Ai-Based On-Demand Mapping: An Alternative In Response To Ever-Growing Mapping Agencies' Challenges

Nouri Sabo[a], [*]

[a] *Canada Centre for Mapping and Earth Observation, Nouri.Sabo@NRCan-RNCan.gc.ca*

[*] Corresponding author

Keywords: On-demand mapping, mapping agencies, Artificial Intelligence (AI), Big Data

Abstract:

Geospatial information has reached an omnipresence in our day-to-day operations. It helps with analysis, prediction, and decision-making in many fields, such as navigation, transportation, telecommunication, environmental management, emergency response, and climate change adaptation. Once the exclusive domain of mapping agencies, producing and maintaining geospatial data has become widespread, involving many organizations and even citizens. We see more and more organizations creating and managing data, and sometimes making it available to the community on a free or commercial basis. This recent democratization of geospatial data has encouraged the reinvention of mapping agencies in many countries.

At the same time, the need for information of all kinds, including geospatial data, is growing exponentially, and increasing in complexity. Users often require near-instantaneous data, and such demands are sometimes incompatible with conventional processes of mapping agencies, i.e., creating national map coverage and updating it at well-defined cycles or through requests from a minimal number of institutional clients. Under the new data-intensive paradigms, these traditional approaches rapidly reach operational limits, especially for countries with vast areas. Ever-growing demand means that mapping agencies struggle to keep data current. Nor can they predict events such as natural disasters, where precise and current geospatial information is required on short notice.

These new constraints, combined with diminishing resources, are pushing mapping agencies to reflect on new paradigms and transition towards business models and technologies that can better satisfy the new demands. Like many mapping agencies worldwide, the Canadian Centre for Mapping and Earth Observation (CCMEO) has been making this transition for several years. The CCMEO is working towards the concept of on-demand mapping via new technologies based on Artificial Intelligence (AI) and Big Data. In addition to being agile and efficient, this concept allows for ad-hoc geospatial data needs to be met efficiently, facilitates the creation of value-added geospatial products, and supports analysis and prediction. In this presentation, we outline the philosophy behind our on-demand mapping concept as well as its underlying architecture and technology. We also discuss what challenges and obstacles remain to address. This interactive presentation allows us to share our experiences with participants and gather their observations and perspectives on meeting new mapping demands of modern society.