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Technical expertise: Geographical names data management

Utilization of Deep Learning and Computer Vision Technology in Geographical Names Management

Summary **

The Ministry of Public Works (MPW) actively contributes to implement the Government Regulation No. 2 of 2021 on Geographical Names Standardization. This includes collecting, reviewing, and validating geographical names within MPW's jurisdiction. The validated data are submitted to the Sistem Informasi Nama Rupabumi (SINAR), managed by the Indonesian Geospatial Information Agency (Badan Informasi Geospasial - BIG) through an Application Programming Interface (API). The submission process ensures that MPW has thoroughly reviewed and validated all geographical names.

The workflow for geographical names management is governed by Standard Operating Procedures (SOP) of MPW No. 147/2024. It begins with collecting secondary data from data producers via APIs, followed by a detailed review and validation process, and culminates in field verification surveys regulated by MPW SOP No. 182/2024. The finalized draft of geographical names is formally signed by the Secretary General of MPW, establishing its legal status. This process is critical for ensuring the legitimacy and governance of geographical names under MPW's jurisdiction.

Given the large volume and variety of infrastructure data under the MPWs' jurisdiction, including 49 infrastructure categories and 72,603 data entities across Indonesia, using manual review would be time-consuming, inefficient as well as prone to errors. Development of the PNR.AI tool, leveraging deep learning and computer vision technologies, is an innovative solution to this challenge.

Given the extensive scope of MPW's infrastructure data—spanning 49 categories and comprising 72,603 data entities across Indonesia—manual review methods are inefficient, time-intensive, and prone to errors. To address this challenge, MPW has developed the PNR.AI tool, which integrates deep learning and computer vision technologies to streamline and enhance the process.

PNR.AI offers significant advantages in speed, accuracy, and efficiency. Capable of processing up to 10 times more data simultaneously than manual methods, it drastically

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** Prepared by Komang Sri Hartini, Amalia Siti Rohmah, and Khoirunnisaa Ronaa F, Indonesia, The Ministry of Public Work of Indonesia. The report will be available under document symbol GEGN.2/2025/130/CRP.130, in the language of submission only, at https://unstats.un.org/unsd/ungegn/sessions/4th_session_2025/

reduces the time required for infrastructure name validation. Moreover, its automated systems minimize human error, ensuring compliance with the legal requirements established by Government Regulation.