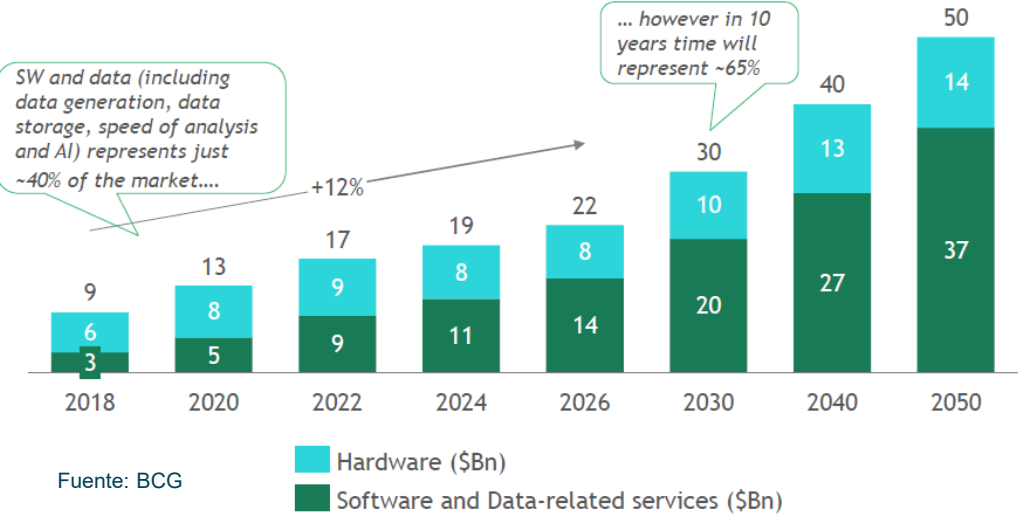# Indra Air Drones

UTM Solutions

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Market & Need

From 2023 onwards Data related services will be setting the pace of growth in the market

Global UAS market ($Bn)

SW and data (including data generation, data storage, speed of analysis and AI) represents just ~40% of the market....

... however in 10 years time will represent ~65%

+12%

	2018	2020	2022	2024	2026	2030	2040	2050
Total	9	13	17	19	22	30	40	50
Hardware	6	8	9	8	8	10	13	14
Software and Data	3	5	9	11	14	20	27	37

Fuente: BCG

■ Hardware ($Bn)
■ Software and Data-related services ($Bn)

Drone activities impact on…

Safety   Privacy   Environment   Security

Drone traffic has to be properly managed to avoid risks for other airspace users and ground risks.
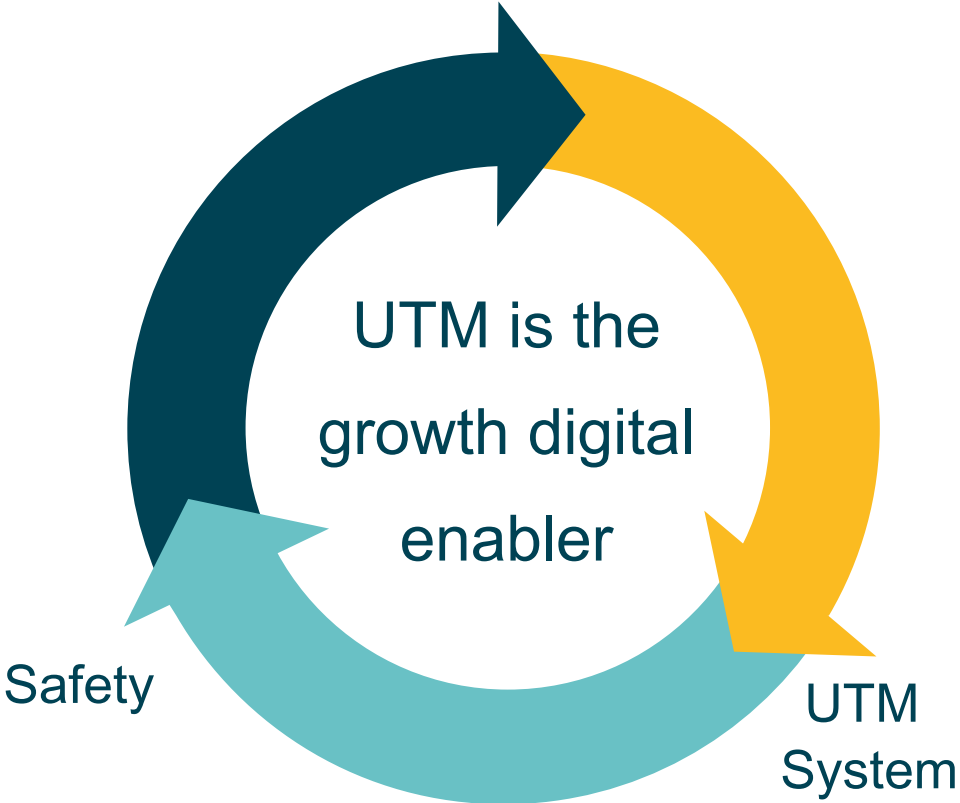
Drone Activities

UTM is the growth digital enabler

Safety

UTM System

Manage safely and efficiently the increasing UAS traffic before, during and after flight

Plan and manage U-space airspace considering flight activity and real-time restrictions

Provide flight monitoring and relevant alerts for drone operators and authorities

Integrated with ATM Systems and C-UAS solutions

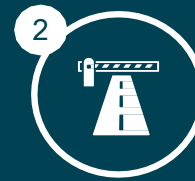Indra Air Drones solution to create a better airspace

Indra Air Drones solution services

Pre-Flight

1 User Registration & identification

2 Geoawareness Service

3 Flight Planning & Management

4 Flight Authorization and Strategic Deconfliction

In-Flight

5 Network Identification

6 Traffic Information

7 Ground Control Station App

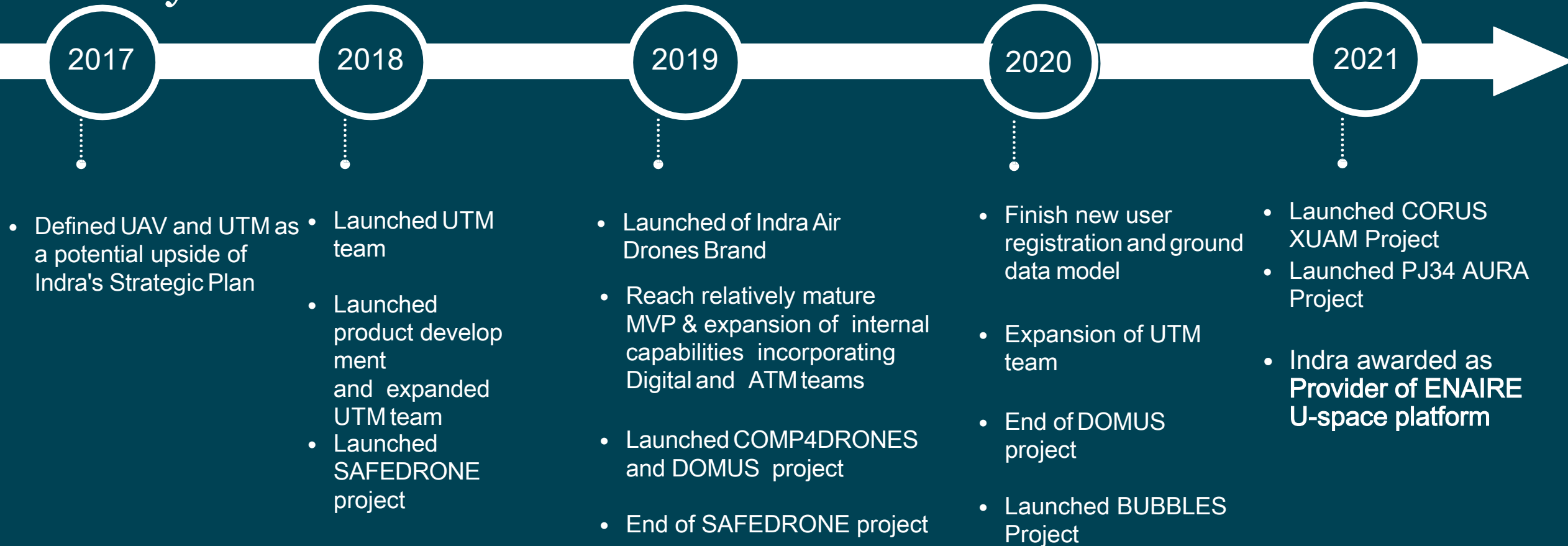8 Conformance and Tactical Monitoring

9 Flight tracking

10 Integration with ATM

Post-Flight

11 Data storage system and analysis

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Indra started in UTM in 2017 achieving great objectives in only four years

2017
- Defined UAV and UTM as a potential upside of Indra's Strategic Plan

2018
- Launched UTM team
- Launched product development and expanded UTM team
- Launched SAFEDRONE project

2019
- Launched of Indra Air Drones Brand
- Reach relatively mature MVP & expansion of internal capabilities incorporating Digital and ATM teams
- Launched COMP4DRONES and DOMUS project
- End of SAFEDRONE project

2020
- Finish new user registration and ground data model
- Expansion of UTM team
- End of DOMUS project
- Launched BUBBLES Project

2021
- Launched CORUS XUAM Project
- Launched PJ34 AURA Project
- Indra awarded as **Provider of ENAIRE U-space platform**

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Indra UTM projects

DOMUS

- Basic/advanced UTM services
- Integration of UTM platform with ATM system
- ~4 M€

Pilot T

- Corridors and automatic routing
- Demo and test with InNova platform
- ~4 M€

Safedrone

- Test at VLL operation with several UAVs
- UAS equipment
- ~2 M€

Civil UAVs Initiative

- Center to process, storage, transmit and monitor UAV sensor data
- UAS equipment
- ~35 M€

PJ13

- RPAS Integration in controlled airspace
- Validation in ATM platform
- ~ 12 M€

COMP4DRONES

- Basic/advanced UTM services
- Integration of UTM platform with ATM system
- ~4 M€

Bubbles

- Definition of separation management service
- Integration in UTM platform
- ~2 M€

USEPE

- Drones separation definition
- Research and test
- ~2 M€

CORUS-XUAM

- Urban Air Mobility Conops, 9 VLDs
- UTM platform for Spanish use case in Barcelona CTR
- ~4 M€

PJ34-AURA

- UTM-ATM integration via SWIM
- Integration of UTM platform with ATM system
- ~12 M€

ENAIRE's U-space platform

1 First 2nd generation of European platforms, aligned with U-space regulation from the design

2 Full Deployment with CISP (central piece and single point of truth) and USSP

3 Three phases:
- February 2022: First delivery, basic services
- July 2022: Full platform
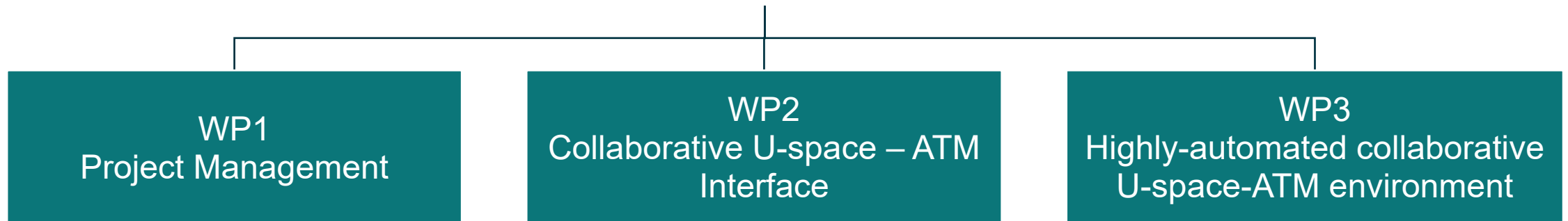- January 2023: Fully Operational to comply with U-space regulation

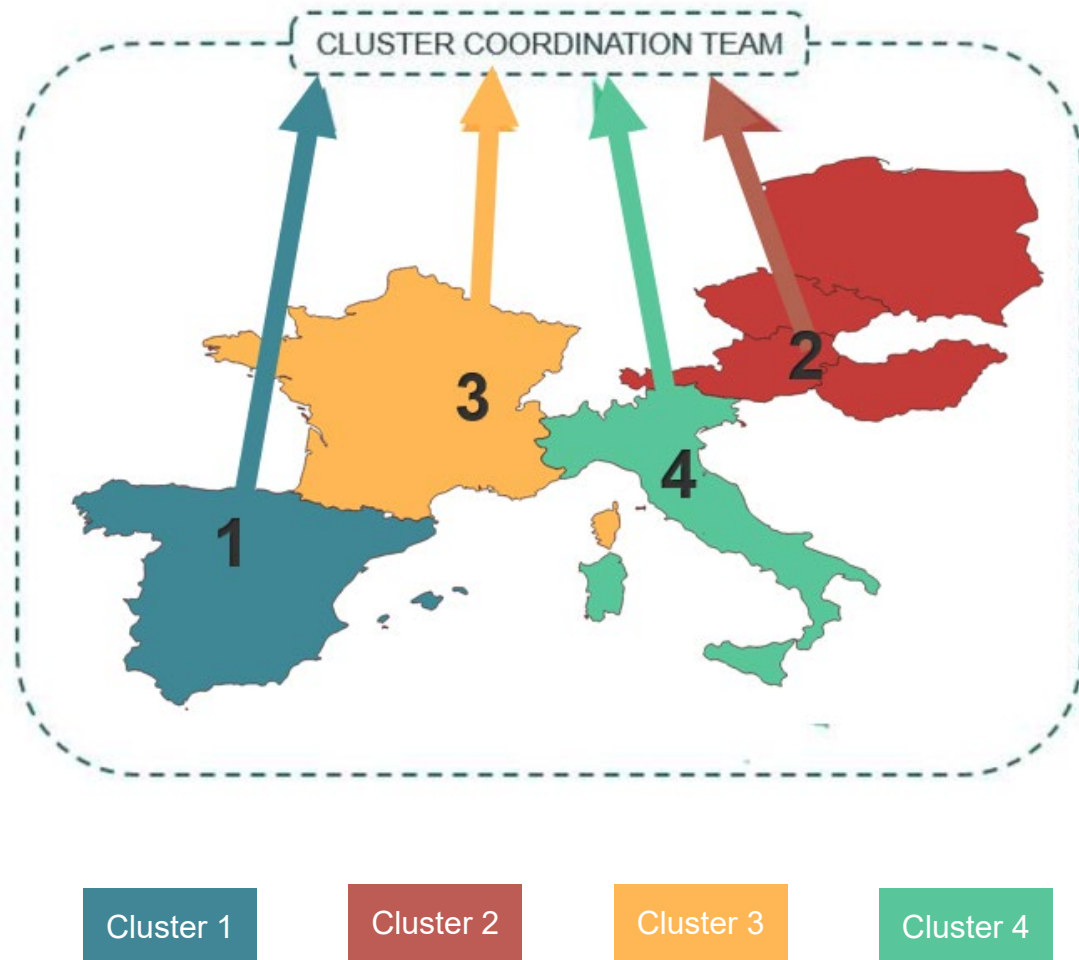**4** Several validation exercises with real drones and third party USSPs
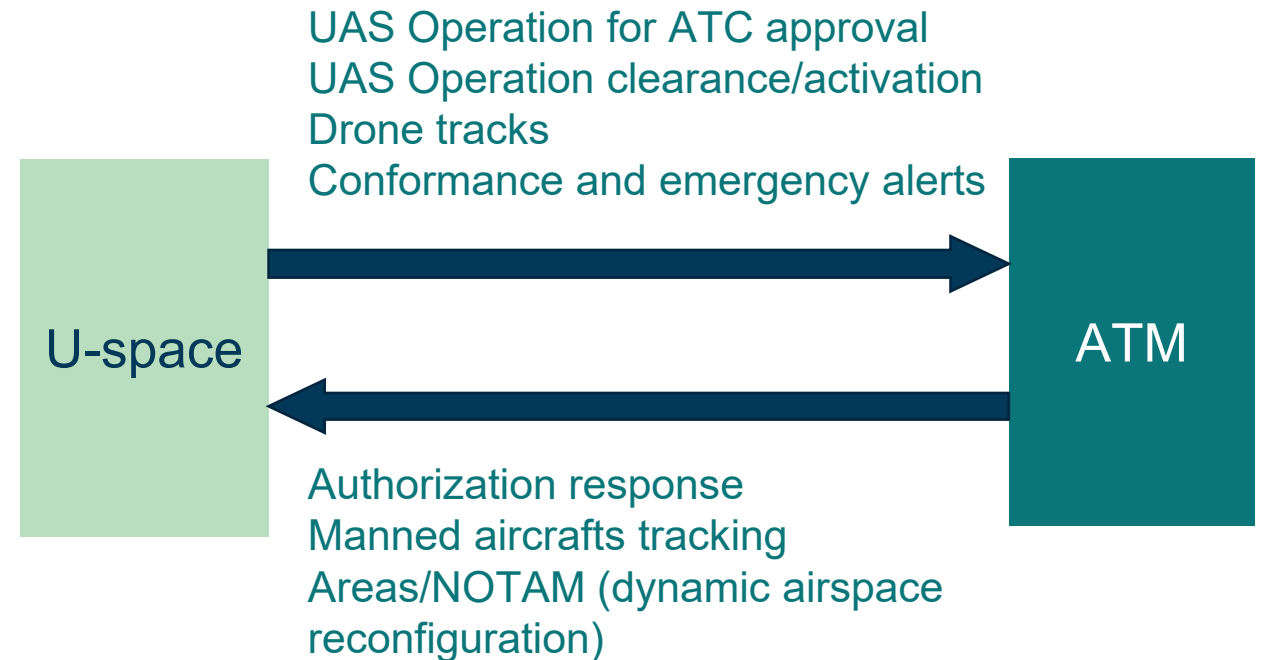
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PJ34 AURA Project

Objective:
To lay the foundations for the integration of drones in current and future air traffic environment, developing the required concept of operations and validating **U-space services information exchange with ATM systems.**

| WP1 Project Management | WP2 Collaborative U-space – ATM Interface | WP3 Highly-automated collaborative U-space-ATM environment |

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PJ34 AURA Project

- Use cases cover the whole flight process: strategic and tactical phase
- Nominal and non-nominal situations

- Relevant information exchange:

UAS Operation for ATC approval
UAS Operation clearance/activation
Drone tracks
Conformance and emergency alerts

U-space → **ATM**

Authorization response
Manned aircrafts tracking
Areas/NOTAM (dynamic airspace reconfiguration)