INDONESIAN JOURNEY: USING MPD TO ENRICH TOURISM STATISTICS

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Alfatihah Reno
Statistics Indonesia
Introduction: Legal Basis

legal basis for MPD data processing

1. Laws that authorize BPS to collect data: The Indonesian Statistical Law No. 16 of 1997 legally protects the confidentiality of individual data and information, which states that the conductor of statistical activities must ensure the confidentiality of the information obtained from respondents.

2. Personal data protection:
   - Customer data used for BPS purposes can be accessed by BPS in the condition that MSISDN is masked, and geolocation is masked in the regulations still in the same sub-district (3rd level Local Administrative Unit);
   - For in-depth research purposes, BPS can access raw data with MSISDN, if BPS manages to get approval from the customer to collect the data;
   - Disseminated data is aggregated to a certain regional level.
   - Access to data is done by sandboxing, the data does not leave the MNO.
Introduction: Roadmap

the use of MPD is continuously being developed

- 2017 - Inbound Tourists (Crossborder)
- 2018 - Domestic Tourists (Inter City); Point of Interest; Outbound Tourists
- 2019 - Commuting Statistics; Delineation on Metropolitan Statistical Area; OD Matrix; MPD for disaster
- 2020 - ICT Indicators
- 2021 - Working with three operators (Outbound)
- 2022 - Update on MPD procurement procedures
- 2023 - Domestic Tourists (Inter City)
Basic Concept: Usual Environment
Understanding mobile subscriber mobility

For algorithm development purposes, especially accuracy in location estimation, BPS recruited several volunteers and can access their MPD data with their consent.

For the usual environment (AMDA) algorithm used by BPS, see: https://proceedings.stis.ac.id/icdss/article/view/239
Basic Concept: Defining Trips
Understanding mobile subscriber mobility

A trip is defined as a journey from one usual environment to another. On each trip, there can be visits to several places, but it is necessary to determine the main destination of the trip. Please note that anomalies in the data, such as fast movers, could affect your analysis. For that, data cleansing needs to be done.
Routines
steps in producing statistics

Data Collection
Quality Gates: Data Input
Data Calculation
Quality Gates: Data Output
Publish

more details about QAF on MPD: https://proceedings.stis.ac.id/icdsos/article/view/134
## Combine Methods: MPD + Surveys

Surveys enrich the information obtained through the MPD, and are no longer the main source of data.

<table>
<thead>
<tr>
<th>MPD + Digital Survey</th>
<th>Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin</td>
<td>Origin</td>
</tr>
<tr>
<td>Destination</td>
<td>Destination</td>
</tr>
<tr>
<td>Length of Stay</td>
<td>Length of Stay</td>
</tr>
<tr>
<td>Length of Journey</td>
<td>Length of Journey</td>
</tr>
<tr>
<td>Purpose of Trip</td>
<td>Purpose of Trip</td>
</tr>
<tr>
<td>Demographic</td>
<td>Demographic</td>
</tr>
<tr>
<td>Expenditure</td>
<td>Expenditure</td>
</tr>
<tr>
<td>Modes of transportation</td>
<td>Modes of transportation</td>
</tr>
</tbody>
</table>

[https://unece.org/sites/default/files/2021-09/DC2021_S4_Indonesia_Putra%20Munaf%20Ruslani_AD.pdf](https://unece.org/sites/default/files/2021-09/DC2021_S4_Indonesia_Putra%20Munaf%20Ruslani_AD.pdf)
### Frequently Asked Question

What about those who do not use the phone? What about multiple SIM cards? What about other MNOs?

In the national socio-economic survey, we added a question about the use of communication devices. The results will be used in estimating the actual number with the customer mobility data we obtain from MPD.

<table>
<thead>
<tr>
<th>No. Urut ART</th>
<th>Dalam 3 Bulan Terakhir, Apakah (Nama) Meninggalkan Telepon Seluler (HP)/Nirkabel untuk Kepentingan Komunikasi?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ya</td>
<td>1. Ya</td>
</tr>
<tr>
<td>5. Tidak</td>
<td>5. Tidak</td>
</tr>
</tbody>
</table>

- Using/not using cell phones
- Have/don't have cell phones

The type and number of SIM cards used.
## Comparison

<table>
<thead>
<tr>
<th>No</th>
<th><strong>MPD Approach</strong></th>
<th><strong>Household Approach (Conventional)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Estimates for smaller areas: districts/cities</td>
<td>Estimates up to the provincial level</td>
</tr>
<tr>
<td>2</td>
<td>Monthly data period</td>
<td>Yearly data period</td>
</tr>
<tr>
<td>3</td>
<td>No surveyors needed</td>
<td>The number of surveyors needed depends on the number of samples</td>
</tr>
<tr>
<td>4</td>
<td>With a more detailed level of estimation, the required budget is only around IDR 15 billion</td>
<td>To conduct a conventional domestic tourist survey, a budget of around IDR 30-40 billion is needed (based on the 2018 and 2019 conventional domestic tourists survey budget).</td>
</tr>
<tr>
<td>5</td>
<td>It has the potential to be able to generate statistics for domestic tourists monthly</td>
<td>Can only generate statistics for domestic tourists on annually</td>
</tr>
<tr>
<td>6</td>
<td>The solution for collecting data for domestic tourists during the covid-19 pandemic, no door-to-door interviews needed</td>
<td>The Covid-19 pandemic condition limits conventional data collection activities</td>
</tr>
<tr>
<td>7</td>
<td>MPD can be used for other statistical calculations</td>
<td>One activity is only used for one type of statistical calculation</td>
</tr>
</tbody>
</table>
Result
Domestic Tourism – Inter City

Indonesia Domestic Tourism 2019
Sumber: Analisis Mobile Positioning Data

Estimasi Jumlah Trip
41,979,861
Result
Inbound Tourists
Thank you

mpd@bps.go.id
About Me

Alfatihah Reno M.N.S.P. Munaf

I started exploring and researching MPD in 2017. With the successful implementation of MPD for official statistics, I was assigned to study new data sources using big data for statistical indicators.

You can contact me via: alfa@bps.go.id
The Team

Sinung
Data Architect

Aditya
Data Engineer

Calvin
Data Scientist

Apri
Data Scientist