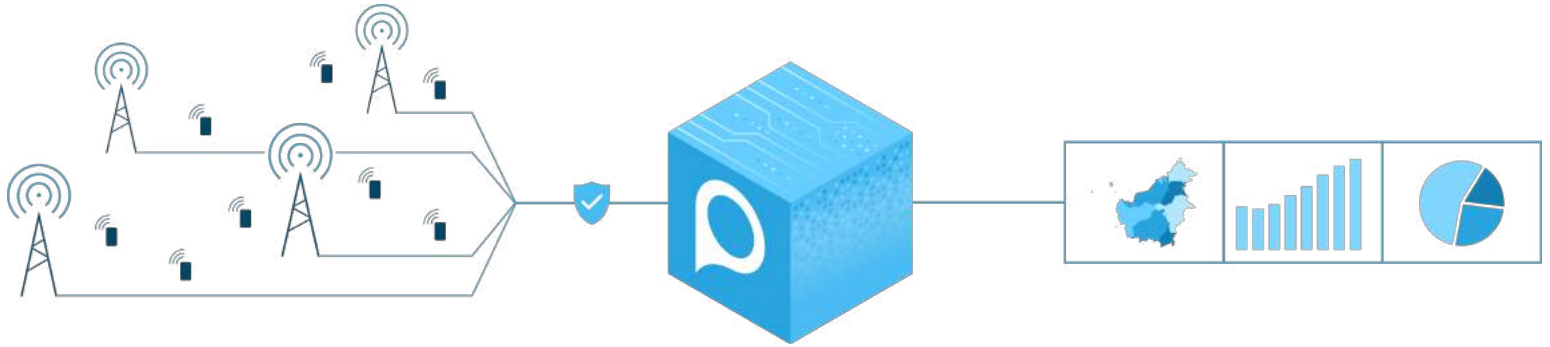
Positium Data Mediator: Official Statistics from Mobile Positioning Data

Cases of Estonia, Indonesia and Oman

About Positium



Why

We provide good data and analytics for better decision making, to make a difference to society

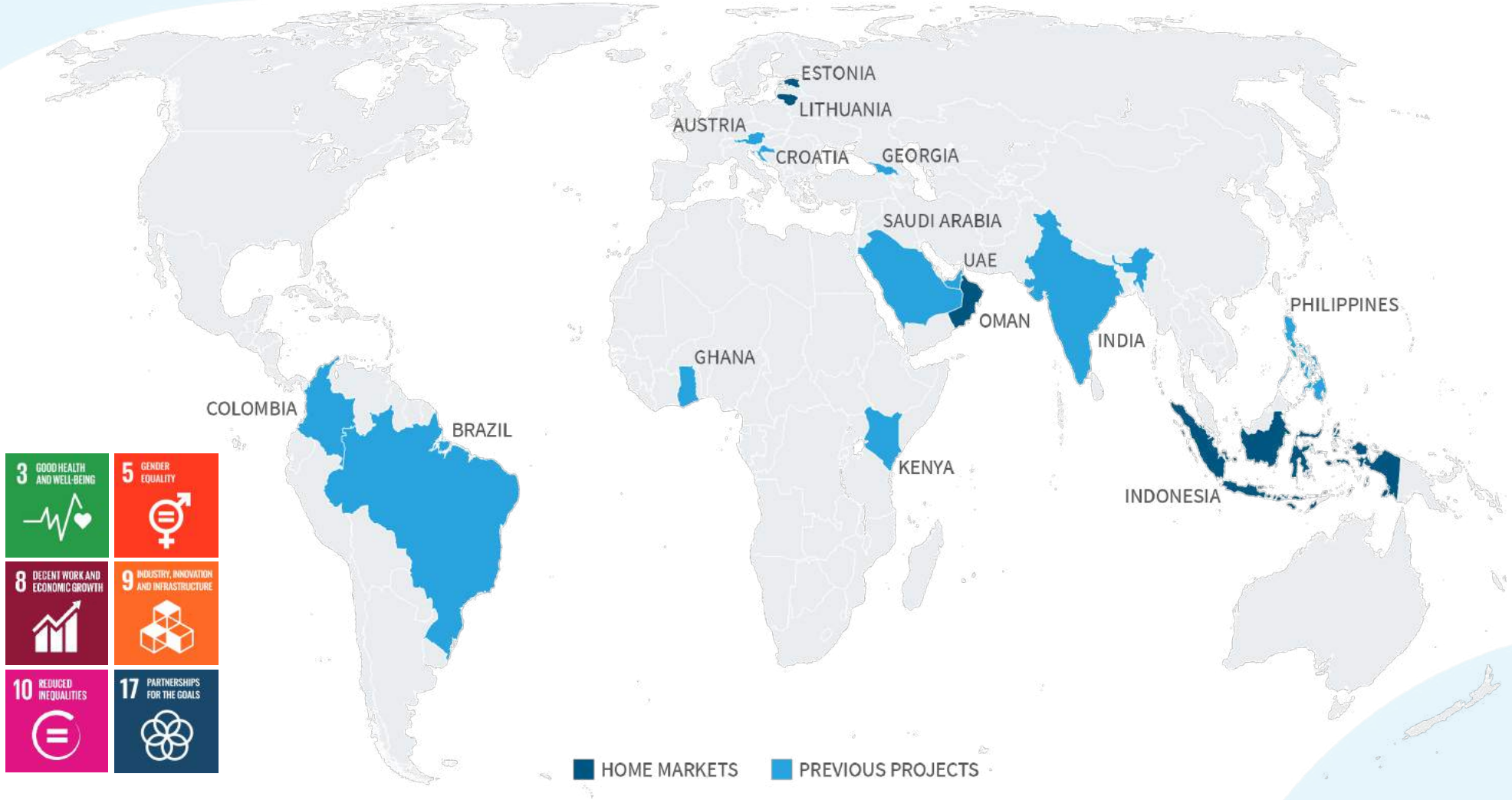
What

Methodology and technological platform for processing mobile positioning data for human mobility monitoring, analyses and statistical indicators

How

We are constantly looking for innovation and solutions for common problems and challenges, while always prioritising quality

Positium MPD Projects Globally



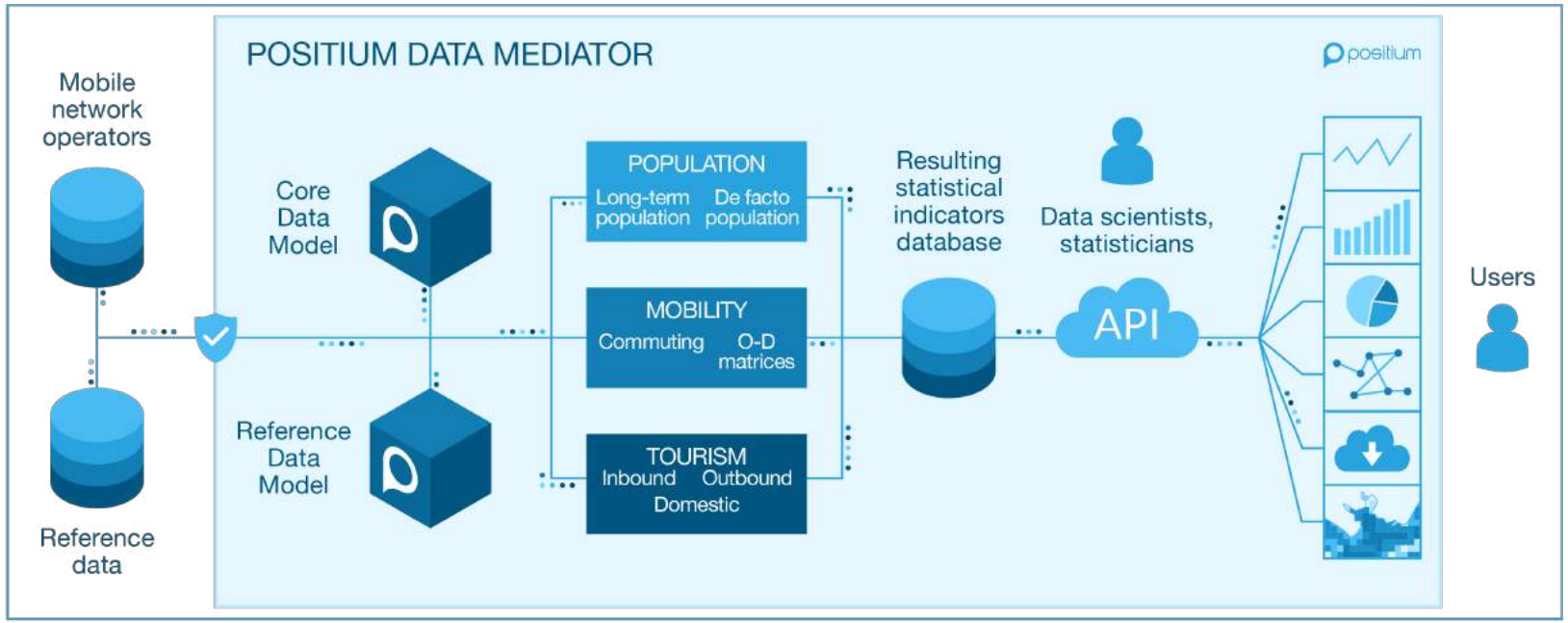
Positium Data Mediator

A platform for processing mobile positioning data (MPD) into statistical indicators

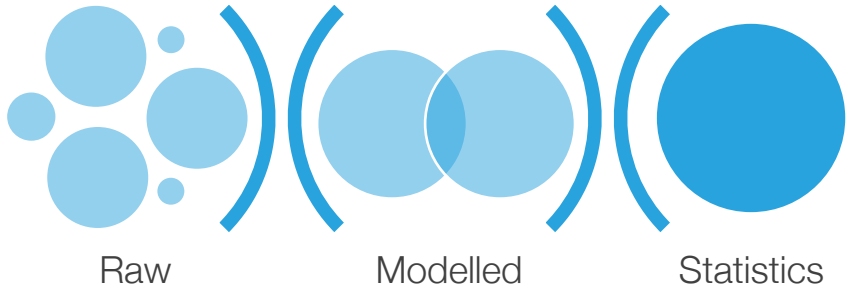
Platform for extracting and processing mobile positioning data into specific applications (population, de facto population, tourism, mobility and commuting, OD-matrices, footfall, heat-maps, event identification, etc.).

Positium Data Mediator:

- Data from one or several mobile network operators
- Central or distributed implementation (NSO or distributed to MNOs)
- Aggregated results extrapolated to general population
- API for data dissemination (SDMX, JSON, XML)
- Visual applications & dashboards



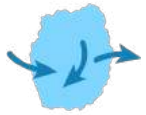
General Data Model for All Domains



- Each subscriber’s data is modelled
- Data model matches official definitions
- Statistical concepts are applied in late data processing
- Allows combining and comparing results for many domains
- Most useful for official statistics

Methodology

The methodology for processing mobile positioning data has been developed with University of Tartu



Inbound, outbound and domestic data

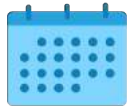
Raw data cleansing, formatting, preparation and QA

Anchor point model for identification of Country of Residence, Place of Residence, work-time, second home, Usual Environment, and other regular meaningful locations

Spatial calculations based on adaptive grid

Continuity data model for most realistic representation of reality model

Identification of regular and tourism trips (inbound, outbound, domestic)

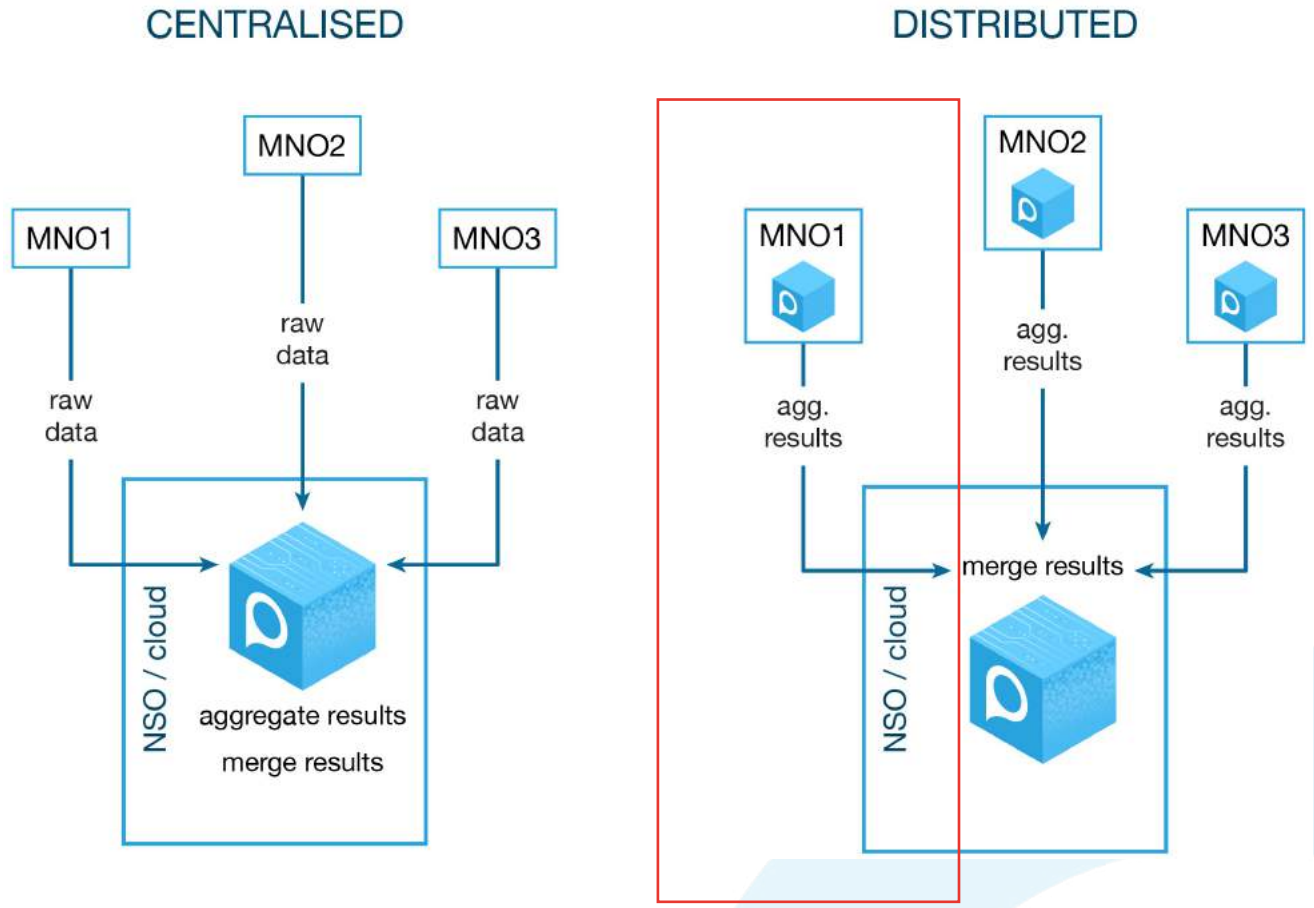


Aggregated statistical indicators for hour, peaks, days, weekdays, weekends, months, quarters, years, or custom periods

Tools for visualisation of data (animations, maps, infographics, applications, dashboards, etc.)

Centralized or Distributed

- Centrally located to NSO or Cloud
- Distributed to MNOs and aggregated data merged centrally



Case: Official Travel Statistics Estonia (2009-…)

Background

2 producers of official statistics in Estonia: Statistics Estonia & Eesti Pank (Bank of Estonia)

Eesti Pank is responsible for external sector statistics

Border-crossing statistics is an important **input for the compilation of Estonian monthly/quarterly balance of payments (BoP)**, where the exports and imports of travel services play a remarkable role

Need for New Data Sources

The rapidly changing external environment forces Eesti Pank to look for new data sources for border-crossing statistics

Growing worldwide travels – challenge for traditional data sources

Estonian membership in the visa-free Schengen Area (no border controls and respective data collection)

Budget cuts in Statistics Estonia in 2009: **quarterly Border Surveys and Travel Agent's statistics were removed from the statistical programme as of 2010**

Cooperation model

Official statistics producer

Specifying Needs
MPD collection through mandate of the Statistics Act

Private 3rd Party Processor

Data collection and processing (monthly)
Calculation of time series
Methodological updates
Maintenance of MPD processing system

Official statistics producer

Data control and validation procedures
Comparison to indirect data sources and logical checks
Estimation of travel exports and imports for BOP (using credit card data)
Dissemination on the web since 2012

Result

Client: Central Bank of Estonia
(the official travel statistics provider in Estonia)

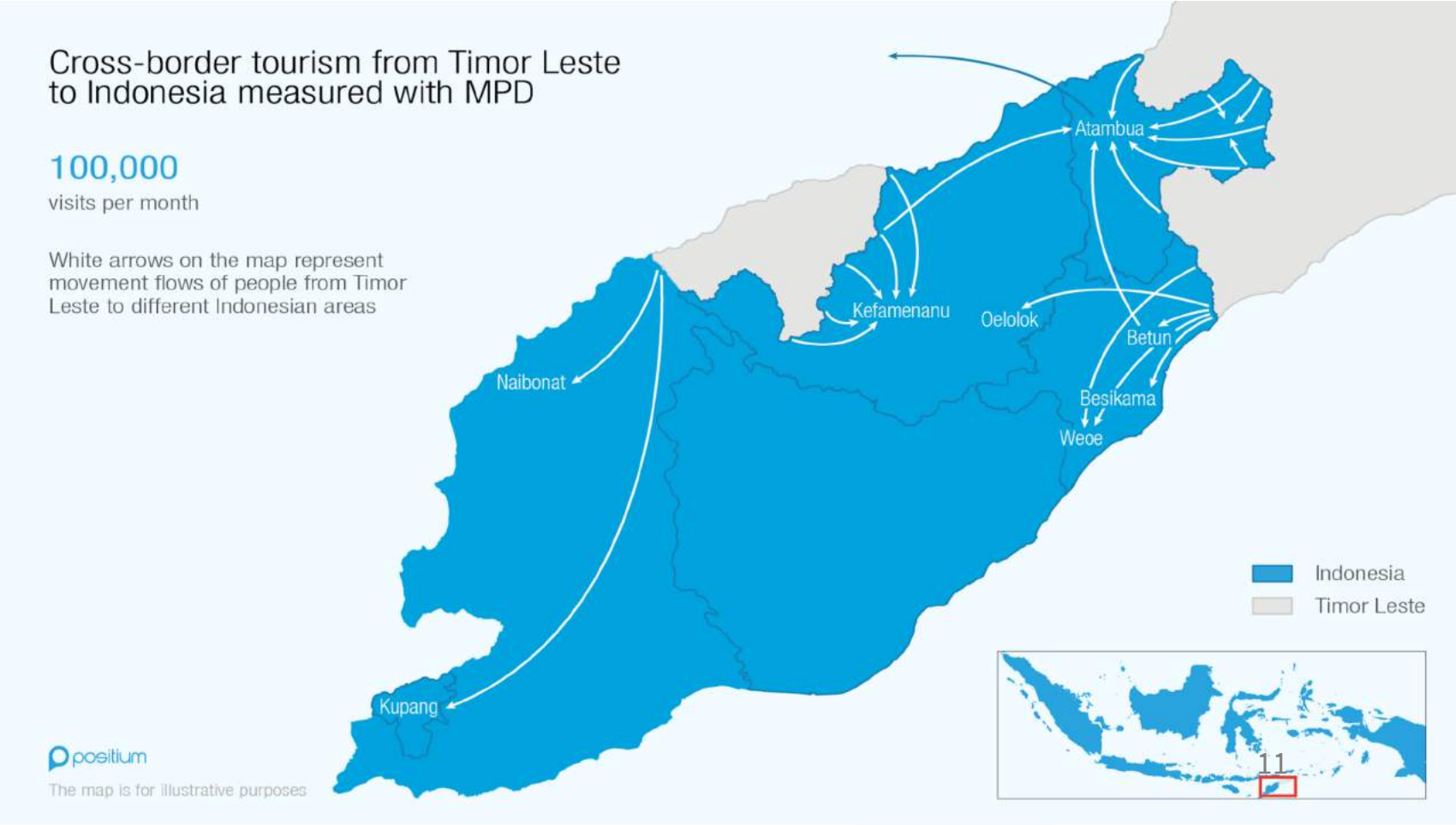
- The longest-running official statistics time series based on MPD in the world – since 2008 – 14 years!
- Quality checks done by statisticians at the bank
- Results compared to survey method:

4x	200x	12x	2.5x	100%
faster	sample size	country-level breakdown	more cost-efficient	less burden on tourists

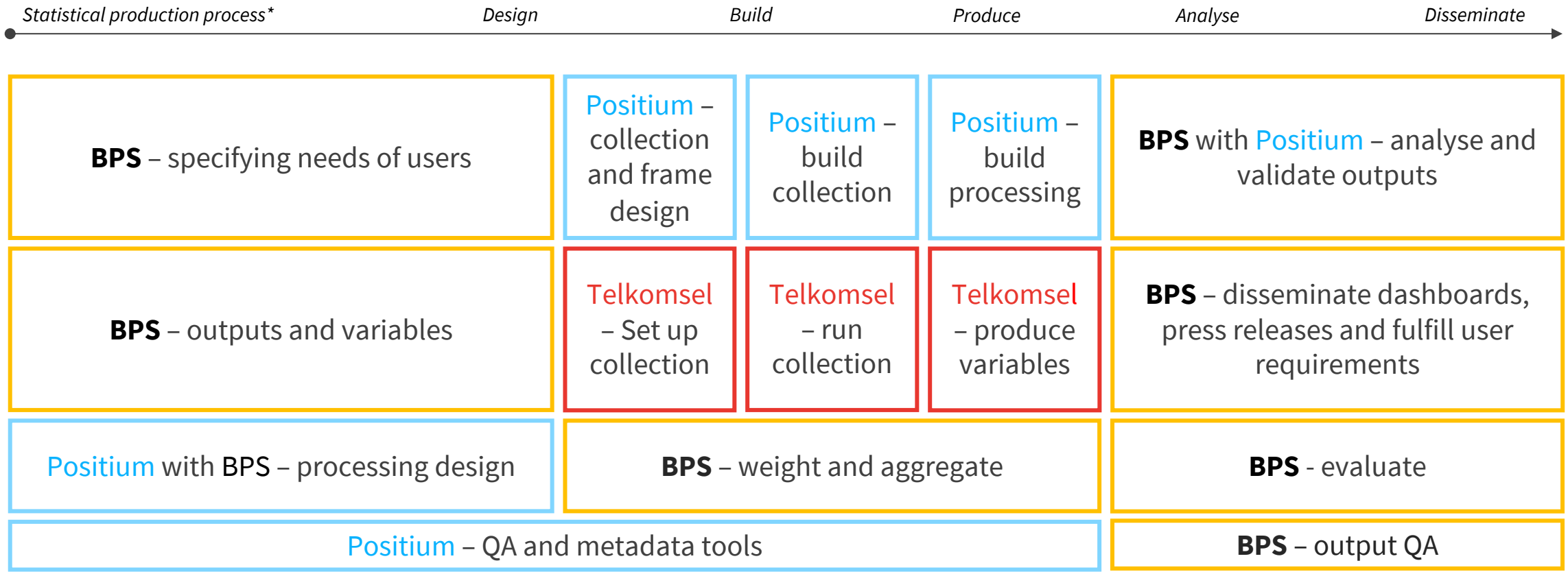
Case: Cross-Border Tourism Statistics Indonesia (2017-…)

300 000 km^2 of border area - measuring the previously unmeasured

Ministry of Tourism / BPS Statistics Indonesia used Positium Data Mediator to measure cross-border tourism

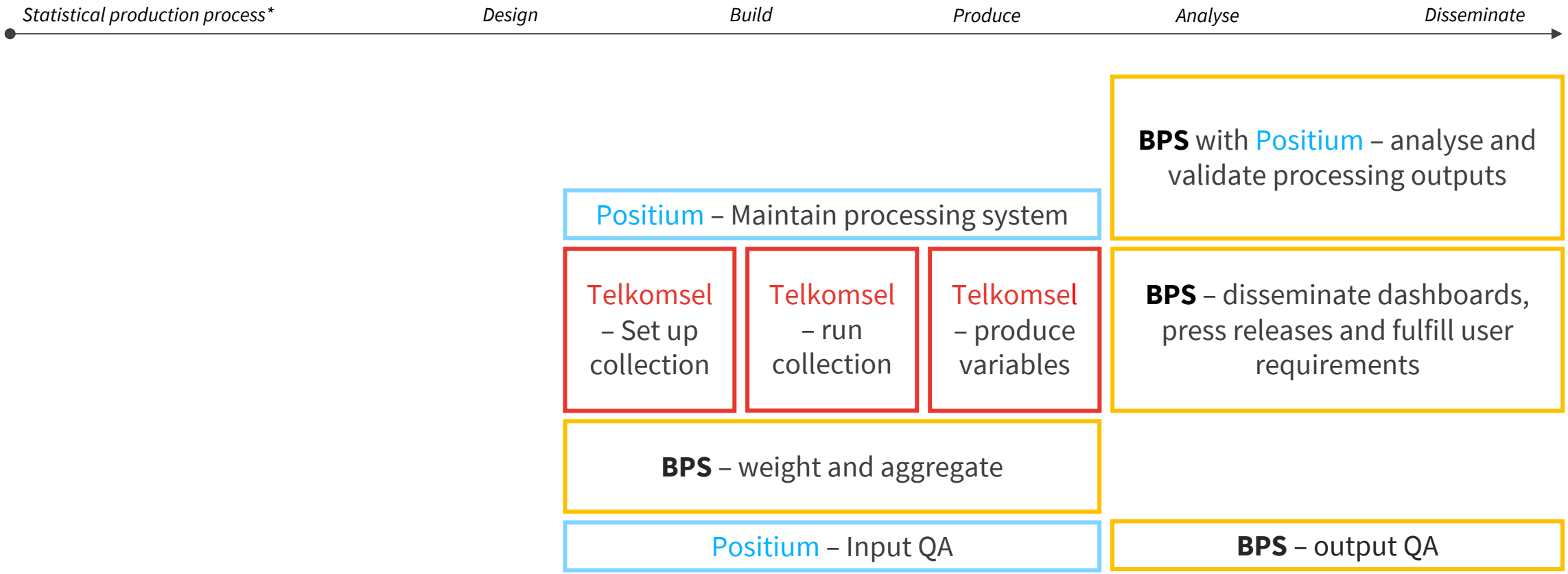


Pilot Project until Implementation



** GSBPM (General Statistical Business Process Model)*

Monthly Production



* GSBPM (General Statistical Business Process Model)

Case: Oman National Statistical System (2021)

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SULTANATE OF OMAN

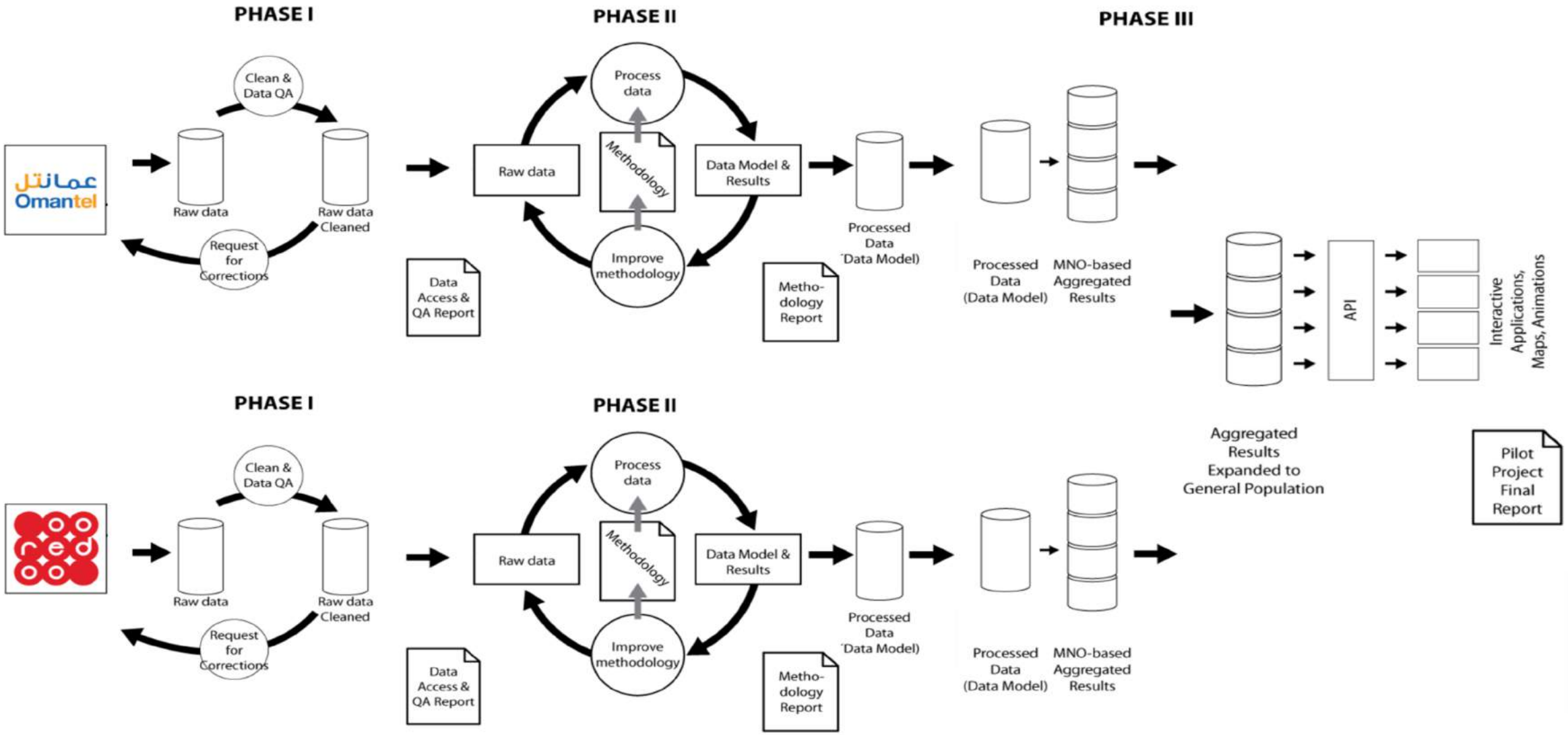
Mobile positioning data for official statistics for the measurement of tourism, population, and commuting in the Sultanate of Oman

Data from 2 Mobile Network Operators (100%)

Processed using 1 system (Positium Data Mediator)

in Government Cloud

Data Flow


PHASE I
PHASE II
PHASE III
Clean & Data QA
Raw data
Raw data Cleaned
Request for Corrections
Process data
Methodology
Raw data
Data Model & Results
Improve methodology
Data Access & QA Report
Metho-dology Report
Processed Data (Data Model)
Processed Data (Data Model)
MNO-based Aggregated Results
API
Interactive Applications, Maps, Animations
PHASE I
PHASE II
Clean & Data QA
Raw data
Raw data Cleaned
Request for Corrections
Process data
Methodology
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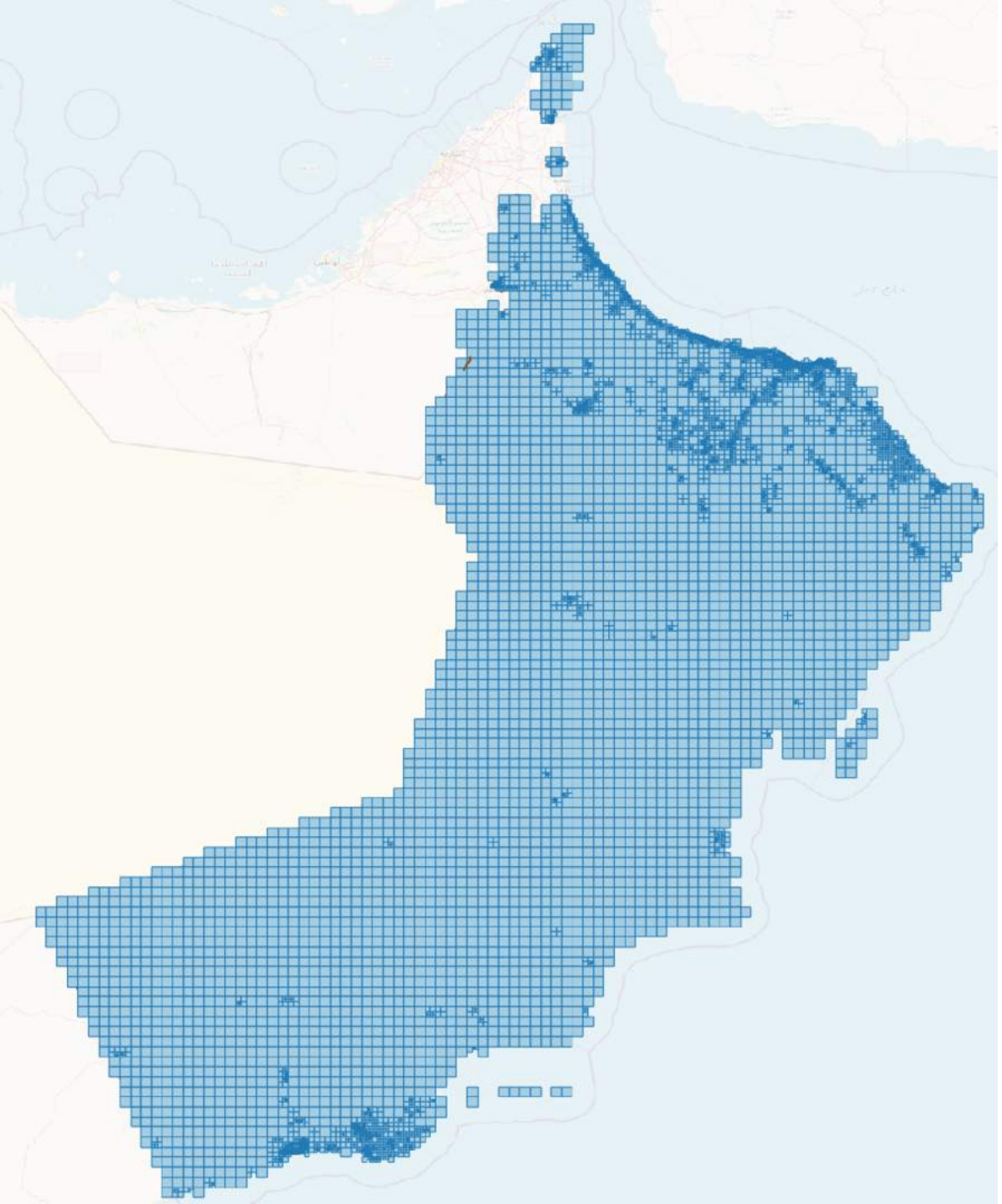
Data Model & Results
Improve methodology
Data Access & QA Report
Metho-dology Report
Processed Data (Data Model)
Processed Data (Data Model)
MNO-based Aggregated Results
Aggregated Results Expanded to General Population
Pilot Project Final Report



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Results based on adaptive grid (grid that adapts to level of activity)

- Home: place of residence
- Secondary home
- Main daytime location
- Other regular locations

Return on Investment

- Faster processing and production of statistical indicators
- No burden on the respondents
- **Supplementary and new indicators, and breakdowns which were previously unavailable**
- Improved temporal and spatial coverage and accuracy of the data
- **Applicability in a wide range of domains**
- **Cost-efficiency compared to the existing methods for same magnitude**

Big Data Project

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SULTANATE OF OMAN

January, 2020

SU	MO	TU	WE	TH	FR	SA
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

Choose layer
Inbound tourism statistics: general

Choose area unit
Wilayat

Day / Month
Day

Choose country
United Arab Emirates

Remarks