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High-end inspection system through AI and drones

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Samenvatting

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Contact & Site

Extra beschrijving

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This startup provides autonomous inspection services to difficult-to-access industrial infrastructure assets, specifically in the offshore sector. The company is developing an autonomous aerial radiography system using a synchronized drone/robot crawler system powered by Artificial Intelligence, capable of detecting internal structural defects.

The product of this startup is one complete integrated system designed to autonomously detect all critical internal defects within the asset structure using aerial radiography, a type of Non-Destructive Testing. The system is enhanced by Artificial Intelligence (Machine Learning & Deep Learning) to differentiate between defects that can cause the failure of an asset. The final end product is built on the pillar of 3 technologies: 1. Aerial positioning & synchronization 2. Aerial radiography control software 3. Image enhancement & processing.

Problems solved: Most of the critical defects which actually lead to structural failure of assets are usually developed on the internal structure and cannot be detected from the exterior. The current inspection techniques in the industry use either skilled technicians to manually inspect (risky, timeconsuming) or drones with visual/thermal camera (detects only exterior defects). The

technology of this firm can inspect the critical internal structural defects autonomously in a cost-effective and rapid manner in order to get the maximum ROI and a more accurate predictive maintenance strategy.

The target audience for these inspection services are the owners/operators/O&M/asset management companies of industrial infrastructure in the following fields: Offshore wind, power grid utilities, photovoltaics, pipeline industry, security, construction, Oil & Gas, railroads, manufacturing etc. The beachhead market is offshore wind parks.

The total size of the O&M market for offshore wind is €5.3B according to Navigant Research. The offshore wind O&M industry is expected to grow at a compound 12.5% annually until 2028.

The drone hardware is going to be produced by a partner in Eindhoven, who are drone/robotics manufacturers. All the software for performing radiography will be developed in-house. Thereby, this startup will also design and manufacture a robotic motion compensator system (hardware) to damp vibrations.

Registration date: 06/Sep/2021

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Business model:

The startup offers its technology as a service-based or a product-based depending on the use case:

● Service-based business model – €7.000,- per wind turbine inspected per year.

● Product-based business model – €350.000,- per product package (margin €140.000,-).

Customer type:

B2B

Preferred investor type:

Angel investor

USP's

The inspection services/products developed by all the other competitors can only inspect the external visual defects in infrastructure assets. Most of the critical defects in assets due to manufacturing, installation, and operation are formed within the internal structure of the material. Hence, the defects can be detected before they appear externally, which in most cases can cause a large drop in asset efficiency.

Digital radiography differs from ultrasonics in that the scans are performed at a higher resolution so that more details come into view. In combination with a 3D presentation of the asset and scan, structural defects can be detected automatically with deep learning algorithms.

The state-of-the-art aerial positioning & synchronization algorithms along with the robotic motion compensator system allow performing complex industrial tasks in difficult-to-access locations, thus eliminating human intervention and bringing down costs due to reduced inspection times.

The fault detection algorithm based on deep learning will be able to accurately detect the critical defects, thus bringing to life a more robust predictive maintenance system and strategies.

The end goal of this startup's innovation is a fully autonomous system including a docking station. This means that inspections can be carried out more often, more easily and on the most favorable days, such as on windless days so there is no need for downtime.

Capital amount needed:

€300.000,-

Investment need:

- €104.000,- Hardware equipment costs
- €161.000,- Human resource costs
- €35.000,- Operating costs + Overhead costs

Sector:

Deep Tech, Energy, AI

Phase:

Pre-Seed

Number of founders:

3

Current number of employees:

1-5

Experience founding team:

The founder and CEO: Hardware development (10+ years as an RC plane/drone hobbyist) + MSc Sustainable Energy Technologies (wind energy), TU Delft, Specializing in wind turbine aeroelasticity, systems integration, Bachelors in Mechanical Engineering.

The co-founder and CTO: Software development - Broad expertise in IT, network, enterprise-level system architecture, infrastructure design & platform development, full project life cycle management, 20+ years experience with software development ranging from low-level system architecture to high-level apps and APIs, previous experience in running a startup.

The COO: MSc Offshore Engineering, TU Delft (2009- 2011), Ph.D. in the field of structural health monitoring from Oxford- Cranfield (UK), 15+ years experience in the offshore Oil & Gas and renewables industry + Previous experience in running a successful startup (WyndTek BV)

Monthly turnover:

€0,-

Turnover (forecast) next 12 months:

€0,-

Turnover (forecast) next 13-24 months:

€700.000,-

Current monthly expenses:

€12.500,-

Additional information:

All costs until now are covered through small government subsidies and self-financing.

The government grants were:

- €60.000- for patenting the technology, working with a investor ready consultant technical feasibility grants.

- €35.000,- additional tax credits for R&D activities.

The team has invested €50.000,- in this startup.

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