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THE MODEL OF AUTOMATION AND EXTENSION OF TOURISM ECONOMIC IMPACT ASSESSMENT IN SPECIFIC REGIONS

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Research Problem

- International tourist arrivals in the world grew by a 7% in 2017 – 4% higher since 2010.
- 311 million people visited NPs in USA in 2017, visitors spending an added value of approx. 2,15 billion dollars in 2016.
- The economic significance of tourism in NP regions of Latvia in 2010 was more than 71,3 million EUR. Such research **has been never repeated** there.
- There are so many current tools, insights, methodologies and innovative technologies used to measure the impacts of tourism across several sectors. **The development of ICT is changing the research methods or approaches. Only a few of them are included in automated or partially automated technical solutions.**
- **Mobile positioning data (MPD)** as Big Data-related data source is one of the most promising ICT data sources for measuring tourism flows. They have great **potential for new spatio-temporal as an innovative tool in social sciences research.**

Research Question

How to automate and supplement the content of tourism economic impact assessment using ICT-enabled capabilities and MPD?

Research Aim

Development of a theoretical model for automating economic impact assessment of tourism and supplementing it with spatial dimension in specific regions.

Research Methods

- Research as qualitative is based on scientific literature and practical findings.
- The study uses the monographic, comparison, abstract-logical methods, synthesis and analysis.
- The conclusions of professional organizations, researchers and practical research results relating to the experience of the estimation of tourism economic impact (EI) assessment, its automation and extension of European, Asian, American countries (especially USA, Finland, Estonia). The methodologies, indicators, data types and sources, technical solutions for automated calculations, potential, problems and limitations have been studied, selected and used.

Results and Discussion

- The **Impact Analysis for Planning (IMPLAN)** (USA, 1976) – software of an EI assessment modelling system what estimates the cross-sectoral economic effects of resource outputs on local communities.
- The **‘Money Generation Model’ (MGM)** (USA, 1995; 2000) – the MGM2 model is an Excel based tool (uses I/O analysis method), available to NP managers in the USA to help gauge the EI of NP visitor spending on local economies.
- The **Finnish standardized EI estimation model** (Finland, 2010) – an Excel-based application ‘Paavo’, applies Excel functions, macros and SQL queries, based on the MGM. The weakness of the model – half-automation.

Models can be used only in administratively defined territories within the region.

- The **methodology for estimating the tourism economic significance** (Latvia, 2012) – based on EI analysis method. The model **can be applied even if the research area is not limited to an administrative territory**. Calculation process is not automated.

- A significant work of passive MPD analysis and usage was done by Estonians – ‘Positium LBS’ in cooperation with the University of Tartu. ‘Positium LBS’ has developed a special software ‘Positium Data Mediator’ for MNO system.
- In preparation for a GDPR, ‘Postium LBS’ has added one more layer for ‘Positium Data Mediator’ called ‘Sharemind’ developed by ‘Cybernetica AS’.
- Their software automatically collects data (call activities of selected roaming service users from the billing memory) from MNO system, processes and encrypt it. After that, researchers can to analyze data.

- The main strengths of MPD is the spatial accuracy and timeline, which allows more precise identification of the number of trips taken, number of nights spent including non-registered accommodation, the duration of visit, frequency of visits, number of unique visitors, and visited places in country or region compared to traditional surveys-based on travellers' honesty and memory (Ahas, Raun, & Tiru, 2014).
- The main advantages of the passive positioning dataset (MNO data) are costs and speed to obtain a huge amount of data.
- MPD can be used as a supplement for tourism statistics and not as a replacement source of data due to the lack of information about the purpose of a trip.

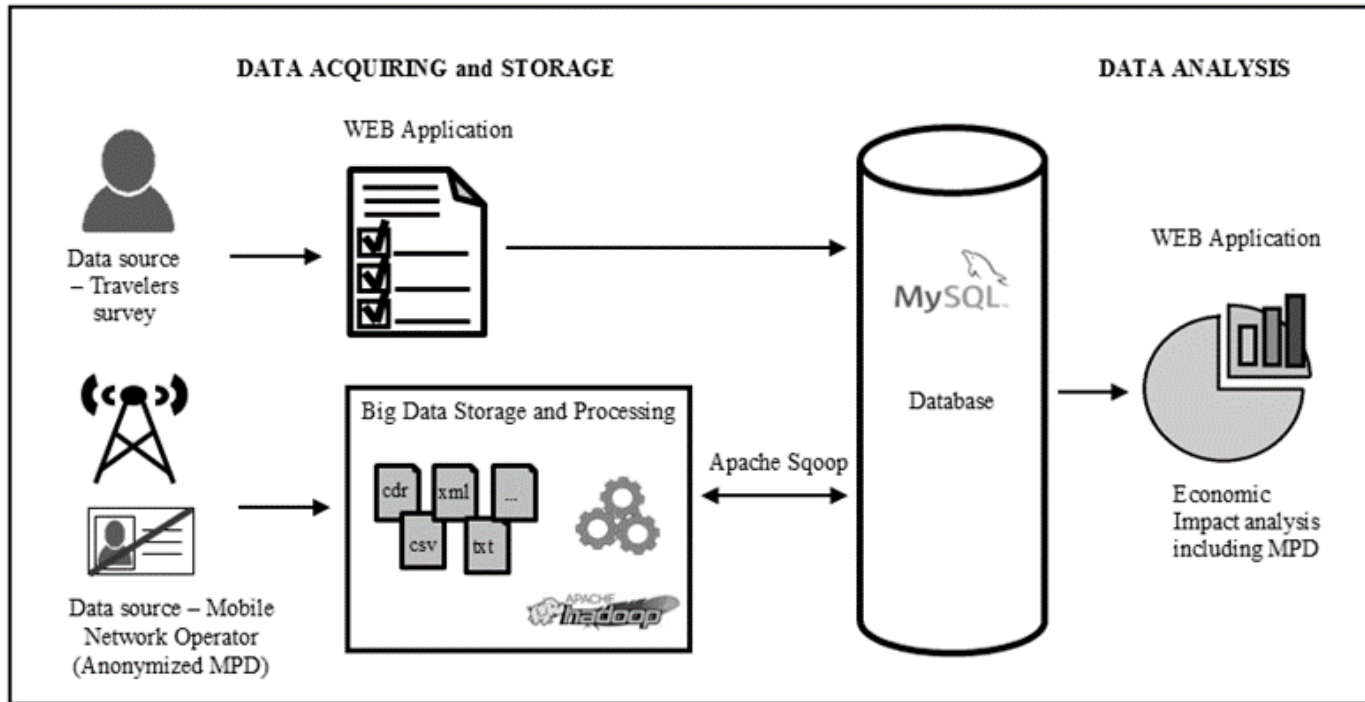


Figure 1. The theoretical model for automating tourism economic impact assessment, and for supplementing it with the spatial dimension (created by authors)

Conclusions

- The assessment of tourism EI in the USA and Finland is based on the use of fully or partially automated technical solutions, but an essential precondition for their use is that the territory to be assessed must have administrative boundaries.
- MPD as a part of the BD set has a high potential for the tourism EI assessment. It is also used increasingly in the world to supplement other tourism economic assessments, including with a spatial dimension. However, this use is aimed at wider administrative territories than a specific region with peculiar economic impact zones.

- The methodology for the tourism EI assessment in the NP regions developed in Latvia in 2012 can theoretically be automated and supplemented by the spatial dimension. The most important novelty would be that a similar combination of methodological and technological solutions could be used in the regions that are not administratively defined, and such combination has not been developed and tested until now.
- Using MPD, EU directives and regulations that limit the processing and use of data must be strictly observed. This is a significant challenge for the authors in further scientific-practical research on the particular topic.

Thanks for attention!