

## **TeleCartography: Applying maps to mobile wireless handheld devices**

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The Internet is changing the way maps are used. It acts as a stimulant for map production and map distribution. Applied web mapping techniques are often seen as a major step in the development of cartography (Peterson 1999). The main advantages of Internet Cartography are described as gaining better accessibility for the user, enabling higher actuality (van Elzakker 2000) or easier distribution of maps. But, the efficiency of the usage of Internet-based applications, as any other digital mapping application, is determined and restricted by the main attributes of the machines, which are used for accessing and interacting with mapping systems. As one of the main attributes, Computers are usually not highly mobile. For a lot of cartographic applications this missing mobility and the fact, that the user has to find access to a machine in order to get his information or map, is not a major disadvantage. But for enabling mapping systems, which could serve products independent from the position/location of an user, in terms of "giving you the information right there where you need the information", the availability of mobile input/output machines and the availability of an infrastructure for wireless submission of information to any location are necessary preconditions.

The infrastructures and technologies of telecommunication systems are developing rapidly. They have reached a stage, where they are judged as a mass market industry. In Austria, more than 5 Mio. cellular phones are used by a total population of 8 Mio. New technologies like the Wireless Application Protocol (WAP) or the Universal Mobile Transfer System (UMTS) together with new functionalities of cellular phones and other wireless handheld devices allow now not only the display of graphics, the enabling of some kind of interactivity but also the development of so-called location based services. This fact, together with the predicted merging of computer industries with telecommunication industries enables for the first time, that the vision of serving actual and interactive cartographic products independent from time and space could become true.

In this paper it will be argued, that the regained mobility of cartographic products and services can be seen as a major stage in the digital (r)evolution of cartography, especially because of the consequences to the usage of maps. TeleCartography as an enlargement of Internet Cartography is using a client/server - structure known from the Internet, adapted by the fact, that the client is mobile. It will be analyzed, which technologies are currently available or will be launched soon. A status quo report of location based services is given. Finally, cartographic concepts and first prototypes of location based services of a TeleCartography project of the Department of Cartography / TU Vienna are described and compared with international examples.