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BENEFITS THROUGH LINKING OF ANALOGUE AND DIGITAL MAPS

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BACKGROUND AND OBJECTIVES

Use of mobile devices with GPS and map function has been steadily increasing during the past years. But the presentation of map data is limited by the size of the display. In comparison, a conventional paper map delivers a quick overview and is intuitively accessible, making it still attractive for detailed route planning in tourism or for mobile data capture. Yet, paper maps are static and cannot be linked with existing digital content. By comparing the affordances of paper and electronic devices the authors show that the advantages of both media complement each other what provides arguments for the linking of the two.

APPROACH & METHODS

Consequently a concept to bridge the technological gap between analogue paper and the electronic domain is presented on the basis of the project NavAD (navigation support through linkage of analogue and digital maps). In the course of this project a map is printed on paper together with an unobtrusive background grid pattern developed by Swedish company Anoto. Since the Anoto pattern is unique at every position of the map, the location and movement of a digital pen that is wirelessly connected to a mobile device can be determined. The potential benefits of this technology are discussed on the basis of two application scenarios. One scenario is a map for tourists the other scenario uses a digitally enhanced map for mobile data capture.

RESULTS

In the first scenario a BlackBerry is used to receive the geocoded pen movements and link them to a map application on the device to enhance the interaction with a paper map for tourists with additional electronic functions and information. The design of the paper map has to be adjusted to avoid interference of the Anoto pattern. The user can interact with the electronic application by pointing the pen at special symbols on the paper. In the second scenario the electronic pen together with a paper form that includes a map is used for mobile data capture for road maintenance. The user can select an area in a GIS to have it printed on a form with Anoto pattern. Then the manually captured data can be transferred to a GIS and synchronized with existing data sets.

CONCLUSION AND FUTURE PLANS

A detailed compilation of previous scientific work in this field has given motivation to investigate the linking of analogue and digital maps. Depending on the application scenario test cases will be developed further to allow information flow in both directions. Hence, the maps developed in this project shall serve as an interface to access information as well as to insert new information into the digital system. Although the developed prototypes are still in an early stage of development, they show that this project is feasible and beneficial for the map user however further studies on the acceptance of end users still need to be conducted. The work done so far raises the question whether in such a near future scenario the paper map's affordance of giving information can be better fulfilled by the linked electronic device while the affordances of giving overview and orientation remain, thus changing the general role of the paper map.