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CURRENT AND FUTURE APPLICATIONS OF EARTH OBSERVATION DATA IN  
ADMINISTRATIVE, CIVIL AND CRIMINAL PROCEEDINGS

**Abstract**

The remote sensing capability of satellites allows the collection of information about a specific zone and enables optimised data-informed decision making. EO captures can be helpful for crisis management, surveillance and protection of critical infrastructures. Furthermore, satellite optical data can be advantageous as evidence in criminal, civil and administrative proceedings. While at an international stage, the International Court of Justice is reluctant about adopting satellite data as valid evidence, on the other side, several domestic jurisdictions accept this type of proof. Moreover, satellite captures are helpful to provide additional contextual information to the lawsuit: the application of modern artificial intelligence technologies permit to analyse of in-depth phenomena that range from the release of harmful substances to the monitoring of active fires.

The data acquired from Outer Space can gain validity in the legal process only through a precise procedure that must meet specific requirements. The data must first be processed and then inserted in a document that proves a historical fact. The final validation must be confirmed and given by a forensic expert.

Additionally, another important aspect that concerns the trustworthiness of the proof acquisition is the satellite transmission and the consequent reliability and integrity of the data. This point fits into the vulnerabilities that affect the space vehicle: potential threats can be present from the beginning of its mission and during its assembly along the supply chain. During its lifecycle possible intrusion can lead to payload malfunction, ranging from unavailability to executing foreign commands. The exposure of EO activities to cyber and electronic threats could make satellite data unreliable and therefore not usable as evidence.

In this context, one must consider other factors that will increase the availability of satellite data, such as the democratisation of space and decreasing launch costs. According to EUSPA, the EO value-added services market will see a CAGR of 6.8%. The research pursued by Partners4Innovation presents multidisciplinary aspects that address the possibility of exploiting EO data in court. The paper will first highlight the satellites' technical requirements and the connected cybersecurity vulnerabilities that potentially affect the reliability of the image's transmission; it will then analyse the juridical process from the satellite acquisitions until the data is shown in court. Finally, an economic analysis is provided that investigates the potentiality behind satellite data as proof of evidence in trials and as a new exploitable business opportunity.