Spatial Big Data

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Everyone *talks* about it, nobody really *knows* how to *use* it, everyone *thinks* everyone else is using it, so everyone *claims* they are using it...
What is the first impression that comes to your mind when somebody talks about Big Data?

Approx. 80% of the Big Data that exists today has a spatial component attached to it.
Spatial Big Data : Definition

Big Data are “data sets that are so big that they cannot be handled efficiently by common database management systems”

It represents Big Data in the form of spatial layers and attributes.

There is no standard threshold on minimum size of Big Data or Spatial Big Data, although big data in 2013 was considered one petabyte (1,000 terabytes) or larger.
Spatial Big Data – Take Aways

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<th>Spatio-temporal data has the potential to make our lives better</th>
<th>Better decision making</th>
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<td>Saves cost from greater efficiency</td>
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<td>Analyze spatial connections</td>
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<td>Get information in real time</td>
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<td>Spot location-related patterns that might previously have been undetected</td>
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Spatial Big Data for Global Challenges

- Sustainable Development
- Clean Water
- Population & Resources
- Democracy
- Global Convergence of IT
- Rich-Poor Gap
- Health Issues
- Peace & Conflict
- Women Empowerment
- Transnational Organized Crime
- Energy
- Science & Technology

35%
Sources for Spatial Big Data

- Activity Data: Listening to Music, use of Smart Phone, Shopping
- Conversation Data: Emails, Social media platforms like Facebook, Twitter, Instagram, Phone Conversations
- Visual Data: Pictures on smart phones or digital cameras, Videos on CCTV, Uploading videos on YouTube
- Sensor Data: GPS enabled devices, UAVs, Satellite Sensors, Mobile Mapping, LIDAR, Aerial Photo.
Five V’s of Spatial Big Data

- VOLUME
- VELOCITY
- VALUE
- VARIETY
- VERACITY
Turning Raw Data into Wisdom

Business acumen says arrange a show of Haitham Mohd. Rafi in Salalah for Guaranteed Success.

Haitham Mohd. Rafi is very popular in Salalah.

10% of the tweets are from Salalah for Haitham Mohd. Rafi to win Dil Hai Hindustani.

Oman Produces 0.5 Million Tweets every day.
Spatial Big Data Applications

- **AUTOMOBILES**
  - Auto sensors reporting location, problems

- **OIL & GAS**
  - Drilling exploration sensor analysis

- **TRAVEL & TRANSPORTATION**
  - Sensor analysis for optimal traffic flows
  - Customer sentiment

- **UTILITIES**
  - Smart Meter analysis for network capacity
Spatial Big Data Applications

**Application Sectors**

**COMMUNICATIONS**
Location based Advertising

**EDUCATION & RESEARCH**
Understand the learners' needs and proactively address them

**Online Services & Social Media**
People & career matching
Web-site optimization

**HEALTH CARE**
Patient sensors, monitoring, EHRs
Quality of care
**STRENGTHS**

- NSA/NCSI/PDO capable Organisations
- Strong Support from Government
- Envisioned in Oman 2020 mission.

**OPPORTUNITIES**

- Scope for Research & Development
- Enables Improved Decision Making.

**WEAKNESSES**

- Lack of Capacity & Capability in Big Data
- Nascent stage of development in Oman

**THREATS**

- Need of a nodal agency for creating or controlling Geospatial Information
- Lack of common standards, Metadata

**SWOT – Big Data in Oman**
ONCN Offers GPS data with cm level accuracy

ONGM Geoid Model enables Orthometric Heights

TOPO50K & 100K Orthophotos, Seamless Vector data & Topographic Maps

OGM Standards, Specifications, Policies

Backbone for any Geospatial Activity / Project

NSA’s Contribution to Geospatial Community in Oman

ONGD-14 Localised Datum for accurate Surveys
Geospatial Data
- Maps, Charts,
- Satellite Images, Aerial Photos
- Vector Data, Elevation Data
- Names, GCPs, VOBs, Airfields

Geospatial Infrastructure
- Local Datum
- Geoid Model
- OmanCORSNet

National Survey Authority

Skilled Manpower
- Trained & Experienced Omani Workforce
- Members of many National & International Conferences/Workshops/Initiatives

Capability Development
- Institute of Topographic Science
- National Diploma courses in Geospatial Information
- Short Term Courses

82%
Global Geospatial Industry Outlook Report – 2017
Geospatial Media & Communications

Oman’s Rank

Geospatial Infrastructure & Policy Framework

Geospatial Institutional Capacity

Geospatial User Adoption Level

Geospatial Industrial Capacity

Geospatial Readiness Index

88%
Key Notes

- Oman shows steady development in adoption of geospatial technology

- Need for research in spatial big data domain, and subsequent studies to ascertain its relevance in Socio economic growth

- Multi Pronged approach to simultaneously develop Capacity & Capability
Thank You

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