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Geographical Names****Second session**

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**Item 14 of the provisional agenda *
Toponymic data files and gazetteers****The development of a geographical name information system to
accelerate geographical name standardization in Indonesia**

Submitted by Indonesia**

Summary

SAKTI (Sistem Akuisisi Data Toponim Indonesia), an application developed for the Android operating platform, was initially developed by the Geospatial Information Agency (Badan Informasi Geospasial) in 2016 for the acquisition of geographical names data in Indonesia. The need to accelerate the processing and verification of geographical names led to the development of a web-based version of the application in 2017. In the following year, the Agency developed SINAR (Sistem Informasi Nama Rupabumi), a web-based application to facilitate the publication of geographical names and the information related to the standardization of geographical names. Since then, SAKTI has been used by ministries, agencies and local governments for the standardization of geographical names. In addition, SINAR has been the main platform that the public can use to access geographical name data, including the gazetteer.

A new regulation on geographical name standardization (government regulation Nr. 2 of 2021), encourages the integration of SAKTI into SINAR to become a single system. The regulation endorses that the system supports the active involvement of local governments and encourages citizen participation by giving access to all entities so that they can contribute, collaborate and engage in geographical name data acquisition, verification and publication. SINAR has been developed according to a new business process set out in the new regulation. It has led to new modules, changes in the system flow and the introduction of new actors into the system.

Recently, the Geospatial Information Agency developed the Gegas and @lit mobile applications. Gegas integrates a 360-degree camera, which it uses for data acquisition on a moving vehicle or a platform. The @lit application is a light-weight and simpler version of SINAR. The two applications could encourage more citizens to participate by contributing to geographical names data acquisition.

The development of SINAR as the primary instrument of geographical name standardization in Indonesia will be discussed in more detail in the full report, together with the challenges of increasing the system's efficiency and capacity to overcome the lack of data in Indonesia

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Introduction

SAKTI developed to accommodate geographical names data acquisition in Indonesia. Instead of using conventional instruments (surveying form, GPS devices, camera, and voice recorder) to collect toponym data, SAKTI would incorporate all the abilities inside a smartphone. It is expected that users can minimize data entry errors, reduce the risk of losing scattered data, and spend less time processing the data. This development was reported in the Eleventh United Nations Conference on the Standardization of Geographical Names (E/CONF.105/85/CRP.85).

Further, the need to accelerate the geographical names processing and verification process led to the development of a web-based version of the application in 2017. This web version facilitates users to process the toponym data that was already collected using the Android version. In the following year, BIG developed a web-based application named SINAR to facilitate the publication of the geographical names and the information related to the geographical names standardization process activities (news, work plan, progress, and activities report). Since then, SAKTI has been used actively by Ministries/Agencies and Local Governments in the geographical names standardization process. On the other side, SINAR has been the main gate for the public to access geographical names data, including Gazetteer.

The new regulation on geographical names standardization (Government Regulation Number 2 of 2021) induces the integration of SAKTI to SINAR to become a single system. The regulation also endorses the system to support the local governments for active involvement and encourage citizen participation by opening all entities' access to contribute, collaborate, and engage in geographical names data acquisition, verification, and publication. The new SINAR developed according to the new business process imprinted on the new regulation. It led to applying new modules, changing the system flow, and introducing new actors into the system. The system flow changed from Data Acquisition, Verification, and Confirmation into Data Acquisition, Verification, Announcement, Confirmation, and Name Change. The development should consider the user-friendliness and accessibility of the application to engage the users for a long term-use.

Methodology

BIG performed analysis and evaluation for the initial step to acquire the previous systems' lacks and bugs (SAKTI and SINAR). The business process from the government regulation is then interpreted into the system requirements and user roles. SINAR will be used by various ministries, local governments, and the public. Each user will have a specific function depending on its role in each stage of the geographical standardization process. BIG developed the application to accommodate these purposes. It goes through meticulous tests and evaluations to ensure all features and functions run as designed.

In the current state, Indonesia's internet connection is not homogenous in terms of stability and speed. The condition makes the system development an advantageous task. Therefore, BIG has to upgrade several components such as server architecture, data storage, logging capabilities, and application security services to ensure the system is accessible for all users.

Development of SINAR

The current application development is focused on the integration of the previous system (SAKTI) to SINAR. Whereas the "new" SINAR will be the single tool to perform geographical name standardization, from data acquisition up to gazetteer publication. Moreover, the development also accommodates the changing system flow, adding new modules and introducing new actors into the system. The Android version of SAKTI is developed by rebranding it into Android SINAR with bugs fixing and upgrading the Android and related libraries. The integration process of web-based SAKTI into SINAR involved developing new modules, the implementation of new system flow, and actors led to the significant transformation in the web-based version of SINAR. The new modules implemented in

the system include the data acquisition modules (both participatory mapping and crowdsourcing), suggesting unnamed feature module, announcement module, and name changing module.

Following the new regulation, the application is now open for the public to access. It is shown on the modules of participatory mapping, crowdsourcing, and unnamed feature suggestion. As an open-access application, SINAR implements a social media login function in the system. This function simplifies the sign-in and registration process, also providing a convenient alternative to mandatory account creation. With all the open-to-access features above, all entities can contribute and overcome the lack of toponym data availability.

BIG, in this case, should anticipate the potential negative consequence from this open access procedure. One of the typical excesses of an open-system is junk data. This kind of data can fill the storage fast and burden the system. Therefore, the garbage is reduced by taking only the reliable/proven source of information. It serves as one of the significant parameters to determine the data quality. Apart from that, users from government officials who perform data verification need to provide an assignment paper to show their competence to maintain data quality.

One of the significant improvements in the business process is to enable the public to contribute to the standardization process. At the announcement stage, every citizen or organization may give comments, suggestions, or corrections to the already-verified geographic names. It engages the citizen to provide corrections on geographical name data such as writing, transcription (voice recording), features location, and other relevant information.

Last but not least, SINAR also provides a module to enable everyone to propose name changing. Any name can be subject to change, even if it already exists in the Gazetteer. The module consists of name changing and a name deletion feature. This module also supports the government and related parties to verify the proposal and make decisions.

This development also improves the documentation of the geographical name standardization process. In the previous system, the verification process is summarized in an official document that is generated manually. In the new system, the report is automatically created by the system. This function supports the system administrator in maintaining and standardizing all reports on verification activities.

Moreover, SINAR facilitates other modules and functionalities, as follow:

1. SINAR Android provides an official base map service provided by BIG; offline base map; tracking function; marking as a point-line-area feature; standardized database; input up to four photos and audio recording (pronunciations); and display surrounding toponyms.
2. Web-based SINAR provides exporting data to interoperability format (shapefile and GeoJSON), toponym data management, and online gazetteer. The online gazetteer is equipped with an advanced search function. It allows users to look for names by 1) name element; 2) feature location (by area and coordinate); 3) feature type; and other categories.

Further Development

Nevertheless, the new-developed SINAR has its caveat. Since it is created with the capability to document all attributes of an object's data as much as possible, in a certain way, it becomes impractical in the situation where the survey is intended only to acquire names in quantity and limited time. Additionally, the typical user might not be interested -or have the time- to fill all the attributes provided by SINAR android. To overcome the possibility, recently, BIG started to develop a variant of SINAR, namely SINAR @lit.

SINAR @lit is introduced as a light-weight and simpler version of SINAR-android. SINAR @lit intends to use users from all entities. The users only need to collect the photo and name of the object. The simplification of the form collection makes it easier and faster for data collection.

Another potential is the utilization of moving platforms/vehicles to speed up data acquisition. For this purpose, another adaptation of SINAR is developed: SINAR Gegas. It utilizes and integrates the camera 360° for data acquisition on a moving vehicle/platform. Gegas facilitate users to collect

geotag photos using time-lapse mode without marking process. The advantage of this surveying method can cover a large area per day.

Conclusion

The utilization of SINAR as the primary instrument in Indonesia's geographical name standardization process brings significant impacts. The data acquisition using SINAR Android is easier and faster than the conventional one. Meanwhile, the web-based SINAR offers a seamless and integrated process in the standardization of the geographical names from data acquisition to publication.

As an online application, SINAR enables everyone to access the application at any time and any location. SINAR utilization can be the solution for pandemic covid situations. It is in tune with the work-from-home culture and minimizes the physical meeting while ensuring the continuity of geographical name standardization.

SINAR @lit becomes suitable for simple and easy data collection. It also embraces the spirit of engaging with the broader user. Simultaneously, SINAR Gegas could be utilized as a tool for acceleration in toponym data acquisition, as it can have a more extensive area and faster survey process.

The group of experts is invited to express its view on the way forward concerning the development concept on the technical paper.