STATE OF THE MAP ASIA 2024 Cox's Bazar, Bangladesh

ASSESSING DATA QUALITY IN OPENSTREETMAP (OSM) AND VOLUNTEERED GEOGRAPHIC INFORMATION (VGI)

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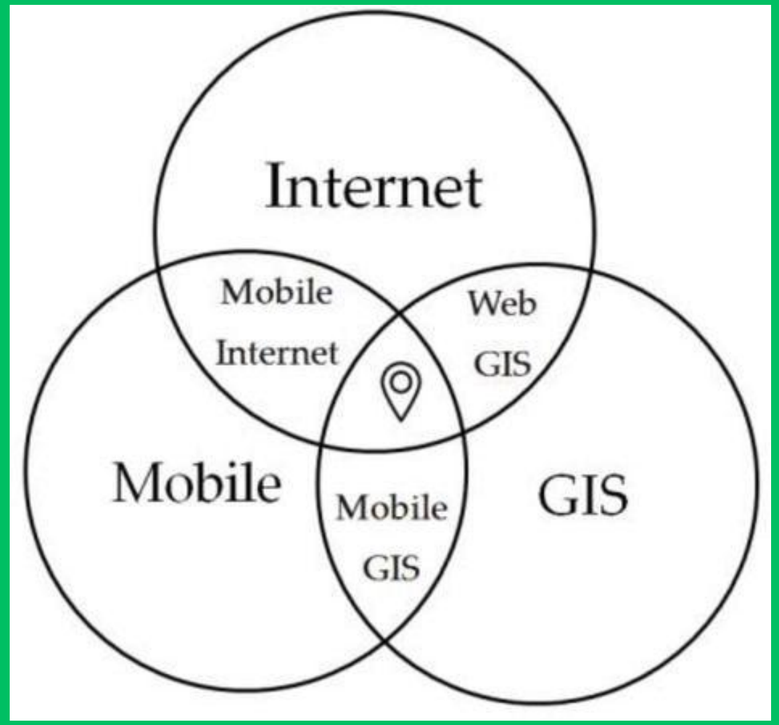
VGI

- **Volunteered Geographic Information (VGI)** refers to the creation and sharing of geographic data by individuals through platforms like OpenStreetMap, where non-experts contribute spatial information voluntarily.



OSM

- **OpenStreetMap (OSM)** is a collaborative, open-source project that provides free, editable geographic data and maps contributed by users worldwide.

- **As of now, OSM has over 11.6 million registered contributors globally. Among them, approximately 70,000 contributors actively make edits each month.**

Who Uses OSM?

- Individual Users
- Developers
- NGOs
- Research Agencies
- Business Entities
- Governments agencies
- Academic researchers
- Mapping and navigation platforms
- Mapping communities

In a word, **EVERYONE** uses OSM

How OSM Impacts?

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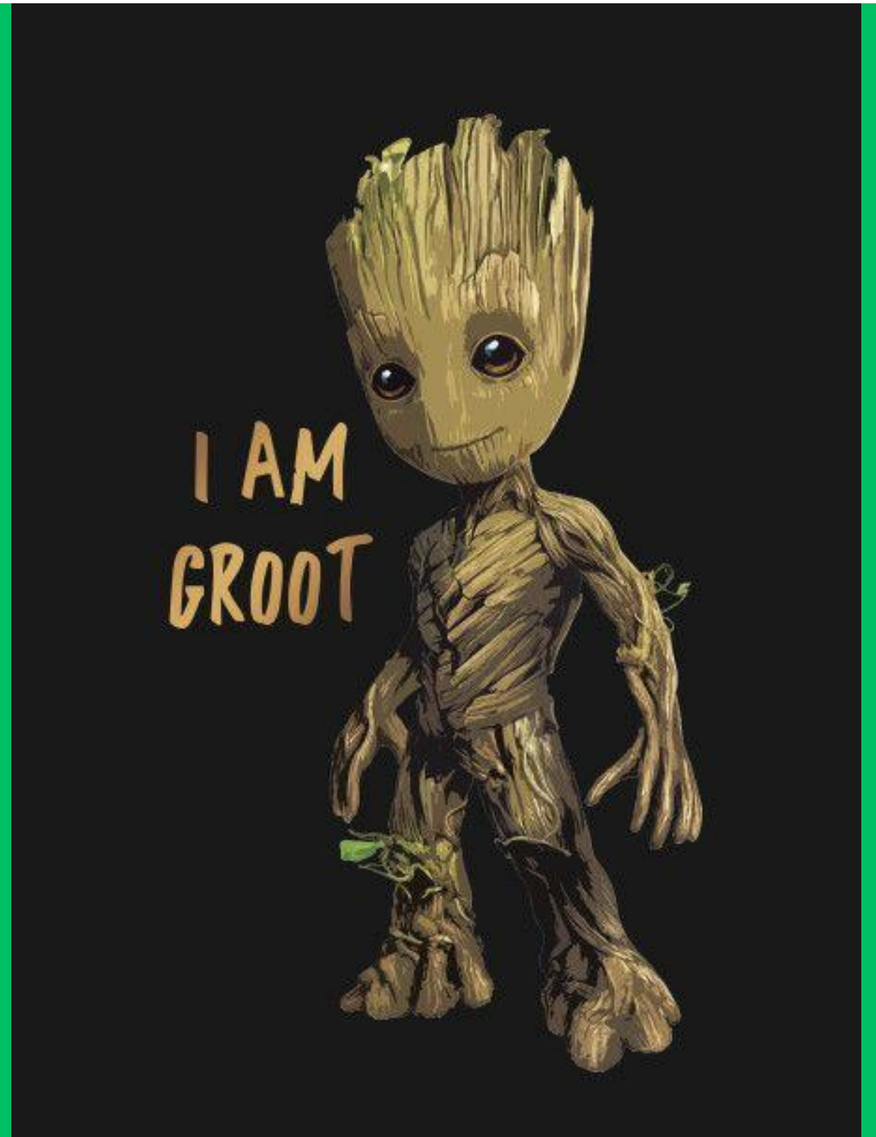
- For business entities, it is cost effective, therefore environment supportive
- For humanitarian organizations, it is free, so the fund allocated for data acquisition can be utilized for vulnerable communities who need it the most

This is an era of Open Source, so why not make the open source perfect?

What is DQA? Why is DQA?

DQA (**Data Quality Assessment**) is the process of evaluating data for **accuracy**, **consistency**, **completeness**, and **relevance**. It ensures that geographic data is reliable for analysis and decision-making by identifying errors and inconsistencies.

In **OSM,** it is highly important to assure data quality since many organizations, individuals, entities **highly depend** on OSM.



Existing DQA in OSM

- **Error Detection Tool** (OSM Inspector, JOSM Validator, Vespucci, Keep Right Osmose etc.)
- **Monitoring Tool** (magOSM, History Browser, OSM Aware)
- **Human Editors** (in some cases)

Mostly **Automated Tools**

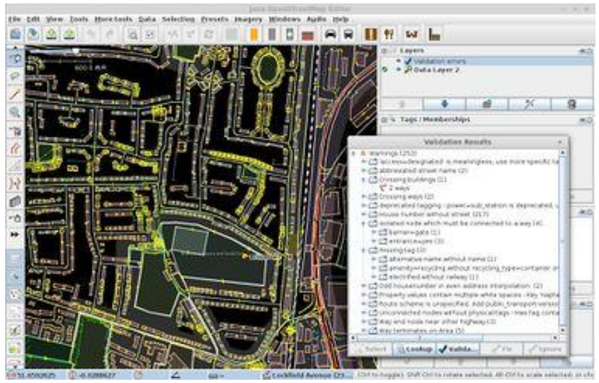
Limited **Human Intervention**

Existing DQA in OSM

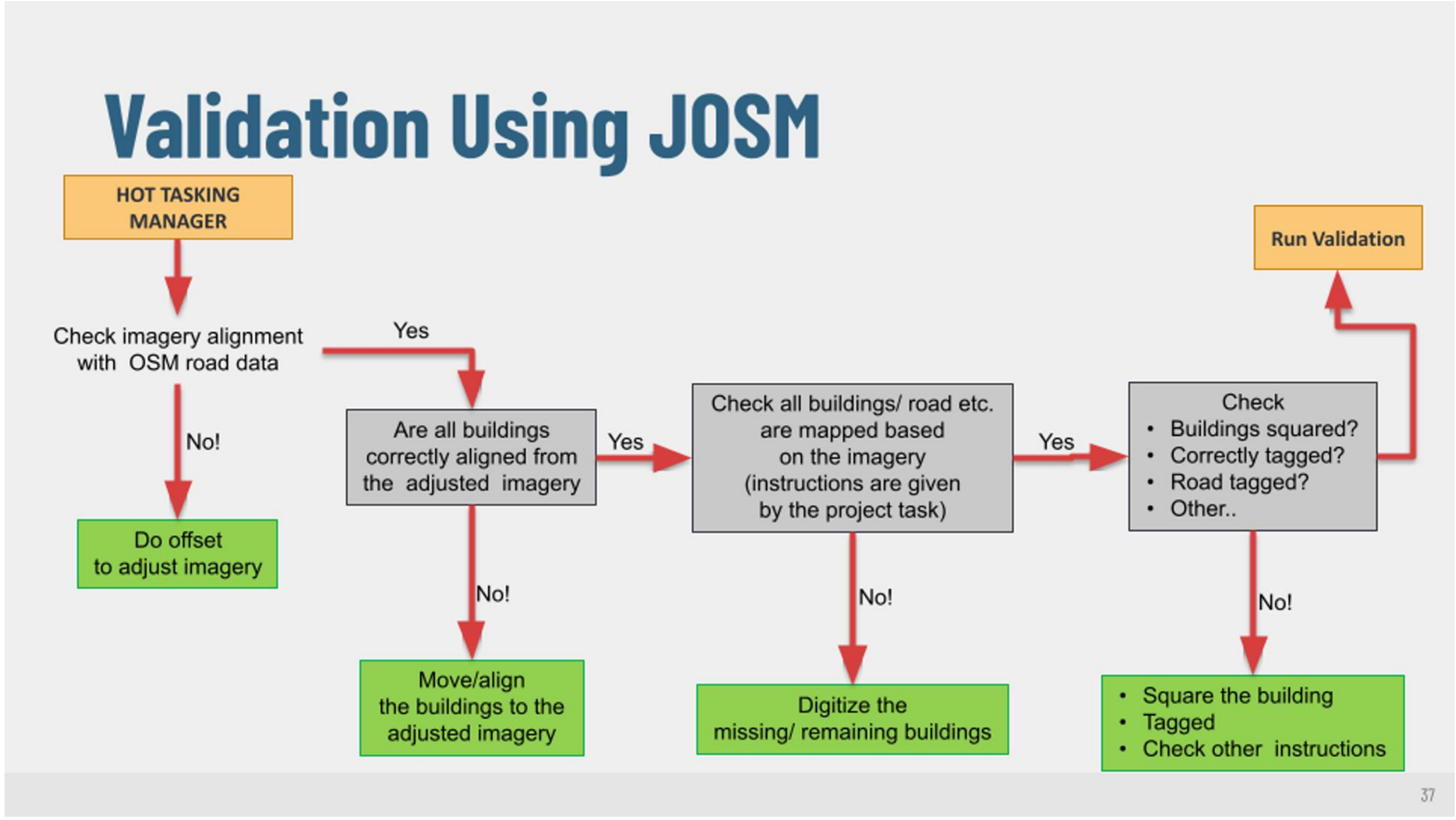
Human-Centered Editing:

Experienced contributors or groups manually review data changes to ensure accuracy and consistency. This includes fixing errors, refining tags, and validating work done by new users.

Existing DQA in OSM



Key	Values
amenity	grave_yard
landuse	allotments, cemetery, farmland, forest, grass, greenfield, meadow, orchard, recreation_ground, village_green, vineyard
leisure	garden, golf_course, nature_reserve, park, pitch
natural	wood, scrub, health, grassland, wetland
tourism	camp_site

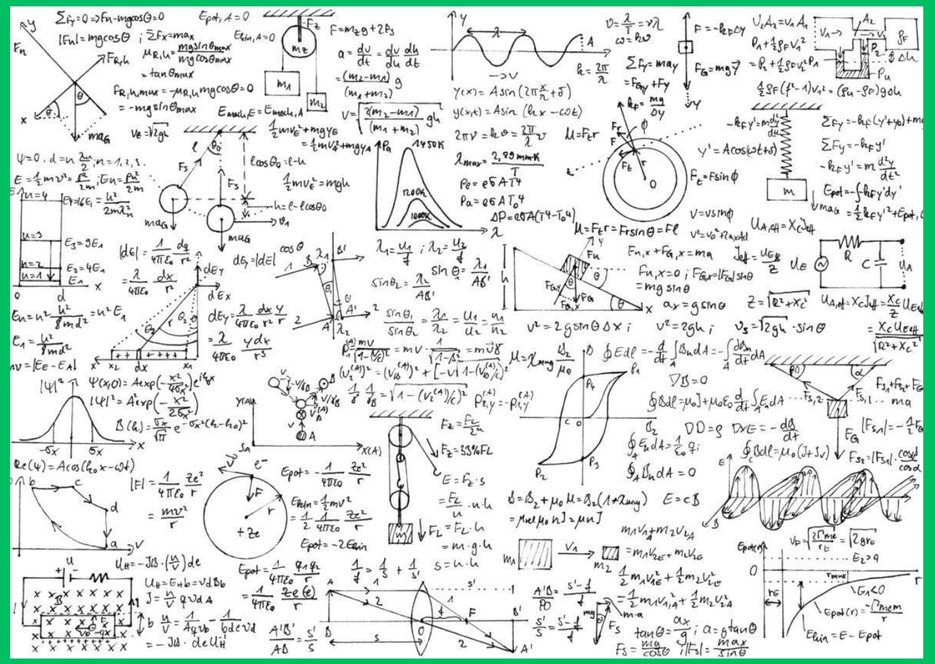


Existing DQA in OSM

AUTOMATED CONTRIBUTION:

Tools like OSMCha, Keep Right, and MapRoulette use algorithms to identify potential issues (e.g., missing tags or invalid geometry).

These tools help humans focus on fixing identified errors but do not make edits autonomously.



Limitation of OSM Data Quality

(Observed by Researchers over the time)

- VGI data accuracy is inconsistent due to the lack of standardized quality assurance processes (**Tavra, 2023**).
- OSM achieves high positional accuracy in urban areas,, but rural areas remain less reliable (**Girres & Touya, 2010**).
- VGI's non-hierarchical nature creates challenges in ensuring data reliability and fitness-for-purpose (**Antoniou, 2023**).
- Inconsistent tagging practices among contributors hinder data standardization and usability (**Girres & Touya, 2010**).
- The quality of OSM data is inconsistent because it is contributed by volunteers with varying levels of expertise.(**Girres & Touya, 2010**).

Limitation of OSM Data Quality

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- Inconsistent Contributions
- Data incompleteness
- Lack of Ground-truthing
- Tagging Inconsistencies
- Quality Control Initiatives
- Automated Tools Limitations
- Vandalism and Data Corruption
- Language and Cultural Barriers
- Time and Resource Constraints

Recommendation - Operational

- Training & Capacity Building for Contributors
- Certifications, award & other incentives for contributing accurately
- Crowdsourced Ground-truthing
- Increase human intervention
- Update automated tools and include AI
- Introduce additional features & algorithms (like a road shows red because it was updated earlier than 10 years)
- Use free areal images to validate data rather than satellite image

Recommendation - Strategic

- **Raising fund** for data quality check & accurate data acquisition
- **MoU** with similar entities to work collaboratively
- **Recognition Program** for volunteers

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Providing free data was a big step, but now it is time to make it accurate

Question/Feedback?