Mobile data pilot for tourism statistics and for seasonal population

• Objective was to obtain pilot data from all three Finnish mobile network operators.

• a process description which details how aggregate tourism statistics can be compiled based on MNO CDR data

• covers inbound and outbound tourism

• Seasonal population covers the population estimation during certain weekdays and weekends on January and during the main summer holiday season (on July).

• Pilot has made progress with 2 out of 3 Finnish MNOs.
Process description

OPERATOR 1

RAW CDR MICRODATA
- SUBSCRIBER ID
- MOBILE COUNTRY CODE
- EVENT TIME
- GEO LOCATION

PROCESSED MICRODATA
- SUBSCRIBER ID
- TRIP / VISIT ID
- TRIP / VISIT DURATION
- MONTH
- COUNTRY CODE
- GEO REGION (NUTS 2)

AGGREGATE DATA
- YEAR
- MONTH
- COUNTRY
- TYPE OF TRIP / VISIT
- DURATION
- NUMBER OF TRIPS / VISIT

OPERATOR 2

RAW CDR MICRODATA

PROCESSED MICRODATA

AGGREGATE DATA

OPERATOR 3

RAW CDR MICRODATA

PROCESSED MICRODATA

AGGREGATE DATA

Statistics Finland
# Current status of datasets – 2018

<table>
<thead>
<tr>
<th>MNO</th>
<th>Outbound tourism</th>
<th>Inbound tourism Finland</th>
<th>Inbound tourism regions</th>
<th>Seasonal population</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNO 1</td>
<td>2017 OK</td>
<td>2017 OK</td>
<td>2017 OK</td>
<td>2017 OK</td>
</tr>
<tr>
<td>MNO 2</td>
<td>2017 OK</td>
<td>2017 OK</td>
<td>2017 OK</td>
<td>2017 OK</td>
</tr>
<tr>
<td>MNO 3</td>
<td>N / A</td>
<td>N / A</td>
<td>N / A</td>
<td>N / A</td>
</tr>
</tbody>
</table>
Monthly outbound tourism 2017

Graphs have been excluded in this version. Please contact, if you find the presentation interesting.

All sources have a consensus on monthly seasonality. Stat registered 10% more trips in Mar-May.
Special case – Outbound Tourism to Estonia

- Trips to Estonia are 25% of outbound tourism
- Most trips to Estonia are made via ferry
- Census of (all) ferry passengers to Estonia is available for comparison
- Monthly trips are presented as a percentage of annual total
Outbound trips to Estonia

Randomness in survey data

All data sources are mostly in consensus, but survey data is affected by randomness -> estimate is often too much or too little

Helsinki is now the busiest passenger port of the world with 12 million people.
Outbound trips to Spain (Top 3 destination)

MNOs are in consensus with each other, they differ only 0.5% units. Survey trips are greatly affected by randomness.
Outbound trips to Thailand (a winter destination)

Randomness in survey data:

MNOs are in consensus with each other.
Survey trips are affected by randomness.
No survey observations in May – Sep.
Outbound tourism conclusions

- The two MNOs have independently of each other provided data for outbound tourism.
- MNO outbound data sets are in consensus with each other.
- MNO data sets are describing the same ’elephant’.
- There is high correlation to survey data also…
- …but survey is affected by randomness.
- Smaller the destination → less trips → more randomness.
- Preliminary conclusion – MNO outbound data should be used to mitigate randomness in the survey data.

17 October 2018
Pasi Piela
Inbound tourism to Finland

• Similar comparison of inbound trips was done for time period 02 / 2017 – 12 / 2017.

• The total number of non-resident arrivals in accommodation establishments is used as a frame to which the number of overnights trips in MNO data is extrapolated.

• Accommodation statistics is not a perfect point of reference, it does not cover day trips or non-paid accommodation
There is general consensus on inbound tourism monthly season in all sources.
Inbound trips from Russia
Inbound trips from Sweden
December is a high season for UK visitors, which is reflected most in accommodation statistics but also in MNO data.
Conclusions – Inbound tourism

• There is a general consensus on monthly seasonality
• MNOs have different market shares depending on country of origin -> data from all 3 MNOs is needed for full picture
• Neighboring countries (EE, SE, NO, RU) have far more trips in MNO data than in accommodation statistics.
• Main inbound countries Japan and China seem to be underrepresented in MNO data?
Mobile data for estimating seasonal population

- Mobile positioning data for seasonal population contains number of subscribers by municipality in Finland
- Data has been provided by two Finnish mobile network operators
- There are four different time periods
  - Weekdays in winter (January)
  - Weekend in winter (January)
  - Weekdays in summer (July)
  - Weekend in summer (July)
- Each subscriber is assigned to the municipality with the greatest number of transactions (call / sms / data) within the period
- Data from operators have been combined and extrapolated to total 2017 population of Finland (5,479 million)
Population of the capital, Helsinki
Seasonal population conclusions

- Seasonal population requires more data, that is the third operate to participate: market share varies on municipality level.
- Municipality level is enough for Statistics Finland
- It is easy to see how populations differ greatly between weekdays and weekends and especially between the summer holiday peak season and the winter season (out of winter holidays).
Conclusion

• … and the story continues, new negotiations ahead.
Kiitos mielenkiinnosta!

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