Exploring the usefulness of information about uncertainty in spatial data of key Geo-registrations in municipal chain processes

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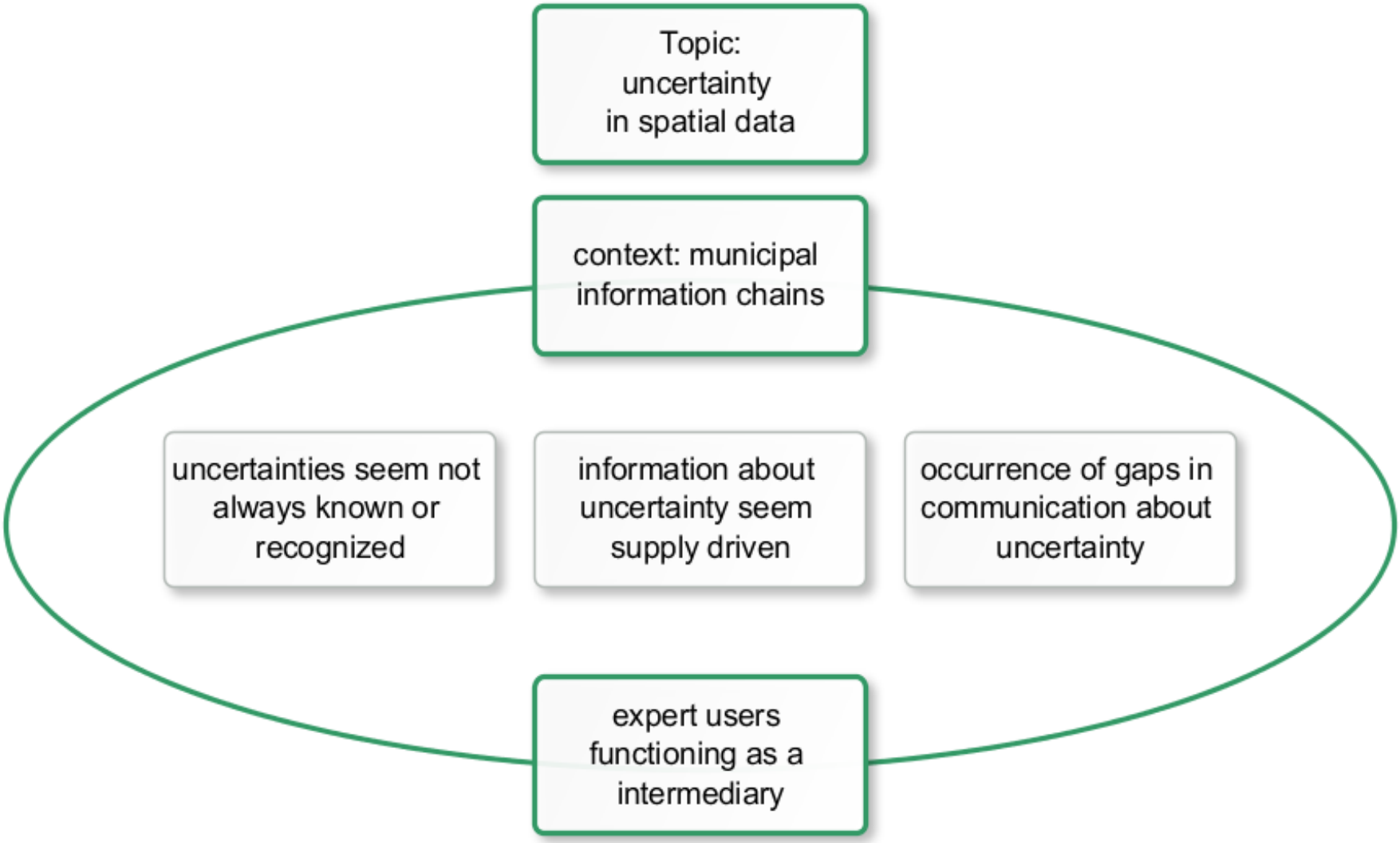
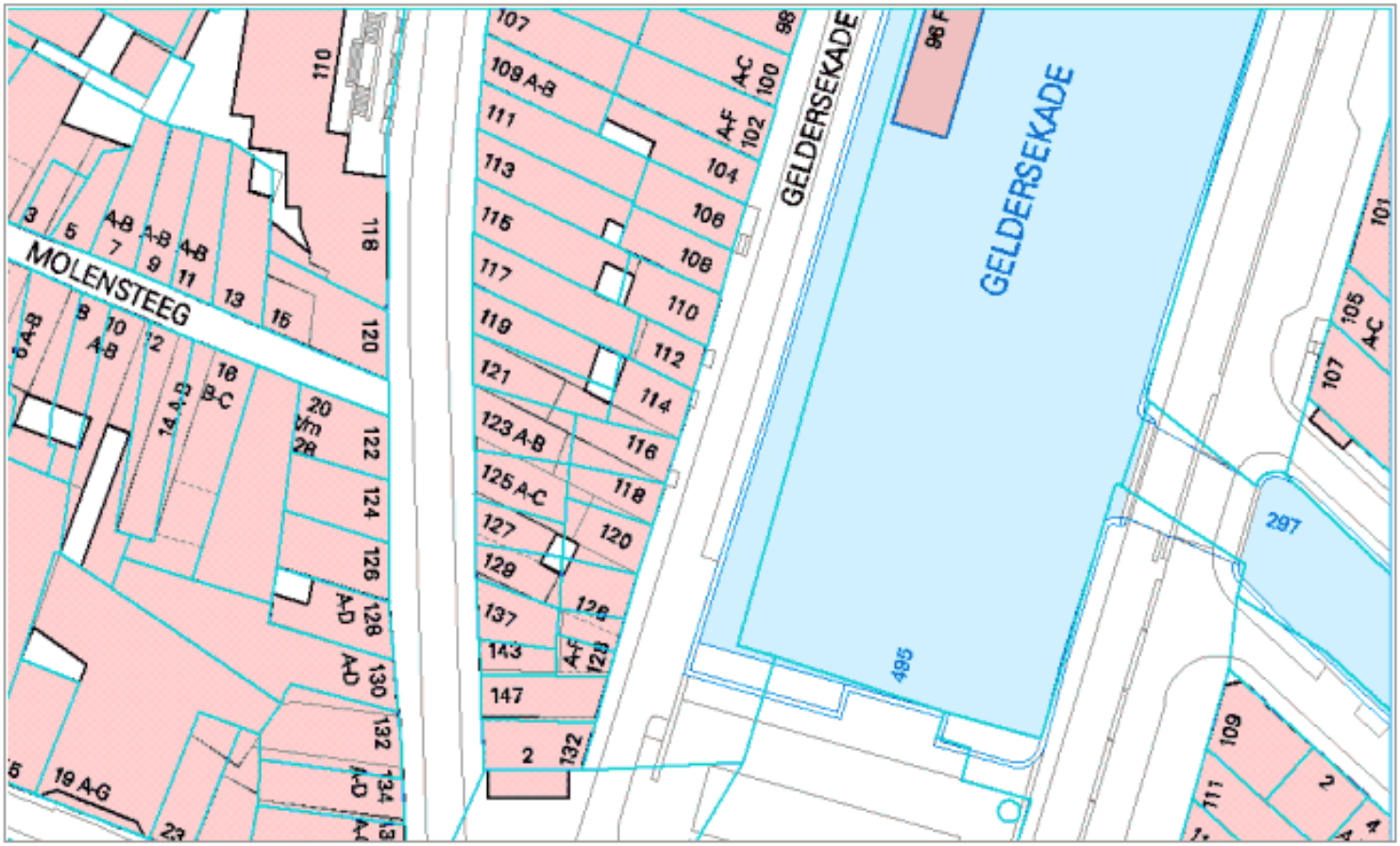
Presentation outline

- Problem field
- Research question & methodology
- Results & conclusions
- Recommendations & further research

Problem field & scope



Problem field – example



Fragment of Atlas Amsterdam, Municipality of Amsterdam

Related research

- 'A user study to compare four uncertainty visualization methods for 1D and 2D datasets'
  Sanyal, J, Zhang, S, Bhattacharya, G, Amburn, P & Moorhead, R 2009

- 'The impact of user expertise on Geographic Risk Assessment under uncertain conditions′
  Roth, RE 2009

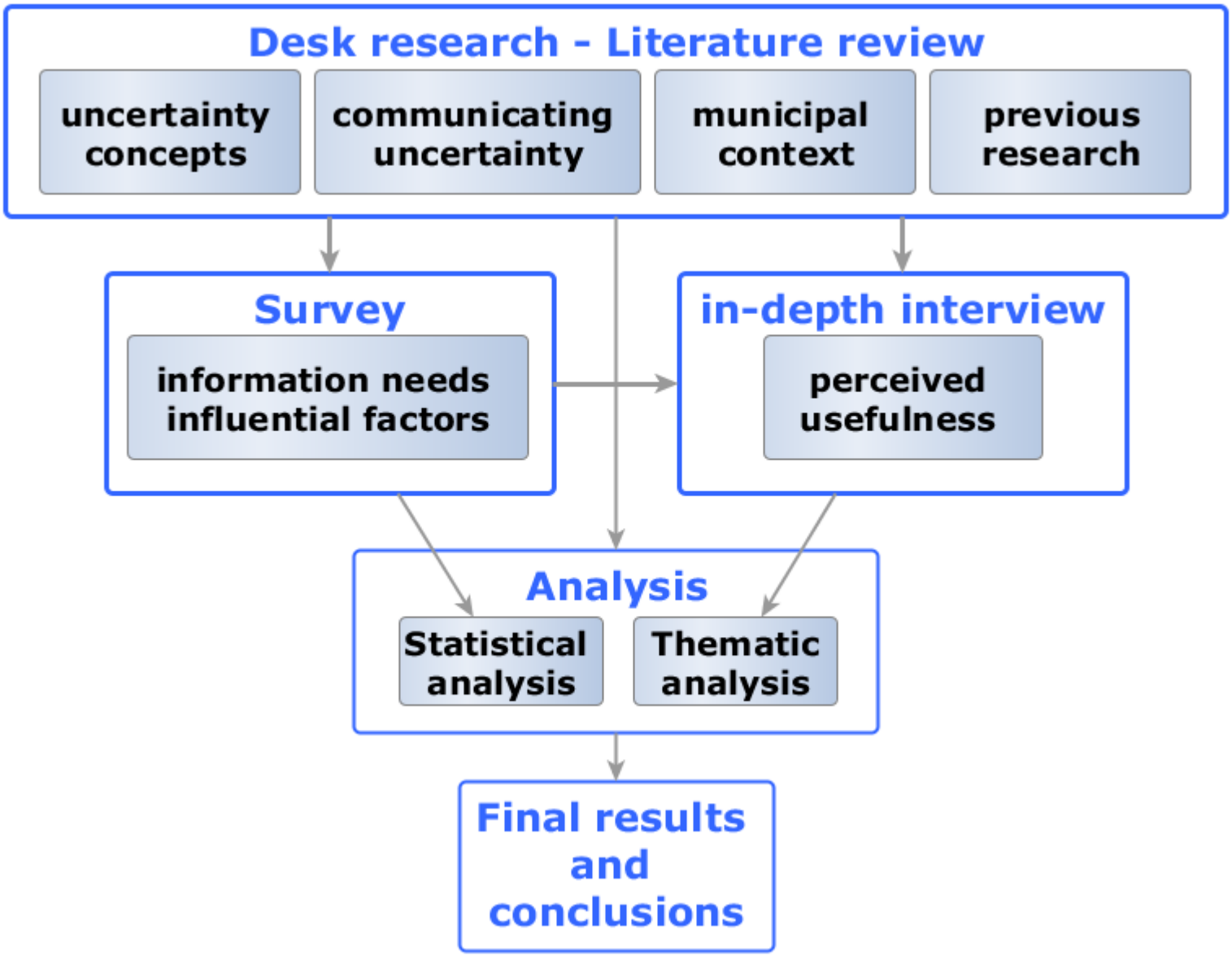
- 'Exposing uncertainty: communicating spatial data quality via the internet'
  Boin, AT 2008

Research question

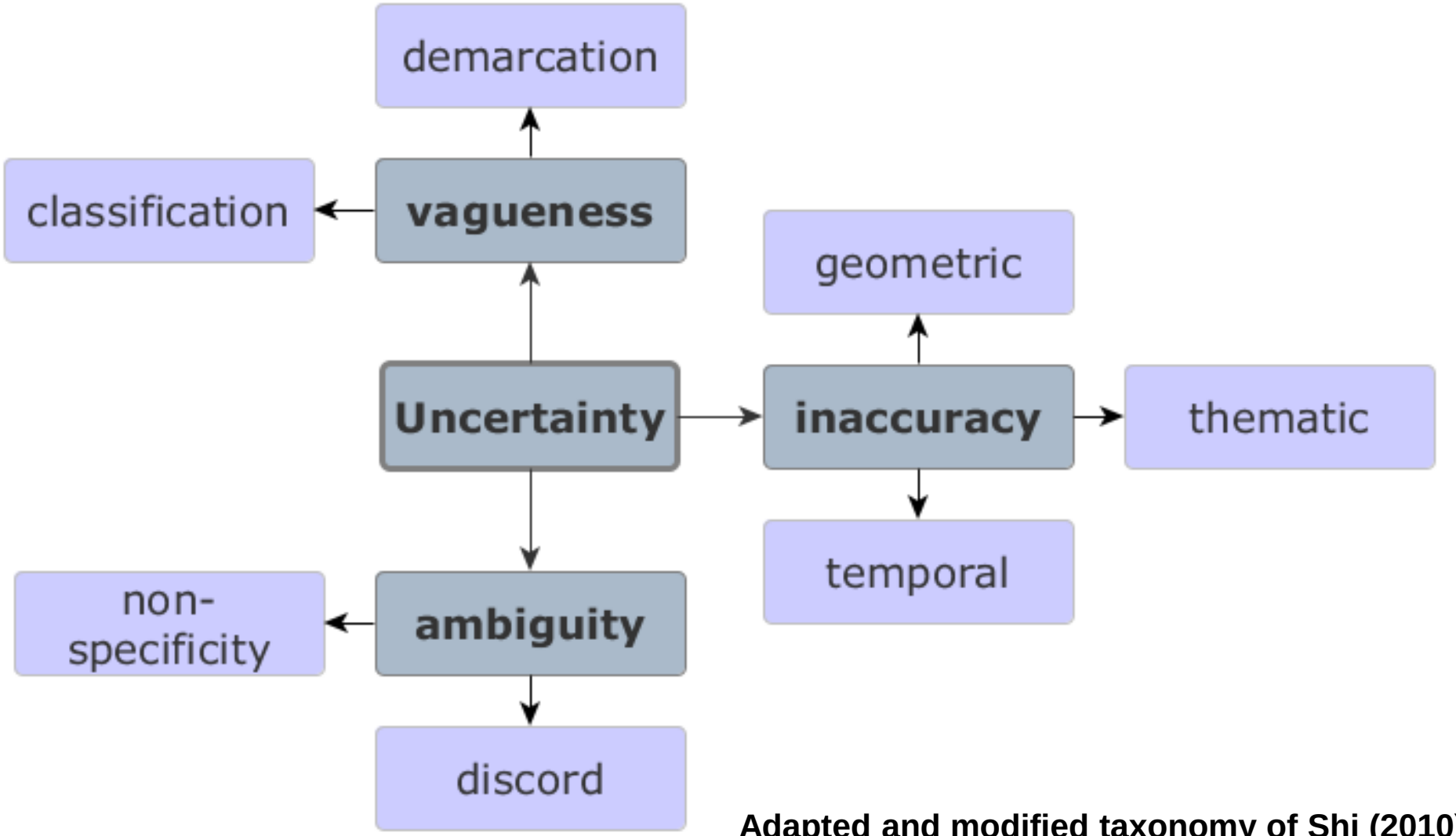
Which factors influence the usefulness of information about uncertainty in spatial data of key Geo-registrations in municipal chain processes?

- Concepts of uncertainty in spatial data
- Relationship uncertainty and spatial data quality
- Information needs about uncertainty
- Factors which affect perceived usefulness

Research methodology

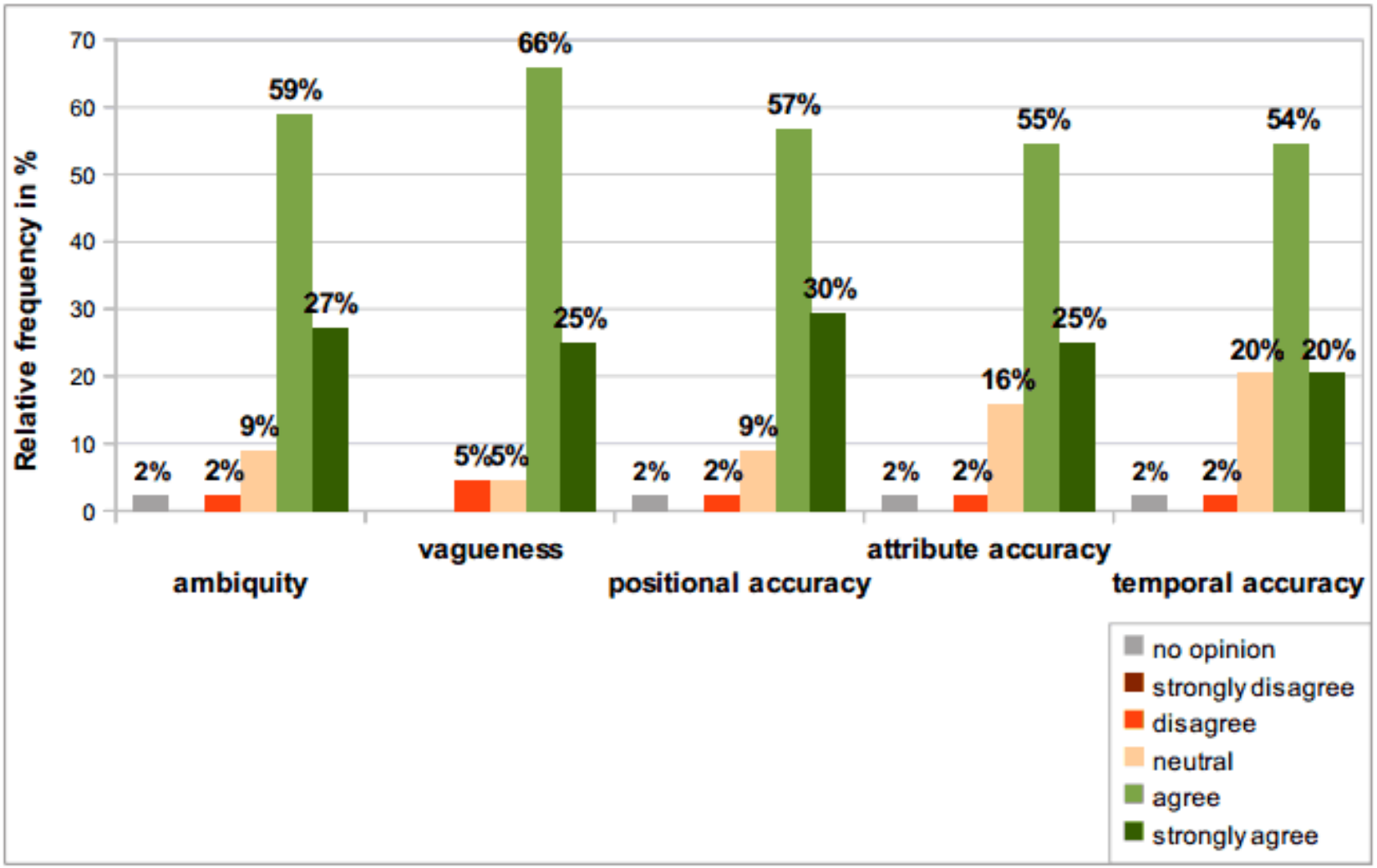


Taxonomy of uncertainty

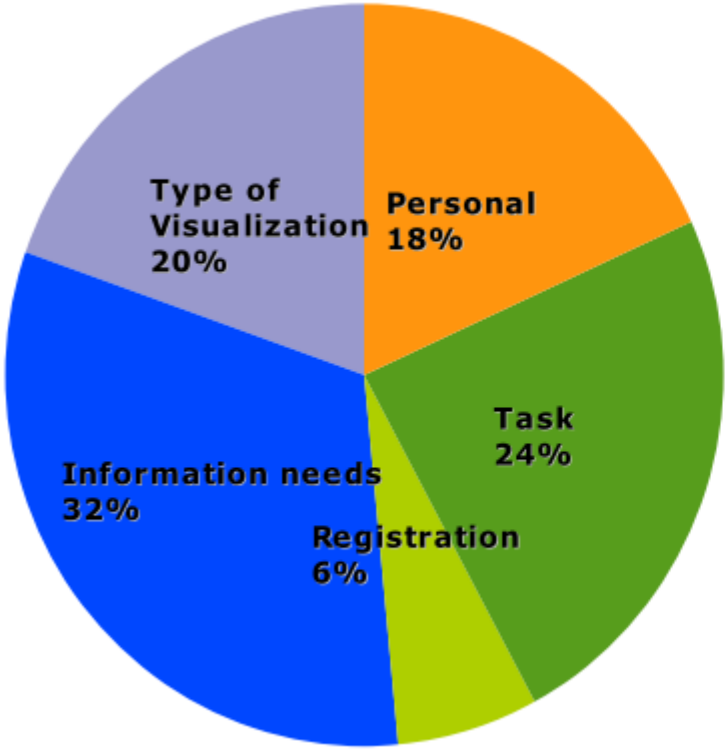


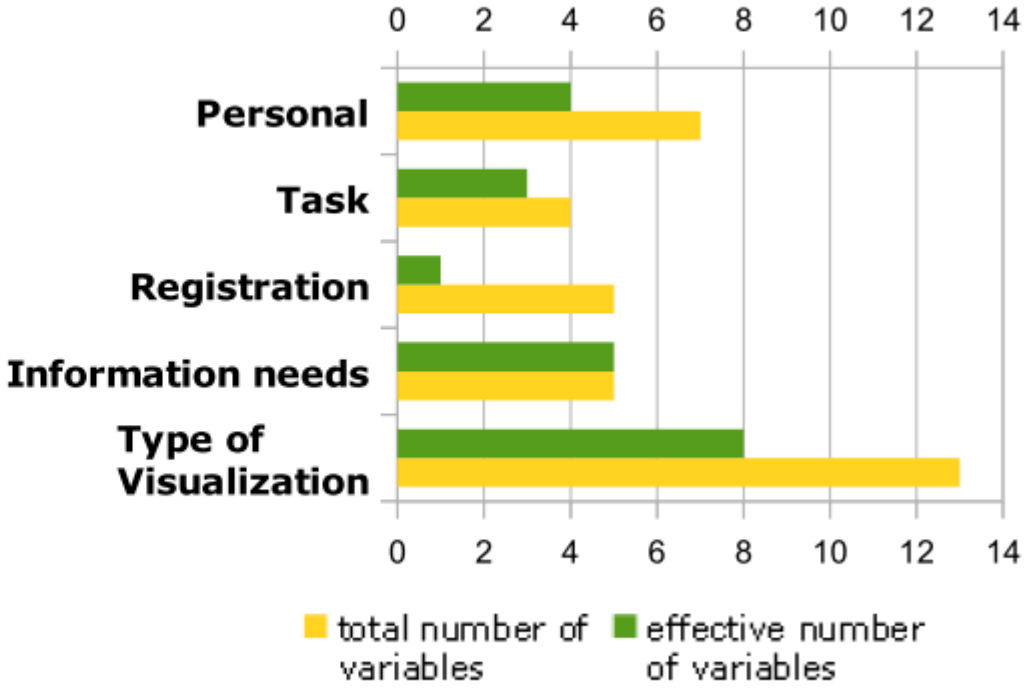
Adapted and modified taxonomy of Shi (2010)

Results: information needs



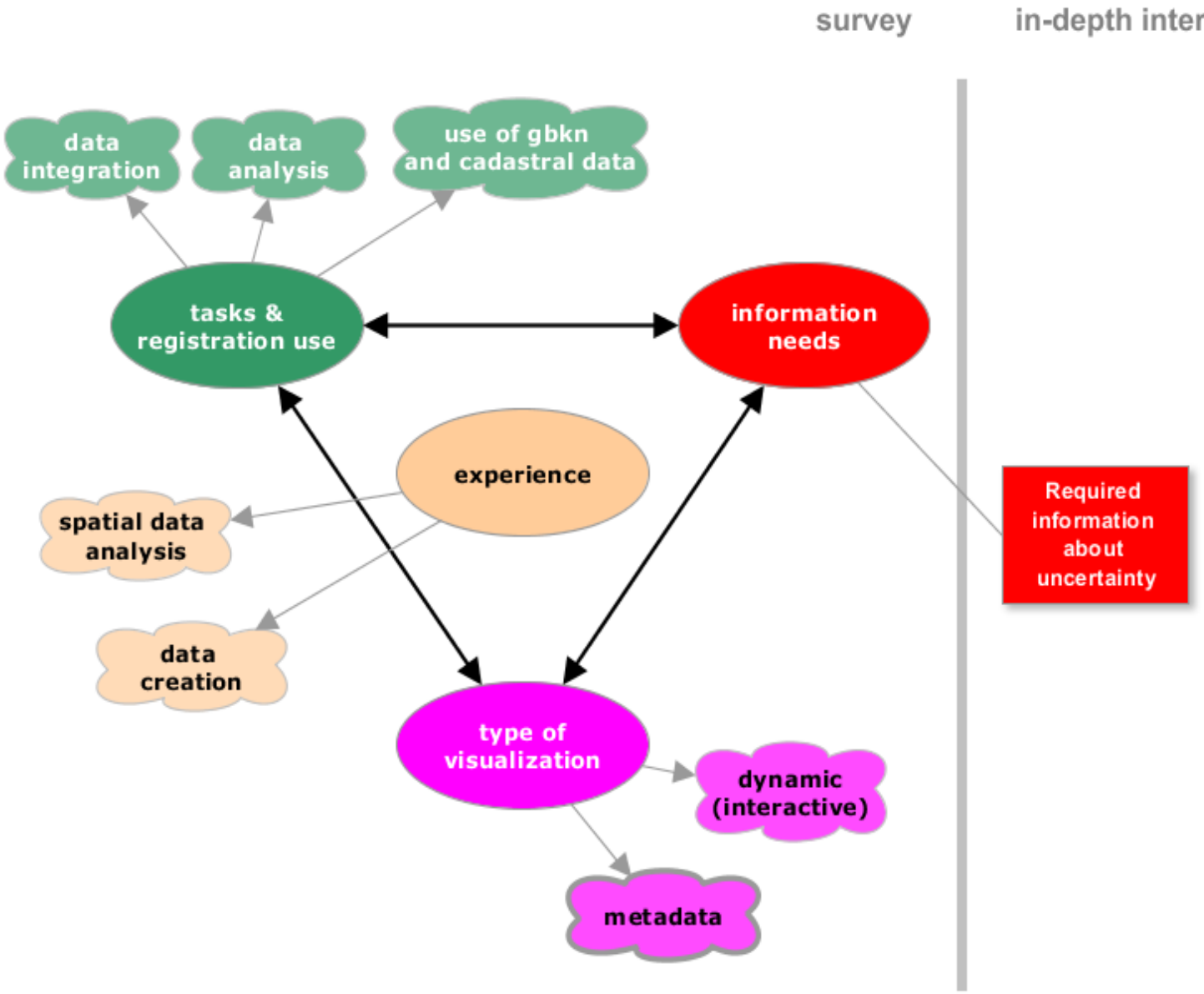
Results: efficacy of variables



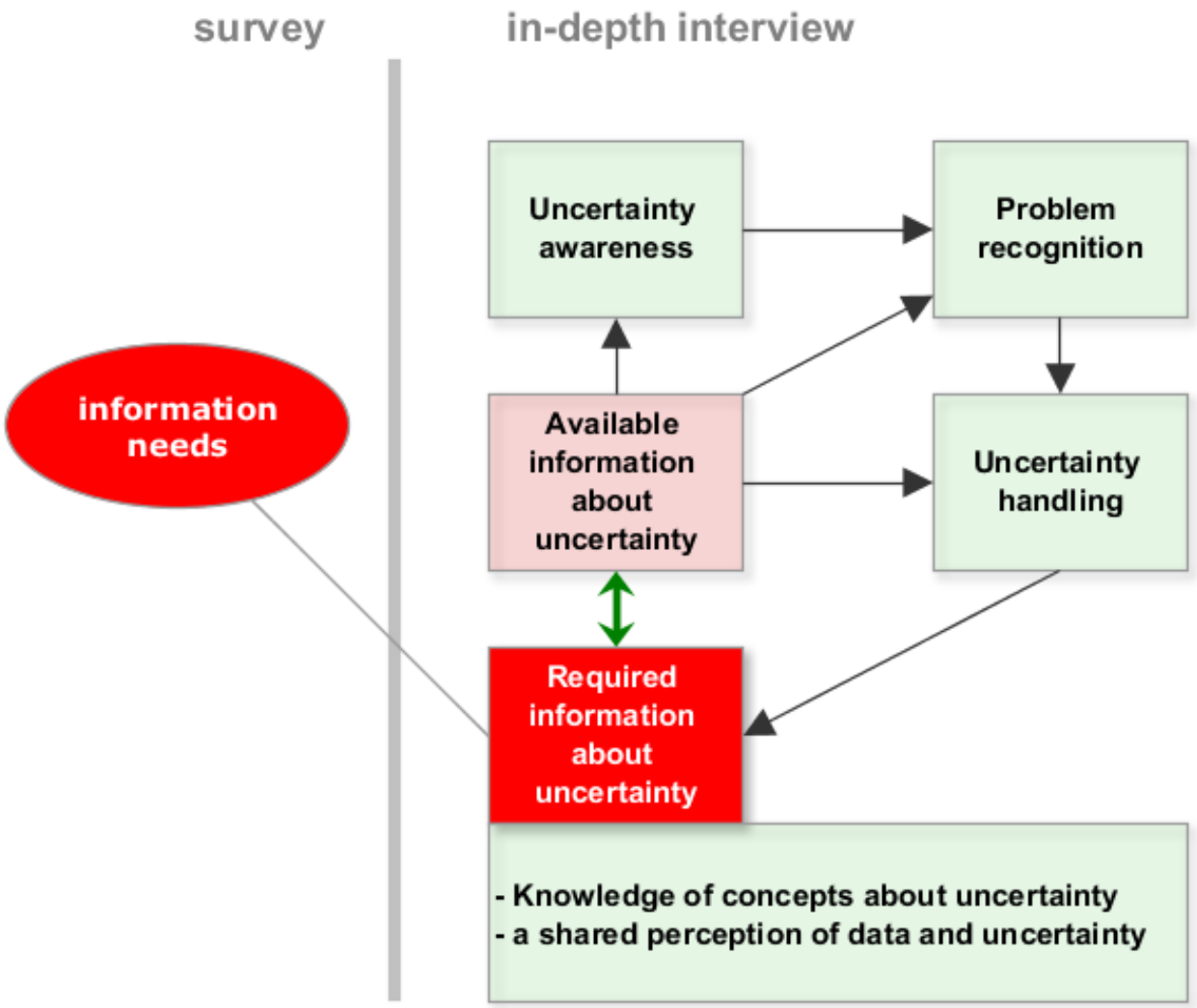


% = effective / total effective

Conclusions (1)

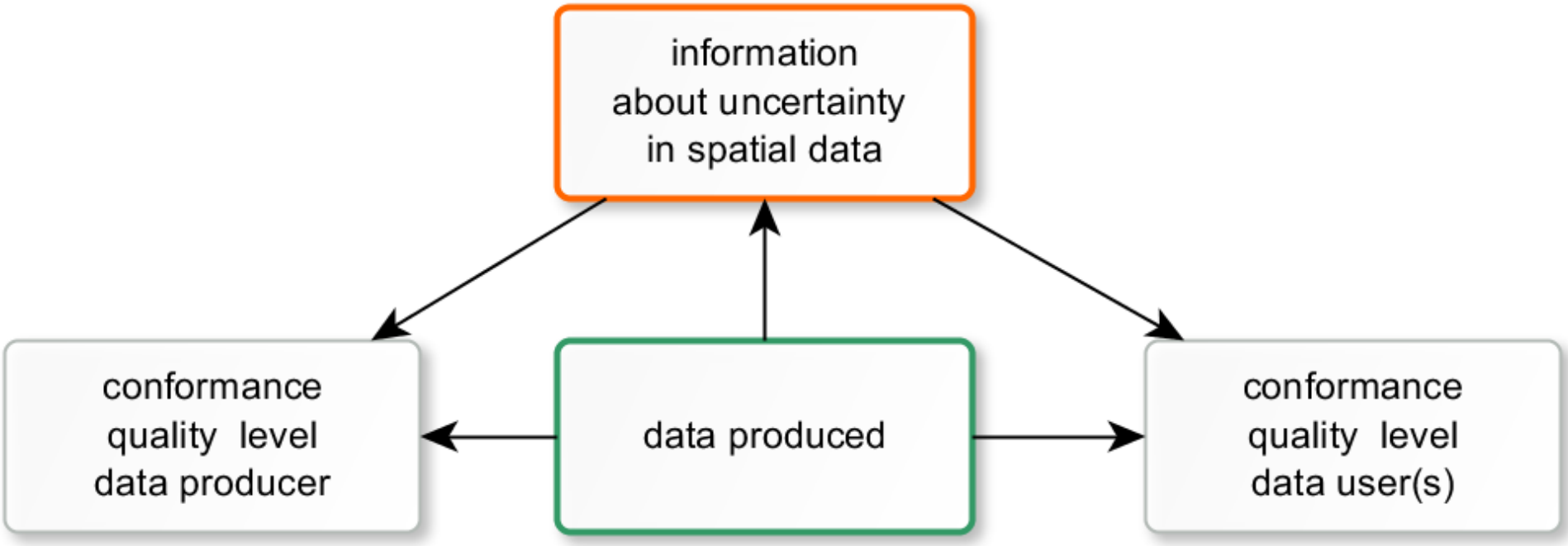


Conclusions (2)



Conclusions (3)

Relationship uncertainty & spatial data quality



Recommendations & further research

- Unify methods and standards to provide information about uncertainty and spatial data quality
- Extend information models with elements of uncertainty
- Reduce the knowledge gap between data providers and data users

Thank you for your attention!

Questions

References

Sanyal, J, Zhang, S, Bhattacharya, G, Amburn, P & Moorhead, R 2009, 'A User Study to Compare Four Uncertainty Visualization Methods for 1D and 2D Datasets,' IEEE Transactions on Visualization and Computer Graphics, vol. 15, no. 6, pp. 1209-1218.

Roth, RE 2009, 'The Impact of User Expertise on Geographic Risk Assessment under Uncertain Conditions,' Cartography and Geographic Information Science, vol. 36, no. 1, pp. 29-43.

Boin, AT 2008, 'Exposing Uncertainty: Communicating spatial data quality via the Internet.,' PhD THESIS thesis, Department of Geomatics,The University of Melbourne, Australia.

Shi, WenZhong 2010, 'Principles of modeling uncertainties in spatial data and spatial analyses', Hong Kong, CRC press,Taylor and Francis Group, LLC.

Conclusions related research

- "*Choice of a visualization technique is heavily context dependent*"
  Sanyal, J, Zhang, S, Bhattacharya, G, Amburn, P & Moorhead, R 2009

- "*it is map-use expertise that most impacts the perceived difficulty of the risk assessment*"
  Roth, RE 2009

- "*providers should find a way to implicitly influence data use if they want to communicate more detailed internal quality*"
  Boin, AT 2008