

# Changes in map use after digitalisation: results from online surveys at three time periods

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## Abstract:

The impact of information and communication technologies (ICT) on cartography and map use can be divided into two phases, viz., digitisation and digitalisation (Brennen and Daniel Kreiss, 2016). Whereas previous studies on cartography have focused on digitisation as the material process of converting analogue streams of information into digital bits, few studies have focused on digitalisation as the mechanism through which numerous domains of social life are restructured around digital communication and media infrastructure. However, the scope of ubiquitous mapping embraces advanced digitisation technologies and the social impact of digitalisation. To address this issue, Wakabayashi (2022) examined the impact of digitalisation on map use, focusing on intergenerational differences based on an online survey in Japan. Data equivalent to this survey were available for 2014, 2018, and 2022. Hence, the author examined the changes in map use after digitalisation by employing data from three time periods.

The data used in this study were derived from online surveys conducted in three time periods of 2014, 2018, and 2022. The questionnaire was designed to gather data on the respondents' current state of map use, their usage of ICT devices, their degree of geospatial awareness, and demographic attributes. We outsourced the sampling and data collection to an Internet-based marketing company. Respondents comprised residents aged 15 years and over in the Tokyo Metropolitan area and featured equal distribution among age groups and sexes. We analysed data from 624, 624, and 664 samples for each period.

A comparison of the answers between the three periods revealed stable trends and temporal changes.

A notable feature of the stable trend is the growing effect of the Internet platform: the majority of respondents used Google Maps (Fig. 1). This can lead to Google's influence on the content and representation of maps on the web. While the use of web maps on smartphones and mobile devices has increased, the use of maps with personal computers has declined (Fig. 2). These changes can be derived from the use of digital maps, mainly for navigating outdoors. Consequently, the reason for the choice of maps has changed: operability and reliability rather than choice of expression have become important (Fig. 3). This suggests that both content and usability are important for maps on the web. Respondents evaluated whether the use of digital maps increased the efficiency of spatial behaviours (Fig. 4). However, a matter of concern is that respondents have lost interest in maps or geography over the years (Fig. 5), which may lead to deterioration of their map literacy.

However, some temporary changes were observed between 2018 and 2022. Whereas maps are mainly used for tourism and recreation, the percentage of map users for these activities has declined. Instead, the respondents' use of hazard and medical/welfare maps has increased (Fig. 6). This reflects people's interest in the frequent occurrence of natural hazards in recent years and the outbreak of COVID-19 since 2019. Additionally, the rate of map use in navigation was reduced, probably owing to the voluntary restraint of travel during the coronavirus crisis. Hence, the COVID-19 pandemic has accelerated the digitalisation of maps and changed people's use of maps.

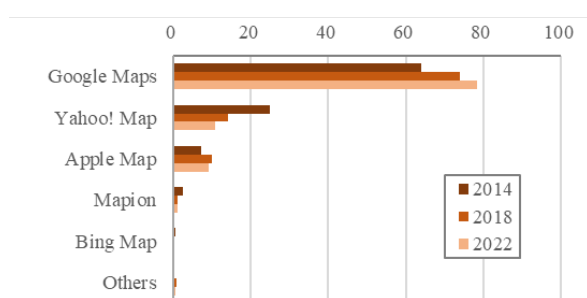


Figure 1. Percent of most frequently used web map

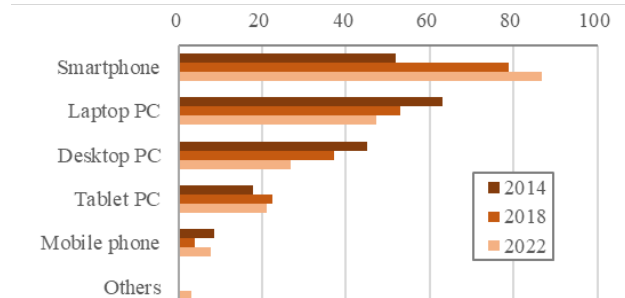


Figure 2. Percent of devices for using web maps

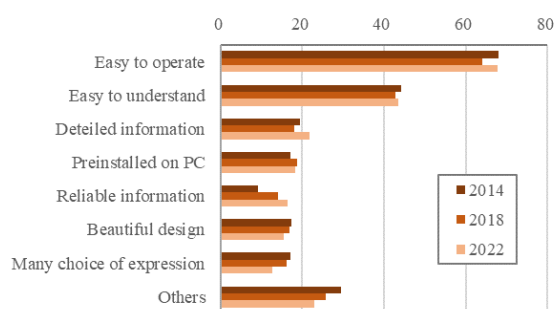


Figure 3. Reason for choosing a web map

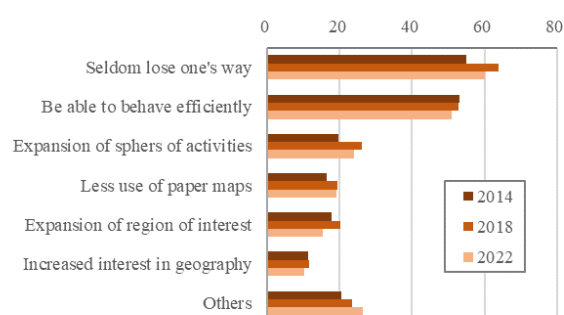


Figure 4. Changes after using web maps

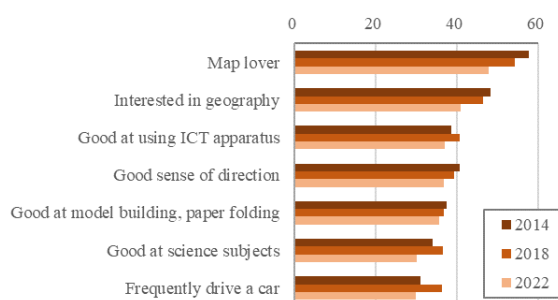


Figure 5. Answers to the items of geospatial awareness

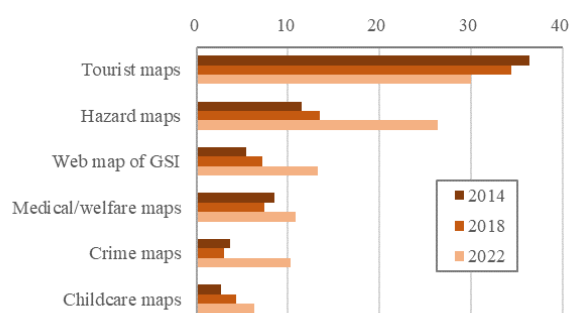


Figure 6. Percent of users by type of the web map

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