

Smart Surveyors: Ensuring Land Rights for All Through Innovative Surveying Approaches

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SUMMARY

Surveyors are increasingly required to tackle new projects with ever changing circumstances; whether it be remote location, changing budgets, diverse workforce and/or climate change. Innovative approaches to solving these challenges, such as positioning-as-a-service and augmented reality, are essential to the toolkit of the modern day smart surveyor. This paper seeks to present recent technological advancements and through real world examples, demonstrate how smart surveyors can leverage these technologies to facilitate land rights for all.

Positioning-as-a-service introduces flexible and on-demand access to high quality RTK positioning for mapping, navigation, and visualization workflows powered by a low cost GNSS antenna paired with your smartphone. From sole operators, through to organizations wanting to equip entire field teams, the power of RTK-quality GNSS field workflows is now more accessible, more affordable, and more flexible than ever before. With the changes to on-demand access subscription, usage can be distributed and tailored across an entire organization to active users, on an hourly basis. This level of flexibility and freedom from high initial equipment costs is unparalleled in the surveying industry, and opens many new application opportunities.

In Haiti, a team of volunteers actively worked over a month long period to catalogue disaster management efforts to confirm drone and aerial imagery post-earthquake in a newly rebuilt area. This settlement was part of a recent relocation from disaster areas in Port Au Prince, and the flexibility of positioning-as-a-service was utilized to quickly verify control points and boundaries for distribution to other groups ahead of coordinated work efforts.

Positioning-as-a-service also provides the foundational component of outdoor augmented reality systems. By making a smaller, lightweight, and cost effective antenna, and pairing it with inertial

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sensors and cameras already embedded in smartphones, accessible augmented reality for survey and mapping applications becomes more feasible. Augmented reality has proven to be a useful tool for visualizing complex 3D data sets, monitoring project progress, and collaborating and informing key project stakeholders. Presenting detailed geospatial data in context, outside, and onsite further enables citizen engagement, allowing the surveyor to articulate project needs and drive better discussion around data, especially when it pertains to non-visible boundaries.

As an example, a large corridor widening construction project was underway in the UK. In order to widen the corridor, approvals were needed from key stakeholders in the municipalities in the vicinity of the project. By leveraging augmented reality to display the proposed construction plan in high accuracy to municipality stakeholders and concerned citizens, it was possible to achieve buy-in for the project quickly, and effectively, with clear understanding where the project would be impacting existing infrastructure. Citizens who had no geospatial experience or context were immediately able to understand how a project would impact their public access and in some cases, property lines.

Surveyors have an increasingly challenging role to play in documenting and ensuring land rights worldwide. By incorporating innovative surveying approaches, smart surveyors can future proof their business and simultaneously incorporate diverse stakeholders in a collaborative approach to mapping people and places, worldwide.

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