



BIG DATA FOR BETTER TOURISM POLICY, MANAGEMENT, AND SUSTAINABLE RECOVERY FROM COVID-19

Matthias Helble (ADB/WHO)



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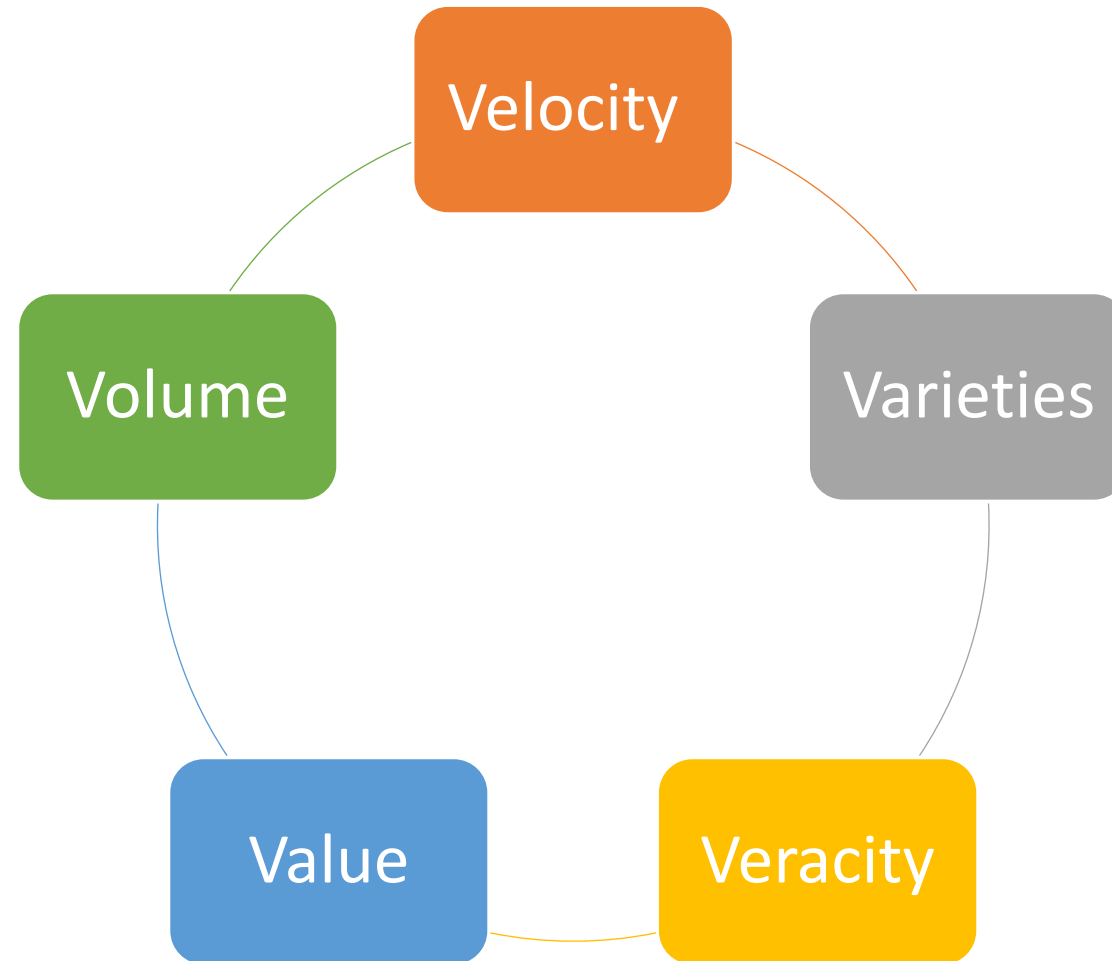
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What is Big Tourism Data?

Definition of big data:

- “Big data” refers to the **large, diverse, structured and unstructured data sets** of ...
- information that organizations, people, and machines (sensors) **constantly generate** (Ghotkar and Rokde 2016).
- Big data is often characterized by the 5 Vs: **volume, velocity, variety, veracity, and value**

What is Big Tourism Data?



What is Big Tourism Data?

- **Inventory data**, including flights, hotel rooms, tours, car rentals, transportation services, or any other travel product for reservation or sale.
- **Loyalty programs**
- **Bookings or reservations data**
- **Web analytics data**, help to understand how websites are used
- **Search data**
- **Travel reviews** are left by travelers about travel products and services
- **Social media**



Non-Tourism Specific Big Data:

Table: Key Big Data Captured by Non-Tourism Specific Providers

Big Data Type	Key Data Captured	Example Companies or Sources
Telecommunication companies	Calls, mobile data, geotagging	Mobile network providers (vary country by country)
Financial services and credit card	Transaction amount, transaction location, transaction type (products), User ID, volume of transactions	Mastercard, Visa
Retail	Products purchased, volume of transactions, location of purchase	Mastercard, Visa
Smart cities sensors	Car parking, noise monitoring, water usage, traffic surveillance, crowd surveillance, facial recognition, electricity use, and air pollution reporting	Cisco, Schneider Electric, Siemens, Microsoft, Hitachi, Huawei, Ericsson, Toshiba, and Oracle ²
Climate change	Air quality, carbon emissions, water pollution, deforestation, coastal or reef degradation	Multiple government ministries, environment-focused NGOs, the UN, Smart Cities Sensors
Health	Patient data, COVID-19 test timing and result	Hospitals and clinics, public health government agencies, CommonPass or other health passports
SuperApps	Communications, movement, food, social, financial, and retail	WeChat, Line, Gojek, Grab, Meituan and Dianping



NGO = nongovernment organization, UN = United Nations.

² Top 10 companies helping build smart cities around the world.

Sources: Bremner (2019) and Smart City Hub. <https://smartcityhub.com/technology-innovation/the-top-ten-companies-that-build-smart-cities>.

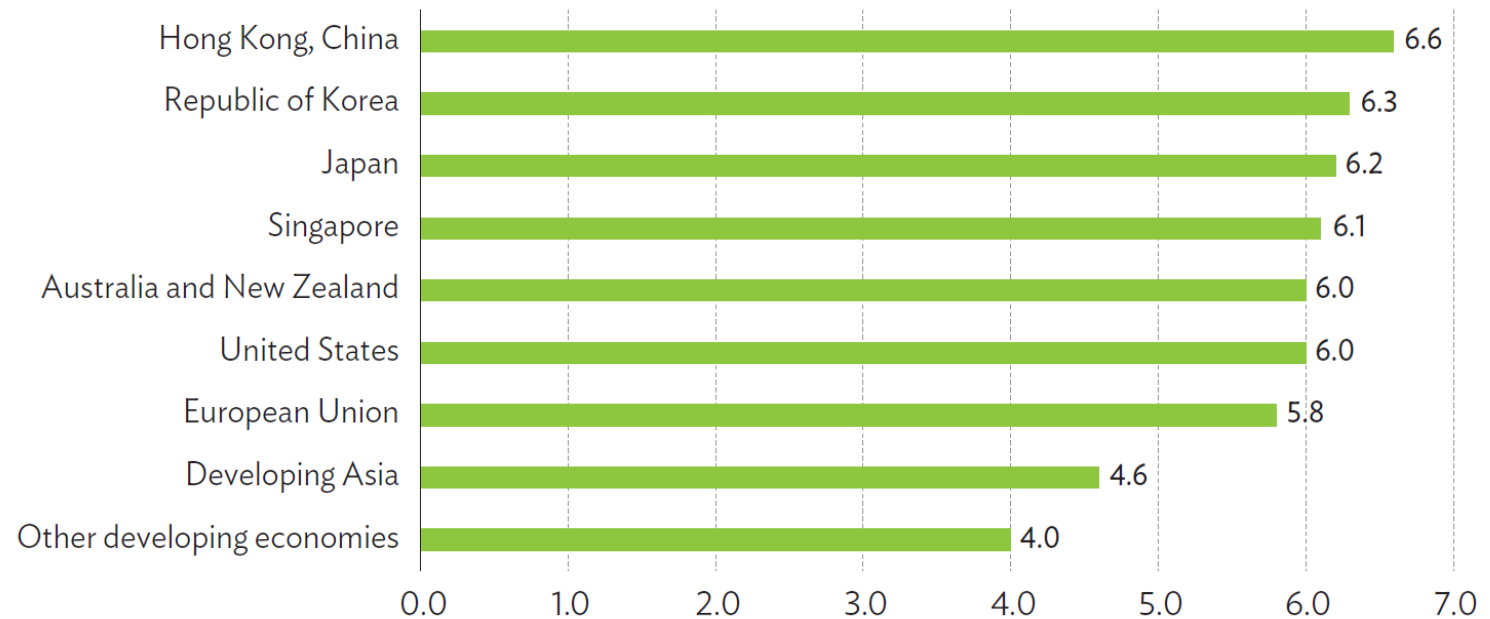


Case Studies

- **Singapore** (Singapore Tourism Board): Singapore Tourism Analytics Network (Stan) based on 15 data-sharing agreements
- **Macau, China** (Macao Government Tourism Office)
- **Thailand** (Tourism Authority of Thailand): Live dashboard
- **Japan** (Ministry of Economy, Trade and Industry): Tourism flows and spending patterns traced
- **Indonesia** (Statistics Indonesia): Mobile positioning data used to estimate tourist arrivals
- **Australia** (Australian Bureau of Statistics): Mobile phone data to estimate flows.
- **New Zealand** (Ministry of Business, Innovation and Employment): Tourism spending

Challenges of Big Data for Tourism

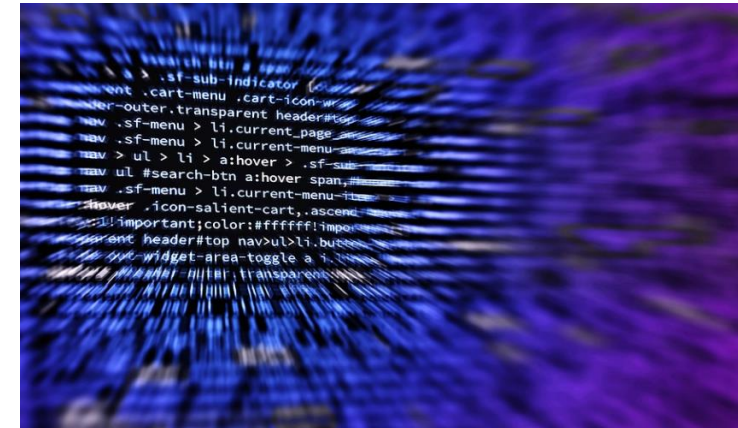
- Skills gap: data science, computer programming, machine learning, data visualization
- Data privacy
- Cybersecurity
- ICT readiness and costs



Information and Communication Technology Readiness Scores of Selected Economies and Regions, 2019 (based on data from the World Economic Forum)

Challenges of Big Data for Tourism

- **Structural dependency:** Early mover advantage
- **Firm size:** SME are less digitized and use less digital tools
- **Lack of governance and policy support:** Only a small share of NSOs with legal frameworks that guarantee access to big data
- **Purpose of data:** Some big data not collected for tourism measurement
- **Selectivity bias and data invisibles**
- **Data continuity**



Role of Big Data in Post-COVID-19 Recovery

Creating an enabling environment:

- Emergence of data philanthropy
- Public Private Partnerships

Regional Cooperation:

- Inflection point for seamless travel
- Health certificates and blockchain-enabled travel
- Harmonizing regional health data and travel technology



Big Data for Sustainable Tourism Recovery

- **Toward New Measurement Frameworks:** Measuring the sustainability of tourism is expected to provide integrated information to better manage the currently unmeasured externalities caused by tourism, facilitate cross-sector dialogue on sustainable tourism development, and encourage coordinated locally relevant decision-making.
- **Financing Needs of Post-COVID-19 Sustainable Recovery:** Policy-led prioritization focused on investing in not only the data itself, but the skills and partnerships required to implement the data within established global frameworks for its use.

Conclusion and Policy Recommendations

- Prioritizing sustainability and establishing big data policies and programs
- Funding and capacity development for big data
- COVID-19 recovery: Policies and public–private partnerships





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