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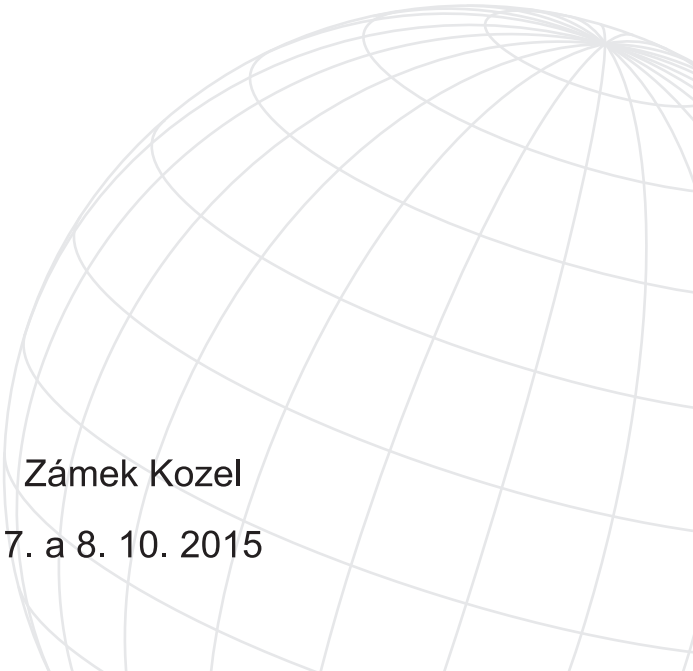

Zámek Kozel

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Evaluating (Geo-) Visualizations in Transport: The Living Lab Approach of Open Transport Net

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This contribution addresses the challenges of evaluating geo-information (GI) visualizations in transport from end-user perspective, in order to be able to gather insights from the data and possibly affect behavior and policy. Information and geo-visualizations have mainly been evaluated through classic usability studies and laboratory-based experiments. These types of evaluation studies are helpful in understanding the potential and limitations of the visualisation tools. However, as stated in Plaisant (2004), visualisations tools should better be studied outside a laboratory setting, using real datasets with realistic tasks, demonstrating in-context usefulness and feasibility. Information visualization is still a novelty to many users, and many of them are struggling to use the tools effectively. To address these challenges and to improve understanding on possible methods of evaluation, this contribution introduces the Living Lab approach to evaluate geo-visualizations from end-user perspective. The Living Lab approach is defined as 'a user-centric research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real-world contexts' (Eriksson, Niitamo, & Kulkki, 2005). The approach has the advantage to study the usage of geo-visualizations in a more

realistic setting, and to monitor and involve the user during the different stages of the development. Furthermore, it enables the user to spend more time with the visualization tool within a given application domain, to receive the necessary training, and to extract insights from the (spatial) data at own pace. Within this approach, the user is also seen as 'co-creator' in the innovation process, and can give actionable feedback on how to make a visualization tool user-friendlier. The suggested approach is being set up and validated within the context of Open Transport Net, a CIP-funded project with four pilot sites in Birmingham (UK), Issy-les-Moulineaux (France), Antwerp (Belgium) and the Liberec Region (Czech Republic). A collaborative service Hub is being set up in these four pilot sites that is collecting, aggregating and harmonizing different spatial and non-spatial datasets to make visualizations in the city's specified applications domains, such as urban planning, infrastructure maintenance, road safety and infrastructure maintenance. The Hub should help both GI-experts and non-experts in making visualizations with the data. In general, to gather insights from the data, users should be able to identify clusters, be able to compare and review relationships, perceive commonalities and distinctions, etc. The Living Lab approach is using a set of ten evaluation metrics to evaluate the user experience of the OTN Hub, which are grounded in several usability, user satisfaction and acceptance studies (cfr. Freitas et al., 2002; Marghescu, 2008). In context of visualization, the 'quality of use' is being evaluated on the level of interaction with the tool, visualization representation and data itself. It is

hypothesized that for the evaluation of the visualization tool, these three different levels will strongly influence each other, and in turn the overall user satisfaction with the system. In the first testing phase of the Living Lab approach, several testing tasks will be performed to test the initial functionality and usability of the visualization tool, such as uploading a dataset, making a data mash-up with multiple datasets, etc. Based on the collected feedback, the chosen evaluation measures will be validated and other good practices for evaluating geo-visualizations will be distilled. In line with our study, it is advised to evaluate geo-visualizations in a more realistic user setting, to use proper metrics, and to investigate new evaluation produces, such as the Living Lab approach. Although the Living Lab approach might be time consuming to conduct, it will not outweigh the benefit of obtaining reliable results that can encourage widespread adoption of information visualization.

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