Functionality similarities of global web mapping services in the context of responsive map design

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Abstract:

The problem discussed in this research is connected with the functionality of the graphical user interface (GUI) of global web mapping services displayed on different devices. Displaying a mapping service on devices with diverse display screen size causes the adaptation of the graphical user interface to the size of the screen. This adaptation is the result of the responsive design technique which enables one to display the same web content on different devices. Eight global web mapping services: Google Maps, Bing Maps, OpenStreetMap (OSM), Baidu Maps, Yandex Maps, 2GIS, MapQuest, and HERE WeGo, constituted the source of the data. All of them were displayed on four display screens: the monitor of a personal computer, laptop, tablet, and smartphone in order to compare the similarities in the adaptation of GUI, its functions and map content.

The aim of the research conducted was to find different solutions for displaying GUI of the same mapping service on diverse display screens of various devices and to track which functions are the most common and how they differ in terms of graphics.

Methodology of the research is based on the comparative analysis of eight global web mapping services in terms of the number of GUI buttons, their layout, graphic style, the map functionality, and map content displayed on four devices of different display screen size.

The results showed that most of the global web mapping services adapt to the device and their way of use. Some of them are also responsive in the context of external conditions. Interestingly, the adaptation between the PC monitor, laptop and tablet occurs only by changing the size of GUI buttons, other functions remaining the same. Only in the case of smartphones GUI adapts to the size of the device, the number of buttons decreases and their layout changes, new functionality is available (e.g. day/night mode), and the map content is more generalized. On that basis, authors concluded that GUI of global map services constituted a good example of responsive web design.