An Empiric Evaluation of the Affordances of Panorama Maps and Planimetric Maps in the Context of Alpine Ski Areas

The Example of SkiWelt Wilder Kaiser - Brixental

by **Jenny Janssen**

Many people across the world enjoy alpine winter sports. Since the advent of modern winter sports, in particular alpine skiing, ski areas have been depicted cartographically for the purposes of marketing and to provide an overview of the slopes and lift infrastructures available. The panorama map, considered the de facto standard for alpine winter sport areas (Tait, 2012)[1], is ubiquitous throughout most ski areas and used to entice prospective visitors and to help guide them on the slopes.

Context

Personal experience with panoramic ski maps and previous studies focusing on their usability including Balzarini et al. (2015)[2] and Balzarini and Murat (2016)[3] have led the author to explore alternative ways of depicting ski areas. The result is a planimetric ski map created by the author which, alongside a panorama ski map of the same geographical area, is the subject of the research for this thesis. This thesis aims to provide a better understanding of the affordances of the two map styles within the context of wayfinding, spatial cognition, emotional response and user needs by evaluating two depictions of one ski area and comparing how each performs in a user evaluation.

Fig. 2: Panorama ski map of the SkiWelt[4]

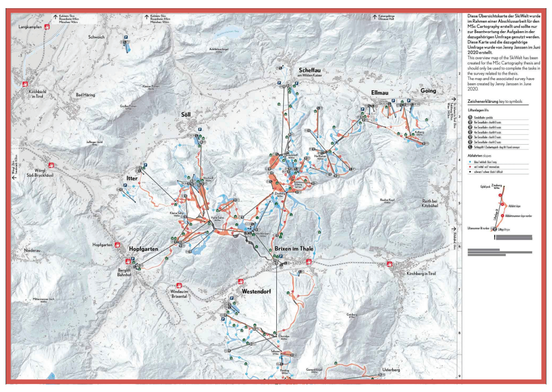

Fig. 3: Planimetric ski map of the SkiWelt

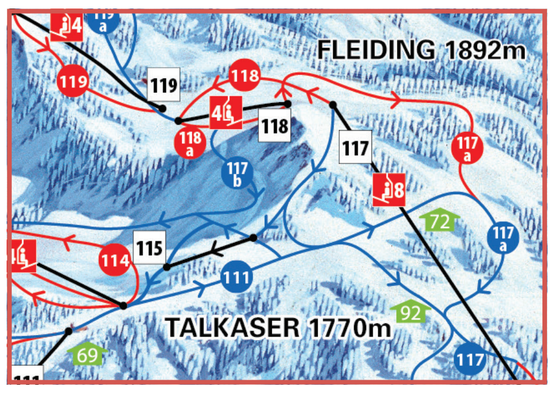

Fig. 4: Detail of panorama ski map[4]

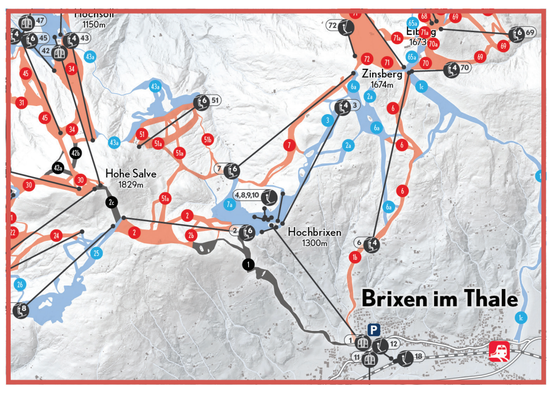

Fig. 5: Detail of planimetric ski map

Methodology

The core of the primary research for this thesis consists of an online-survey through which two random sample groups evaluate either the panorama map (Map A) [Fig. 2] or planimetric (Map Map B) [Fig. 3] of the SkiWelt Wilder Kaiser - Brixental, one of the largest ski areas in Austria. The questions and tasks contained in the survey correspond to the research objectives and research questions pertaining to the affordances of both maps within the context of assisting with wayfinding tasks, imparting geographic comprehension and eliciting emotional reaction and questions related to user needs.

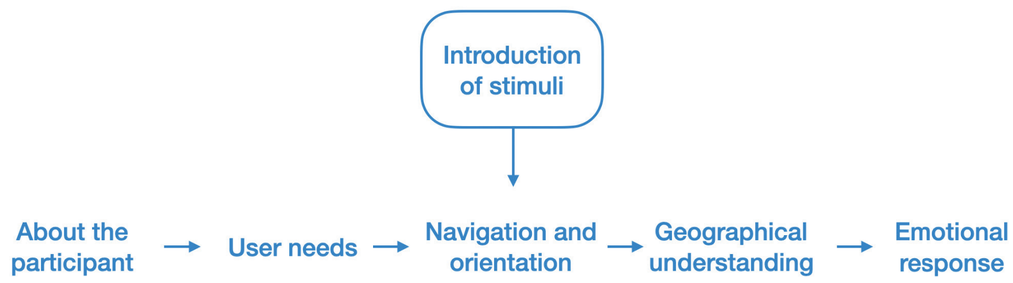

Fig. 6: Survey structure and point at which the stimuli (Map A or Map B) is presented to the user

Fig. 1: Skiers using a large panorama map

Results

By evaluating two very different map types and comparing the results, this thesis not only provides insight into how each map performs on its own but allows for a direct comparison of the results from two sample groups. Despite the stark differences which Map A and Map B exhibit, the overall results from the user evaluation are not clear cut, suggesting that neither map is completely successful. Rather, the results suggest that both map types have visual characteristics that are useful for navigation and orientation.

Conclusions

Changes to each map type to improve areas that are currently proving difficult to understand in the context of navigation and orientation may include:

- visualise the terrain more clearly on the planimetric map to enable a better understanding of the direction of lifts and slopes
- reduce the complex appearance of parts of the panorama map to improve finding locations
- consider adding more descriptive route information to lifts and slopes to reduce ambiguity

A suite of different map types to support the entire user journey of the alpine winter sport experience could help to avoid dual-use by not forcing one map type to fulfil several, possibly opposing, roles. One aim for future research may be identifying which map type is best suited for which activity, which user type and which communication channel.

Thesis Conducted at

Department of Geo-Information Processing
Faculty of Geo-Information Science and Earth Observation
University of Twente (UTwente)

Thesis Assessment Board

Dr. Franz-Benjamin Mocnik (Supervisor)

Florian Ledermann, TU Wien (Reviewer)

Prof. Dr. Menno-Jan Kraak (Chair)

Dr. Paulo Raposo (Local Coordinator)

Year

2020

Keywords

ski map, panoram, planimetric

References

[1] Tait, A. (2012). Mountain Ski Maps of North America: Preliminary Survey and Analysis of Style. *Cartographic Perspectives, 67*, 5–18.

[2] Balzarini, R., Dalmasso, A., & Murat, M. (2015). A Study On Mental Representations For Realistic Visualization: The Particular Case Of Ski Trail Mappings. *ISPRS - International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XL-3/W3*, 495–502.

[3] Balzarini, R., & Murat, M. (2016). The Effectiveness Of Panoramic Maps Design: A Preliminary Study Based On Mobile Eye-Tracking. *ISPRS - International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XLI-B2*, 361–368.

[4] SkiWelt Wilder Kaiser - Brixental Marketing GmbH (2020). *Winter Season.* https://www.skiwelt.at/de/skiwelt-wilder-kaiser-brixental-skigebiet-kitzbueheler-alpen.html

This master thesis was created within the Cartography M.Sc. programme – proudly co-funded by the Erasmus+ Programme of the European Union.

cartographymaster.eu