



FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

*Protecting
Our World,
Conquering
New Frontiers*

*Presented at the FIG Working Week 2023,
28 May - 1 June 2023 in Orlando, Florida, USA*

Responsible Land Administration in Colombia

**A research agenda on geoinformation
sciences**

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Alejandro Reyes: "In Colombia there is no land problem, there are 100 land problems".
(Daniel Pardo interview – oct/2021)



Almost all of Colombia's problems can be reduced to one cause: unequal land ownership.

1% of the population in Colombia owns 81% of the territory, according to the NGO Oxfam.



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Colombia Peace Agreement

Chapter 1

- Comprehensive rural reform (Bank of Lands)
- Tertiary Roads
- Irrigation systems



How to get a research agenda?

- Actors
- Study object
- SWOT Analysis
- Specializacion areas





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Actors

Land Administration
Civil Engineers
Geodata Sciences
Sustainability
Geoinformation Systems
Social Sciences
Mathematicians
Cadastral Engineers

Geosciences

Geodetics

Economist

Data Science

Environmental Valuation

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Study object

Institutions

- The National Planning Office,
- The National Department of Statistics
- The National Registry

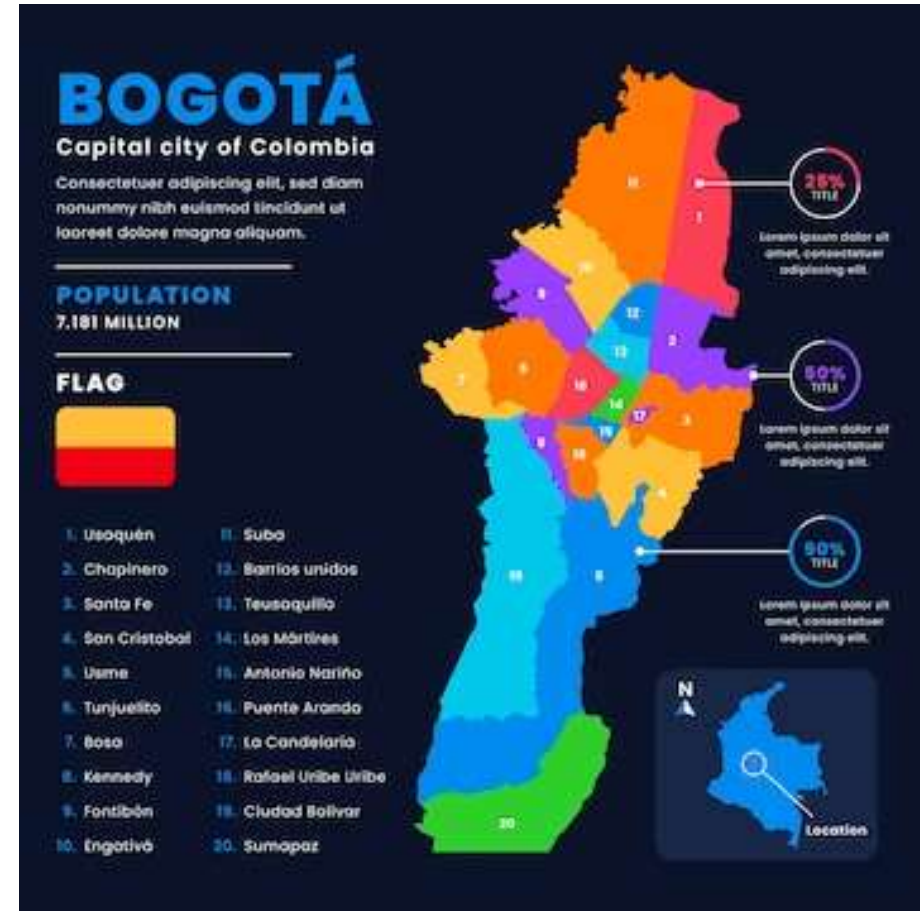
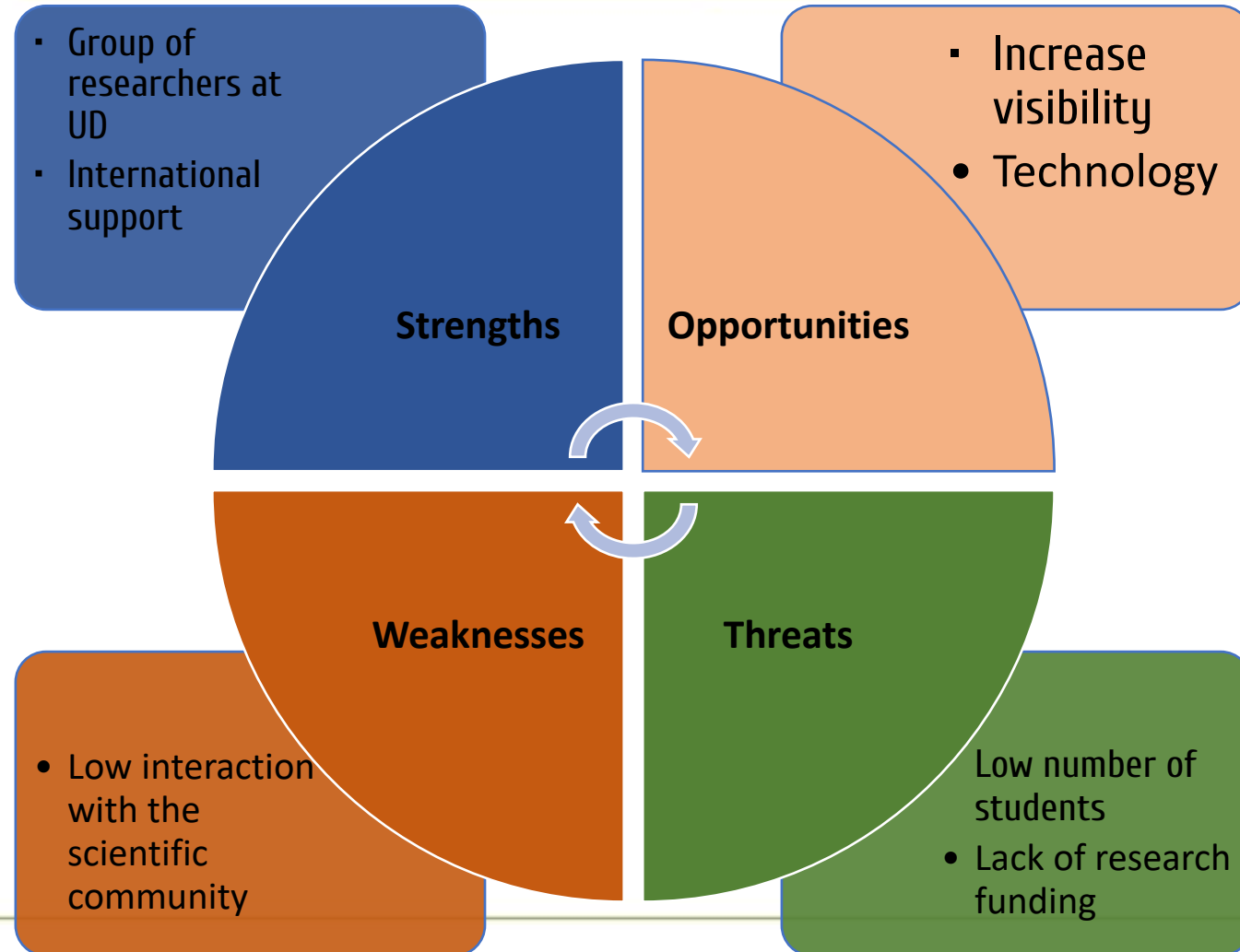


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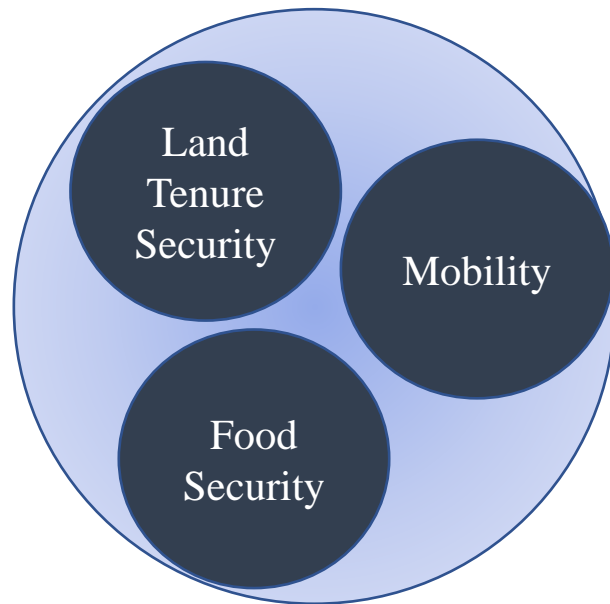
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SWOT Analysis



Internal Relationships

Colombian Peace Agreement



U. Distrital Geographic Framework

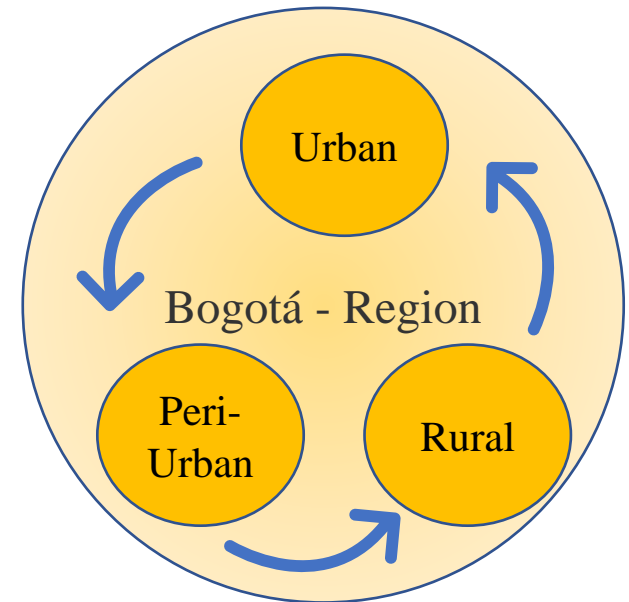
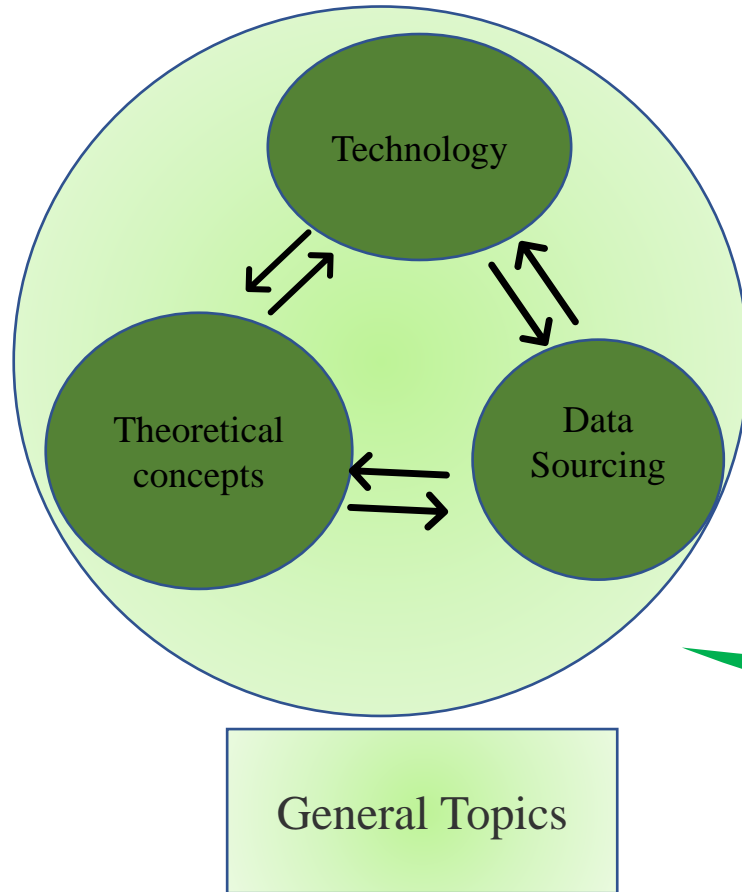


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External Relationships

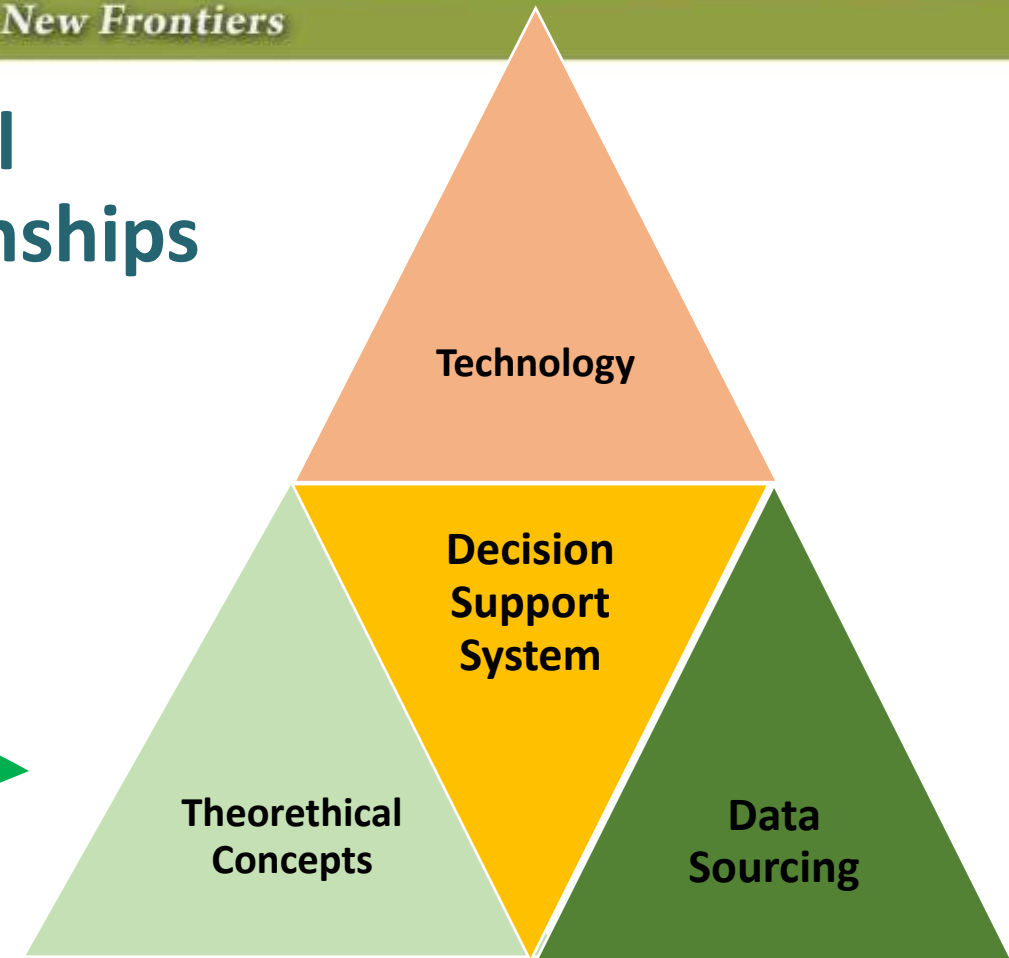


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- Machine Learning for Geospatial Data Analysis
- Sensor-driven Mapping
- Cartographic Information Extraction
- Spatial DBMS (database management system)
- Big Data and Cloud Computing
- Massive Online Open Courses (MOOC)
- GNSS Services

- Building/ Infrastructure Information Modeling (BIM)
- 3D reconstruction of built environments
- Service Oriented Mapping (SOM)
- Application Programming Interfaces (API's)
- Internet of Things (IoT)
- Geovisualization, Augmented and Virtual Reality
- Advanced Geospatial Applications for Smart Cities and Regions

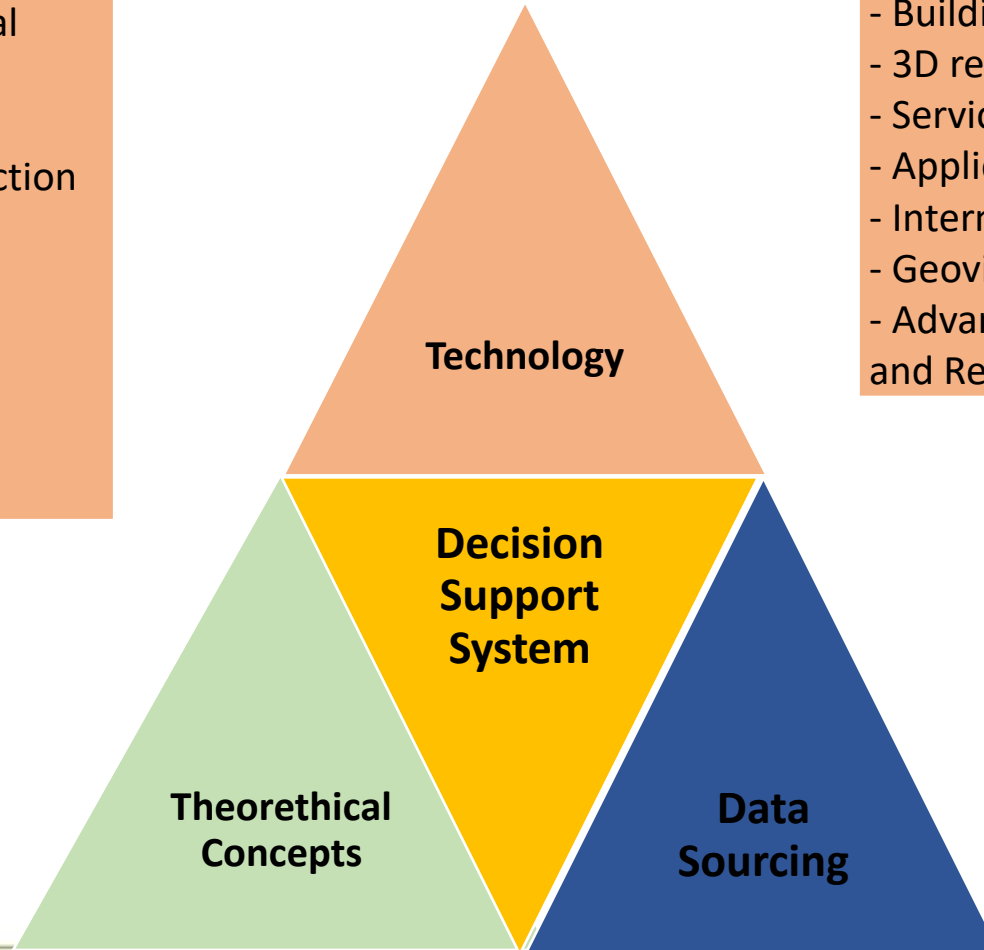


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- Geodesy, Topography and Photogrammetry
- Conceptual models of spatial data infrastructure (SDI)
- Ontologies, Semantics and Knowledge
- Representation for Geospatial Information
- Land Administration for Sustainable Development
- Climate Change
- Risk Management
- Territorial Planning and Territorial Intelligence.

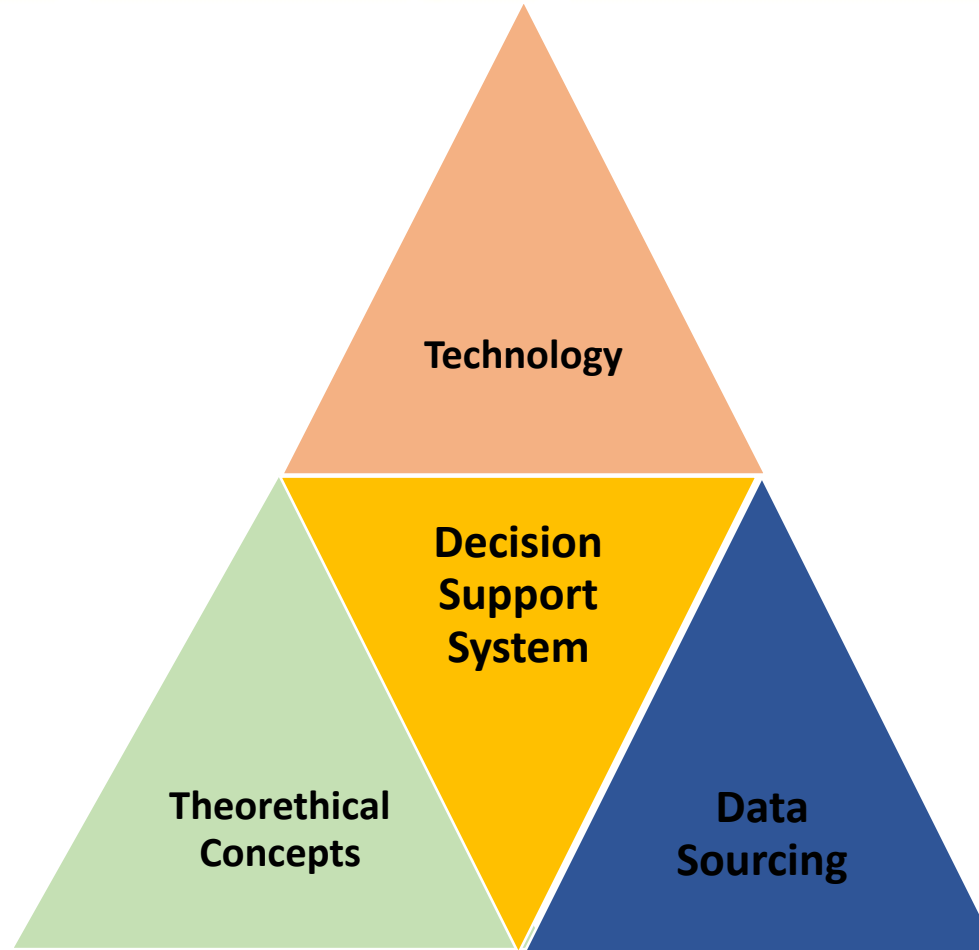
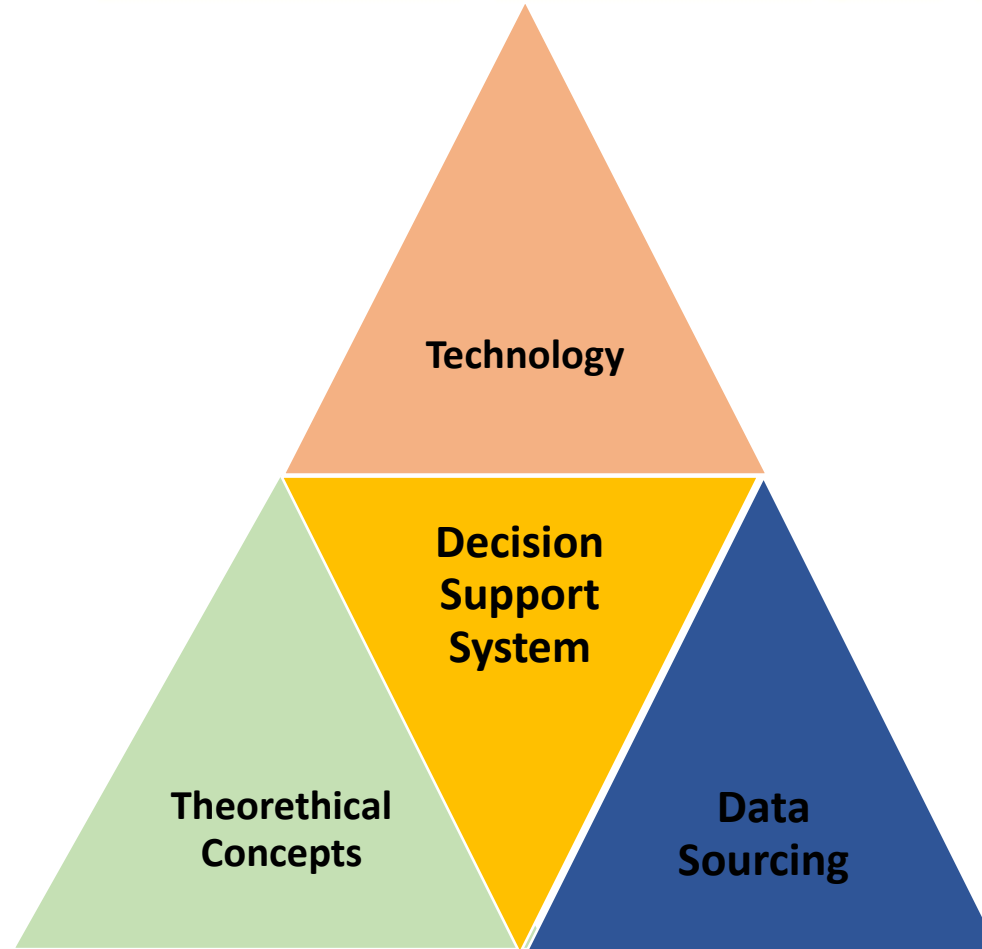


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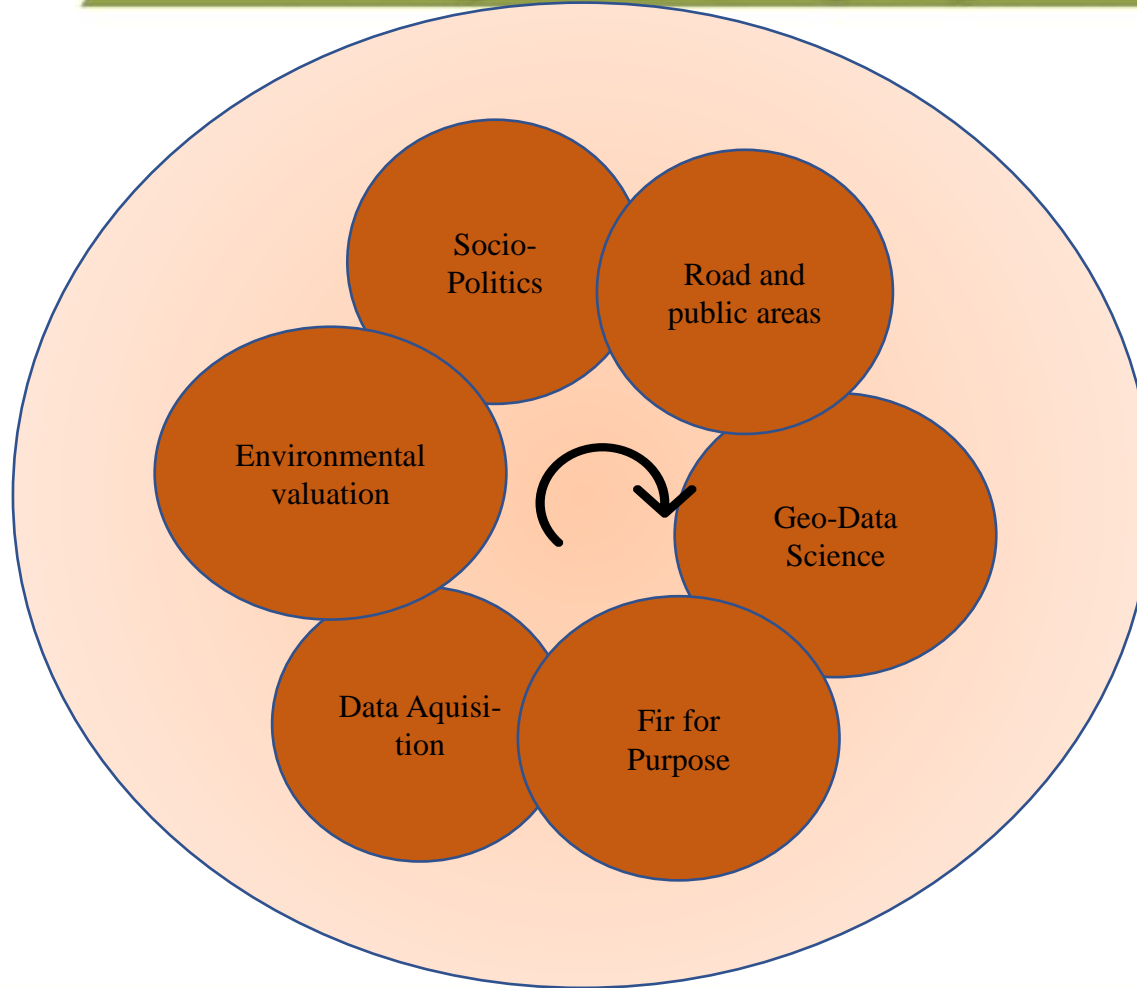


- Volunteered geographical information (VGI)
- Collaborative Crowdsourced Cloud Mapping (C3M)
- Thematic Information Extraction
- Microwave Remote Sensing
- SAR-based Surface Generation and Deformation Monitoring
- Hyperspectral Image Processing
- Information Extraction from LiDAR
- Remote Sensing Data Fusion
- Point Cloud Processing
- Integration and fusion of multiple data sources
- Small and low-cost active sensing
- UAS-oriented sensor and (small) platform concepts
- Mobile Mapping
- Quantum Navigation

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Research Focus
L.A.

Discussion

Efficient and reliable LAS requires an infrastructure that allows articulation between responsible entities on the different parts of the process.

It is necessary to provide the country with knowledge and information that integrates technical concepts, geospatial technologies, and data sources.

Conclusions

In the case of ***technical concepts***, progress must be made in areas such as the geoidal model, geoidal undulation models for cities with flat topography, local topographic plans, atmospheric correction studies for GPS in the equatorial zone, and adjustments to reference systems.

Conclusions

The **geospatial technologies** topics are intended to continue with the broad discussion on GNSS Services and the Internet of Things with geographic applications. Geovisualization, Augmented Reality and Virtual Reality, Building / Infrastructure Information Modeling, Digital Twins, Geographic Big data and cloud computing, Machine learning, advanced geospatial applications for smart cities and regions, location-based services, data fusion, disruptive technologies, and precision agriculture.

Conclusions

Regarding ***data sources***, topics such as Mobile Mapping Systems, UAS-oriented sensors, Point cloud processing, Remote sensing data fusion, Information extraction from LIDAR, Hyperspectral image processing, and Collaborative, crowdsourced cloud mapping,

However

We need people!!!

But ...

That is another story

Acknowledgments

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