

UNDERSTANDING THE INFLUENCE OF SPECIFIC WEB GIS ATTRIBUTES IN THE FORMATION OF NON-EXPERTS

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ABSTRACT

There are a significant number of Web GIS applications which are open to the wider public including people without any GIS knowledge. The complexity of Web GIS interfaces, the risk and uncertainty they incorporate and the limited knowledge of non-experts in spatial data handling and GIS operations influence the perceived trustworthiness of these systems. Previous scholars, such as Monmonier (1996) recognised the importance of trust in map design, however, there is limited knowledge about what influences non-experts' trust perceptions when they interact with Web GIS.

Two previous studies investigated Web GIS trustee attributes and a set of trust guidelines has been developed (Skarlatidou et al. 2010a; 2010b). However, both studies had three limitations. The number of participants was too small and it was difficult to isolate the Web GIS component and assess in detail the trustworthiness of specific Web GIS elements. For example, the studies identified that legend, colours, logos, map size, scales and map tutorials influence non-experts' trust perceptions but it was not clear how these elements should be designed to improve trust. Also, affective elements and especially map colour, was not examined as an aspect of the maps' perceived trustworthiness.

To address these problems, three studies have been conducted. The first study, an online survey aimed to identify non-experts trust perceptions about maps in general and about specific Web GIS trustee attributes. The second study focused on affective trust and especially the use of colour in Web GIS, with five maps that were showing the same information but in different colour schemes. Finally, a co-operative evaluation was conducted to comparatively assess each trustee attribute in three different Web GIS applications (London Profiler – LP; London Air Quality Network-LAQN and England Noise Mapping-ENM) and to understand which one participants prefer in terms of trust.

The results of the first study revealed that non-experts trust paper maps more than online maps, which shows the need to research trust in this context. More evidence that trust should be further investigated is provided by the second study, since the participants' strongest emotional response was related to trust. Based on the responses of both the first and third study, the majority of participants agreed that all trustee attributes are important trustee attributes, in the following order: legend, scales, data source logos, and map tutorial (Study 3 only), although their importance changed after accessing the three websites.

An important finding of the third study is that designing for trust cannot always be achieved in parallel to designing likeable Web GIS interfaces. For example, the legend and colours that were most liked were not also the most trusted. It was also found that a big map size and the existence of different scales improve trustworthiness. One of the most significant trust concerns of non-experts was found to be the recency of the map and information provided. Based on this feature the most trusted Web GIS should have been the LAQN, which collects data by monitoring sites and update them every two hours, which was not the case. LAQN had the least preferred, in terms of trust, attributes and this further highlights the importance of a trust-oriented interface design in the Web GIS context. Moreover, this research further suggests the need to introduce a set of trust-based guidelines which can assist non-experts' trust assessments before they decide to rely on them.

REFERENCES

- Monmonier M (1996) *How to lie with Maps*. The University of Chicago Press: Chicago and London
- Skarlatidou A, Haklay M, Cheng T (2010a) Preliminary investigation of WEB GIS Trust: The example of the “WIYBY” website. Joint Int. Conf. on Theory, Data Handling and Modelling in GeoSpatial Information Science, Hong Kong May 26-28
- Skarlatidou A, Haklay M, Cheng T, Francis N (2010b) Trust in Web GIS: A Preliminary evaluation of Environment Agency WIYBY website with non-expert users. GISRUUK London, April 14-16