# Expanded Data Quality Model for Increased Reliability in Mashed-Up Environments

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## SUMMARY

Along with the growing availability of Spatial Data Infrastructures the publication of spatial data through the Open Government Data initiatives has been significantly increased. Thanks to standardised services (Web Map Services, Web Feature Services) and a range of supporting software tools and libraries the consumption of spatial data is uncomplicated. But in many cases the consumer of data is neither aware of the data source and its quality nor of the service provider and its service reliability. This tendency is amplified with growing data distribution through mash-ups and integration services. Data sets may be used therefore for purposes for which they are not made for and wrong decisions may be taken. On the other side, data providers becoming also more and more decoupled from the consumer side not knowing how their data is being used. The currently understanding of spatial data quality is mostly limited to the evaluation of data quality elements in a "static data set" as reflected in ISO 19157:2013.

To ensure correctness of data and correct use of the data at the end user the quality model for the SDI of the Canton of Zurich (Switzerland) must be completely revised. The quality model covers the roles of data producers, data providers and data users as well as the transport processes in between them (complete data chain). For the producer side it is based on existing concepts (ISO 19157) but is expanded for better addressing the fourth dimension. To ensure the data integrity from data origination to the end user the aspect of traceability must be moved from a descriptive metadata item to a quality element. Data originators are the starting point for an adequate collection of lineage information.

The real-time use of data sets requires the introduction of the element service quality. The service quality comprises service stability (availability, accessibility), performance (response time, maximum throughput), algorithmic accuracy (correct implementation of database queries and

presentation definition), traceability (of the service configuration, not the data items themselves), security and integrity. Service quality must be addressed by service providers and service brokers.

Last but not least the data consumers must be sensitised for appropriate selection and combination of data sets. Because with the provision of feature based web-services the control over data is with the user they must be made aware of potential misuse and eventually they must ensure algorithmic accuracy and usability.

Free of charge, non-governmental maps services disclaim the responsibility for continuity of the data service and the correctness of the provided data in their service policies. Governmental and moreover cadastral data must put highest priority for correct, reliable and trustable data and the contingency of data services also under adverse conditions. The quality model presented in this paper serves as guideline for the further development of the SDI of the canton of Zurich and of a regional SDI.