

## **A Cooperative, Autonomous, and Continuously Operating Drone System Offered to Railway and Bridge Industry: The Business Model Behind**

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**Abstract :** Bridges and Railways are critical infrastructures. Ensuring safety for transports using such assets is a primary goal as it directly impacts the lives of people. By the way, improving safety could require increased investments in O&M, and therefore optimizing resource usage for asset maintenance becomes crucial. Drones4Safety (D4S), a European project funded under the H2020 Research and Innovation Action (RIA) program, aims to increase the safety of the European civil transport by building a system that relies on 3 main pillars: • Drones operating autonomously in swarm mode; • Drones able to recharge themselves using inductive phenomena produced by transmission lines in the nearby of bridges and railways assets to be inspected; • Data acquired that are analyzed with AI-empowered algorithms for defect detection This paper describes the business model behind this disruptive project. The Business Model is structured in 2 parts: • The first part is focused on the design of the business model Canvas, to explain the value provided by the Drone4safety project; • The second part aims at defining a detailed financial analysis, with the target of calculating the IRR (Internal Return rate) and the NPV (Net Present Value) of the investment in a 7 years plan (2 years to run the project + 5 years post-implementation). As to the financial analysis 2 different points of view are assumed: • Point of view of the Drones4safety company in charge of designing, producing, and selling the new system; • Point of view of the Utility company that will adopt the new system in its O&M practices; Assuming the point of view of the Drones4safety company 3 scenarios were considered: • Selling the drones > revenues will be produced by the drones' sales; • Renting the drones > revenues will be produced by the rental of the drones (with a time-based model); • Selling the data acquisition service > revenues will be produced by the sales of pictures acquired by drones; Assuming the point of view of a utility adopting the D4S system, a 4th scenario was analyzed taking into account the decremental costs related to the change of operation and maintenance practices. The paper will show, for both companies, what are the key parameters affecting most of the business model and which are the sustainable scenarios.

**Keywords :** a swarm of drones, AI, bridges, railways, drones4safety company, utility companies

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