Citizens

Smart Drone Strategy



South Korea (LGU +)

- In South Korea, we have already started commercial UTM service using LTE

South Korea



with  **LG U+**

- Nov, 2017, Launched “U+ Smart Drone UTM System” which will provide UTM solution for Beyond Visual Line of Sight, BVLOS.
- Similar concept of KDDI’s Smart Drone for Industrial use case.
- Conducted demonstrations in South Korea which was the first use case of LTE network with drones.



Terra Drone And LG U+ Put UTM System Into South Korea

South Korea’s First Project

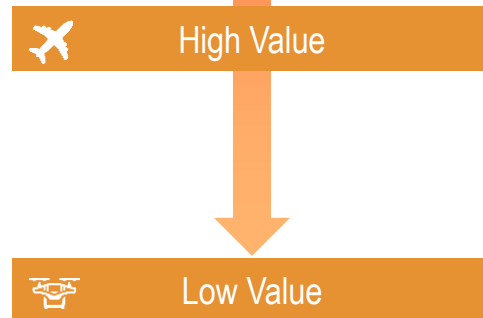
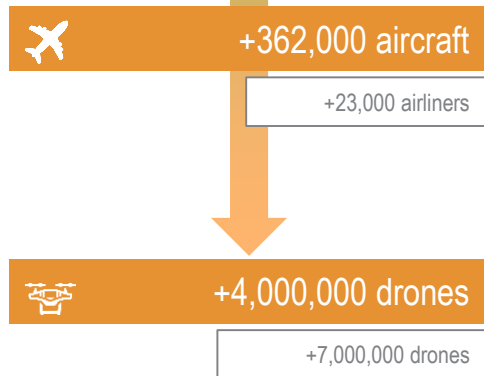


LTE connected Drone

PROBLEM STATEMENT



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PROBLEM STATEMENT

- Collision between drones and manned aircraft is real and serious urgent issue
- Need management system both Manned and Unmanned Craft management system

Drone hits passenger plane in Canada

by Sherisse Pham @Sherisse

🕒 October 16, 2017: 11:02 PM ET

👍 Recommend 5.3K



Social Surge - What's Trending ⚡



These companies are distancing themselves from the gun industry



Advertisers flee InfoWars founder Alex Jones' YouTube channel



L.L. Bean raises minimum age for gun purchases to 21



TOSHIBA

UTM Overview(Movie)



Global Partnership

- Terra Drone invested as biggest share holder on Unify which is leading companies at UTM business domain in the world.
- **Unify is only 1 provider which has experience National UTM**
- We will leverage Unify's technology into our business at Asia Pacific region.



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Towards a large-scale UTM System deployment



The future
of unmanned traffic
management,
applied today.





Collaboration
is the key.

Safety is the most
urgent challenge.

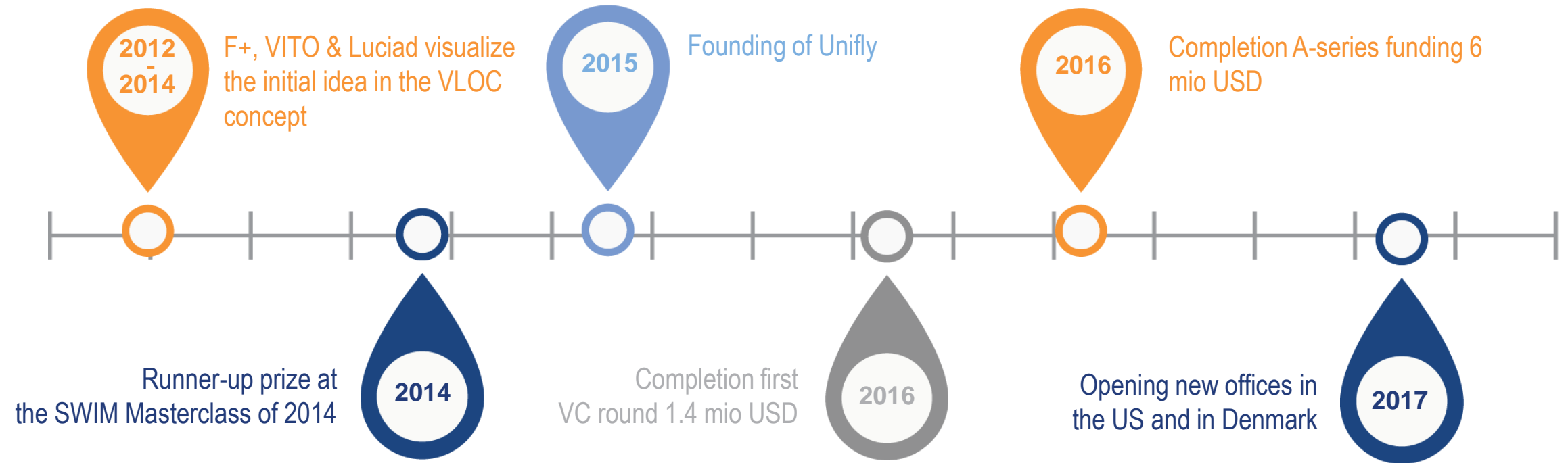


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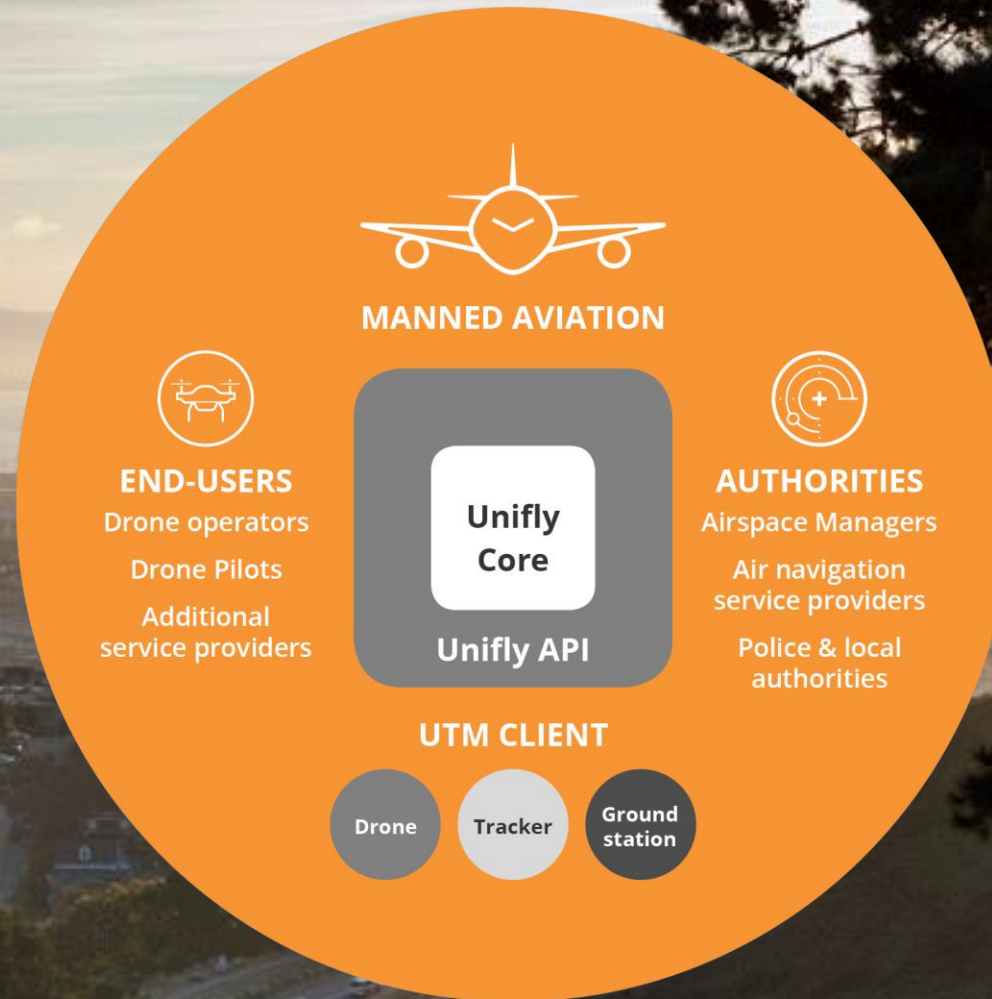


UNIFLY

Unifly history



Software Architecture



UTM System – Core functionalities

Drone Registration & Identification

Dynamic Airspace Management

Drone Surveillance & Tracking

Dynamic Drone Flight Management

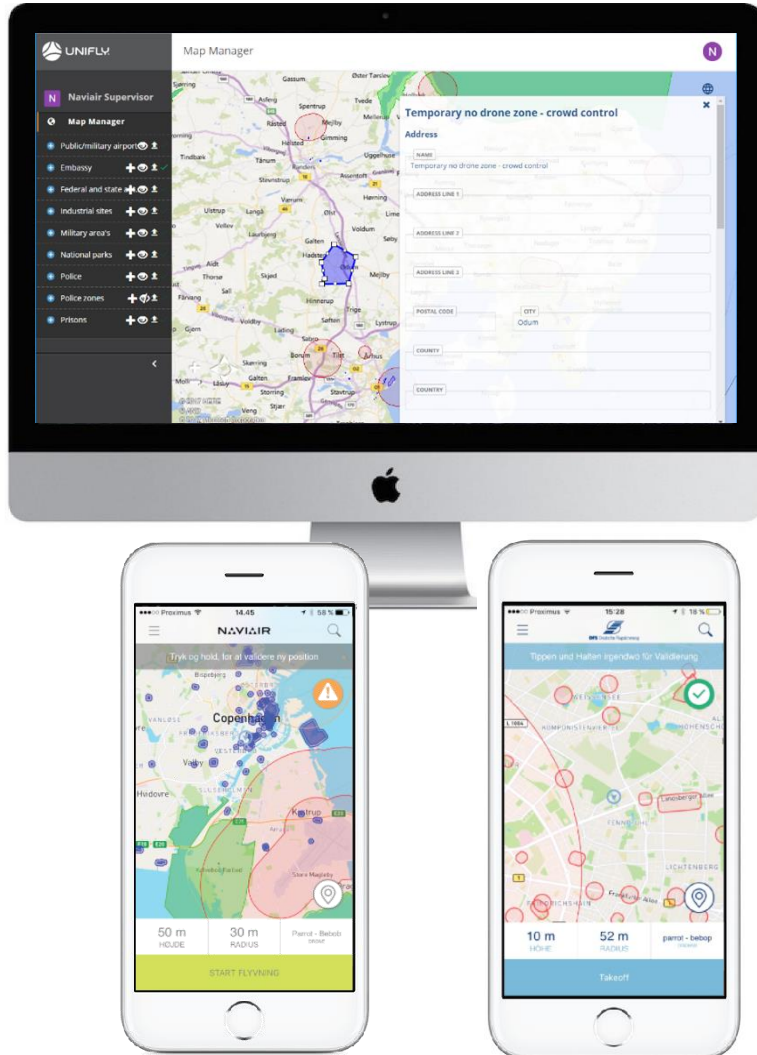
Drone Flow Management



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UTM System – Core functionalities for Authorities



- Reach out to your community
 - Easy access to readable information
 - No-fly zones map
- Manage access to the airspace
 - Publish no-fly zones in real time
 - Automated, instantaneous flight approval
 - Manual flight authorizations process flow
 - Send notifications to the pilots
 - Manage the database: registered pilots and drones, flights logbook, special authorizations, etc.
- Monitor flight traffic in real time
 - Real-time flights status and location
 - Visualize manned and unmanned flights
- Multiple levels of authorities

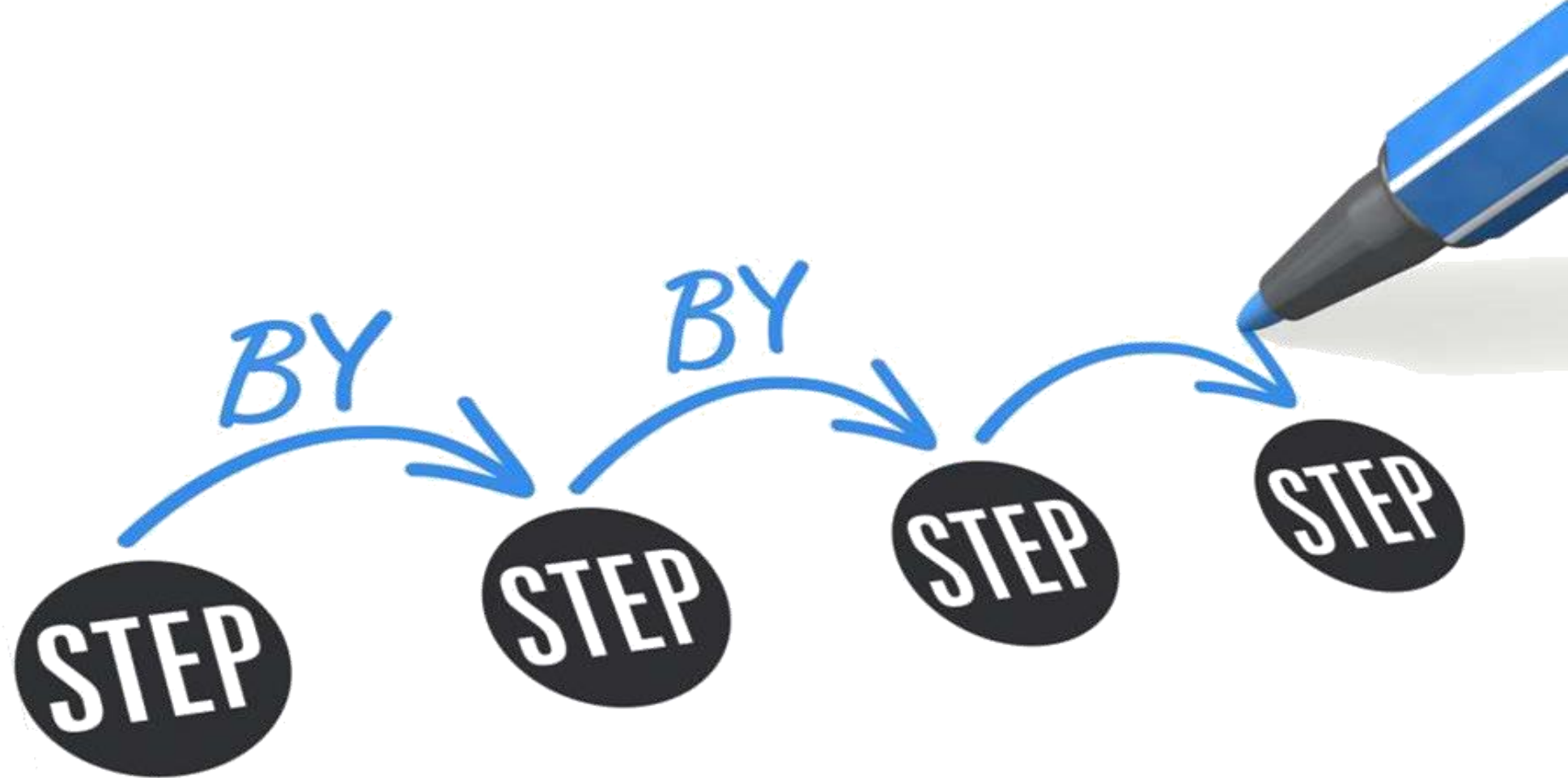
UTM System – Core functionalities for UAS Operators

- Easy-to-use mobile & web applications
 - Limited aviation knowledge required
 - Complete and accurate national & local rules
 - Readable no-fly zones map
- Plan & validate your operations
 - Manage your operations, pilot crew & drone fleet
 - Automated, instantaneous flight approval
 - Manage your pilot crew and drone fleet, flights logbook, special authorizations, etc.
- Keep track of your flights
 - Real-time flights status and location
 - Visualize manned and unmanned flights
 - Logbook and document management





Implementing a UTM system is phased approach



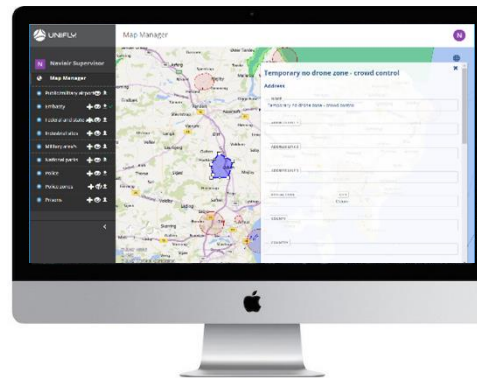
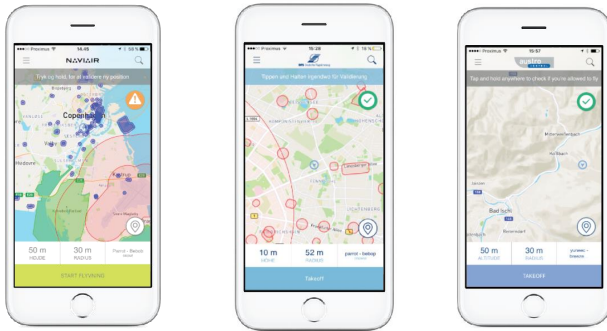
Implementing a UTM system is phased approach



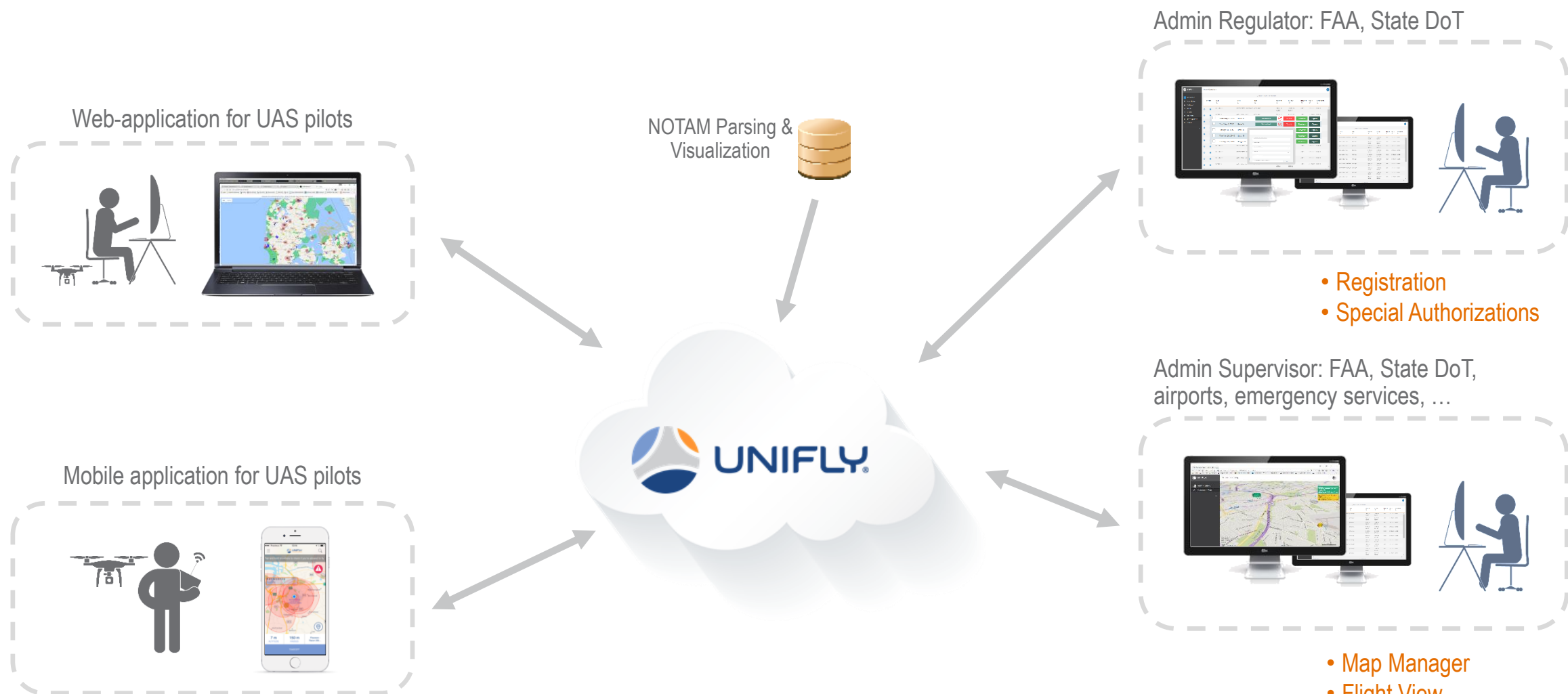
- Readable information
- Easy-to-access channels
- No-fly zones map
- Instantaneous flight approval

- Publish no-fly zones
- Manual flight authorizations process
- Notify the pilots
- Manage the database

- Real-time flight status and tracking
- Visualize both manned and unmanned flights
- Conflict resolution



Example of UTM solution with roles & responsibilities



Collaboration
is key.



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Research Projects Partners



HERE Technologies and Unifly map the airspace



Leader in mapping &
location services

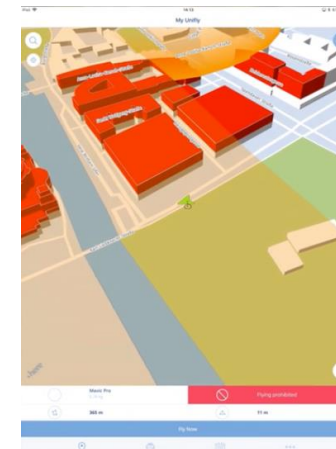
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Leader in Unmanned Traffic Management
Systems



Physical data about the world surrounding us

- Information about 3-D obstacles
- Structures, heights, dimensions, etc.

Invisible limitations imposed by regulations

- Federal, local, and aviation regulations
- Real-time information about manned and unmanned air traffic
- Temporary & permanent no-fly zones

4-Dimensional airspace maps for safe drone traffic

- Maximizing situational awareness
- Paving the way towards autonomous flights



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Memberships

Global



Europe

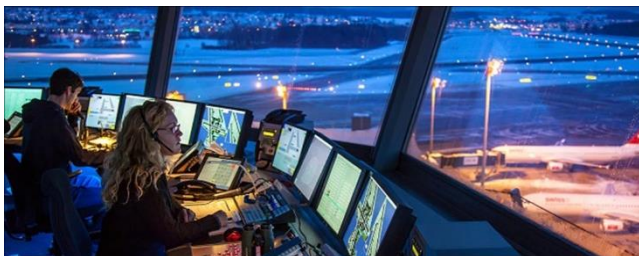


Local

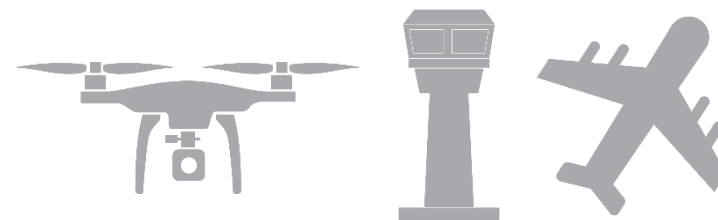


What makes Our product unique?

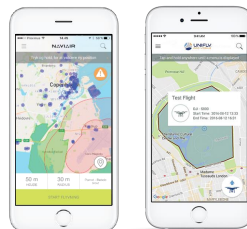
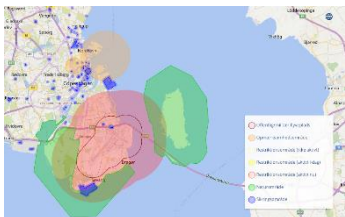
Safety is in our DNA



Clear long-term vision



State-of-the-art technology



Unprecedented experience



Thank you for
your attention



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